
IRRIGATION

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SPECIAL AGENT FOR IRRIGATION

CONTENTS—IRRIGATION.

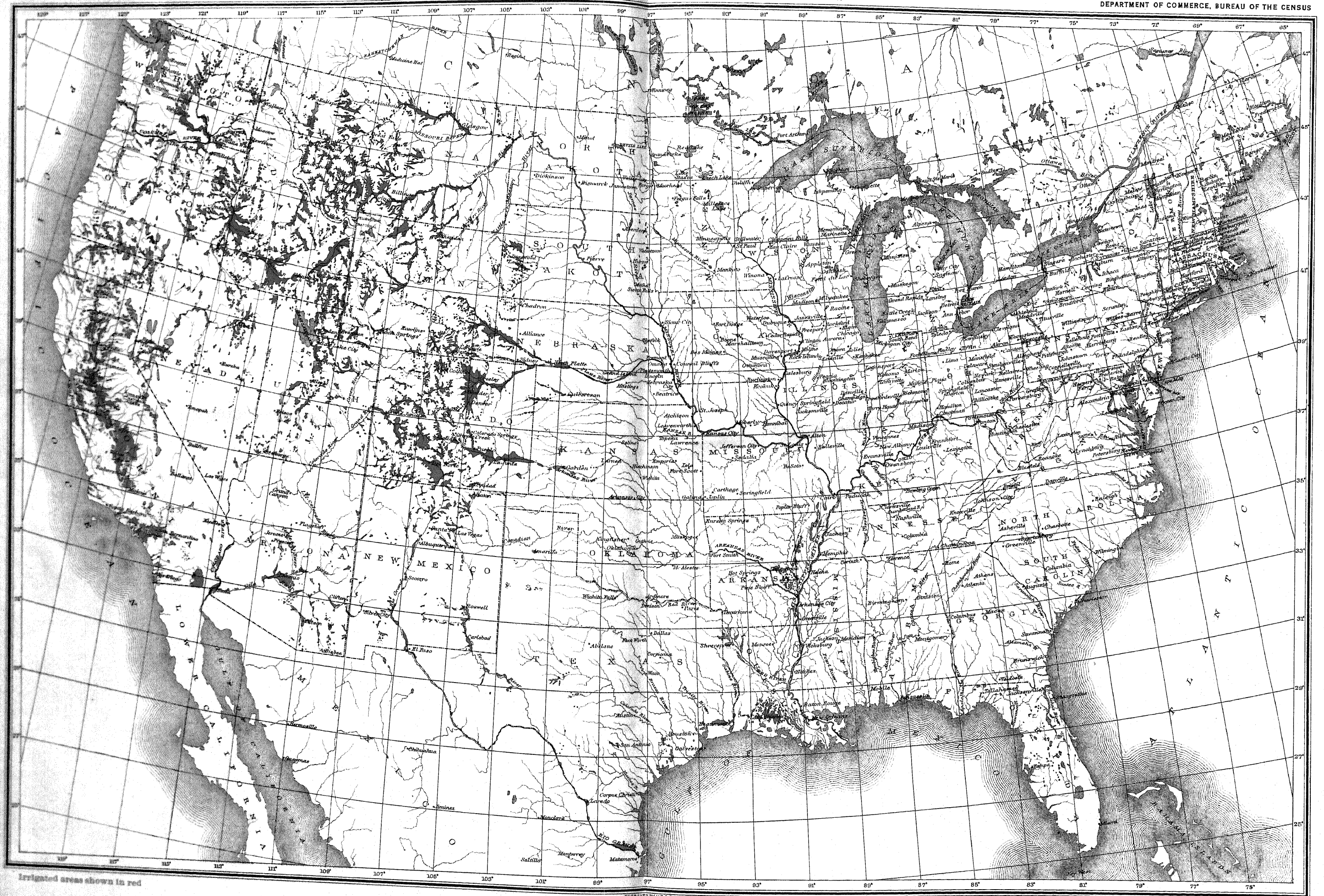
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Irrigated areas shown in red

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IRRIGATION.

INTRODUCTION.

Scope of the census of irrigation.—The basic inquiries included in the census of irrigation, taken as a part of the Fourteenth Census, are the area of land under irrigation, the capital invested in irrigation enterprises, the character of irrigation enterprises, and the crops grown under irrigation. The law providing for the Thirteenth Census directed that inquiries be made regarding other phases of irrigation, notably, prices of land and water rights, amount of water used per acre, and physical condition of irrigation works, and these inquiries were continued in the Fourteenth Census, although they are of secondary importance.

Territory covered.—The census of irrigation is confined to the part of the United States in which irrigation is a recognized feature of agricultural practice. It covered the following states: Arizona, Arkansas, California, Colorado, Idaho, Kansas, Louisiana, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming. In the remainder of the United States irrigation is practiced to a limited extent in the growing of fruit and truck crops by scattered individuals, but most crops are grown without it, and irrigation is only incidental to accepted agricultural practice; consequently this part of the country was not covered by the irrigation census, although certain questions relating to irrigation were included in the farm schedule and the replies to these have been tabulated separately. In Arkansas and Louisiana irrigation is limited to rice growing.

In the reports of the Thirteenth Census the data relating to rice growing were presented separately from the data for the arid region because rice growing was confined principally to parts of Arkansas, Louisiana, and Texas, where other crops were not irrigated. Since 1910 rice growing has assumed large proportions in California, where the area devoted to rice is not segregated from other irrigated land; consequently, the data relating to rice growing is not reported separately in the Fourteenth Census.

Reports of the Fourteenth Census.—The reports of the Fourteenth Census relating to irrigation are as follows: A report for each of the states covered by this inquiry, a summary for the United States, based on the state reports, and this report, which consists of the state and United States reports, a general discussion of the results, and several special tabulations not included in the United States summary and the state

reports. In addition to these separate reports, a chapter on irrigation is included in the Abstract of the Fourteenth Census.

Previous reports.—Inquiries relating to irrigation have been included in the Eleventh, Twelfth, and Thirteenth Censuses, and a special census of irrigation was taken in 1902. Reports for all of these inquiries have been published and the results are used in this report for purposes of comparison. No statistics of irrigation prior to 1889 are available, but in this report all data are classified by the dates of beginning of the enterprises supplying water, making it possible to show the progress of irrigation development prior to 1889 with some degree of accuracy.

Date of the census.—The date of the Fourteenth Census was fixed as January 1, 1920, while that of the Thirteenth Census was April 15, 1910. In each case the statistics of farms and area irrigated and of crops grown under irrigation relate to the preceding calendar year, so that the change of date does not affect comparisons in any way, the period covered being exactly 10 years. In each case the statistics of acreage to which existing enterprises are capable of supplying water relate to the year in which the enumeration is made, and here also the period covered in making comparisons is exactly 10 years. In the Fourteenth Census the capital invested in irrigation enterprises is reported as of January 1, 1920, while in the Thirteenth Census it is reported as of July 1, 1910, and the period covered in comparisons is 9½ years.

Method of collecting information.—The plan adopted for making the canvass for irrigation provided that the regular census enumerators should obtain from the persons controlling irrigation enterprises schedules representing small enterprises watering from one to three farms at the same time that they made the canvass for population and agriculture; and that special agents should obtain schedules for the larger enterprises and any small ones missed by the enumerators, after the canvass by the enumerators was finished. This plan was followed, and proved quite satisfactory.

Accuracy of results.—In general, the principal causes of inaccuracies in census reports are incompleteness in the canvass, lack of exact knowledge of facts on the part of those supplying information, carelessness on the part of enumerators in recording the information furnished them, and the errors incident to the handling of so large a mass of statistics in the short time allowed for the work.

There is no way in which the completeness of the canvass can be determined with absolute certainty, since there are no exact records against which returns can be checked. Both supervisors and enumerators, and most of the special agents, were local people who should know of the existence of all enterprises; in the sections covered by the irrigation canvass almost all enumerators and all special agents were working on a per diem salary and consequently would not be tempted to omit enterprises difficult of access; the farm schedule contained inquiries as to irrigation enterprises from which water was obtained, and all irrigation schedules were checked against the farm schedules to see that schedules were received for all enterprises shown on the farm schedules. In view of all these facts, it is believed that the canvass for irrigation was approximately complete.

As an offset to errors due to omissions, there is the possibility of duplication. Some farms receive water from more than one enterprise, and there is the possibility that they will be included in the areas served by all the enterprises from which they receive water; some enterprises extend into more than one county or state, and they may be reported more than once; and again, some enterprises are known by more than one name and may be reported more than once. Great care was exercised to eliminate duplication, and such as occurs tends to compensate for any incompleteness in the canvass that may have occurred.

The degree of probability of error on account of lack of knowledge of the facts varies considerably with the different inquiries on the irrigation schedule and the different classes of enterprises.

The inquiries which serve for classifying the data, namely,—source of water supply, character of enterprise, and character of water rights—should be correctly answered since it is probable that the owners of practically all enterprises, large and small, have exact knowledge on these points.

With regard to many of the points covered by the description of irrigation works, there will be a lack of exact knowledge. This is particularly true of capacities of the smaller ditches, length of the smaller ditches, capacities of the smaller reservoirs, and the capacities of wells, pumps, and engines. Most of the owners of pumps and engines should know the capacities at which their pumps and engines were rated by their manufacturers, but, in many instances, these ratings vary widely from that attained in actual practice. Most wells have never been tested beyond the capacities of the pumps being used in them, and it is probable that in only a small percentage of cases have the volumes pumped been measured. Therefore, the reported capacities of pumped wells represent the owners' estimates of what has been pumped from them, based on the rated capacities of the pumps used, not the volume of water that can be pumped from them, as determined by tests or measurements.

The owners of the small individual and partnership irrigation enterprises are likely to have quite accurate knowledge of the areas irrigated in 1919, since they are also the users of the water. The officials of the organized enterprises are not so likely to know the exact areas irrigated, since their records show, generally, only the areas for which the water users are entitled to receive water or do receive water, and not what is done with the water delivered. Usually in the larger enterprises farmers obtain rights to water for their entire farms, while it is seldom that a farmer actually applies water to his whole farm. For these reasons there will be a tendency for the areas reported to exceed the areas actually irrigated.

The statements as to area to which enterprises were capable of supplying water in 1920 are estimates, based on the condition of the works and the expected water supply. Here, also, there is a tendency for the area reported to exceed that for which water is actually available.

The area included in enterprises represents the estimates of promoters and, no doubt, it is greater than the area to which the enterprises reporting will be able to supply water when they are completed.

The area of irrigated land available for settlement represents the estimates made by officials of enterprises of the area to be irrigated by their enterprises that is not included in farms already settled. There is some tendency toward overestimates in this item.

For capital invested in irrigation enterprises, the amounts reported for the individual and partnership enterprises are almost all estimates. The larger parts of the works of such enterprises were built by the owners or their predecessors without any records of expenditures of money or time, and the same is true of many of the cooperative enterprises. It is probable that the estimates for many of these enterprises are too small. The amounts reported for the larger enterprises are much more likely to be based on records and, therefore, to be much more accurate. The totals ought to be approximately correct, with a slight tendency to be too small.

For many enterprises the cost of operation and maintenance was not reported and no attempts to estimate this cost were made. It is probable, therefore, that the cost that is reported is based on records and is correct. In tables showing this item the areas represented are shown in order that the reader may form his own judgment as to the value of the averages given.

The same condition exists with reference to the data relating to the quantity of water used. No estimates have been made for enterprises for which this item was not reported, and the data representing estimates and those representing measurements are shown separately. In every case the area represented is given to serve as an index to the value of the averages.

The area for which drains have been installed should be accurate, but the additional area in need of drainage is, in the nature of things, an estimate, based on the opinion of the person supplying the information.

The returns for irrigated crops were taken from the farm schedules. These schedules contained inquiries as to whether any crops were irrigated and whether any crops were grown without irrigation and called for the area irrigated, in case any crops were irrigated. Enumerators were instructed to mark the crops that were irrigated, but there were many schedules reporting irrigated land on which the enumerators had marked no crops as being irrigated. Clerks were instructed to mark as irrigated, on such schedules, the crops most likely to have been irrigated in the sections from which the schedules came. Under these conditions, the reports for irrigated crops are not satisfactory, particularly as to total areas and yields. The areas correctly reported are sufficiently large to make average yields quite reliable. The values of irrigated crops are computed from the reported yields and average values per unit supplied by the Bureau of Crop Estimates of the United States Department of Agriculture.

The magnitude of the work and the speed with which it must be done preclude any checking by the

agents of the bureau of the correctness of the information given by owners or officials of irrigation enterprises. The time and expense involved in making surveys to determine irrigated areas and in checking accounts to determine capital invested would be so great that such courses are out of the question.

The schedules were all examined in the bureau for errors made by enumerators, and in cases in which questions applicable to the enterprises represented were not answered, and in cases in which answers that appeared to be unreasonable were given, letters were written to those supplying information asking them for additional information. Answers that seemed reasonable were not questioned. While enumerators may have made mistakes in entering such answers there is no way in which these mistakes can be detected, and it is not believed that they are numerous enough to affect the general accuracy of the results.

Every care was exercised to secure accurate work in tabulation, but it is not to be expected that errors have not been made. However, there is in work of this kind a strong tendency for errors to compensate, and almost no opportunity for cumulative errors. The results, as a whole, are believed to be substantially correct, with a slight probability of exaggeration in areas.

DEFINITIONS AND EXPLANATION OF TERMS.

Irrigated land.—The following instructions, given to those who made the canvass for irrigation, show what land was to be reported as irrigated: "Land should be classed as irrigated which has water supplied to it for agricultural purposes by artificial means or by seepage from canals, reservoirs, or irrigated lands, but land which has natural ground water sufficiently near the surface to support plant life should not be classed as irrigated. Land which is flooded during high-water periods should be classed as irrigated, if water is caused to flow over the land by dams, canals, or other artificial means, but should not be classed as irrigated if the overflow is due to natural causes alone."

Farms irrigated.—The number of "farms irrigated" is the number on which irrigation is practiced, and for the census of irrigation a "farm" is defined as for the general census of agriculture; that is, to be classed as a farm an establishment either must be 3 acres in extent or must have produced crops to the value of \$250 in 1919, or must have required for its agricultural operations the continuous services of at least one person. "Number of farms irrigated" as used in this report and in that of 1910, is equivalent to the term "number of irrigators" used in census reports on irrigation previous to 1910. The number of farms irrigated in 1919, as given in this report, is the number of farm schedules showing irrigation.

Irrigation enterprise.—An "enterprise" is an independent irrigation establishment and includes the works for supplying water and the land to which water is supplied or is to be supplied, except that the cost or value of the land is not included in the "capital invested." An enterprise may represent a small ditch or pumping plant watering a single small farm, or a great system of canals and reservoirs operated under one management, supplying thousands of farms. Consequently the number of enterprises reported is not of much consequence as an indication of the extent of irrigation. It is of importance for indicating whether land is supplied with water by independent enterprises controlled by individual farmers and requiring no extensive financing or construction, or by large enterprises involving organization, financing, and large-scale construction prior to settlement. The establishment of the smaller enterprises progresses naturally without the need for public supervision or control, but the establishment of the larger enterprises has involved both Federal and state legislation covering every phase of organization and management.

Areas irrigated, in enterprises, and available for settlement.—The area irrigated is the acreage to which water was actually applied in the season preceding the census year—1919 for the Fourteenth Census and 1909 for the Thirteenth Census.

Acreage to which enterprises were capable of supplying water relates to the season following the time of taking the census and, consequently, is based on estimates made by those controlling the enterprises.

Acreage included in enterprises represents the extent of the plans of those controlling enterprises.

Acreage of irrigated land reported as available for settlement relates to land within existing enterprises and not to land that is susceptible of reclamation and settlement by new enterprises or extensions of existing enterprises.

Character of enterprises.—As stated previously, the establishment of large irrigation enterprises is controlled to a large extent by Federal and state legislation. The Federal Government is engaged directly in the construction and operation of irrigation works, and the several states have enacted laws to aid and encourage the establishment of large enterprises. The areas reported as irrigated and in enterprises will indicate the degree of need for further public aid or encouragement in the establishment of new enterprises.

The Fourteenth Census Act provides for inquiries as to the "location and character" of irrigation enterprises. The Thirteenth Census Act called for the same information, and provided further for showing in the reports the land irrigated under state and Federal laws, and whether water was obtained from national, state, or private works. In the reports of the Thirteenth Census the state and Federal laws for direct construction or for aid and encouragement to organization and construction under which enterprises operated were made the basis of the classes of "character" into which all enterprises were divided, and the same classification has been continued in the reports of the Fourteenth Census. The classes of enterprises under which all data are classified are as follows:

United States Reclamation Service enterprises, which operate under the Federal law of June 17, 1902, providing for the construction of irrigation works with the receipts from the sale of public lands and with other funds provided by subsequent legislation. In addition to serving land within its own projects, the United States Reclamation Service supplies stored water to land within other enterprises.

United States Indian Service enterprises, which operate under various acts of Congress providing for the construction by that service of works for the irrigation of land in Indian reservations.

Carey Act enterprises, which operate under the Federal law of August 18, 1894, granting to each of the states in the arid region 1,000,000 acres of land on condition that the state provide for its irrigation, and under amendments to that law granting additional areas to Idaho and Wyoming. The conditions contained in this law necessitate state legislation before the law becomes operative, thus Carey Act enterprises operate under both Federal and state laws.

Irrigation districts, which are public corporations that operate under state laws providing for their organization and management, and empowering them to issue bonds and levy and collect taxes with the object of obtaining funds for the purchase or construction

and for the operation and maintenance of irrigation works. They are controlled by the owners of the lands forming the districts through boards of directors elected by the landowners. Irrigation districts are more often organized for the purchase of irrigation works built by other agencies than for the purpose of building new works. In this report all enterprises now operating as districts, except those organized to take over and operate works built by the United States Reclamation Service, are reported as districts. In the case of United States reclamation enterprises, they are not reported as districts because the Reclamation Service still controls the projects to a large extent, and the districts are organized principally for the purpose of collecting charges due for water.

Cooperative enterprises, which are controlled by the water users under some organized form of cooperation. The most common form of organization is the stock company, the stock of which is owned by the water users. Some states have special laws providing for the organization of such stock companies, and in those states in which they are organized under general incorporation laws there are laws regulating their actions to some extent. The state laws governing operations under the Carey Act provide that works built under these laws shall be turned over to stock companies composed of the water users when certain payments have been made, and many commercial enterprises are organized on the same plan. In the Southwest, where irrigation was practiced before this territory became a part of the United States, much of the land is watered by "community ditches," or "public acequias," which are organized and operated in accordance with old Mexican customs providing for the election of officials by the landowners and for forced labor on repairs and cleaning. These enterprises are classed as cooperative.

The United States Reclamation Act provides that when the payments required by that act are made for the major portion of the lands in any enterprise, the management and operation of the works shall pass to the water users "under such form of organization * * * as may be acceptable to the Secretary of the Interior." Originally the Secretary of the Interior favored the organization of stock companies for taking over reclamation projects, but more recently he has favored the organization of irrigation districts.

Many of the enterprises now reported as cooperative enterprises were originally in some other class and have become cooperative.

Commercial enterprises, which supply water for compensation to parties who may own no interest in the works. Such enterprises may be organized in any form, but their operations are subject to some degree of public control in most states. This was the earliest type of enterprise for the construction of large irrigation works. Such enterprises built irrigation works and sold rights entitling the purchasers to receive water from their works upon the payment of annual charges, but conveyed no interest in the works. Many of the states have enacted laws prohibiting the sale of such rights, and commercial enterprises organized since the passage of these laws usually sell stock representing part ownership in the works, to become effective upon the payment of specified portions of the purchase price. These enterprises eventually become cooperative. There are some commercial enterprises that sell no rights but supply water to the public for charges based, in some instances, on acreage served, and in other instances, on the quantity of water delivered. In most states rates charged by commercial enterprises are subject to public control.

Individual and partnership enterprises, which belong to individual farmers or to neighboring farmers, who control them without formal organization. State laws provide the procedure for compelling part owners in partnership ditches to contribute their share of the labor and expense of operation and maintenance.

Capital invested.—The capital invested in irrigation enterprises is that reported by the owners. For the larger works the capital invested is taken, in most

cases, from books of account and represents the actual investment. In the case of most of the private and partnership and many of the cooperative enterprises, however, the works were built by their owners without records of labor or money expended, and the capital reported represents the owners' estimates. The schedules used in 1910 called for "cost," while the schedules used in the present census call for "capital invested," but the instructions accompanying the schedules make these two terms equivalent. In both cases the investment includes cost of construction and of acquiring rights. The latter usually consists of filing fees only, but in some instances it includes the purchase price of rights. However, these cases are so rare that they are unimportant. The cost reported for 1900 is designated "cost of construction," but probably includes the cost of acquiring rights as in 1910. For the Thirteenth and Fourteenth Censuses the average cost per acre is based on the acreage which enterprises were capable of irrigating in the census year and the cost to the date of the census—January 1, 1920, for the Fourteenth Census, and July 1, 1910, for the Thirteenth Census. Capital invested in enterprises for which this is not reported is computed by multiplying the number of acres to which the enterprises not reporting capital were capable of supplying water in the census year by the average capital per acre for the other enterprises of the same class in the same county. When the acreage for which capital was reported in any county was not sufficient to justify its use as a base for an average, the average for some other county having similar conditions was used. However, the percentage of enterprises not reporting capital was very small.

Operation and maintenance.—Cost of operation and maintenance was not reported on all schedules, and averages are based on the acreages irrigated in 1919 by the enterprises for which cost is reported. No estimate of total cost of operation and maintenance for all irrigation enterprises has been made, but if such a total be desired, it is probable that a total obtained by applying the average cost per acre in each state to the total acreage irrigated in that state, and adding these state totals for a United States total would be approximately correct. In the case of enterprises operating pumping plants the cost of operation and maintenance includes cost of fuel and attendance. In all cases the acreages on which averages are based are given to serve as guides to the value of the averages.

Water rights.—A water right is a right to take and use water from some specified source and to continue such taking and using of water from year to year. Water rights are divided into two general classes, with reference to the source of supply: (1) Rights to take water from natural sources, and (2) rights to take water from artificial sources, such as irrigation canals, which receive water from natural sources. The nature and

extent of rights of the first class are governed by state laws, while those of the second class are governed by contracts, rules, and regulations of irrigation enterprises.

There are in effect in the states where irrigation is practiced two more or less conflicting systems of laws governing water rights: (1) The English common law doctrine that the right to use water from a stream or other body of water attaches to land abutting on the stream or other body of water, known as the riparian doctrine; and (2) the American doctrine that water may be taken from streams without reference to the location of the place of use, known as the doctrine of appropriation.

In all states where irrigation is practised rights by appropriation are recognized, and some of the states recognize riparian rights also. In the reports contained in this volume the irrigated land has been classified by the character of rights under which it receives water. The classes used are defined as follows. They are discussed more fully in the various reports.

Appropriation and use.—In most of the states irrigation began before the states assumed control over water, and those needing water took it and used it. Their rights to continue the use were recognized by the courts and later by legislation, and many rights have no other basis.

Notice filed and posted.—The first step in public control of the use of water was the enactment of laws requiring those wishing to acquire rights to water to post at the points where water was to be taken notices of their intentions, or to file such notices with county officials, or to both post and file notices. These were to serve as notice to those coming later of the existence of the prior rights represented by the notices. In many of the states laws required all parties who had appropriated water before the passage of the laws to file notices of their claims, with the object of making complete records of rights; and many rights, originally acquired by appropriation and use, passed into this class.

Adjudicated by court.—Rights acquired by appropriation and use, and those represented by notices filed and posted, while they are recognized by law, are not defined as to extent or priority, since, in the first class there is no record on these points, and in the second class the records may bear no relation to the facts. When rights come into conflict they are carried into the courts and are then defined or adjudicated, and pass from the other classes into this class. Most of the states have laws providing special procedure for water-right cases. These are discussed in the United States summary and the state reports.

Permit from state.—The evident disadvantages of having rights undefined until they come into conflict and are adjudicated by courts, and the advance in the completeness of public control have led in most states to the enactment of laws requiring parties wishing to acquire rights to apply to some state official or board for permits. These applications must set forth in detail what is intended, and in their approval the boards and officials fix conditions as to extent of rights and time within which works must be completed, etc. Rights are not complete until proof of compliance with the prescribed conditions has been submitted, and certificates are granted by the state, but they are defined as they are acquired rather than only after they come in conflict with other rights. Rights reported in this class are in the process of being acquired rather than vested.

Certificate or license from the state.—The states having laws requiring applications for permits provide for the issuing of certificates or licenses when works have been completed and water put to use in

accordance with the terms of the permits issued, and some of the states provide also for the issuing of certificates when older rights are adjudicated by courts or administrative boards. This class includes all rights represented by such certificates or licenses, and may include rights originally in any one of the other classes named.

Riparian rights.—Rights in this class are those based on the ownership of land abutting on the source from which water is taken, in the states which recognize such rights. The most common interpretation of riparian rights in the western states is that the owner of riparian land may make any reasonable use of the water that will not interfere with a like reasonable use by all other owners of land riparian to the same source. Under such an interpretation the right is not fixed as to extent or nature, but depends upon the number of other owners and their needs.

Underground.—In most states public control of the use of water has not extended to wells, and, consequently, these have been put in a class by themselves. This class includes all land watered from wells.

Source of water supply.—The classes of sources of water supply into which all data are divided are self-explanatory. In making this classification for the reports of the census of 1910 all acreage was credited to what seemed to be the principal source of supply, while in the reports for the census of 1920 the attempt is made to represent the facts more closely by presenting various mixed classes.

Date of beginning.—In the reports that follow, all data collected in the census of 1920 have been classified by the date of the beginning of the enterprises supplying water. The date of beginning of an irrigation enterprise is, in some cases, the date when construction began, and, in other cases, the date of filing a claim or of applying for a permit. If a filing or application for permit was made and work was begun and continued with reasonable diligence the date of filing is considered the date of beginning, otherwise the date of construction is taken as the date of beginning. This classification should indicate the extent to which the plans of promoters of irrigation enterprises are realized in various periods of time after their beginning, which is a very important factor in financing irrigation enterprises.

Drainage basins.—In all previous regular censuses of irrigation all data have been presented by states and counties, but for determining the extent to which

various stream systems have been utilized and the possibilities of further development, the drainage basin is the more logical unit of territory. In the reports that follow all data are presented by drainage basins as well as by states and counties. The results of a special census of irrigation taken in 1902 were reported in this form, and these are included in the reports of this census, for purposes of comparison. The drainage basin of a stream consists of all land drained by the stream and its tributaries.

Units of quantity and capacity.—Capacities of canals, reservoirs, wells, pumps, and engines, and quantities of water used are expressed in the units commonly used in engineering literature to express the same items. They are as follows:

Capacities of canals and volumes of flowing water are given in second-feet, a shorter equivalent for cubic feet per second.

Capacities of wells and pumps are given in gallons per minute. Four hundred and fifty gallons per minute equal 1 second-foot.

Capacities of reservoirs are given in acre-feet. An acre-foot is the quantity of water that will cover 1 acre to a depth of 1 foot. It equals 43,560 cubic feet.

Capacities of engines and motors are given in horsepower. One horsepower is the power required to lift 33,000 pounds through a vertical distance of 1 foot in 1 minute of time.

Farm value of crops.—At the census of 1920, whenever a unit value for a crop could be used, such as the value per bushel or ton, the farmer was asked to report the acreage and production of each crop, but not the value. To supplement the information obtained from the farmers, the Bureau of Crop Estimates of the United States Department of Agriculture secured by special schedule from its crop reporters average values for such crops. These special schedules were tabulated by the Bureau of the Census, and the resulting averages, approved by the Bureau of Crop Estimates as representing a fair average of the farm value per unit, were used in computing most of the crop values presented in the accompanying tables.

For some products it was not possible to find any satisfactory unit on which to base a computation of the total value. Values were therefore obtained on the 1920 census schedule for vegetables, other than potatoes and sweet potatoes, and for the farm garden.

GENERAL DISCUSSION OF RESULTS OF IRRIGATION.

ACREAGE IRRIGATED.

The total area reported as irrigated in the United States in 1919, exclusive of the small areas of truck and fruit that are watered in the humid region, is 19,191,716 acres, an increase of 4,758,431 acres, or 33 per cent over the area reported as irrigated in the same territory in 1909. The increase in the area irrigated during the preceding decade was 6,688,818 acres, indicating that the rate of expansion during the last decade was much less rapid than that of 1899 to 1909.

Climatic conditions in 1919 were such that some land that is irrigated in normal years was not watered in that year. In the northern part of the Great Plains, in Montana, Wyoming, North Dakota, and South Dakota, the precipitation was much below normal, and streams were so low that there was no water for much of the land ordinarily irrigated. In the southern part of the Great Plains, in Oklahoma, Texas, and New Mexico, the condition was just the opposite—the rainfall was so heavy that land ordinarily watered needed no irrigation, and was not

reported as irrigated in 1919. It is not possible to determine from the returns the extent of the area ordinarily watered which did not receive water in 1919 on account of too much or too little precipitation. A comparison of the areas irrigated in the plains section of Montana, taken as a whole, in 1919 and 1909, shows a decrease of more than 200,000 acres. County boundaries were changed so much that comparisons for smaller sections are not possible, but it is known that in some sections the area irrigated in 1919 was greater than that in 1909; consequently it seems probable that the area not watered in 1919 in eastern Montana exceeded 200,000 acres. No estimate of the area in Texas and New Mexico that is ordinarily watered, but not in 1919, is justified by the returns.

The period from 1899 to 1909 was marked by a great speculative boom in irrigation development by private agencies, and by the beginning of works under the United States Reclamation Act in 1902. At the end of the decade the boom had spent itself and the Reclamation Service had spent its accumulated funds and has been compelled to proceed less rapidly than before. Between 1909 and 1919 there was no such activity, but a more normal expansion.

Government limitations on the issuing of securities during the world war probably checked reclamation work to some extent, although this was offset by the demand for the growing of the largest possible areas of food crops and the high prices of farm products, which tended to bring into use the idle lands under works already built.

Geographic distribution.—The geographic distribution of the area irrigated and of the increased area of irrigated land is shown in Table 1.

TABLE 1.—GEOGRAPHIC DISTRIBUTION OF ACREAGE IRRIGATED IN 1919 AND 1909, AND OF THE INCREASE IN ACREAGE IRRIGATED, 1909 TO 1919.

STATE.	AREA IRRIGATED.				INCREASE. ¹	
	1919		1909		Acres.	Per cent of total. ²
	Acres.	Per cent of total.	Acres.	Per cent of total.		
Total.....	19,191,716	100.0	14,433,285	100.0	4,758,431	100.0
Arizona.....	467,565	2.4	320,051	2.2	147,514	3.0
Arkansas.....	143,946	0.8	27,753	0.2	116,193	2.4
California.....	4,219,040	21.9	2,664,104	18.5	1,554,936	31.7
Colorado.....	3,348,385	17.4	2,792,032	19.3	556,353	11.4
Idaho.....	2,488,806	13.0	1,430,848	9.9	1,057,958	21.6
Kansas.....	47,312	0.2	37,479	0.3	9,833	0.2
Louisiana.....	454,882	2.4	380,200	2.6	74,682	1.5
Montana.....	1,681,729	8.8	1,679,084	11.6	2,645	0.1
Nebraska.....	442,690	2.3	255,950	1.8	186,740	3.8
Nevada.....	561,447	2.9	701,833	4.9	-140,386	.....
New Mexico.....	538,377	2.8	461,718	3.2	76,659	1.6
North Dakota.....	12,072	0.1	10,248	0.1	1,824	(³)
Oklahoma.....	2,969	(³)	4,388	(³)	-1,419	.....
Oregon.....	986,162	5.1	686,129	4.8	300,033	6.1
South Dakota.....	100,682	0.5	63,248	0.4	37,434	0.8
Texas.....	586,120	3.1	451,130	3.1	134,990	2.8
Utah.....	1,371,651	7.1	999,410	6.9	372,241	7.6
Washington.....	529,899	2.8	334,378	2.3	195,521	4.0
Wyoming.....	1,207,982	6.3	1,133,302	7.9	74,680	1.5

¹ A minus sign (—) denotes decrease.

² Based on the sum of the increases, 4,900,236, not on the net increase.

³ Less than one-tenth of 1 per cent.

California reports the largest area irrigated, while Colorado ranks second, Idaho third, and Montana fourth. These four states reported the largest areas in 1909 also, but in that year Colorado ranked first, California second, Montana third, and Idaho fourth.

In increase in acreage irrigated California leads, Idaho ranks second, Colorado third, and Utah fourth. In all of these states the increases are fairly well distributed. Montana shows very little increase, but there was a large increase in the western part of the state, which was offset by the decrease due to drought in the eastern part. Nevada shows a considerable decrease. This decrease occurred almost entirely in the Humboldt Valley. Most of the irrigation in this valley consists in forcing the water over river-bottom lands during the spring floods. In Nevada 1919 was one of the driest seasons on record, while the snows melted early, leaving a very limited supply of water for use during the crop-growing season. Oklahoma also shows a decrease, which, as previously stated, is due to abnormally heavy precipitation rather than to drought.

The results of the Fourteenth Census have been tabulated by drainage basins, as well as by states and counties. The only other census for which results have been presented in this way is a special census of irrigation taken in 1902. The distribution of the acreage irrigated in this way in 1919 and 1902 is shown in detail in the table beginning on page 48. The distribution by the principal drainage basins is shown in Table 2.

TABLE 2.—DISTRIBUTION OF ACREAGE IRRIGATED, BY DRAINAGE BASIN: 1919 AND 1902.

DRAINAGE BASIN.	AREA IRRIGATED (ACRES).			
	1919	1902	Increase. ¹	
			Amount.	Per cent.
Total.....	19,191,716	8,874,408	10,317,308	116.3
Missouri River and tributaries.....	4,147,278	2,533,237	1,614,041	66.7
Mississippi River and tributaries other than Missouri River.....	958,493	393,687	564,806	143.5
Gulf streams other than Mississippi River and Rio Grande.....	698,077	21,833	676,244	.....
Rio Grande and tributaries.....	1,293,863	496,587	797,276	100.6
Independent streams in Rio Grande drainage basin.....	13,992	8,355	10,637	127.3
Colorado River and tributaries.....	2,312,047	927,183	1,384,864	149.4
Whitewater Draw.....	5,871	384	5,487	.....
Great Basin.....	2,313,163	1,639,473	673,690	41.1
Columbia River and tributaries.....	3,873,245	1,297,437	2,575,808	198.5
Pacific Ocean streams other than Columbia and Colorado Rivers.....	3,570,687	1,556,232	2,014,455	129.4

¹ Per cent not shown when more than 1,000.

Missouri River shows the largest area, with Columbia River second, and other Pacific Ocean streams third. The largest increase since 1902 occurred in the Columbia River Basin, the principal part of this occurring in the Snake River Basin in Idaho.

Distribution by type of enterprise.—The distribution of the acreage irrigated in 1919 and 1909, and of

the increase in acreage irrigated, 1909 to 1919, is given in Table 3, showing the relative importance of the various agencies in supplying water for irrigation, and in the increase in the area supplied during the last decade.

TABLE 3.—DISTRIBUTION OF ACREAGE IRRIGATED IN 1919 AND 1909, AND OF INCREASE IN ACREAGE IRRIGATED 1909-1919, BY TYPE OF ENTERPRISE.

TYPE OF ENTERPRISE.	AREA IRRIGATED.				INCREASE.	
	1919		1909		Acres.	Per cent of total.
	Acres.	Per cent of total.	Acres.	Per cent of total.		
Total.....	19,191,716	100.0	14,433,285	100.0	4,758,431	100.0
Individual and partnership.....	6,848,807	35.7	6,594,614	45.7	254,193	5.3
Cooperative.....	6,581,400	34.3	4,643,539	32.2	1,937,861	40.7
Irrigation district.....	1,822,687	9.5	528,642	3.7	1,294,045	27.2
Carey Act.....	523,929	2.7	288,553	2.0	235,376	4.9
Commercial.....	1,822,601	9.5	1,809,379	12.5	12,222	0.3
U. S. Reclamation Serv. for.....	1,254,559	6.5	385,646	2.7	858,913	18.1
U. S. Indian Service.....	284,551	1.5	172,912	1.2	111,639	2.3
State.....	5,620	(¹)	(²)	.....	5,620	0.1
City.....	40,146	0.2	(²)	.....	40,146	0.8
Other.....	7,236	(¹)	(²)	.....	7,236	0.2
Not reported.....	570	(¹)	(²)	.....	570	(¹)

¹ Less than one-tenth of 1 per cent.
² Not included in classification in 1910.

Individual and partnership enterprises occupy, as in 1909, the first place, in extent of area supplied with water. These enterprises represent principally the earlier, easier, and cheaper types of construction. However, this class is particularly well adapted to irrigation from wells, and it is probable that both the number of enterprises and the area of land irrigated will continue to increase. On the other hand, there is, in some sections, a tendency to consolidate small enterprises by the organization of stock companies or irrigation districts. This tendency is indicated by the relatively large increases in the areas irrigated by enterprises of these types.

Cooperative enterprises supply water to about the same area as individual and partnership enterprises, the area served by them being also more than one-third of the total area irrigated—the two combined serve just 70 per cent of the total. Enterprises of this class showed the largest increase in area irrigated from 1909 to 1919, having more than 40 per cent of the total increase. This type of enterprise is not utilized for the development of new lands but rather for taking over enterprises of other types, particularly Carey Act and commercial enterprises after works have been built and lands have been settled. The increase in the area served by cooperative enterprises represents, therefore, transfers to this type and more complete use of old enterprises rather than new ones.

Irrigation districts rank third in area irrigated, and second in the extent of increase in the area irrigated from 1909 to 1919. Like cooperative enter-

prises, districts are not well adapted to the development of new lands and, speaking generally, the increase in area reported under districts represents reorganizations rather than new enterprises. The figures given in the table do not show the full extent of this movement, since the districts organized within United States Reclamation enterprises are not reported, because the Reclamation Service still controls these enterprises to a large extent, the districts serving merely as collecting agencies for the Reclamation Service.

Commercial enterprises supplied water to about the same area in 1919 as did irrigation districts. The figures do not represent correctly the importance of this type of enterprise in reclaiming land, since enterprises of this type are constantly being reorganized into cooperative enterprises or districts, and a considerable part of the area reported by enterprises of these classes was, in fact, originally supplied with water by commercial enterprises, and probably a considerable part of the increase reported for cooperative enterprises and districts represents reorganized commercial enterprises.

The United States Reclamation Service ranks fifth among the types of enterprises, in the extent of the area irrigated in 1919, having 6.5 per cent of the total. This does not represent the full extent of the work of the Reclamation Service since it supplies stored water to lands receiving their principal supply from other sources. The area thus furnished with a partial supply of water in 1919 was slightly less than one million acres. On the other hand, some of the land reported by the Reclamation Service was supplied with water by enterprises of other types that have been incorporated into the reclamation enterprises. In extent of increase in area irrigated from 1909 to 1919 the Reclamation Service ranks third, with 18.1 per cent of the total. This increase represents a real extension in the area irrigated, and not transfers from other enterprises, as is the case with cooperative enterprises and irrigation districts.

Carey Act enterprises show the smallest areas irrigated in 1919 of any of the types of enterprise engaged primarily in supplying water for irrigation, and they show also only a small part of the total increase in area irrigated during the last decade. Here, again, the figures do not present the whole truth, since under state laws Carey Act enterprises pass to cooperative enterprises as soon as they become well developed. However, there has been an almost complete cessation of activity under this law since 1910, except for the settlement of lands under enterprises begun previously.

The United States Indian Service supplies water to land in Indian reservations only.

Distribution by source of water supply.—The character and extent of the water supply for irrigation in the United States is discussed on pages 43 to 45, and in more detail in the section of this report.

giving the results for the various states, in which area irrigated and capital invested have been classified on this basis.

The areas irrigated in 1919 and 1909, the area enterprises were capable of irrigating in 1920, and the area included in enterprises in 1920, classified by the source from which water is received are given in Table 4, on page 46. In the table which follows, the distribution of the areas irrigated in 1919 and 1909, and of the increases from 1909 to 1919, is shown.

TABLE 4.—DISTRIBUTION OF AREA IRRIGATED 1919 AND 1909, AND OF INCREASE IN AREA IRRIGATED 1909 TO 1919, BY SOURCE OF WATER SUPPLY.

SOURCE.	1919		1909		INCREASE. ¹	
	Acres.	Per cent of total.	Acres.	Per cent of total.	Acres.	Per cent of total. ²
Total.....	19,191,716	100.0	14,433,285	100.0	4,758,431	100.0
Streams, gravity.....	14,527,060	75.7	12,767,351	88.5	1,759,709	36.3
Streams, pumped.....	1,226,510	6.4	608,659	4.2	617,851	12.8
Streams, pumped and gravity.....	199,595	1.0	(3)	—	199,595	4.1
Wells, pumped.....	1,263,093	6.6	489,341	3.4	773,757	16.0
Wells, flowing.....	65,856	0.3	144,420	1.0	-78,564	—
Wells, flowing and pumped.....	35,685	0.2	(3)	—	35,685	0.7
Lakes, pumped.....	35,730	0.2	17,826	0.1	17,904	0.4
Lakes, gravity.....	100,646	0.5	59,631	0.4	41,015	0.8
Springs.....	198,008	1.0	196,186	1.4	1,822	(9)
Stored storm water.....	98,873	0.5	105,792	0.7	-6,919	—
City water.....	930	(4)	(3)	—	930	(9)
Sewage.....	2,578	(4)	(3)	—	2,578	0.1
Streams, gravity, and pumped wells.....	344,713	1.8	(3)	—	344,713	7.1
Streams, gravity, and flowing wells.....	82,665	0.4	(3)	—	82,665	1.7
Other mixed.....	995,621	5.2	44,079	0.3	952,542	19.7
Other, and not reported.....	13,148	0.1	(3)	—	13,148	0.3

¹ A minus sign (—) denotes decrease.

² Based on sum of all increases, 4,843,914, not on the net increase.

³ Not included in classification in 1909.

⁴ Less than one-tenth of 1 per cent.

In studying Table 4 it should be kept in mind that the classes used in 1919 are not exactly the same as those used in 1909. In 1909 land was credited to what seemed to be the principal source of supply, while in 1919 various mixed classes are used. However, all of the mixed classes combined include less than 9 per cent of the total area irrigated in 1919, so that the comparisons are substantially correct, except, possibly, for "streams, gravity." But if all of the mixed classes into which "streams, gravity" enters, including "other mixed," were added to "streams, gravity," there would still be a considerable decrease in the percentage of the total area irrigated represented by this class.

As shown by the table, more than three-fourths of the area irrigated in 1919 was supplied by streams by gravity diversion; more than 83 per cent of the area received its total supply from streams, by either gravity or pumping, while much of the balance represented by the mixed classes, received part of its supply from this source.

Wells furnished the full supply to slightly more than 7 per cent of the total area, most of this being supplied by pumped wells.

Springs supplied 1 per cent of the total area, but none of the other single sources supplied so much as 1 per cent of the total.

Of the various mixed classes "streams, gravity, and pumped wells" shows the largest area. In many places water is pumped from wells to supplement the supply by gravity diversions from streams, the extent to which the wells are used in any season depending on the sufficiency of the supply from the streams, a conspicuous example of this being found in the San Joaquin Valley, California. Another condition in which wells are used to supplement a stream supply is found in the Salt River Valley, Arizona. Here the rise of the ground water has injured considerable land, and wells have been put in for the double purpose of lowering the ground water and furnishing an added supply of water for irrigation.

Of the simple classes "streams, gravity," shows the largest absolute increase from 1909 to 1919, "pumped wells" ranks next and "streams, pumped," ranks third. In per cent of increase "pumped wells" stands first, "pumped streams" second, and "pumped lakes" third. Each of these pumping classes shows an increase of more than 100 per cent in the area irrigated; while no other class shows so high a percentage.

"Flowing wells" shows a decrease of more than 50 per cent. This is due to the increased draft on the artesian supplies, which has caused many wells to cease to flow. In most cases such wells are pumped when they do not flow.

"Stored storm water" also shows a decrease. Storm-water reservoirs are found principally on the Great Plains, and the abnormal season in that section in 1919 is responsible for this decrease.

Notwithstanding the fact that "streams, gravity" shows a decrease in the percentage of the total area served and a comparatively small percentage of increase from 1909 to 1919, it shows the largest actual increase from 1909 to 1919 in area irrigated. Pumped wells rank second, and pumped streams third.

The most conspicuous fact brought out by this classification of the area irrigated is the rapid development of pumping during the last decade. As noted previously, each of the pumping classes included in the table shows an increase of more than 100 per cent in the area served, while the average for all classes is only 33 per cent, and the increase for "streams, gravity," the largest class, is only about 14 per cent. In addition to the above, there is the large area receiving a partial supply from pumped wells. In all of the older irrigated sections there are large opportunities for watering new lands and for supplementing the supply from streams, by pumping from wells. Irrigation has brought the ground water near the surface, so that the pumping lift is small. The supply is re-

plenished by the continued irrigation of surrounding lands, assuring a future supply. This source is particularly valuable where stored water is not available, since it makes possible the growing of long-season crops where this would not be possible if water were available only when the streams are in flood.

Distribution of area receiving water from different sources, by states.—The distribution by states of the areas receiving water from the principal sources is shown in Tables 5, 6, and 7. All of the sources that report more than 1 per cent of the total area irrigated are included in the tables.

TABLE 5.—DISTRIBUTION OF AREA RECEIVING ITS ENTIRE WATER SUPPLY FROM STREAMS IN 1919, BY STATES.

STATE.	Total (acres).	Gravity (acres).	Pumped (acres).	Gravity and pumped (acres).
Total.....	15,953,165	14,527,060	1,226,510	199,595
Arizona.....	196,453	189,782	6,671	.....
Arkansas.....	6,129	120	6,009	.....
California.....	2,920,896	2,564,445	295,673	60,278
Colorado.....	3,050,964	3,028,787	12,747	9,430
Idaho.....	2,384,010	2,274,959	107,181	1,870
Kansas.....	82,137	30,807	730	600
Louisiana.....	271,152	10,226	248,306	12,620
Montana.....	1,550,827	1,515,212	15,743	19,872
Nebraska.....	457,532	425,567	1,115	850
Nevada.....	470,179	406,812	2,647	720
New Mexico.....	494,868	432,478	1,890	.....
North Dakota.....	11,499	9,030	2,469	.....
Oklahoma.....	2,710	2,522	188	.....
Oregon.....	641,183	786,354	64,676	253
South Dakota.....	98,860	92,491	869	.....
Texas.....	496,870	73,822	421,638	350
Utah.....	1,116,130	1,105,691	10,389	50
Washington.....	471,145	352,199	26,244	92,702
Wyoming.....	1,157,121	1,155,596	1,525	.....

Of the area receiving its entire supply from streams, water diverted by gravity supplied more than 91 per cent, that pumped supplied nearly 8 per cent, while the area supplied in part by gravity and in part by pumping was slightly more than 1 per cent of the total. The only states in which the area supplied by pumping exceeded the area supplied by gravity were Arkansas, Louisiana, and Texas. These areas represent the rice-growing districts in the states named and the area irrigated from the Rio Grande near its mouth in Texas, where most of the water is pumped. These three states report considerably more than one-half of the total area served by water pumped from streams, while California reports nearly one-fourth. Idaho and Oregon are the only other states reporting large areas.

California reports nearly two-thirds of the area receiving its entire water supply from wells. The rice-growing states of Louisiana and Arkansas rank next, the two combined reporting slightly more than one-fifth of the area. New Mexico, Texas, and Arizona follow in the order named. Only one state, North Dakota, reports no land irrigated from wells,

but the areas supplied from this source in Idaho, Montana, Nebraska, Nevada, Oklahoma, South Dakota, and Wyoming are negligible.

TABLE 6.—DISTRIBUTION OF AREA RECEIVING ITS ENTIRE WATER SUPPLY FROM WELLS IN 1919, BY STATES.

STATE.	Total (acres).	Pumped (acres).	Flowing (acres).	Flowing and pumped (acres).
Total.....	1,364,639	1,263,088	65,850	35,685
Arizona.....	41,810	39,604	1,558	558
Arkansas.....	135,260	135,260	.....	.....
California.....	868,060	826,846	17,663	23,601
Colorado.....	14,300	10,114	4,191	85
Idaho.....	1,545	414	1,131	.....
Kansas.....	13,285	13,235	.....	50
Louisiana.....	155,575	154,304	196	1,075
Montana.....	351	139	212	.....
Nebraska.....	546	546	.....	.....
Nevada.....	1,171	295	811	65
New Mexico.....	62,295	16,709	30,030	6,556
North Dakota.....	.....	.....	.....	.....
Oklahoma.....	125	107	18	.....
Oregon.....	2,405	1,993	72	340
South Dakota.....	130	.....	130	.....
Texas.....	44,466	39,433	3,256	1,727
Utah.....	12,394	7,308	4,908	178
Washington.....	20,865	17,504	1,671	1,490
Wyoming.....	166	147	10	.....

Of the area receiving its total supply of water from wells, pumped wells supplied 92.6 per cent, flowing wells 4.8 per cent, and mixed 2.6 per cent.

Since pumped wells supply so large a percentage of the total area supplied from wells, the area supplied by pumped wells is distributed in approximately the same way as the total. A notable exception to this is in New Mexico, where the area irrigated from flowing wells is approximately double the area irrigated from pumped wells. Neither North Dakota nor South Dakota reports any land watered from pumped wells.

Arkansas, Kansas, Nebraska, and North Dakota report no land watered from flowing wells. New Mexico reports nearly one-half of the total area irrigated from flowing wells, and California slightly more than one-fourth of the total, while Utah, Texas, and Colorado report considerable areas.

California reports nearly two-thirds of the area receiving water from both flowing and pumped wells. Many wells in southern California that originally flowed are now pumped, while others flow at times and are pumped at times. Most of the area reported in this class lies in that section of the state. In the Pecos Valley, New Mexico, much the same condition exists. These two states report about 85 per cent of the total area in this class.

As stated elsewhere, pumping from wells represents a later and more expensive stage of development than diverting water from streams. In all states there is opportunity for much expansion in this field whenever the returns will justify the expense.

TABLE 7.—DISTRIBUTION OF AREA RECEIVING ITS WATER SUPPLY FROM MIXED SOURCES, IN 1919, BY STATES.

STATE.	Streams, gravity, and pumped wells (acres).	Streams, gravity, and flowing wells (acres).	Other mixed (acres).
Total.....	344,713	82,665	996,621
Arizona.....	217,799	525	7,690
Arkansas.....	250	.....	1,817
California.....	87,897	4,255	228,424
Colorado.....	16,258	87,880	165,825
Idaho.....	357	1,927	54,801
Kansas.....	1,540	.....	350
Louisiana.....	10,045	.....	7,885
Montana.....	155	6,068	89,070
Nebraska.....	115	.....	1,120
Nevada.....	4,957	82	45,176
New Mexico.....	1,341	685	29,787
North Dakota.....	.....	.....	65
Oklahoma.....	.....	.....	125
Oregon.....	105	209	111,137
South Dakota.....	500	20	3,864
Texas.....	454	45	24,170
Utah.....	125	537	173,495
Washington.....	2,415	441	19,027
Wyoming.....	400	.....	33,043

The area reported in Table 7 for "streams, gravity, and pumped wells" represents land that receives its principal supply from streams, but gets a supplemental supply from wells. More than 60 per cent of the total area is reported for Arizona, and most of this area lies in the Salt River project of the United States Reclamation Service. By far the larger part of the water supply is diverted from Salt River by gravity, but wells have been sunk in places within the irrigated areas where the ground water has come near the surface. Water is pumped from these wells into the ditches carrying water from the river, and supplements the supply from the river. About 70 per cent of the remaining area reported in this class lies in California, mostly in the San Joaquin Valley. Here individual farmers have put down their own wells to supplement the water of large ditches from which they receive their principal supply.

More than 80 per cent of the land receiving water from both streams and flowing wells is reported for Colorado. Most of this land is located in the San Luis Valley on the headwaters of the Rio Grande, where there are many flowing wells.

Montana reports the next largest area, and this land is located principally in Beaverhead County. The remainder of the land is scattered through the states.

"Other mixed" includes so many different combinations that an analysis of the returns is not justified.

AREA ENTERPRISES WERE CAPABLE OF IRRIGATING AND ACREAGE INCLUDED IN ENTERPRISES.

The area enterprises were capable of irrigating and the acreage in enterprises are classified in the same way that all other data are classified in the tables contained in this report. These areas have been tabulated in the Thirteenth and Fourteenth Censuses as an indication

of the degree to which irrigation works are utilized and of the need for the construction of new works. The geographic distribution of the area enterprises were capable of irrigating in 1920 and 1910 and the excess of these items over the acreages irrigated in 1919 and 1909 are shown in Table 8.

TABLE 8.—AREAS ENTERPRISES WERE CAPABLE OF IRRIGATING IN 1920 AND 1910, AND EXCESSES IN THESE AREAS OVER AREAS IRRIGATED IN 1919 AND 1909, BY STATES.

STATE.	1920		1910		INCREASE, ¹ 1910-1920.	
	Acres.	Excess over area irrigated in 1919 (acres).	Acres.	Excess over area irrigated in 1909 (acres).	Acres.	Excess over area irrigated (acres).
Total.....	26,020,477	6,828,761	20,285,403	5,852,118	5,735,074	976,643
Arizona.....	627,303	159,738	387,656	67,004	239,648	92,134
Arkansas.....	179,013	35,067	47,136	19,383	131,877	15,684
California.....	5,894,466	1,675,426	3,619,378	955,274	2,275,088	720,152
Colorado.....	3,855,348	506,963	3,890,166	1,198,134	-134,818	-691,171
Idaho.....	3,092,810	604,004	2,388,959	958,111	703,851	-354,107
Kansas.....	67,853	20,541	139,995	102,616	-72,142	-81,976
Louisiana.....	728,742	273,860	553,220	173,020	175,522	100,840
Montana.....	2,753,498	1,071,769	2,205,155	526,071	548,343	645,698
Nebraska.....	562,468	119,778	429,225	173,275	133,243	-53,497
Nevada.....	704,708	143,261	840,962	139,129	-136,254	4,132
New Mexico.....	696,119	157,742	644,970	183,252	51,149	-25,510
North Dakota.....	34,235	22,163	21,917	11,669	12,318	10,494
Oklahoma.....	9,672	6,703	6,397	2,009	3,275	4,694
Oregon.....	1,344,046	387,884	830,526	144,397	513,520	213,487
South Dakota.....	150,914	50,232	128,481	65,233	22,433	-15,001
Texas.....	1,150,542	584,422	690,991	239,861	459,551	324,561
Utah.....	1,700,550	328,899	1,250,246	250,836	450,304	78,063
Washington.....	637,151	107,252	470,514	136,136	166,637	-28,884
Wyoming.....	1,831,039	623,057	1,639,510	506,208	191,529	116,849

¹ A minus sign (—) denotes decrease.

As shown in the table, existing irrigation enterprises were capable of supplying in 1920 nearly 7,000,000 acres in addition to the area irrigated in 1919. In other words, the area irrigated can be increased about 36 per cent, and considerably more than it has been increased in the last 10 years, without the construction of any new works or the extension of existing works. The corresponding figure for 1910 is about 6,000,000 acres, showing that the margin between actual use and possible use had increased about 1,000,000 acres since 1910. In the discussion of acreage irrigated in 1919 attention has been called to the fact that much land ordinarily irrigated was not irrigated in 1919 because of drought in some sections and because of excessive rainfall in others. It seems probable that this area will about offset the increase in the area for which water is available but not used. Even in that case, the latter area is more than the increase in the area irrigated between 1909 and 1919.

The last column of the table shows in what states the water supply ready for use has increased more rapidly than has the area irrigated, and in what states use has extended more rapidly, Colorado, Idaho, Kansas, Nebraska, New Mexico, South Dakota, and Washington being in the latter class, while in all the other states use has lagged behind.

This excess area consists in part of land in existing farms that is not yet watered and in part of land that

is not yet settled but is available for settlement. The extent to which the area consists of each of these classes is not shown by the returns. However, the schedules called for the area available for settlement, and the total area reported as available by enterprises reporting this item was 2,257,981 acres. (See pp. 94 to 99.) This is about one-third of the total excess over the area irrigated. Some further light is thrown on this question by Table 9, in which the excess is distributed by type of enterprise.

TABLE 9.—AREAS ENTERPRISES WERE CAPABLE OF IRRIGATING IN 1920 AND 1910, AND EXCESSES IN THESE AREAS OVER AREAS IRRIGATED IN 1919 AND 1909, BY TYPE OF ENTERPRISE.

TYPE OF ENTERPRISE.	1920		1910		INCREASE, ¹ 1910-1920.	
	Acres.	Excess over area irrigated in 1919 (acres).	Acres.	Excess over area irrigated in 1909 (acres).	Acres.	Excess over area irrigated (acres).
Total.....	28,628,477	6,828,761	20,285,409	5,862,118	5,735,074	976,643
Individual and partnership.....	9,255,756	2,406,949	8,958,766	1,492,152	1,168,990	914,797
Cooperative.....	8,409,228	1,821,898	6,191,577	1,548,038	2,211,721	273,860
Irrigation district.....	2,531,428	708,538	800,451	371,869	1,730,974	456,729
Carey Act.....	804,298	289,369	1,089,477	801,124	-285,179	-520,755
Commercial.....	2,730,563	977,562	2,954,166	1,144,787	-154,603	-107,225
U. S. Reclamation Service.....	1,080,643	428,074	789,190	390,544	804,453	35,530
U. S. Indian Service.....	484,486	199,035	378,576	203,664	107,910	-3,729
State.....	7,379	1,759	(?)	.....	7,379	1,759
City.....	44,458	4,312	(?)	.....	44,458	4,312
Other.....	8,546	1,310	(?)	.....	8,546	1,310
Not reported.....	625	55	(?)	.....	625	55

¹ A minus sign (-) denotes decrease. * Not included in classification in 1910.

Slightly more than one-third of the excess area is reported by individual and partnership enterprises, and this does not, generally, represent land available for settlement, but land on individual farms that was not watered in 1919 for one reason or another. The areas not watered in 1919 on account of drouth on the northern Great Plains and in Nevada, and those not watered in 1919 on account of excessive rainfall in the southern Great Plains fall largely in this class.

Slightly more than one-fourth of the excess area is reported by cooperative enterprises. This is more likely to represent land in farms that is not watered than land available for settlement, although more of it will fall in the latter class than is the case with individual and partnership enterprises.

Irrigation districts, Carey Act enterprises, commercial enterprises, and United States Reclamation enterprises, the classes of enterprises that are engaged in reclaiming new land, taken together reported slightly more than one-third of the total excess. Not all of this represents land not yet taken up, but a considerable part of it does. From this tabulation and that of land reported as available for settlement it appears that between one-third and one-half of the total excess of area represents land outside of existing farms, and available for settlement—between 2,250,000 and 3,500,000 acres.

A fact shown conspicuously by this table is the decrease in land not watered in Carey Act enterprises. This is due to an almost complete cessation in the undertaking of new enterprises and the transfer of some old enterprises to enterprises of other forms.

The data given above indicate that irrigation works, taken as a whole, were utilized to about 74 per cent of their available capacity. Table 10 shows the extent to which works belonging to the various classes of enterprises were utilized, as represented by the ratio between the areas they were capable of irrigating in 1920 and the areas irrigated in 1919.

TABLE 10.—PERCENTAGE WHICH AREA IRRIGATED IS OF AREA ENTERPRISES WERE CAPABLE OF IRRIGATING IN 1920.

TYPE OF ENTERPRISE.	Per cent.
Total.....	73.8
Individual and partnership.....	74.0
Cooperative.....	78.3
Irrigation district.....	72.0
Carey Act.....	65.1
Commercial.....	65.1
U. S. Reclamation Service.....	74.6
U. S. Indian Service.....	58.7

The areas included in enterprises in 1920 and 1910, with the excesses in these areas over the areas irrigated in 1919 and 1909 are given in Table 11.

TABLE 11.—AREAS INCLUDED IN ENTERPRISES IN 1920 AND 1910, AND THE EXCESSES IN THESE AREAS OVER THE AREAS IRRIGATED IN 1919 AND 1909, BY STATES.

STATE.	1920		1910		INCREASE, ¹ 1910-1920.	
	Acres.	Excess over area irrigated in 1919 (acres).	Acres.	Excess over area irrigated in 1909 (acres).	Acres.	Excess over area irrigated (acres).
Total.....	35,890,821	16,699,105	32,245,464	17,812,179	3,645,357	-1,113,074
Arizona.....	813,153	345,588	944,090	624,039	-130,937	-278,451
Arkansas.....	246,480	102,534	52,883	25,130	193,597	77,404
California.....	7,808,207	3,586,167	5,490,890	2,826,266	2,317,317	759,911
Colorado.....	5,220,583	1,872,203	5,917,457	3,125,425	-696,869	-1,253,222
Idaho.....	3,780,048	1,291,242	3,549,573	2,118,725	230,475	-827,483
Kansas.....	102,562	55,256	161,300	123,821	-58,738	-68,571
Louisiana.....	851,211	396,326	581,865	201,766	269,246	194,564
Montana.....	4,329,148	2,047,419	3,515,602	1,836,618	813,546	810,901
Nebraska.....	766,768	324,078	680,133	424,183	86,635	-100,105
Nevada.....	1,382,036	801,559	1,232,142	530,809	149,894	271,280
New Mexico.....	961,879	423,502	1,102,287	640,679	-140,418	-217,077
North Dakota.....	57,476	45,404	38,173	27,225	19,303	17,479
Oklahoma.....	11,742	8,773	8,528	4,140	3,214	4,633
Oregon.....	1,925,967	939,825	2,527,208	1,841,079	-601,221	-901,254
South Dakota.....	188,382	87,700	201,625	138,877	-13,243	-50,677
Texas.....	1,687,447	1,101,327	1,253,173	802,043	434,274	299,284
Utah.....	2,350,244	658,693	1,947,625	948,215	411,619	-289,522
Washington.....	830,795	308,896	817,032	482,654	19,763	-176,758
Wyoming.....	2,564,608	1,356,686	2,224,298	1,090,998	340,370	265,690

¹ A minus sign (-) denotes decrease.

The excess of the area in enterprises over the area irrigated in 1919 was 16,699,105 acres, which is a little less than one-half of the area included in enterprises; that is, all enterprises taken together are watering a little more than one-half of the land included in their plans. The excess area is 87 per cent as great as the area irrigated in 1919, hence the completion and full utilization of all existing enterprises would permit of almost doubling the area now irrigated.

The area included in enterprises increased between 1910 and 1920 less than did the area irrigated or the

area enterprises were capable of irrigating, indicating that it was a period of building up under existing enterprises rather than of undertaking new enterprises. This is shown conspicuously by the last column of Table 11, which shows a decrease from 1910 to 1920 in the excess of area in enterprises over area irrigated for the irrigated region as a whole and for many of the states.

The distribution of the area in enterprises and the excesses over the areas irrigated, by type of enterprise, are shown in Table 12.

TABLE 12.—AREA INCLUDED IN ENTERPRISES IN 1920 AND 1910, AND THE EXCESSES IN THESE AREAS OVER AREAS IRRIGATED IN 1919 AND 1909, BY TYPE OF ENTERPRISE.

TYPE OF ENTERPRISE.	1920		1910		INCREASE, ¹ 1910-1920.	
	Acres.	Excess over area irrigated in 1919 (acres).	Acres.	Excess over area irrigated in 1909 (acres).	Acres.	Excess over area irrigated (acres).
Total.....	35,390,821	10,099,105	32,245,464	17,812,179	3,645,357	-1,113,074
Individual and partnership..	13,008,415	6,159,008	10,621,067	4,026,453	2,387,348	2,133,155
Cooperative.....	10,628,543	4,047,143	8,850,197	4,180,058	1,798,346	-139,515
Irrigation district.....	3,432,109	1,009,222	1,581,465	1,052,823	1,850,644	556,399
Carey Act.....	1,185,937	665,008	2,573,874	2,285,321	-1,384,937	-1,620,313
Commercial.....	3,999,581	2,177,580	5,786,777	3,977,398	-1,787,190	-1,799,818
U. S. Reclamation Service.....	2,627,176	1,372,607	1,973,016	1,577,370	654,160	-204,763
U. S. Indian Service.....	932,985	648,434	879,068	706,156	53,917	-57,722
State.....	9,581	3,961	(²)	(²)	9,581	3,961
City.....	49,650	9,504	(²)	(²)	40,650	9,504
Other.....	13,144	5,908	(²)	(²)	13,144	5,908
Not reported..	700	130	(²)	(²)	700	130

¹ A minus sign (-) denotes decrease.

² Not included in classification in 1910.

TABLE 13.—PER CENT DISTRIBUTION OF AREA IRRIGATED IN 1919, AREA ENTERPRISES WERE CAPABLE OF IRRIGATING IN 1920, AREA INCLUDED IN ENTERPRISES IN 1920, AND EXCESSES IN THESE ITEMS OVER AREA IRRIGATED IN 1919, BY SOURCE OF WATER SUPPLY.

SOURCE.	PER CENT OF TOTAL.				
	Area irrigated in 1919.	Area enterprises were capable of irrigating in 1920.	Area included in enterprises, 1920.	Excess of area enterprises were capable of irrigating in 1920 over area irrigated in 1919.	Excess of area included in enterprises over area irrigated in 1919.
Total.....	100.0	100.0	100.0	100.0	100.0
Streams, gravity.....	75.7	74.1	72.6	69.4	68.9
Streams, pumped.....	6.4	8.1	8.0	13.1	9.9
Streams, gravity and pumped..	1.0	0.9	0.8	0.6	0.5
Wells, pumped.....	6.6	6.4	6.6	8.0	6.5
Wells, flowing.....	0.3	0.3	0.4	0.2	0.4
Wells, flowing and pumped....	0.2	0.2	0.2	0.1	0.3
Lakes, gravity.....	0.5	0.6	0.9	0.7	1.3
Lakes, pumped.....	0.2	0.2	0.2	0.4	0.3
Springs.....	1.0	1.0	1.1	0.8	1.3
Stored storm water.....	0.5	0.9	0.9	1.8	1.3
City water.....	(¹)	(¹)	(¹)	(¹)	(¹)
Sewage.....	(¹)	(¹)	(¹)	(¹)	(¹)
Streams, gravity, and pumped wells.....	1.8	1.5	1.3	0.7	0.7
Streams, gravity, and flowing wells.....	0.4	0.4	0.6	0.3	0.7
Other mixed.....	5.2	5.4	5.4	5.9	7.8
Other, and not reported.....	0.1	0.1	(¹)	(¹)	(¹)

¹ Less than one-tenth of 1 per cent.

Several of the states show actual decreases in the area included in enterprises, indicating the abandonment of extravagant schemes conceived during the boom period in irrigation development between 1900 and 1910, as well as a cessation in the undertaking of new enterprises.

The distribution of the area to which enterprises were capable of supplying water in 1920 and the area included in enterprises in 1920, and of the excesses in these items over the area irrigated in 1919 are shown in percentages, by source of water supply, in the preceding table. The distribution of the area irrigated in 1919 is repeated for the purpose of making comparisons.

CAPITAL INVESTED IN IRRIGATION ENTERPRISES.

The capital invested in irrigation works is presented in the United States summary and in the state reports, classified in the same way that acreage and other items are classified. The total investment and the average investment per acre in 1920 and 1910 are given by states in Table 14.

TABLE 14.—CAPITAL INVESTED IN IRRIGATION ENTERPRISES BY STATES: 1920 AND 1910.

STATE.	1920		1910		INCREASE, ¹ 1910-1920.	
	Amount.	Average per acre.	Amount.	Average per acre.	Amount.	Average per acre.
Total.....	\$697,657,328	\$26.81	\$321,454,008	\$15.85	\$376,203,320	\$10.96
Arizona.....	33,498,094	53.40	17,677,966	45.60	15,820,128	7.80
Arkansas.....	7,183,322	40.13	587,834	12.47	6,595,488	27.66
California.....	194,886,388	33.06	72,580,030	20.05	122,306,358	13.01
Colorado.....	88,302,442	22.90	56,636,443	14.19	31,665,999	8.71
Idaho.....	91,501,009	28.59	40,977,688	17.15	50,523,321	12.44
Kansas.....	2,067,381	30.47	1,365,563	9.75	701,818	20.72
Louisiana.....	14,063,181	19.30	6,859,166	12.40	7,204,015	6.80
Montana.....	52,143,363	18.94	22,970,958	16.42	29,172,405	8.52
Nebraska.....	13,909,185	24.73	7,798,310	18.17	6,110,875	6.66
Nevada.....	14,754,280	20.94	6,721,924	7.99	8,032,356	12.95
New Mexico.....	18,210,412	26.16	9,154,897	14.19	9,055,515	11.97
North Dakota.....	1,857,118	54.25	836,482	38.17	1,020,636	16.08
Oklahoma.....	151,325	15.65	47,200	7.38	104,125	8.27
Oregon.....	28,929,151	21.52	12,760,214	15.36	16,168,937	6.16
South Dakota.....	5,465,248	36.21	3,043,140	23.69	2,422,108	12.52
Texas.....	35,072,739	30.48	13,487,347	19.52	21,585,392	10.96
Utah.....	32,037,351	18.84	14,028,717	11.22	18,008,634	7.62
Washington.....	20,290,011	45.98	16,219,149	34.47	13,079,862	11.51
Wyoming.....	34,326,328	18.75	17,700,930	10.80	16,625,348	7.95

The capital invested in irrigation enterprises was more than doubled in the last decade. This is due principally to two causes: (1) Prices have been higher during this period than in any other period since irrigation construction on a large scale began, and this not only increased the cost of construction actually done during this period, but had a tendency to make owners of works built previously give higher estimates of capital invested than they would have done had prices been lower. (2) The bringing of water to land becomes constantly more difficult, and the easier projects are, naturally, carried out first, leaving the more difficult projects to be developed as the demand for agricultural products becomes greater.

The absolute increase in the average investment per acre was greater than in any previous period. This increase is due to the causes already enumerated, and to the fact that a considerable part of the capital invested during the last decade was for pumping equipment for supplementing the supply of water from canals and ditches for lands already under irrigation. Such investment and that for reservoirs to supply water in the late summer when streams are low are not accompanied by corresponding increases in the areas irrigated, and consequently raise the average investment per acre. At the same time, however, they increase and insure the returns from irrigated land to an extent that more than justifies the added investment per acre. Dependence upon the natural flow of streams, without storage or a supplemental water supply from wells, limits the crops grown to those with short growing periods, which, generally, are the less valuable crops.

In the discussion of water supply (pages 43 to 45) it is stated that future extension of the irrigated area will depend largely upon the storage of flood water and pumping from underground sources. This will be a more costly type of development, and consequently the average investment per acre is likely to continue to increase. In fact, the determining factor in fixing the limit of irrigation development is likely to be the amount that can be expended profitably in providing a water supply.

The data presented in the preceding pages show very large areas for which water is available that were not watered in 1919. The average investment per acre is computed on the basis of the areas to which enterprises were ready to supply water in 1920, consequently the average investment per acre actually watered and bringing a return was much higher than the figure reported. This fact is at the foundation of the financial difficulties of irrigation enterprises. The land actually producing must furnish whatever income there is. If the whole burden is thrown on this land, it is too heavy, and the farmer fails; and if the producing land bears only its proper share of the burden the investor must carry the rest, and the enterprise fails.

The capital invested in irrigation enterprises and the average investment per acre, based on the area enterprises were capable of irrigating in 1920, classified by the sources from which water is received, are given on page 52. The area that enterprises were capable of irrigating in 1920, classified in the same way, is given on page 46. The distribution of the areas enterprises were capable of irrigating and the capital invested, by the sources from which water is received, are shown, in percentages, in Table 15, which follows, with the average investment per acre, and comparison of the average for each class with the general average.

TABLE 15.—PER CENT DISTRIBUTION OF AREAS ENTERPRISES WERE CAPABLE OF IRRIGATING AND CAPITAL INVESTED, BY SOURCES FROM WHICH WATER IS RECEIVED.

SOURCE.	PER CENT OF TOTAL.		AVERAGE PER ACRE.	
	Area enterprises were capable of irrigating in 1920.	Capital invested to January 1, 1920.	Amount.	Per cent of general average.
Total.....	100.0	100.0	\$26.81	100.0
Streams, gravity.....	74.1	63.0	22.81	85.1
Streams, pumped.....	8.1	8.5	28.01	104.5
Streams, gravity and pumped.....	0.9	1.4	40.02	149.3
Wells, pumped.....	6.4	11.0	45.85	171.1
Wells, flowing.....	0.3	0.4	36.02	137.7
Wells, flowing and pumped.....	0.2	0.4	58.51	218.2
Lakes, pumped.....	0.2	0.3	38.06	142.0
Lakes, gravity.....	0.6	0.4	19.46	72.6
Springs.....	1.0	0.3	23.01	85.8
Stored storm water.....	0.9	2.2	67.47	251.7
City water.....	(1)	(1)	156.88	585.2
Sewage.....	(1)	(1)	52.85	197.1
Streams, gravity, and pumped wells.....	1.5	4.1	72.69	271.1
Streams, gravity, and flowing wells.....	0.4	0.4	27.38	102.1
Other mixed.....	5.4	6.9	34.67	129.3
Other, and not reported.....	0.1	0.1	54.86	204.6

¹ Less than one-tenth of 1 per cent.

As is the case with area irrigated, "streams, gravity," is by far the most important class in area enterprises were capable of irrigating in 1920, and in capital invested, while "streams, pumped," and "wells, pumped," are the other classes showing any considerable part of the area and capital. "Streams, gravity," is less important in capital invested than in area because of the fact that the average investment per acre for this class is less than the average for all classes.

In average investment per acre only one class—"lakes, gravity," which includes only about one-half of 1 per cent of the total area and capital—falls below "streams, gravity," and these two classes, and "springs"—which includes only 1 per cent of the total area—are the only classes for which the average investment is less than the general average. Streams, taken as a whole, show an average investment per acre of \$23.51, about 88 per cent of the general average; wells, taken as a whole, show an average of \$45.75 per acre, approximately double the average for streams; and the average investment for all pumped sources—streams, wells, and lakes—is \$35.92 per acre, 134 per cent of the general average.

While averages are shown for city water and sewage, the areas included are so small that the averages are not of much value. Eight other classes report less than 1 per cent of the total area, but the areas included are large enough to give the averages some value. All ten of these classes combined do not affect the general average greatly.

The outstanding fact shown by this table is that the cost of a water supply from wells is approximately double that of a supply from streams.

COST OF OPERATION AND MAINTENANCE.

The cost of operation and maintenance and the average cost per acre, classified by the sources from which water is received are given on page 52. The average cost per acre and a comparison of the cost for each source with the general average cost are given in Table 16.

TABLE 16.—PER CENT DISTRIBUTION OF COST OF OPERATION AND MAINTENANCE, 1919, BY SOURCE FROM WHICH WATER IS RECEIVED.

(When water is pumped, cost of operation and maintenance includes cost of fuel and attendance.)

SOURCE.	Per cent of total area for which cost is reported.	AVERAGE PER ACRE.	
		Amount.	Per cent of general average.
Total.....	100.0	\$2.43	100.0
Streams, gravity.....	75.0	1.25	51.4
Streams, pumped.....	7.1	6.50	267.5
Streams, gravity and pumped.....	1.2	2.33	95.9
Wells, pumped.....	6.5	10.07	414.4
Wells, flowing.....	0.2	2.77	114.0
Wells, flowing and pumped.....	0.2	5.04	330.9
Lakes, pumped.....	0.3	5.20	214.0
Lakes, gravity.....	0.5	1.30	53.5
Springs.....	0.9	1.63	67.1
Stored storm water.....	0.5	2.30	93.4
City water.....	(1)	20.73	853.1
Sewage.....	(1)	9.05	372.4
Streams, gravity and pumped wells.....	1.9	5.67	245.7
Streams, gravity and flowing wells.....	0.5	1.36	56.0
Other mixed.....	5.2	2.71	111.5
Other, and not reported.....	0.1	10.75	442.4

¹ Less than one-tenth of 1 per cent.

Disregarding city water and sewage, on account of the small areas covered, and "other mixed" and "other, and not reported," because they do not represent definite classes, the average cost per acre for every class that does not include pumping, except for flowing wells, is below the general average cost; while the average cost for every class that does include pumping, except for "streams, gravity and pumped," is more than double the general average cost.

Table 15, page 22, shows that the average first cost of a water supply from pumped wells is about double that of a gravity supply from streams, while Table 16, above, shows that the average cost of operation and maintenance for "wells, pumped," is about eight times as great as that for "streams, gravity," and that the cost of operation and maintenance for "streams, pumped," is more than five times as great as that for "streams, gravity."

The very low cost of a gravity supply from streams, as compared with a pumped supply, is accounted for in very large part by the fact that "streams, gravity," includes practically all of the early inexpensive ditches that water river-bottom lands, where both capital invested and cost of operation and maintenance are very low. Comparisons with large, modern enterprises taking water from streams by gravity, would be much less unfavorable to pumping enterprises.

DRAINAGE OF IRRIGATED LAND.

The irrigation of land has, in many cases, brought about the necessity for draining a part of the land. Where there is not good natural drainage it has brought the ground water near the surface, and in many places this has caused an accumulation of mineral salts, which are grouped under the term "alkali." In these cases artificial drainage will remove the surplus water and make it possible to wash out the alkali and restore the land to productivity.

The extent of the land damaged and the extent of the land for which drains have been installed are shown by states in State Table I, on pages 100 to 102.

About 5 per cent of all irrigation enterprises reported either land drained or land in need of drainage, or both. The area for which drains have been installed is about 8 per cent of the total area irrigated in 1919, and nearly as much more land is reported as in need of drainage. The area that has been injured by irrigation water is, therefore, slightly less than 16 per cent of the total area irrigated, and slightly more than 8 per cent of the total area included in enterprises.

The appearance of swampy places within irrigation projects has led to suggestions that drains should be put in when the irrigation works are built. The data given do not seem to justify such a plan. With only 5 per cent of the enterprises reporting any injured land, and only 8 per cent of the area in enterprises reported as injured, it is apparent that installing drains for all the land in irrigation enterprises as a part of the original construction would involve a very large expense for drains that are not needed, and this at a time when expense should be kept as low as possible. It seems much more logical to install drains as the necessity develops.

QUANTITY OF WATER USED.

The schedules used in both the Fourteenth and the Thirteenth Censuses called for the average volume of water entering canals, in second-feet; the total quantity of water entering canals, in acre-feet; and the total quantity of water delivered from canals, in acre-feet. In both censuses this inquiry was answered on only part of the schedules, and no attempts were made to supply missing information; nor were attempts made to convert measurements reported in one form into another form. Those reported in each form were tabulated together.

In the Fourteenth Census, the schedules showed whether water was measured, and the reports representing measurements and those not representing measurements were tabulated separately, and then combined. The results are shown on page 56, and in the state reports, and are summarized in the following table:

TABLE 17.—QUANTITY OF WATER USED IN 1919 AND 1909.

ITEM.	1919			1909
	Total.	Measured.	Not measured.	
Average number of acres irrigated per second-foot of water entering canals.....	41	60	25	62
Average quantity of water entering canals per acre.....	5.5	4.7	7.5	4.8
Average quantity of water delivered per acre.....	2.5	2.2	3.2	.....

The reports for 1919 cover a very much larger area than those for 1909. The results for 1909 correspond very closely with the results representing measurements for 1919, but differ quite widely from the averages of all reported.

The results from measurements in 1919 should be considered to be of the most value. They show an average of 4.7 acre-feet entering canals per acre irrigated, and 2.2 acre-feet delivered per acre irrigated, the quantity delivered being about 47 per cent of the quantity entering canals. These measurements do not represent the same canals, and the comparison is justified only on the assumption that each average is representative of all canals. The first average represents measurements of water diverted for nearly 8,000,000 acres, or over 40 per cent of the total area irrigated, and should be fairly representative. The average of quantity of water delivered represents about 4,000,000 acres, and is not so valuable as the other, but still is based on a sufficient area to justify its use. Assuming, then, that these averages are representative, 53 per cent of the water entering canals is either lost or wasted between the point of diversion and the point of delivery. In this connection "wasted" is not used in its usual sense, but as meaning turned out of the canal without being used for irrigation. Most of this water is not wasted, in the usual sense, but is available for use elsewhere.

It is worthy of note that the average number of acres irrigated per second-foot of average volume entering canals (41) is exactly the same as the average number of acres enterprises were capable of irrigating per second-foot of ditch capacity reported.

TYPES OF ENTERPRISES SUPPLYING WATER FOR IRRIGATION.

Classification of enterprises.—All the data relating to irrigation collected in connection with the Fourteenth Census have been classified by the types of enterprises supplying water for irrigation, and the results in detail are presented in the United States summary and in the state reports at the end of this volume. The types used are defined on page 12. In this section the field of usefulness of each type of enterprise as a

means of bringing land under irrigation is discussed in the light of the returns of the census. They are taken up in the order of their importance, as indicated by the area to which they supplied water in 1919. This order is shown, in percentages, in Table 18.

TABLE 18.—PER CENT DISTRIBUTION OF AREA IRRIGATED IN 1919 AND 1909, AND OF THE INCREASE IN AREA IRRIGATED 1909 TO 1919, BY TYPE OF ENTERPRISE.

TYPE OF ENTERPRISE.	PER CENT OF TOTAL AREA IRRIGATED SERVED BY EACH TYPE.		Per cent of total increase, 1909 to 1919.
	1919	1909	
Total.....	100.0	100.0	100.0
Individual and partnership.....	35.7	45.7	5.3
Cooperative.....	34.3	32.2	40.7
Irrigation district.....	9.5	8.7	27.2
Commercial.....	9.5	12.5	0.3
U. S. Reclamation Service.....	6.5	2.7	18.1
Carey Act.....	2.7	2.0	4.9
U. S. Indian Service.....	1.5	1.2	2.3
City.....	0.2	(1)	0.8
Other.....	(2)	(1)	0.2
State.....	(2)	(1)	0.1
Not reported.....	(2)	(1)	(2)

¹Not included in classification in 1909. ²Less than one-tenth of 1 per cent.

Individual and partnership enterprises.—Individual and partnership enterprises occupy, as in 1909, the first place, in extent of area supplied with water, although the relative importance of such enterprises is decreasing. These enterprises supply water to more than one-third of the area irrigated and represent principally the earlier, easier, and cheaper types of construction. Since opportunities for such development are constantly diminishing, enterprises of this class must become relatively less important. However this class is particularly well adapted to irrigation from wells, and it is probable that both the number of enterprises and the area of land irrigated will continue to increase. The increase in the area irrigated by individual and partnership enterprises from 1909 to 1919 was less than 4 per cent, and this represented only a little more than 5 per cent of the total increase in area irrigated from 1909 to 1919. This poor showing for 1919 is due in part, at least, to the drouth in the northern part of the Great Plains region and the excessive rainfall in the southern part, since this semi-arid region is the section where such enterprises find their greatest usefulness. On the other hand, there is, in some sections, a tendency to consolidate small enterprises by the organization of stock companies or irrigation districts. This tendency is indicated by the relatively large increases in the areas irrigated by enterprises of these types and the increase shown for individual and partnership enterprises is, in fact, the net increase after deducting areas transferred to other classes.

The effect of the peculiar climatic conditions in 1919 is indicated by the large excesses in the areas that enterprises were capable of irrigating in 1920 and that were included in enterprises over the areas irrigated in 1919. The areas irrigated in 1919 were but 53 per cent of the total areas included in these enterprises, and but 74 per cent of the areas they were capable of supplying with water in 1920.

No doubt the area reported included in enterprises is greater than these enterprises can actually irrigate even when used to their fullest extent, but there is no way in which the extent of exaggeration can be measured. The area which all individual and partnership enterprises combined were capable of irrigating in 1920 was 71 per cent of the total area reported as included in such enterprises. At any time there will be some enterprises in the course of development, so that some of the excess represents land that will be irrigated when the enterprises are completed.

While individual and partnership enterprises represented 35.7 per cent of the area irrigated in 1919, and about the same percentage of the area enterprises were capable of irrigating in 1920, and the area included in enterprises, they represented only 22.2 per cent of the capital invested—that is, the average capital invested per acre for this class is below the general average investment per acre. The average investment per acre for all classes was \$26.81, and that for individual and partnership enterprises was \$16.71 or 62 per cent of the general average.

Irrigation works, classified by type of enterprise, are reported on page 57, and in the state reports at the end of this volume. The proportion of the total of each item belonging to individual and partnership enterprises is shown in the form of percentages in Table 19.

TABLE 19.—PERCENTAGE OF ALL IRRIGATION WORKS BELONGING TO INDIVIDUAL AND PARTNERSHIP ENTERPRISES.

ITEM.	Per cent of total.
Diverting dams.....number..	85.2
Storage dams.....number..	72.1
Main ditches:	
Number.....	89.9
Length.....miles..	63.0
Capacity.....second-feet..	42.2
Lateral ditches:	
Number.....	59.0
Length.....miles..	26.8
Reservoirs:	
Number.....	83.0
Capacity.....acre-feet..	11.1
Pipe lines, length.....miles..	54.0
Flowing wells:	
Number.....	86.1
Capacity.....gallons per minute..	88.4
Pumped wells:	
Number.....	94.8
Capacity.....gallons per minute..	91.2
Pumping plants:	
Number.....	96.2
Engine capacity.....horsepower..	71.7
Pumps—	
Number.....	93.4
Capacity.....gallons per minute..	62.2

As is to be expected, the irrigation works belonging to individual and partnership enterprises are the smaller ones. This is particularly noticeable in the case of ditches, reservoirs, and pumping plants. Enterprises of this type own about 90 per cent of the main ditches, but these report only a little more than 40 per cent of the total capacity; they report 83 per cent of the reservoirs, but these have less than 12 per cent of the total capacity; they report 96 per cent of the pumping plants, but only 62 per cent of the pump capacity.

In regard to wells the situation is different. Irrigation from wells is naturally an individual matter, and enterprises of this class report 86 per cent of the flowing wells and 95 per cent of the pumped wells, and about the same proportion of the total capacities of wells.

Table 20 shows the historical development of enterprises of this type.

TABLE 20.—NUMBER OF INDIVIDUAL AND PARTNERSHIP ENTERPRISES, WITH AREA IRRIGATED IN 1919, CLASSIFIED BY DATE OF BEGINNING.

DATE OF BEGINNING.	Number of enterprises.	AREA IRRIGATED IN 1919.	
		Acres.	Per cent of total.
Total.....	58,640	6,023,798	100.0
Before 1860.....	424	63,603	0.9
1860-1869.....	1,770	379,602	5.5
1870-1879.....	3,252	775,054	11.2
1880-1889.....	7,064	1,575,408	22.8
1890-1899.....	5,551	904,773	13.1
1900-1904.....	4,407	586,065	8.5
1905-1909.....	5,066	436,709	6.3
1910-1914.....	11,104	749,813	10.8
1915-1919.....	12,149	734,983	10.6
Not reported.....	7,853	716,888	10.4

The figures given in the table show that this type of enterprise reached its greatest importance, measured by the area irrigated, in the eighties, before the advent of large enterprises. As measured by the number of enterprises there has been great activity since 1910, but this represents principally pumping enterprises, supplying comparatively small areas.

Cooperative enterprises.—Cooperative enterprises supply water to about the same area as individual and partnership enterprises, the area served by them being also more than one-third of the total area irrigated—the two combined serve just 70 per cent of the total. Enterprises of this class showed the largest increase in area irrigated from 1909 to 1919, having more than 40 per cent of the total increase. This type of enterprise is not utilized for the development of new lands but rather for taking over enterprises of other types, particularly Carey Act and commercial enterprises, after works have been built and lands have been settled. The increase in the area served by cooperative enterprises represents in considerable part, therefore, trans-

fers to this type and more complete use of old enterprises rather than new enterprises.

The most common form of organization for cooperative enterprises is the stock company organized under the general incorporation laws of the state, with most of the stock owned by the water users. Water is apportioned on the basis of stock ownership, and the cost of the operation and maintenance is raised by assessments on the stock. There is not, in most cases, any necessary relation between amount of stock owned and area of land owned or irrigated, although there is a tendency for the two to be proportional. In fact, stock may be owned independent of land ownership, and it may be, and is at times, rented, the lessee receiving the water apportioned to the stock rented. This renders the stock good collateral for loans, and it is sometimes used in that way.

As stated previously, this type of organization is not well adapted for the construction of new enterprises of large size. In an arid region irrigation works must be built in advance of settlement, and consequently those who are to use the water are not there to organize the enterprises or build the works, except in the case of colonies backed by some powerful organization.

This type of organization for controlling irrigation works in the United States was originated in Utah, where the Mormon Church furnished the money necessary to support the settlers during the construction period, paid the settlers for work on construction in stock in the companies which were to control the enterprises, and, in return for its advances, took stock which was disposed of to later settlers. The famous Union Colony at Greeley, Colorado, was organized in much the same way, the settlers receiving stock in payment for work.

Commercial enterprises which have gone into land reclamation for profit have very generally adopted the plan of selling land and water, or water rights only, under contracts that provide for the irrigation works and water rights becoming the property of the purchasers of water rights, organized into stock companies, when the rights have been paid for. These enterprises then become cooperative. Carey Act enterprises almost universally operate on the same plan; and originally the United States Reclamation Service adopted this plan, but more recently it has changed and its enterprises are being organized into irrigation districts.

The cooperative enterprise has been found well adapted to the operation and management of irrigation enterprises, even those of large size. While in many cases it is possible for stock to get into the hands of persons who are not water users, this has not developed into a serious abuse, and the danger of abuse is more than offset by the advantages of being able to use the stock as collateral for loans. In some cases the stock is at-

tached to the land, and can not be owned apart from the land to which it is attached. In such cases the stock is proportioned to the acreage, and representation in the management is directly proportional to extent of land ownership.

The area irrigated in 1919 by cooperative enterprises was 78.3 per cent of the area these enterprises were capable of irrigating in 1920; that is, about 78 per cent of their effective capacity was utilized. This is higher than the average for all classes, 73.8 per cent. The area irrigated in 1919 was 61.9 per cent of the total area in enterprises of this class. This is considerably above the average for all classes. This is to be expected, since this class consists so largely of completed enterprises transferred to it.

Cooperative enterprises report 26.2 per cent of the total capital invested, with an average of \$21.78 per acre, based on the acreage enterprises were capable of irrigating in 1920. This average investment per acre is about 19 per cent less than the general average for all classes.

Table 21 shows, in percentages, what part of all irrigation works is controlled by cooperative enterprises.

TABLE 21.—PERCENTAGE OF ALL IRRIGATION WORKS BELONGING TO COOPERATIVE ENTERPRISES.

ITEM.	Per cent of total.
Diverting dams.....number.....	12.2
Storage dams.....number.....	20.0
Main ditches:	
Number.....	7.6
Length.....miles.....	21.9
Capacity.....second-feet.....	31.5
Lateral ditches:	
Number.....	20.7
Length.....miles.....	20.8
Reservoirs:	
Number.....	11.3
Capacity.....acre-feet.....	17.1
Pipeline, length.....miles.....	23.6
Flowing wells:	
Number.....	5.5
Capacity.....gallons per minute.....	6.6
Pumped wells:	
Number.....	3.4
Capacity.....gallons per minute.....	6.2
Pumping plants:	
Number.....	2.6
Engine capacity.....horsepower.....	11.1
Pumps—	
Number.....	3.7
Capacity.....gallons per minute.....	9.7

The figures in the table show that the works belonging to cooperative enterprises are larger than the average, since they control larger percentages of the capacity than of the number.

Table 22 shows the history of enterprises of this class.

Like individual and partnership enterprises, cooperative enterprises showed their greatest activity, measured by area irrigated, in the eighties. The succeeding decade shows the next largest area, and the two preceding decades rank next. Since 1904 new enterprises of this type have not been so important.

TABLE 22.—NUMBER OF COOPERATIVE ENTERPRISES, WITH AREA IRRIGATED IN 1919, CLASSIFIED BY DATE OF BEGINNING.

DATE OF BEGINNING.	Number of enterprises.	AREA IRRIGATED IN 1919.	
		Acres.	Per cent of total.
Total.....	3,477	6,465,090	100.0
Before 1860.....	198	176,618	2.7
1860-1869.....	373	793,432	12.3
1870-1879.....	348	842,049	13.0
1880-1889.....	686	1,745,745	27.0
1890-1899.....	492	762,640	11.8
1900-1904.....	282	783,969	12.1
1905-1909.....	301	625,782	9.7
1910-1914.....	288	380,223	5.9
1915-1919.....	262	169,222	2.6
Not reported.....	237	181,912	2.8

Irrigation districts.—Irrigation districts rank third in area irrigated, and second in the extent of increase in the area irrigated from 1909 to 1919. Like cooperative enterprises, districts are not well adapted to the development of new lands and, speaking generally, the increase in area reported under districts represents reorganizations rather than new enterprises. The figures given in Table 18 do not show the full extent of this movement, since the districts organized within United States Reclamation enterprises are not reported, because the Reclamation Service still controls these enterprises to a great extent, the districts serving merely as collecting agencies for the Reclamation Service. The large extent to which such reorganizations have taken place in the last decade is due very generally to the enactment of the Federal Farm Loan Act and the interpretation of that law. Under the Federal Farm Loan Act loans can be made only on first liens, while under the Reclamation Act as it was previously administered, under the Carey Act, and under most commercial enterprises, deferred payments on water rights were first liens on the lands to be irrigated, and, consequently farmers could get no loans from the Federal Farm Loan banks until their water rights were paid for—a period of 20 years under the Reclamation Act. Under irrigation district laws the cost of construction is covered by the issuance of bonds, with the principal and interest to be raised by taxation of the lands to be irrigated, rather than by mortgages to be enforced by foreclosure. It has been held that district bonds are not a bar to loans under the Federal Farm Loan Act.

A part of the increase in area irrigated by irrigation districts, however, represents new enterprises. This is particularly true in parts of California, where conditions are peculiar. It has been stated that the irrigation district is not adapted to the reclamation of new land, but this does not apply where districts are organized to supply water to land that has been farmed without irrigation. Unsettled desert land is not considered sufficient security for the capital necessary to

build works to bring water to the land, and consequently, districts composed of such lands can not sell bonds; but land already settled and under cultivation has, in some cases, sufficient value to serve as a basis for a bond issue, and bonds can be sold. That is the condition that prevails where districts have provided water for land already farmed but not previously irrigated.

The fundamental purpose of the organization of irrigation districts is the obtaining of funds for the construction or purchase of irrigation works, except for such reorganizations as have just been discussed. The inclusion of land within a district renders the land subject to taxation for interest and principal of bond issues, and also for the expense of operation and maintenance, and under state laws district taxes are to be collected in the same manner as state and county taxes, under the same penalties. This throws the burden of enforcing the bond lien, which is equivalent to a mortgage to secure deferred payments, upon the county officials, which is quite an advantage, from the standpoint of the holder of the lien.

An added advantage from the standpoint of the bond holder is that the whole bond issue is an obligation of the whole district. If any part of the land does not meet its share of the obligation, this deficit is added to the burden of the balance of the land.

Because of defaults in the payment of interest and principal on district bond issues, the markets for such securities have not been good, and the states have made many attempts to make irrigation district bonds more attractive to investors. The steps in this direction, taken by the several states, are shown in the following paragraphs, in which the state laws are analyzed from this viewpoint:

Arizona.—The original irrigation district law in Arizona was enacted in 1912. This law provided for the organization of districts under the supervision of county supervisors and for testing the validity of organizations and of bond issues in the courts, and irrigation district bonds were made legal investments for "all trust funds and for the funds of insurance companies, banks, banking institutions, and trust companies, and for the state and school funds, and whenever any money or fund may by law be invested in bonds of cities, counties, school districts, or municipalities in the state, such money or funds may be invested in said bonds of irrigation districts." (See sec. 5425, R. S., 1913.)

In 1921 there was created a state certification board, which is to investigate districts and certify their bonds.

No irrigation districts are reported in Arizona.

Arkansas.—Arkansas has no irrigation district law.

California.—Petitions for the organization of districts are submitted to the county supervisors and to the state engineer. If the supervisors find that a petition submitted to them conforms to the law, the state engineer is so notified. He then makes an investigation as to the feasibility of the project and reports to the supervisors. If the engineer reports that the water supply is not sufficient for the proposed district, the commissioner may still approve a district, but only after receiving a petition signed by an increased proportion of the landowners.

A law enacted in 1913 created an irrigation district bond commission and provided for the certification of bonds by the state comptroller, under certain conditions. Any district proposing the issuing of bonds may apply to have its bonds certified. Upon the receipt of such an application the commissioner examines: (1) The water supply, (2) the soil and its probable water requirements, (3) the feasibility of the plans for supplying water, (4) the reasonable market value of the water, water rights, and irrigation works of the district, (5) the reasonable market value of the land in the district, (6) whether the proposed bond issue, together with others that have been issued or proposed, exceeds 60 per cent of the value of the water, water rights, works, and land, and (7) the character and number of bonds proposed to be issued.

The commission reports to the state comptroller, and if it reports that the water supply is sufficient, that the plans are feasible, and that the proposed bond issue does not exceed 60 per cent of the value of the water, water rights, works, and land, the bonds are certified by the comptroller.

Bonds certified by the comptroller are legal investments for "all trust funds, and for the funds of all insurance companies, banks, both commercial and savings, and trust companies, and for the state school funds, and whenever any money or funds may, by law now or hereafter enacted, be invested in bonds of cities, cities and counties, counties, school districts, or municipalities in the state of California, such money or funds may be invested in said bonds of irrigation districts."

Colorado.—In Colorado all irrigation districts are organized under the supervision of the county commissioners. In 1921 Colorado provided for investigation of proposed districts by the state engineer and by a commission, and bonds certified by this commission were made legal investments for public and trust funds.

Idaho.—In Idaho irrigation districts are organized under the supervision of the county commissioners. When a petition for the organization of a district is filed it is submitted to the state engineer, who makes a report on it to the county commissioners. If the state engineer reports adversely the petition for organization is denied, unless a new petition signed by three-fourths of the landowners of the district is received. The board of directors of each district is required to report to the state engineer at least once a year, and to publish a financial statement on or before the first Tuesday in February of each year. In addition, the county commissioners have access to the books at all times.

In 1921 Idaho created a "Reclamation District Bond Commission," similar to the irrigation district bond commission of California, described above. The Idaho commission handles drainage district bonds as well as irrigation district bonds. The provisions of the Idaho law are similar to those of California except that the commission is to determine the reasonable "cost" of the water, water rights, and works belonging to the district rather than their "value"; is to determine the value of the land in the district "when supplied with the water that will be made available," and is to determine whether the aggregate amount of bonds proposed exceeds 50 per cent of the reasonable value of the "lands within the district, with the water right that will be made available." The essential differences seem to be that California takes into account the value of the water, water rights, and irrigation works, while Idaho does not; but, on the other hand, Idaho takes into consideration the prospective increased value of the land on account of irrigation, while California takes the value of the land as it stands. Idaho requires a margin of value above bond issues of 50 per cent, while California requires only 40 per cent. Bonds are certified by the state treasurer and are then legal investments for the same classes of funds as in California.

Kansas.—Kansas has an irrigation district law, but no districts are reported.

Louisiana.—Louisiana has no irrigation district law.

Montana.—In Montana irrigation districts are organized under the supervision of the county commissioners, the proceedings for

issuing bonds are reviewed by the courts, and the books of districts are open to state examiners. In 1919 there was created a public service commission under which districts may be organized.

A law enacted in 1921 provides for an irrigation bond commission, similar to the California commission, and makes bonds that have been certified legal investment for the same classes of funds as in California. After bonds have been certified no expenditures from funds raised may be made without approval of the commission.

Nebraska.—The Nebraska irrigation district law provides for the organization of districts under the supervision of the county commissioners. A copy of the petition for organization is filed with the state board of irrigation, and the secretary of the board (the state engineer) makes a report to the commissioners. After organization the board employs an engineer to make plans, and his plans are submitted to the state engineer. After the receipt of the report of the state engineer the directors of the district decide upon the amount of the bond issue needed, and call an election to decide whether the bonds shall be issued. The law provides a special court procedure for passing on the validity of the bond issue. There is no further provision for public supervision.

Nevada.—In Nevada irrigation districts are organized under the supervision of the county commissioners, and there is provision for submitting and testing the validity of organization and bond issues in the courts. A law of 1911 provided for submitting plans to the state engineer, but this was repealed in 1915. In 1921 Nevada created a bond commission similar to that of California.

New Mexico.—The New Mexico irrigation district law provides for the organization of districts under the supervision of the county commissioners. Each district is to employ an engineer, and his report is to be submitted to the state engineer, who is to determine the sufficiency of the water supply. If he finds that there is not enough water, he is to disapprove the report, and in such a case, no bonds can be issued. The validity of bond issues is to be tested in the courts.

North Dakota.—The provisions of the North Dakota irrigation district law regarding public supervision of the organization of districts and of bond issues are exactly like those of Nebraska. No districts are reported.

Oklahoma.—Oklahoma has an irrigation district law, but no districts are reported.

Oregon.—In Oregon districts are organized under the supervision of the county courts. Plans are submitted to the state engineer for his approval or disapproval. A commission similar to the California irrigation district bond commission was created in 1917. The law is similar to the California law except that the aggregate bond issues may not exceed 50 per cent of the value of the land, water, water rights, and irrigation works. Bonds are certified by the secretary of state, and, when certified, are legal investments for the same classes of funds as in California. In 1919 Oregon provided for state guarantee of bond interest, for not to exceed five years.

South Dakota.—South Dakota has an irrigation district law, but no districts are reported.

Texas.—Water improvement districts in Texas are organized under the supervision of the county commissioners. The proceedings for issuing bonds are reviewed by the court. When an action for this purpose is brought, notice is served on the state attorney general, who examines the proceedings and files an answer with the court. If the case is decided in favor of the district, the clerk of the court certifies this fact to the state controller of accounts, and on presentation of this certificate and the bonds of the district he registers the bonds, and attaches to each bond a certificate of the fact that the proceedings have been validated by the court.

Utah.—In Utah irrigation districts are organized under the supervision of the county commissioners, and organization and bond issues are validated by the court. In 1919, Utah enacted a law similar to the California law creating an irrigation bond commission. The provisions of this law are the same as those of the California law, and certified bonds are legal investments for the same funds.

When bonds have been certified in accordance with this law the district can make no expenditures without the consent of the bond commission.

Washington.—In Washington irrigation districts are organized under the supervision of the county commissioner. When a petition for the organization of a district is received by the county commissioners the state hydraulic engineer is notified and sits with the commissioner in an advisory capacity when a hearing is held on the petition. Proceedings for organization and bond issues are validated by the courts. There is no further state supervision.

Wyoming.—Wyoming enacted a new irrigation district law in 1920, which is entirely different from any previously existing irrigation district law. Under this law petition is filed with the district court of the county containing the largest part of the area of the proposed district, and all proceedings regarding organization and bond issues are handled by the court. There is no provision for participation by any public official.

The preceding analysis of the irrigation district laws shows the successive steps in attempting to give irrigation district bonds a standing to have been as follows: First, the organization of districts under public supervision, usually by the county commissioners; second, the validation of proceedings for organization and bond issues by the courts; third, examination and report upon plans by the state engineers but without authority to take any action; fourth, the making of irrigation district bonds legal investments for trust funds and public funds; fifth, the certification of bonds by public commissions after examination of the enterprises; sixth, giving the bond commissions supervision over expenditures from funds obtained by the sale of certified bonds. Oregon has gone one step further and guarantees interest on district bonds for the first five years. No other state has gone so far as to guarantee bonds in any way.

Still further attempts to utilize district bonds for financing the construction of irrigation works have been made by enacting legislation in the states providing for issuing bonds to the United States in payment for the construction of irrigation works by the Federal Government and by attempting to get Federal legislation authorizing the acceptance of such bonds by the Federal Government, and the issuance of its own bonds, to secure funds, which, in turn, would be repaid with the payments on the district bonds. No such law has been enacted, but many bills providing for such laws have been introduced and urged. This would amount to the guaranteeing of district bonds by the Federal Government, since the Government could not afford to default in its payments, even if the districts defaulted in the payments on the bonds on which the Government bonds were based. Except in California and Oregon the laws providing for the certification of bonds are of so recent date that the census returns do not show their results, if there are any. The returns for California show 19 districts begun in the period from 1915 to 1919, including

238,000 acres. This is much greater activity than has been shown at any previous time, and may be due, in part, at least, to this law. Oregon reports in the same period 11 districts, including about 145,000 acres, which is nearly one-half of all the districts organized in the state, and about one-third of the area included in districts.

No other state shows any marked activity in the organization of districts, and consequently it seems that the results in California and Oregon may be attributed to their laws.

In 1919 irrigation districts supplied 9.5 per cent of the total area irrigated, which is less than one-third of the area served by either individual and partnership enterprises or cooperative enterprises. In 1909, however, districts served only 3.7 per cent of the total area, showing a large increase in relative importance. In fact, districts showed 27.2 per cent of the total increase in area irrigated from 1909 to 1919. This increase has been discussed (p. 16).

The area irrigated by districts in 1919 was 72 per cent of the area they were reported capable of supplying in 1920, and 53 per cent of the area included in district enterprises. These figures indicate that districts were in about the same condition as the average, for all enterprises, considered as a whole. Irrigation districts reported 9.5 per cent of the total area irrigated in 1919, and about the same percentage of the area enterprises were capable of irrigating in 1920 and the area in enterprises. On the other hand, they represented 12.7 per cent of the capital invested to January 1, 1920, indicating an average investment per acre higher than the general average. The average investment per acre, based on the area districts were capable of irrigating in 1920, was \$34.98, while the general average for all enterprises was \$26.81.

The percentages of all irrigation works of all classes belonging to irrigation districts are given in Table 23.

TABLE 23.—PERCENTAGE OF ALL IRRIGATION WORKS BELONGING TO IRRIGATION DISTRICTS.

ITEM.	Per cent of total.
Diverting dams.....number..	1.1
Storage dams.....number..	2.0
Main ditches:	
Number.....	0.9
Length.....miles..	4.8
Capacity.....second-feet..	8.2
Lateral ditches:	
Number.....	4.3
Length.....miles..	10.8
Reservoirs:	
Number.....	1.1
Capacity.....acre-feet..	7.9
Pipe lines, length.....miles..	9.2
Flowing wells:	
Number.....	6.6
Capacity.....gallons per minute..	1.3
Pumped wells:	
Number.....	0.3
Capacity.....gallons per minute..	0.6
Pumping plants:	
Number.....	0.3
Engine capacity.....horsepower..	5.8
Pumps—	
Number.....	0.9
Capacity.....gallons per minute..	5.1

The table shows that the works belonging to irrigation districts are larger than the average, since the percentages of capacities are larger than the percentages of the total numbers of works of various kinds.

Table 24 shows the history of irrigation district enterprises.

TABLE 24.—NUMBER OF IRRIGATION DISTRICT ENTERPRISES, WITH AREA IRRIGATED IN 1919 CLASSIFIED BY DATE OF BEGINNING.

DATE OF BEGINNING.	Number of enterprises.	AREA IRRIGATED IN 1919.	
		Acres.	Per cent of total.
Total.....	256	1,840,874	100.0
Before 1880.....	1	2,000	0.1
1880-1889.....	9	93,672	5.1
1890-1899.....	32	235,327	12.8
1890-1899.....	41	395,562	21.5
1890-1899.....	44	387,568	21.0
1900-1904.....	16	62,270	3.4
1905-1909.....	44	254,108	13.8
1910-1914.....	29	166,568	9.0
1915-1919.....	49	204,684	11.1
Not reported.....	11	28,914	1.6

It is evident that in some instances districts have given as the date of beginning the date on which the enterprises that have been reorganized into districts were begun, rather than dates when the districts were organized. The eighties and nineties were the periods of greatest activity in the beginning of enterprises that are now controlled by districts. This period was followed by a slump from 1900 to 1905, due to defaults of existing districts, a revival between 1905 and 1909, with another slump from 1910 to 1914. Within the last five years there has been some revival, due to increased public supervision, reorganizations to permit of loans under the Federal Farm Loan Act, and other causes previously discussed.

Commercial enterprises.—Commercial enterprises report the same percentage of the total area irrigated in 1919 as that reported for irrigation districts, 9.5 per cent. They show, however, a decrease in relative importance since 1909, when they reported 12.5 per cent of the total area irrigated. While cooperative enterprises and districts are continually gaining in relative importance by the reorganization of other enterprises into these forms, commercial enterprises are losing in relative importance by the same process. Notwithstanding this loss commercial enterprises rank among the leading types, measured by the area irrigated in 1919, and much higher in the area actually reclaimed by such enterprises, now reorganized into other forms.

Commercial enterprises reported practically no increase in area irrigated from 1909 to 1919, and an actual decrease during the same period in area enterprises were capable of irrigating and the area in enterprises. Table 26, page 31, shows considerable areas in enterprises begun between 1910 and 1915, but almost a complete cessation in the organization of such enterprises since 1915.

The original plan of operation of commercial enterprises was to build irrigation works and sell water rights that carried with them no interest in the works, but merely entitled the purchasers to obtain water upon the payment of annual charges. This was the plan on which most of the large irrigation enterprises promoted between 1870 and 1895 operated. There were so many abuses in selling rights to more water than could be delivered, in unfair contracts, and in excessive annual charges, that from time to time the states passed laws prohibiting the sale of rights beyond the capacities of canals, providing for the regulation of rates by some public authority, and, in some states, prohibiting the sale of water rights of this type. In most states rates are regulated by the county commissioners, but in California and Nebraska they are regulated by the state railway commissions.

The restrictive legislation referred to and the general financial failure of such enterprises have led to the abandonment of this plan of operation, and in recent years commercial enterprises sell rights which carry an interest in the works and water supply under contracts that provide that the works and rights shall become the property of the water users. Under this plan organization as a commercial enterprise is only a stage in the development of a cooperative enterprise.

The area irrigated in 1919 by commercial enterprises was 65 per cent of the area these enterprises were capable of irrigating in 1920, indicating that these enterprises are not so fully utilized as those of the types previously discussed. The area irrigated in 1919 was but 46 per cent of the land in the enterprises. The excess in area in enterprises over area irrigated is by far greater in the more recent enterprises, indicating that it represents enterprises in the process of development.

The part of all irrigation works that belongs to commercial enterprises is shown in Table 25.

TABLE 25.—PERCENTAGE OF ALL IRRIGATION WORKS BELONGING TO COMMERCIAL ENTERPRISES.

ITEM.	Per cent of total.
Diverting dams.....number..	0.8
Storage dams.....number..	3.0
Main ditches:	
Number.....	0.8
Length.....miles..	6.1
Capacity.....second-feet..	8.6
Lateral ditches:	
Number.....	7.7
Length.....miles..	13.2
Reservoirs:	
Number.....	2.7
Capacity.....acre-feet..	11.1
Pipe lines, length.....miles..	9.5
Flowing wells:	
Number.....	1.3
Capacity.....gallons per minute..	2.8
Pumped wells:	
Number.....	0.9
Capacity.....gallons per minute..	1.4
Pumping plants:	
Number.....	0.6
Engine capacity.....horsepower..	8.9
Pumps:	
Number.....	1.4
Capacity.....gallons per minute..	18.8

Commercial enterprises report 12.3 per cent of the capital invested in all enterprises, with an investment per acre to which they were capable of supplying water in 1920 of \$30.62, as compared with \$26.81 for all classes.

The table shows that for every item the percentage of the total capacity exceeds the percentage of the total number, indicating that the works belonging to commercial enterprises exceed the average size.

In recent years many commercial enterprises have secured control of tracts of land, and sell the land with the works and rights. This form of organization is particularly well adapted to this type of development, operating on a comparatively small scale.

The historical development of commercial enterprises is shown by Table 26.

TABLE 26.—NUMBER OF COMMERCIAL IRRIGATION ENTERPRISES, WITH AREA IRRIGATED IN 1919, CLASSIFIED BY DATE OF BEGINNING.

DATE OF BEGINNING.	Number of enterprises.	AREA IRRIGATED IN 1919.	
		Acres.	Per cent of total.
Total.....	309	1,802,590	100.0
Before 1880.....	18	13,877	0.8
1880-1889.....	8	9,535	0.5
1870-1879.....	36	726,505	40.3
1880-1889.....	24	273,089	15.1
1890-1899.....	53	279,817	15.5
1900-1904.....	38	178,311	9.9
1905-1909.....	37	168,481	9.3
1910-1914.....	52	113,050	6.3
1915-1919.....	26	18,813	1.0
Not reported.....	17	21,621	1.2

The largest development of commercial enterprises was coincident with the beginning of large-scale irrigation enterprises in 1870, and commercial enterprises continued to be of importance, although on a decreasing scale, until 1914. Since 1914 commercial enterprises have ceased to be important, because of the difficulty in financing such enterprises.

United States Reclamation Service enterprises.—The United States Reclamation Service ranks fifth among the types of enterprises in the extent of the area irrigated in 1919, having 6.5 per cent of the total.

This does not represent the full extent of the work of the Reclamation Service, since it supplies stored water to lands receiving their principal supply from other sources. The area thus furnished a partial supply of water in 1919 was slightly less than one million acres. On the other hand, some of the land reported by the Reclamation Service was supplied with water by enterprises of other types that have been incorporated into the reclamation enterprises. In extent of increase in area irrigated from 1909 to 1919 the Reclamation Service ranks third, with 18.1 per cent of the total. This increase represents a real extension in the area irrigated, and not transfers from other enterprises, as is the case with cooperative enterprises and irrigation districts.

The Reclamation Service reports about the same percentages of the total area all enterprises were capable of irrigating in 1920 and of the total area included in all enterprises that it does of the area irrigated in 1919, 6.5 per cent and 7.3 per cent, respectively.

The area irrigated in 1919 was 74.6 per cent of the area enterprises were capable of irrigating in 1920, showing that the effective capacity of the United States Reclamation Service enterprises was more fully utilized than that of most other types of enterprise. The area irrigated in 1919 was but 47.8 per cent of the area included in enterprises. This low percentage is due to the fact that the Reclamation Service is actively engaged in construction work and very few of its enterprises are completed.

The United States reclamation law was enacted in 1902. The original law provided for the construction of irrigation works with the proceeds from the sale of public lands, after deducting certain amounts, and for the repayment of the cost by the water users in 10 annual installments. These repayments were to go into the reclamation fund, to be used in building additional works, thus creating a revolving fund continually augmented by the proceeds from the sale of lands. To this fund was added in 1914 a loan from the Treasury of \$20,000,000, which is to be repaid, and consequently does not form a part of the revolving fund. Table 27, taken from the Nineteenth Annual Report of the Reclamation Service (p. 57), shows the amounts which have gone into the reclamation fund from 1901 to June 30, 1920.

TABLE 27.—ACCRETIONS TO THE RECLAMATION FUND FROM ALL SOURCES TO JUNE 30, 1920.

FISCAL YEAR.	Total.	Sale of public lands.	Sale of town lots.	Bond loan.	Miscellaneous collections and repayments.
Total.....	\$153,657,583.43	\$100,300,195.79	\$498,329.63	\$20,000,000	\$32,857,058.01
1901.....	3,144,821.91	3,144,821.91			
1902.....	4,585,520.53	4,585,520.53			
1903.....	8,714,238.97	8,713,906.60			242.37
1904.....	6,826,964.48	6,826,253.59			710.84
1905.....	4,806,854.24	4,805,515.39			1,338.85
1906.....	5,189,261.13	5,166,336.50			22,924.63
1907.....	8,072,116.16	7,914,131.71	61,535.00		96,449.45
1908.....	9,961,540.18	9,430,573.98	12,864.06		518,102.14
1909.....	8,519,885.24	7,755,466.81	10,017.85		754,400.58
1910.....	8,810,876.85	7,028,185.73	60,112.86		1,722,578.27
1911.....	8,239,355.55	6,135,547.76	69,468.80		2,034,338.99
1912.....	8,127,546.65	5,657,498.88	15,224.10		2,454,823.70
1913.....	6,115,808.91	3,737,910.55	17,784.74		2,360,113.62
1914.....	9,717,890.35	3,460,451.63	16,280.25	3,500,000	2,742,158.47
1915.....	14,177,564.75	3,268,057.73	18,436.28	3,500,000	3,391,070.74
1916.....	8,518,265.80	2,648,057.74	21,189.28	3,500,000	2,349,018.78
1917.....	7,578,869.57	2,865,386.34	31,250.15	1,500,000	3,182,233.08
1918.....	9,073,087.21	2,552,650.65	60,990.66	3,000,000	3,459,446.00
1919.....	5,877,084.04	1,959,496.88	55,362.49		3,862,224.67
1920.....	7,600,030.92	2,644,334.88	43,813.21		4,911,882.83

¹ Of this total, \$9,286,469.16 is reported as repayments on construction charges; \$6,462,557.23 as operation and maintenance charges; and \$17,115,031.62 as miscellaneous collections. These items are not reported separately by years.

The same report gives the gross construction cost as \$126,140,986.18 and the operation and maintenance cost as \$18,588,049.85. The gross construction cost reported here is slightly less than the capital invested

as reported by the census. The report states that this difference is due "to a combination of items included in disbursements but not in cost and items included in cost but not in disbursements." The reported repayments on construction charges are 7.4 per cent of the gross construction cost. From this it appears that the "revolving fund" feature of the reclamation fund is as yet not realized.

Since the date of the census, and therefore not affecting the reclamation fund as reported above, Congress has provided that 52.5 per cent of the receipts under the oil-leasing act and 50 per cent of the receipts under the Federal power act shall be paid into the reclamation fund.

For the purpose of permitting of more construction of irrigation works than the reclamation fund provides for, many bills have been introduced in Congress providing that the Federal Government may accept the bonds of irrigation districts in payment for construction work, or in advance of construction, and issue its own bonds, to be repaid from the payments on the district bonds, for the purpose of obtaining funds for construction. (See page 29.) No such law has been enacted, however.

As stated previously, the reclamation law originally provided that the cost of construction should be repaid in not more than 10 annual installments. In 1914 Congress enacted the so-called "extension act," which provided for extending payments over a period of 20 years instead of 10. In both cases the Secretary of the Interior was authorized to fix the time when the payments shall begin, and in neither case is interest charged on deferred payments. The extension of the time during which payments may be made and the fact that for several projects the Secretary of the Interior has not yet fixed the time when payments shall begin account for the smallness of the amount received from the repayments of construction charges.

Projects for which the payments have not begun are operated on temporary rental agreements. The report referred to above gives (p. 52) the receipts from water rentals to June 30, 1920, as \$6,149,617.27.

The census schedules returned by the Reclamation Service show the total capital invested to January 1, 1920, to be \$129,509,819, which is 18.6 per cent of the total capital invested in enterprises of all classes. On the basis of the area capable of being irrigated in 1920, this is an average investment per acre of \$77.06. However, the Reclamation Service supplied stored water to nearly 1,000,000 acres receiving their principal supply of water from other sources. A part of its expenditures should be charged to these lands, but the census returns do not show how much. Including the total area supplied with stored water in the area used in computing the average investment per acre would give an average of \$48.31 per acre. The correct average lies between these two sums, above rather than

below the mean of the two. Probably \$65 per acre approximates the correct amount. The average for all enterprises is \$26.81, and the average for the Reclamation Service is about two and one-half times the general average.

The average cost per acre of operation and maintenance for Reclamation Service enterprises was \$2.20, which is but 91 per cent of the average cost of all enterprises.

With reference to the ultimate control of Reclamation Service enterprises the law contains the following provision (sec. 6):

Provided, That when the payments required by this act are made for the major portion of the lands irrigated from the waters of any of the works herein provided for, then the management and operation of such irrigation works shall pass to the owners of the lands irrigated thereby, to be maintained at their expense under such form of organization and under such rules and regulations as may be acceptable to the Secretary of the Interior: *Provided*, That the title to and the management and operation of the reservoirs and the works necessary for their protection and operation shall remain in the Government until otherwise provided by Congress.

In the earlier years of the operation of the Reclamation Act the Secretary of the Interior required the organization of water-users' associations with which he dealt in matters relating to the various enterprises, but in more recent years he has preferred the organization of irrigation districts. Some of the enterprises are organized in one form and some in the other, but none has yet reached the stage described in the law. In either case the local organizations act as collecting agents for the Reclamation Service. As pointed out in the discussion of districts, this form of organization has the advantage that the deferred payments represented by district obligations do not bar settlers from obtaining loans under the Federal Farm Loan Act.

While the United States Reclamation Act nominally relates to public lands, it provides for the inclusion of private lands in reclamation enterprises, and therefore is available for supplying water to lands of either class.

The Reclamation Act originally provided in general for expenditures in the various states in proportion to the funds arising from the sales of public lands within the states. This restriction was later removed, leaving the allotment of funds to the discretion of the Secretary of the Interior. The act extending the period of repayment to 20 years provided that after July 1, 1915, expenditures from the reclamation fund should not be made except out of appropriations made annually by Congress, and since that date Congress has made annually appropriations for specific projects.

The percentage of the total of all irrigation works that belongs to the Reclamation Service is shown in Table 28.

For only one item does the number credited to the Reclamation Service equal 1 per cent of the total, but

in capacity its works rank much higher. This is particularly noticeable in the case of reservoirs, where the number is less than 1 per cent of the total, while the capacity is only a little less than 50 per cent of the total.

TABLE 28.—PERCENTAGE OF ALL IRRIGATION WORKS BELONGING TO UNITED STATES RECLAMATION ENTERPRISES.

ITEM.	Per cent of total.
Diverting dams.....number.....	0.2
Storage dams.....number.....	1.0
Main ditches:	
Number.....	0.2
Length.....miles.....	1.9
Capacity.....second-feet.....	5.2
Lateral ditches:	
Number.....	5.6
Length.....miles.....	10.2
Reservoirs:	
Number.....	0.6
Capacity.....acre-feet.....	46.7
Pipe lines, length.....miles.....	2.0
Pumped wells:	
Number.....	0.2
Capacity.....gallons per minute.....	0.3
Pumping plants:	
Number.....	0.1
Engine capacity.....horsepower.....	1.9
Pumps—	
Number.....	0.2
Capacity.....gallons per minute.....	2.7

The activity of the Reclamation Service, measured by the area irrigated in 1919 in enterprises begun at various dates, is shown by Table 29.

TABLE 29.—NUMBER OF UNITED STATES RECLAMATION SERVICE ENTERPRISES, WITH AREA IRRIGATED IN 1919, CLASSIFIED BY DATE OF BEGINNING.

DATE OF BEGINNING.	Number of enterprises.	AREA IRRIGATED IN 1919.	
		Acres.	Per cent of total.
Total.....	74	1,241,018	100.0
1900-1904.....	18	368,946	29.7
1905-1909.....	37	761,361	61.3
1910-1914.....	10	102,360	8.2
1915-1919.....	5	7,644	0.6
Not reported.....	6	705	0.1

The reclamation law was enacted in 1902, and more than 90 per cent of the land irrigated in 1919 is in enterprises begun between 1902 and 1910. For many years it has been the policy of the service, as well as of Congress, to complete existing projects rather than begin new ones. Table 12 on page 21, shows that the area included in these enterprises but not irrigated in 1919 exceeds the area irrigated in 1919. In other words, the area irrigated by Reclamation Service enterprises can be doubled without the undertaking of any new enterprises.

Carey Act enterprises.—Carey Act enterprises show the smallest area irrigated in 1919 of any of the types of enterprise engaged primarily in supplying water for irrigation—only 2.7 per cent of the total; and they show also only about 5 per cent of the total increase in area irrigated during the last decade. Here again,

the figures do not present the whole truth, since under state laws, Carey Act enterprises pass to cooperative enterprises as soon as they become well developed.

The area irrigated in 1919 was 65 per cent of the area enterprises were capable of irrigating in 1920, and 44 per cent of the area included in enterprises, as compared with general averages of 74 per cent, and 53 per cent for enterprises of all types. The poor showing of Carey Act enterprises as to utilization of their full capacity, as compared with enterprises of other classes, is due in part, at least, to the fact that they, like commercial enterprises, represent only one stage in the development of cooperative enterprises. As soon as an enterprise is fairly well developed it is reorganized into a cooperative enterprise and would not be reported as a Carey Act enterprise.

Carey Act enterprises report 4.7 per cent of the total capital invested in irrigation enterprises, with an average of \$40.63 per acre, while the average per acre for all enterprises is \$26.81.

The Federal Carey Act is very general in its terms, the plan of operation being left largely to the several states. The states are authorized to make all contracts necessary for the reclamation of the lands, but are prohibited from leasing any land, from disposing of it in any way except to secure its reclamation, cultivation and settlement, and from disposing of more than 160 acres to any one person.

The state laws governing operations under the Carey Act differ much in detail but are alike in general plan. All operations are placed under the supervision of state boards. Any person or corporation desiring to reclaim land under this law applies to the proper board, specifying the lands which it is desired to have segregated, and describing the proposed plan of reclamation. If the application is approved by the state board, it is submitted to the General Land Office, and if it is approved there the land is segregated and set aside to be disposed of in accordance with a contract entered into by the state and the applicant. This contract provides for the construction of works and fixes the terms on which water rights may be sold to settlers, one of the conditions being that the rights sold shall carry an interest in the works, so that when rights are paid for the works and rights become the property of the purchasers of rights. On its part the state agrees to sell lands only to parties who have entered into contract with the applicant for the purchase of water rights. The plan adopted for passing title from the applicant to the purchaser of water rights and land is to issue with the rights stock in a new company which becomes effective upon the completion of specified payments. The Federal Government patents the land to the state, and the state issues title to the purchaser, when his payments are made.

The Federal law authorizes the states to create liens on the lands "for the actual cost and necessary expense of reclamation and reasonable interest thereon from the date of reclamation until disposed of to actual settlers," and for this purpose the Government may pass title to the states as soon as an adequate water supply is made permanently available. This, however, is not the usual plan. Water rights are sold on deferred payments, and bonds are sold, secured by the notes for these deferred payments and the settlers' interest in the land. Settlers agree to give mortgages on the land as soon as they get title, but until that time the bonds are secured only by the settlers' interest in the land. The usual practice has been for the states to apply for patent only when the settlers have fulfilled the conditions entitling them to patent; consequently, up to that time the title to the land is in the Federal Government and it is not liable for the bonds.

Table 30, compiled from the annual reports of the General Land Office, shows the areas applied for, segregated and patented under the Carey Act from 1911 to 1920. As the amounts are cumulative, they show in fact what has been done under this act from the date of its passage in 1894.

TABLE 30.—AREAS APPLIED FOR, SEGREGATED, AND PATENTED UNDER THE CAREY ACT (ACRES).

YEAR.	APPLIED FOR.		SEGREGATED.		PATENTED.	
	To date.	During year.	To date.	During year.	To date.	During year.
1911.....	7,116,339	975,529	3,193,314	328,795	388,404	60,540
1912.....	7,301,037	184,697	3,291,231	97,917	474,000	85,596
1913.....	7,773,359	356,687	3,685,082	394,761	480,048	35,171
1914.....	7,682,445	21,766	3,692,230	6,238	460,054	30,006
1915.....	7,781,130	98,685	3,705,445	13,215	631,573	141,519
1916.....	7,735,846	34,338	3,708,367	2,922	761,455	159,962
1917.....	7,741,963	6,116	3,711,615	3,247	803,519	42,064
1918.....	7,797,631	55,668	3,755,429	43,814	815,163	11,644
1919.....	7,797,631	.....	3,758,965	3,536	883,264	68,103
1920.....	8,373,973	576,343	3,781,649	22,685	888,793	5,527

Except for the application for something over 500,000 acres in 1920—the application coming from Idaho—there have been few applications and fewer segregations since 1913. The issuing of patents represents progress on older enterprises, rather than the undertaking of new ones.

The Carey Act applies only to public lands, and as large bodies of public land susceptible of irrigation become more scarce there is less and less opportunity for development under this act. It has been stated that desert lands in irrigation districts are not considered sufficient security for bonds to cover the cost of construction of irrigation works, where these bonds are a tax lien on the lands, and Carey Act bonds have even less security, since they do not become a lien on the lands until the settlers on the lands secure title to their holdings. Many Carey Act enterprises have

failed, and this has given Carey Act bonds a poor standing in the market. Because of this and the fact that the areas of public land fitted to be reclaimed under the Carey Act are diminishing, it appears that the Carey Act will not be made use of to so large an extent as it has in the past.

Table 31 shows what part of the irrigation works of the country are controlled by Carey Act enterprises. The table shows that Carey Act enterprises control an insignificant part of the irrigation works.

TABLE 31.—PERCENTAGE OF ALL IRRIGATION WORKS BELONGING TO CAREY ACT ENTERPRISES.

ITEM.	Per cent of total.
Diverting dams.....number.....	0.2
Storage dams.....number.....	0.7
Main ditches:	
Number.....	0.1
Length.....miles.....	1.4
Capacity.....second-feet.....	3.0
Lateral ditches:	
Number.....	1.0
Length.....miles.....	4.5
Reservoirs:	
Number.....	0.4
Capacity.....acre-feet.....	4.2
Pipe lines, length.....miles.....	0.7
Flowing wells:	
Number.....	0.2
Capacity.....gallons per minute.....	0.6
Pumping plants:	
Number.....	(¹)
Engine capacity.....horsepower.....	0.1
Pumps—	
Number.....	0.1
Capacity.....gallons per minute.....	(¹)

¹ Less than one-tenth of 1 per cent.

Table 32 shows the acreage irrigated by Carey Act enterprises in 1919, distributed by date of beginning.

TABLE 32.—NUMBER OF CAREY ACT ENTERPRISES, WITH AREA IRRIGATED IN 1919, CLASSIFIED BY DATE OF BEGINNING.

DATE OF BEGINNING.	Number of enterprises.	AREA IRRIGATED IN 1919.	
		Acres.	Per cent of total.
Total.....	42	521,829	100.0
1890-1899.....	7	50,855	9.7
1900-1904.....	7	243,565	46.7
1905-1909.....	19	221,256	42.4
1910-1914.....	7	6,103	1.2
1915-1919.....	2	50	(¹)

¹ Less than one-tenth of 1 per cent.

This table shows, as did that compiled from the reports of the General Land Office, that there has been little activity under the Carey Act since 1910.

Other types of enterprises.—The other types of enterprises included in the classification are not engaged primarily in supplying water for irrigation.

The United States Indian Service supplies water to land in Indian reservations, and the land to which it supplied water in 1919 was 1.5 per cent of the total.

State enterprises have some significance because they include a state land-settlement project in California, the first of its kind in the United States. In

this case the state has prepared so-called "ready-made farms," equipped with buildings, fences, and other improvements, as well as irrigation and drainage facilities. The lands are sold on long-time, amortized payments, and there has been a high degree of state supervision and leadership in the affairs of the colony. A second colony has been established in California, but was not sufficiently advanced to be reported in the census. This plan of land settlement, backed by both state and Federal governments is being urged, but has not been adopted, except in California.

WATER RIGHTS.

In the arid sections of the United States the right to use water is the most important factor entering into the value of land. Yet the development of the West was begun without an adequate appreciation of the value of titles to water rights, and without adequate legislation for perfecting titles, and according to the returns of the Fourteenth Census only a little more than one-half of the land irrigated is served by enterprises whose titles to water are defined and recognized by any legally constituted authority. Nearly \$700,000,000 has been invested in irrigation enterprises, and land values of many times that amount are dependent on rights to water, only about one-half of which are properly defined. The laws of the several states relating to this subject are summarized on pages 47 to 48, and are stated more in detail in the state reports at the end of this report.

There are in the Western states two general theories as to water rights, one known as the doctrine of appropriation—that water may be taken from streams for use on land without reference to its bordering on the streams—and the other known as the riparian doctrine—that water from a stream may be used only on land bordering that stream. The doctrine of appropriation is recognized in all of the states where irrigation is generally practised, while the riparian doctrine is recognized to a limited extent in several of the states. However, less than 2 per cent of the land irrigated in 1919 is reported to be served by riparian rights. Consequently, it may be stated that practically all of the rights to water for irrigation rest on the doctrine of appropriation.

The fundamental elements of the doctrine of appropriation are as follows:

1. Water may be taken from streams for beneficial uses on lands not bordering the streams from which it is taken.
2. The appropriation (the taking of the water) must be for some useful or beneficial purpose.
3. Among appropriators the first in time is the first in right. That is, when there is not water enough for all, the appropriators are to be supplied in the order of the dates of their first use of water, up to the limit of their rights.

4. When the use ceases the right ceases.

The states have assumed the right under their police powers to control the acquirement and enforcement of water rights, and the United States Supreme Court has recognized this right on the part of the states. (*Kansas v. Colorado*, 206 U. S., 46.)

Notwithstanding that all Western states have provided for some public control over the acquirement of water rights, they have all recognized rights acquired without conforming to the legal requirements or prior to the establishment of such requirements; that is, by "appropriation and use." The reports show that 13.1 per cent of the land irrigated in 1919 was served by rights of this class that have not been defined or otherwise made of record.

The first step in public control was the enactment of laws requiring the posting of notices at the points of intended diversion stating what was claimed, and the filing of copies of these notices in county records. In several states the laws required also the filing of claims for rights acquired prior to the enactment of the laws. The dates of the enactment of laws requiring posting and filing of notices or the filing of claims are shown on page 47. Since "beneficial use" is essential to the acquirement of a right and to its maintenance, it is obvious that the filing of a claim does not give title and the filing is merely evidence of an intent to acquire a right and not evidence of the right itself. Consequently, rights acquired in this way are not defined as they are acquired. The area irrigated in 1919 under rights initiated in this way and not otherwise defined is 14.4 per cent of the total area irrigated.

All of the states covered by the census of irrigation, except Arkansas, Colorado, Kansas, Louisiana, and Montana, have provided for a more orderly and efficient system of the acquirement of rights. The dates of the enactment of their laws making this provision are shown on page 48. These laws require a party wishing to acquire a right to apply to some state board or official for a permit to take a specified quantity of water from some source, stating the nature and the place of use. The approved application becomes a permit. Proof of the completion of irrigation works and of the use of water is to be submitted, and if the work has been done in accordance with the permit a certificate or license is issued that states the nature and extent of the rights acquired. The land irrigated in 1919 under rights of this character is 16.9 per cent of the total area irrigated.

Since so large a part of the rights have been acquired in a manner in which they are not defined as acquired, the states have made provision for defining rights. The nature of the procedure adopted and the date of its adoption in the several states are shown on page 48. In all of the states except Nebraska and Wyoming, rights are defined in the courts, and 37.3 per cent of all the land irrigated in 1919 was supplied with water

under rights that have been defined by courts. As shown on page 48, in Arkansas, Colorado, Idaho, Kansas, Louisiana, Montana, and South Dakota, rights are defined by the courts on the testimony of interested parties without the aid of state officials or boards; while Arizona, California, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, Texas, Utah, and Washington provide for the making of surveys, the collection of information, and the formulation of decrees by state boards or officials, with provision for review and the issuing of decrees defining rights by the courts. The returns do not show what part of the rights that have been defined by the courts have been defined by each of these procedures.

Table 33, which follows, shows the percentages of the areas irrigated in each of the states, in 1919, that are served by rights of the various classes.

TABLE 33.—PERCENTAGE OF ACREAGE IRRIGATED IN 1919, SERVED BY WATER RIGHTS OF VARIOUS CLASSES.

STATE.	Appropriation and use.	Notice filed and posted.	Adjudicated by court.	Permit from state.	Certificate of license from state.	Reliance on riparian rights.	Underground.	Other, mixed, and not reported.
Total.....	13.1	14.4	37.3	10.2	6.7	1.9	5.6	10.7
Arizona.....	48.5	20.8	18.2	(¹)	.....	.....	8.9	8.6
Arkansas.....	.....	.....	.....	.....	.....	.....	.....	100.0
California.....	11.4	16.7	23.3	1.9	9.6	5.7	20.5	20.0
Colorado.....	2.4	6.2	87.2	.....	.....	.....	0.4	2.8
Idaho.....	5.3	9.6	44.4	19.6	13.6	0.6	(¹)	6.9
Kansas.....	55.9	8.9	9.9	.....	.....	0.1	28.5	5.7
Louisiana.....	.....	.....	.....	.....	.....	.....	.....	100.0
Montana.....	13.7	39.6	41.7	.....	.....	0.3	(¹)	4.6
Nebraska.....	9.5	3.7	2.1	83.0	28.6	0.1	0.1	4.7
Nevada.....	25.7	9.3	28.7	19.0	1.2	.....	0.2	5.9
New Mexico.....	28.4	10.1	17.1	19.2	3.7	0.1	9.7	11.7
North Dakota.....	32.6	19.3	.....	24.3	.....	.....	.....	3.8
Oklahoma.....	1.2	7.2	74.1	10.4	.....	2.7	4.0	0.3
Oregon.....	15.1	15.3	29.8	13.3	22.0	1.5	0.3	2.7
South Dakota.....	1.8	61.6	7.6	17.4	8.6	1.6	0.1	1.4
Texas.....	11.8	17.9	0.5	39.2	2.0	12.4	7.6	8.6
Utah.....	34.3	12.4	42.4	4.1	4.9	.....	0.6	1.2
Washington.....	37.1	32.0	10.6	7.5	3.3	3.2	3.9	2.3
Wyoming.....	2.1	5.6	13.4	33.6	37.8	.....	(¹)	3.0

¹ Less than one-tenth of 1 per cent.

In Table 34, the percentages of the areas irrigated in 1919 and 1909 that are served by rights that have

been defined or are being acquired under permits, so that they will be defined as they are acquired, are shown by states.

TABLE 34.—PERCENTAGE OF ACREAGE IRRIGATED IN 1919 AND 1909, THAT IS SUPPLIED BY WATER UNDER DEFINED RIGHTS.

STATE.	1919	1909
Total.....	54.2	47.7
Arizona.....	18.2	8.6
California.....	25.8	28.0
Colorado.....	87.2	84.4
Idaho.....	77.6	55.6
Kansas.....	0.9	(¹)
Montana.....	41.7	38.0
Nebraska.....	81.7	81.1
Nevada.....	48.9	7.6
New Mexico.....	40.0	13.7
North Dakota.....	24.3	4.3
Oklahoma.....	84.5	17.1
Oregon.....	65.1	9.2
South Dakota.....	33.6	39.7
Texas.....	41.7	(¹)
Utah.....	51.4	42.2
Washington.....	21.4	7.6
Wyoming.....	89.9	90.5

¹ Less than one-tenth of 1 per cent.

The degree to which rights have been defined in the several states seems to depend more largely upon the time when they adopted plans for defining rights than upon the character of the system adopted. Colorado was the first state to adopt a special procedure in the courts for this purpose and reports that more than 87 per cent of the land irrigated in the state is served by defined rights. Wyoming was the first state to provide for the defining of rights by an administrative board and shows about 90 per cent of the land served by defined rights—the highest percentage shown by any state, while Nebraska, the only other state having this system, ranks high.

The table shows a slight advance in the area served by defined rights in the states taken as a whole, with very marked increases in Nevada, New Mexico, Oklahoma, Oregon, and Texas, and slight decreases in several of the states. In most cases the decreases are due to the new enterprises, the rights for which have not been defined.

PUMPING FOR IRRIGATION.

The summary for the United States and the reports for the several states contain data on the areas irrigated with pumped water and on pumping equipment. This chapter contains additional information regarding pumping equipment, and brings together that found in the other reports, in order to make a complete presentation of the data relating to pumping for irrigation collected in the Fourteenth Census, with such comparisons with the results of the Thirteenth Census as can be made.

Table 35 shows the areas receiving either a total or a partial water supply from pumps in 1919, by states. In classifying the areas irrigated in 1909 by the source of supply all areas were credited to what seemed to

be the principal source of supply, so that comparisons of the areas receiving pumped water in 1919 and in 1909 are not justified.

Other tables follow, without discussion. The accuracy of the data is discussed on pages 9 to 11.

The average investment per acre in 1910 for pumping enterprises furnishing the entire water supply to the land irrigated was \$21.96 per acre, while that reported for 1920 was \$35.92, an increase of 63.6 per cent. The per cent of increase from 1910 to 1920 in average investment per acre for all classes of enterprises was 69.1 per cent, showing that the pumping enterprises increased in about the same proportion as did all others.

IRRIGATION.

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TABLE 35.—DISTRIBUTION OF AREA IRRIGATED WITH PUMPED WATER IN 1919, BY STATES.

STATE.	TOTAL SUPPLY PUMPED.								PARTIAL SUPPLY PUMPED.							
	Total.		Streams.		Wells.		Lakes.		Total.		Streams, gravity, and pumped.		Streams, gravity, and pumped wells.		Wells, flowing and pumped.	
	Acres.	Per cent of total.	Acres.	Per cent of total.	Acres.	Per cent of total.	Acres.	Per cent of total.	Acres.	Per cent of total.	Acres.	Per cent of total.	Acres.	Per cent of total.	Acres.	Per cent of total.
Total.....	2,525,338	100.0	1,226,510	100.0	1,263,098	100.0	35,730	100.0	579,993	100.0	199,595	100.0	344,713	100.0	35,685	100.0
Arizona.....	46,370	1.8	6,671	0.5	39,694	3.1	5	(¹)	218,357	37.6	.....	.....	217,799	63.2	558	1.6
Arkansas.....	141,719	5.6	6,009	0.5	135,260	10.7	450	1.3	250	(¹)	.....	.....	250	0.1	.....	.....
California.....	1,126,687	44.6	295,673	24.1	826,846	65.5	4,168	11.7	171,736	29.6	60,278	30.2	87,897	25.5	23,561	66.0
Colorado.....	23,732	0.9	12,747	1.0	10,114	0.8	871	2.4	25,773	4.4	9,430	4.7	16,258	4.7	85	0.2
Idaho.....	112,507	4.5	107,181	8.7	414	(¹)	4,912	13.7	2,227	0.4	1,870	0.9	357	0.1	.....	.....
Kansas.....	13,965	0.6	730	0.1	13,235	1.0	.....	.....	2,190	0.4	600	0.3	1,540	0.4	50	0.1
Louisiana.....	409,576	16.2	248,306	20.2	154,304	12.2	6,956	19.5	23,740	4.1	12,620	6.3	10,045	2.9	1,075	3.0
Montana.....	15,961	0.6	15,743	1.3	139	(¹)	79	0.2	20,027	3.5	19,872	10.0	155	(¹)	.....	.....
Nebraska.....	1,681	0.1	1,115	0.1	546	(¹)	.....	.....	965	0.2	850	0.4	115	(¹)	.....	.....
Nevada.....	2,942	0.1	2,647	0.2	295	(¹)	.....	.....	5,742	1.0	720	0.4	4,987	1.4	65	0.2
New Mexico.....	17,599	0.7	1,890	0.2	15,709	1.2	.....	.....	7,897	1.4	.....	.....	1,341	0.4	6,558	18.4
North Dakota.....	2,469	0.1	2,469	0.2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oklahoma.....	295	(¹)	188	(¹)	107	(¹)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oregon.....	68,189	2.7	64,676	5.3	1,933	0.2	1,620	4.5	698	0.1	253	0.1	105	(¹)	340	0.1
South Dakota.....	869	(¹)	880	0.1	.....	.....	.....	.....	500	0.1	.....	.....	500	0.1	.....	.....
Texas.....	461,618	18.3	421,538	34.4	39,483	3.1	597	1.7	2,531	0.4	350	0.2	454	0.1	1,727	4.8
Utah.....	29,097	1.2	10,380	0.8	7,308	0.6	11,400	31.9	353	0.1	50	(¹)	125	(¹)	178	0.5
Washington.....	48,410	1.9	26,244	2.1	17,504	1.4	4,662	13.0	96,607	16.7	92,702	46.4	2,415	0.7	1,490	4.2
Wyoming.....	1,672	0.1	1,525	0.1	147	(¹)	.....	.....	400	0.1	.....	.....	400	0.1	.....	.....

¹ Less than one-tenth of 1 per cent.

TABLE 36.—DISTRIBUTION OF PUMPING EQUIPMENT, 1920 AND 1910, BY STATES.

STATE.	PUMPING PLANTS.						PUMPS.				Average lift, 1920 (feet). ²
	Number.			Engine capacity (horsepower).			Number, 1920. ³	Capacity (gallons per minute).			
	1920	1910	Per cent of increase. ¹	1920	1910	Per cent of increase. ¹		1920	1910	Per cent of increase. ¹	
Total.....	29,458	15,803	86.4	748,971	361,480	107.2	33,804	36,275,005	19,355,864	87.4	41
Arizona.....	744	429	73.4	22,014	37,258	-40.9	1,001	1,048,030	851,873	23.0	44
Arkansas.....	1,041	815	280.5	58,332	12,440	368.9	1,121	1,654,097	436,402	279.0	50
California.....	21,561	9,297	131.9	386,200	128,143	201.4	24,134	16,773,692	5,276,298	217.9	41
Colorado.....	406	206	97.1	8,635	7,969	8.4	435	299,726	296,937	0.9	23
Idaho.....	143	58	146.6	28,364	7,065	301.5	232	1,397,681	278,569	401.7	29
Kansas.....	198	698	-71.6	6,946	1,517	357.9	288	297,975	128,276	132.3	30
Louisiana.....	1,250	1,007	24.1	85,628	57,426	49.1	1,941	4,968,686	5,064,173	-1.9	32
Montana.....	253	125	102.4	10,341	3,511	194.5	299	453,231	281,199	61.2	20
Nebraska.....	51	75	-32.0	959	140	585.0	54	73,686	5,366	.....	24
Nevada.....	64	18	255.6	409	693	-41.0	72	35,266	24,295	45.2	22
New Mexico.....	472	413	14.3	8,488	14,226	-40.3	491	304,789	216,355	40.9	40
North Dakota.....	4	4	.....	2,068	2,038	1.5	10	51,250	182,115	-71.9	38
Oklahoma.....	22	68	-67.6	184	107	72.0	26	7,608	4,541	68.9	59
Oregon.....	573	229	150.2	13,769	3,095	344.9	614	600,045	118,514	406.3	28
South Dakota.....	25	8	212.5	498	63	690.5	25	23,320	5,289	340.9	21
Texas.....	1,369	2,359	-42.0	80,511	69,094	16.5	1,641	6,825,998	5,362,605	27.3	45
Utah.....	250	69	262.3	11,392	2,143	431.6	291	783,588	315,057	148.7	25
Washington.....	975	391	149.4	22,929	13,847	65.6	1,059	636,552	365,411	74.2	60
Wyoming.....	57	34	67.6	1,304	705	85.0	70	39,725	142,529	-72.1	31

¹ A minus sign (-) denotes decrease. Per cent not shown when more than 1,000.

² Not reported in 1910.

TABLE 37.—DISTRIBUTION OF CAPITAL INVESTED, 1920, AND COST OF OPERATION AND MAINTENANCE, 1919, FOR ENTERPRISES USING PUMPED WATER, BY SOURCE OF WATER SUPPLY.

SOURCE.	CAPITAL INVESTED, 1920.				COST OF OPERATION AND MAINTENANCE, 1919.			
	Amount.	Per cent of total.	Average per acre.		Area for which cost is reported (acres).	Average per acre.		
			Amount.	Per cent of general average.		Amount.	Per cent of general average.	
Total supply pumped.....	\$138,405,150	100.0	\$35.92	134.0	2,261,209	\$8.15	335.4	
Streams.....	59,343,298	42.9	28.01	104.5	1,151,313	6.50	267.5	
Wells.....	76,737,251	55.5	45.85	171.1	1,004,338	10.07	414.4	
Lakes.....	2,274,601	1.6	38.00	142.0	45,558	5.20	214.0	
Partial supply pumped.....	40,359,414	100.0	60.21	223.8	543,896	4.75	195.5	
Streams, gravity and pumped.....	9,512,907	23.6	40.02	149.3	198,650	2.33	95.9	
Wells, flowing and pumped.....	2,498,672	6.2	58.51	218.2	29,600	8.04	330.9	
Streams, gravity, and pumped wells.....	28,347,835	70.2	72.69	271.1	315,040	5.97	245.7	

TABLE 38.—DISTRIBUTION OF PUMPED WELLS, BY DATE OF BEGINNING.

DATE OF BEGINNING.	Number.	Per cent of total.	CAPACITY (GALLONS PER MINUTE).	
			Amount.	Per cent of total.
Total.....	32,094	100.0	16,396,549	100.0
Before 1860.....	37	0.1	19,628	0.1
1860-1869.....	79	0.2	38,909	0.2
1870-1879.....	82	0.3	46,174	0.3
1880-1889.....	327	1.0	144,899	0.9
1890-1899.....	846	2.6	400,373	2.4
1900-1909.....	1,591	5.0	745,045	4.5
1910-1919.....	3,504	10.3	1,741,309	10.6
1920-1924.....	10,467	32.6	5,436,719	33.2
1915-1919.....	10,971	34.2	5,861,661	35.7
Not reported.....	4,390	13.7	1,962,502	12.0

TABLE 39.—DISTRIBUTION OF PUMPING EQUIPMENT, BY DATE OF BEGINNING.

DATE OF BEGINNING.	PUMPING PLANTS.		ENGINE CAPACITY (HORSEPOWER).		PUMPS.			
	Number.	Per cent of total.	Number.	Per cent of total.	Number.		Capacity (gallons per minute).	
					Amount.	Per cent of total.	Amount.	Per cent of total.
Total.....	29,458	100.0	748,971	100.0	33,804	100.0	36,275,005	100.0
Before 1860.....	46	0.2	684	0.1	55	0.2	28,073	0.1
1860-1869.....	43	0.1	574	0.1	44	0.1	43,439	0.1
1870-1879.....	83	0.3	3,697	0.5	108	0.3	80,287	0.2
1880-1889.....	290	1.0	14,938	2.0	407	1.2	1,476,530	4.1
1890-1899.....	698	2.3	27,387	5.0	862	2.5	4,378,623	12.1
1900-1909.....	1,455	4.9	59,296	7.9	1,741	5.2	3,706,532	10.2
1910-1919.....	2,898	9.8	98,729	13.2	3,492	10.3	4,379,501	12.1
1920-1924.....	9,468	32.1	226,748	30.3	10,867	32.1	8,316,741	22.9
1915-1919.....	10,469	35.5	242,629	32.4	11,713	34.6	10,668,654	29.4
Not reported.....	4,038	13.7	64,299	8.6	4,515	13.4	3,198,625	8.8

TABLE 40.—DISTRIBUTION OF PUMPED WELLS, BY TYPE OF ENTERPRISE.

CLASS.	NUMBER.		CAPACITY (GALLONS PER MINUTE).	
	Amount.	Per cent of total.	Amount.	Per cent of total.
Total.....	32,094	100.0	16,396,549	100.0
Individual and partnership.....	30,415	94.8	14,953,275	91.2
Cooperative.....	1,082	3.4	1,014,138	6.2
Irrigation district.....	100	0.3	63,770	0.6
Commercial.....	298	0.9	235,272	1.4
U. S. Reclamation Service.....	49	0.2	46,000	0.3
U. S. Indian Service.....	72	0.2	7,268	(¹)
State.....	34	0.1	9,636	0.1
City.....	22	0.1	27,619	0.2
Other.....	12	(¹)	9,570	0.1

¹ Less than one-tenth of 1 per cent.

Efficiency of pumping plants.—The census returns on pumping are not sufficiently accurate to justify the computation of the efficiency of pumping plants. In many instances the schedules contained only a part of the information required, and it was not possible to supply what was lacking. However, a special tabulation was made from the schedules that contained engine capacity, pump capacity and average lift, and the results are given in Tables 45 and 46, with the ratio between engine capacity and the work done, computed on the pump capacity and the average lift.

TABLE 41.—DISTRIBUTION OF PUMPING EQUIPMENT, BY TYPE OF ENTERPRISE.

CLASS.	PUMPING PLANTS.		ENGINE CAPACITY (HORSEPOWER).		PUMPS.			
	Number.	Per cent of total.	Number.	Per cent of total.	Number.		Capacity (gallons per minute).	
					Amount.	Per cent of total.	Amount.	Per cent of total.
Total.....	29,458	100.0	748,971	100.0	33,804	100.0	36,275,005	100.0
Individual and partnership.....	28,336	96.2	537,381	71.6	31,564	93.4	22,563,649	62.2
Cooperative.....	752	2.6	82,963	11.1	1,252	3.7	3,515,742	9.7
Irrigation district.....	109	0.3	43,394	5.8	312	0.9	1,837,264	5.1
Carey Act.....	1	(¹)	746	0.1	25	0.1	—	—
Commercial.....	188	0.6	60,409	8.0	464	1.4	6,814,220	18.8
U. S. Reclamation Service.....	15	0.1	14,423	1.9	84	0.2	973,170	2.7
U. S. Indian Service.....	14	(¹)	733	0.1	25	0.1	87,243	0.2
State.....	16	0.1	416	0.1	21	0.1	60,810	0.2
City.....	18	0.1	2,225	0.3	40	0.1	411,722	1.1
Other.....	15	0.1	281	(¹)	17	0.1	11,185	(¹)

¹ Less than one-tenth of 1 per cent.

TABLE 42.—DISTRIBUTION OF PUMPING EQUIPMENT, BY KIND OF PUMP.

KIND OF PUMP.	CAPACITY OF ENGINES (HORSE-POWER).		NUMBER OF PUMPS.		CAPACITY OF PUMPS (GALLONS PER MINUTE).		Average lift (feet).
	Amount.	Per cent of total.	Amount.	Per cent of total.	Amount.	Per cent of total.	
Total.....	748,971	100.0	33,804	100.0	36,275,005	100.0	41
Centrifugal.....	581,274	77.6	26,019	77.0	29,250,062	80.6	33
Rotary.....	36,716	4.9	1,305	3.9	2,080,211	5.8	42
Reciprocating.....	32,344	4.3	2,720	8.1	735,362	2.0	94
Turbine.....	24,390	3.3	677	2.0	525,728	1.4	84
Air lift.....	10,072	1.3	319	0.9	304,105	0.8	58
Other, mixed, and not reported.....	64,175	8.6	2,755	8.1	3,370,537	9.3	57

TABLE 43.—DISTRIBUTION OF PUMPING EQUIPMENT, BY KIND OF POWER.

KIND OF POWER.	CAPACITY OF ENGINES (HORSEPOWER).		NUMBER OF PUMPS.		CAPACITY OF PUMPS (GALLONS PER MINUTE).		Average lift (feet).
	Amount.	Per cent of total.	Amount.	Per cent of total.	Amount.	Per cent of total.	
Total.....	748,971	100.0	33,804	100.0	36,275,005	100.0	41
Wind.....	10,768	1.4	287	0.8	247,445	0.7	44
Water.....	8,093	1.1	186	0.5	212,346	0.6	40
Steam.....	106,568	14.2	1,862	5.5	7,526,435	20.7	36
Electricity.....	289,018	38.6	12,743	37.7	13,311,435	36.7	50
Gas.....	259,613	34.7	15,691	46.4	10,461,867	28.8	35
Other, mixed, and not reported.....	74,911	10.0	3,055	9.0	4,515,487	12.4	46

TABLE 44.—COMPARISON OF CAPACITY OF ENGINES AND CAPACITY OF PUMPS, 1920 AND 1910, BY KIND OF POWER.

KIND OF POWER.	CAPACITY OF ENGINES (HORSEPOWER).			CAPACITY OF PUMPS (GALLONS PER MINUTE).		
	1920	1910	Per cent of increase. ¹	1920	1910	Per cent of increase. ¹
Total.....	671,694	361,480	85.8	32,333,097	19,355,864	67.0
Wind.....	10,682	1,525	600.5	226,029	71,403	216.6
Water.....	4,990	17,023	-71.7	154,432	603,606	-74.4
Steam.....	91,124	140,177	-35.0	6,387,040	11,068,597	-42.3
Electricity.....	257,268	51,559	399.0	11,603,079	1,898,372	511.2
Gas.....	237,316	123,209	92.6	9,632,395	4,762,890	102.2
Other, mixed, and not reported.....	70,313	27,387	156.7	4,330,122	950,996	355.3

¹ A minus sign (—) denotes decrease.

TABLE 45.—RATIO OF ENGINE CAPACITY TO WORK DONE, BY KIND OF PUMP.

[Work done computed on pump capacity and average lift.]

KIND OF PUMP.	Capacity of engines (horse-power).	Capacity of pumps (gallons per minute).	Average lift (feet).	Ratio of engine capacity to work done.
Total.....	671,694	32,333,097	40	48.6
Centrifugal.....	519,535	26,257,469	33	42.1
Rotary.....	31,869	1,523,093	45	54.5
Reciprocating.....	29,745	620,965	97	51.1
Turbine.....	22,756	478,966	81	43.0
Air lift.....	9,736	297,798	60	46.4
Other, mixed, and not reported.....	58,301	3,150,964	49	6.7

TABLE 46.—RATIO OF ENGINE CAPACITY TO WORK DONE BY KIND OF POWER.

[Work done computed on pump capacity and average lift.]

KIND OF POWER.	Capacity of engines (horse-power).	Capacity of pumps (gallons per minute).	Average lift (feet).	Ratio of engine capacity to work done.
Total.....	671,694	32,333,097	40	48.6
Wind.....	10,683	226,029	40	21.4
Water.....	4,990	154,432	43	33.6
Steam.....	91,124	6,337,040	38	67.2
Electricity.....	257,208	11,608,079	49	55.8
Gas.....	237,316	9,632,395	34	34.8
Other, mixed, and not reported.....	70,313	4,330,122	46	71.5

LAND IN IRRIGATION ENTERPRISES REPORTED AS AVAILABLE FOR SETTLEMENT.

An important factor in determining the need for the construction of additional irrigation works is the area of land available for settlement under existing enterprises. The reports of areas irrigated in 1919 and areas enterprises were capable of irrigating in 1920 indicate a very large area already supplied with water that is not in use (see p. 19). While this land is not in use and is available for expansion of the irrigated area, it is not, necessarily, available for settlement. As a check on these figures, and for the purpose of determining how much land in existing irrigation enterprises was actually available for settlement, its location, and the terms on which it can be obtained, inquiries covering these points were placed on the irrigation schedules.

The instructions to enumerators showing what should be reported under these inquiries were as follows:

Land available for settlement covered by this enterprise.—This item should be limited to land for which water is available or is to be made available, and which is not yet settled. Land already settled should not be included even if it is for sale, unless the holdings are to be subdivided, when only the parts of such holdings that are to be sold for new farms should be reported as available for settlement. If the management of an enterprise is itself farming land pending its settlement, the land should be reported as available for settlement.

Price of unimproved lands suitable for agriculture covered by this enterprise.—This item relates strictly to land covered by the enterprise reported, and not to other land in the vicinity. If no unimproved land is included in the enterprise this inquiry should

not be answered. If land and water rights are sold together for a specified price and it is not possible to segregate the part representing land from that representing water rights, this fact should be stated and the part representing land should be estimated. If land is not for sale at a uniform price, the average price prevailing at the time of the canvass should be given.

Average cost of preparing land for irrigation.—Under this heading should be given the best estimate obtainable from the officials of the enterprise reported or from farmers operating under the enterprise. Frequently this amount will vary so much from farm to farm that a strictly accurate reply to this inquiry can not be obtained; yet for any enterprise it should be possible to make a fairly representative estimate.

In State Table II, on page 94, the land reported as available for settlement is given by counties, with such information as the schedules contained, as to the types of enterprises supplying water, sources of water supply, prices of land and water rights, terms on which land and water rights are sold, and the cost of preparing land for irrigation. Prices and cost vary so much that no attempt has been made to average them.

IRRIGATED CROPS.

The areas, production, and values of the principal crops grown on irrigated land are given in the State Reports and in the United States Summary, which are contained in this volume. In none of these reports however, is shown the distribution of the crops by counties. There has been considerable call for this information, and it is presented in State Table I, beginning on page 71.

As stated in the discussion of the accuracy of the results of the census of irrigation, the returns for crops grown under irrigation are not considered complete. Enumerators were instructed to mark on the farm schedules the crops that were irrigated, and in many instances it was evident that this instruction was not followed. Where this was the case, the crops were marked as irrigated, but there were many cases where there was doubt as to whether crops were irrigated, and in such cases they were not marked. Consequently, the figures given should be considered as below the correct figures. For a few counties, however, the total area of crops reported as irrigated exceeds the total area of land reported as irrigated. The two items are taken from different schedules and each has been tabulated as reported. This course seemed better than to adjust the figures arbitrarily.

Owing to the fact that the reports of the census of agriculture give complete crop returns by counties, only the areas harvested are reported here.

The totals for the areas harvested, production, and value for each crop, by states, are included in the table. Average yields per acre are given in the state reports and can be computed from the figures reported here.

The values are computed in the manner stated on page 14. Averages per acre can be computed from the figures given here.

SUMMARY FOR THE UNITED STATES.

INTRODUCTION.

This summary presents the statistics of irrigation collected at the census of 1920 for the 17 arid and semiarid states of the United States, comprising the states of Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming and for the states of Arkansas and Louisiana, in which, together with the eastern part of Texas, irrigation is confined largely to rice growing. In the eastern states there are small areas irrigated for the growing of fruit and truck crops, but statistics for these states are not included in the general tables presented. Statistics of acreage irri-

gated, of acreage, yield, and value of crops grown on irrigated land, and of cost of operation and maintenance relate to the year 1919; other items relate to the year 1920. Throughout this summary figures for the census of 1910 are given for purposes of comparison; and, for the purpose of showing the historical development of irrigation, items which have been reported in censuses previous to 1910 are presented.

Statistics of number of farms irrigated and of acreage, yield, and value of crops grown on irrigated land were collected in the general census of agriculture. All other statistics were obtained in a special canvass of irrigation enterprises.

TABLE 1.—SUMMARY: 1920 AND 1910.

ITEM.	CENSUS OF—		INCREASE, ¹	
	1920	1910	Amount.	Per cent.
Number of all farms.....	1,916,391	1,776,046	140,345	7.9
Approximate land area of states included.....acres..	1,223,989,120	1,224,063,860	² —74,240	(³)
All land in farms in states included.....acres..	505,440,954	416,462,547	88,978,407	21.4
Improved land in farms in states included.....acres..	214,689,819	186,786,227	27,903,592	14.9
Number of farms irrigated.....	231,541	162,723	68,818	42.3
Area irrigated.....acres..	19,191,716	14,433,285	4,758,431	33.0
Area enterprises were capable of irrigating.....acres..	26,020,477	20,285,403	5,735,074	28.3
Area included in enterprises.....acres..	35,890,821	32,245,464	3,645,357	11.3
Per cent irrigated:				
Number of all farms.....	12.1	9.2	2.9	-----
Approximate land area.....	1.6	1.2	0.4	-----
Land in farms.....	3.8	3.5	0.3	-----
Improved land in farms.....	8.9	7.7	1.2	-----
Excess of area enterprises were capable of irrigating over area irrigated.....acres..	6,828,761	5,852,118	976,643	16.7
Excess of area included in enterprises over area irrigated.....acres..	16,699,105	17,812,179	—1,113,074	—6.2
Area of irrigated land reported as available for settlement.....acres..	2,257,981	(⁴)	2,257,981	-----
Capital invested.....	\$697,657,328	\$321,454,008	\$376,203,320	117.0
Average per acre enterprises were capable of irrigating.....	\$26.81	\$15.85	\$10.96	69.1
Estimated final cost of existing enterprises.....	\$819,778,005	\$437,943,825	\$381,829,180	87.2
Average per acre included in enterprises.....	\$22.84	\$13.58	\$9.26	68.2
Average cost of operation and maintenance per acre.....	\$2.43	⁵ \$1.07	\$1.36	127.1
IRRIGATION WORKS.				
Number of enterprises.....	63,298	56,858	6,440	11.3
Number of main ditches.....	51,621	46,677	4,944	10.6
Length of main ditches.....miles..	103,177	88,927	14,250	16.0
Capacity of main ditches.....second-feet..	631,079	618,097	12,982	2.1
Number of lateral ditches.....	57,553	36,513	21,040	57.6
Length of lateral ditches.....miles..	56,687	30,003	26,684	88.9
Number of reservoirs.....	7,538	6,956	582	8.4
Capacity of reservoirs.....acre-feet..	21,246,436	12,602,924	8,643,512	68.6
Number of flowing wells.....	4,608	5,071	—463	—9.2
Capacity of flowing wells.....gallons per minute..	935,057	1,345,676	—410,619	—30.5
Number of pumped wells.....	32,094	15,871	16,123	101.0
Capacity of pumped wells.....gallons per minute..	16,396,549	7,248,699	9,147,850	126.2
Number of pumping plants.....	29,458	15,803	13,655	86.4
Engine capacity.....horsepower..	748,971	361,480	387,491	107.2
Pump capacity.....gallons per minute..	36,275,005	19,355,864	16,919,141	87.4
Average lift.....feet..	41			-----

¹ A minus sign (—) denotes decrease.

² Decrease due to the building of several reservoirs in connection with irrigation projects.

³ Less than one-tenth of 1 per cent decrease.

⁴ Not reported in 1910.

⁵ Does not include cost of operation and maintenance for rice growing districts in Gulf states; consequently figures for 1919 and 1909 are not comparable.

CLIMATIC CONDITIONS.

The climatic conditions having the largest influence in determining the necessity for irrigation are the amount and seasonable distribution of precipitation, particularly rainfall, while wind movement and relative humidity also have an influence.

In that part of the United States lying east of the arid and semiarid states named in the introduction to this summary the normal annual precipitation exceeds 25 inches and is so distributed throughout the year as to provide sufficient moisture for the growing of general farm crops. In this section short periods of drought occur sufficiently often to make irrigation desirable for such crops as truck and small fruits, which may be damaged to a large extent by lack of moisture for even short periods, although the irrigation of these crops is not general. Seasons with too little rainfall for the proper growth of general crops occur, but not sufficiently often to justify making provision for irrigation.

Arkansas, Louisiana, and eastern Texas have a normal annual precipitation of from 40 to 50 inches, which is ample for all crops except rice. It is necessary to keep water standing on rice fields during most of the growing period of this crop, and for this the rainfall is not sufficient. Irrigation in this section is practically confined to the rice fields.

The states of North and South Dakota, Nebraska, Kansas, Oklahoma, and western Texas lie in the so-called semiarid region, and have a normal annual precipitation varying from about 15 inches at their western boundaries to about 25 or more inches at their eastern boundaries. In this section success in growing crops without irrigation varies from year to year according to the amount and distribution of the rainfall, and the practice of irrigation advances eastward and recedes to the west with periods of deficient or excessive rainfall.

The same condition exists on the plains in the eastern parts of Montana, Wyoming, Colorado, and New Mexico. Here crops are grown on the high plains without irrigation, with varying success, while irrigation is generally practiced in the stream valleys.

The main ranges of the Rocky Mountains extend through Montana, Wyoming, Colorado, and New Mexico. On the high mountains the precipitation, particularly snowfall, is heavy, while in the valleys between the ranges the precipitation is light and irrigation is necessary for the growing of most crops.

West of the Rocky Mountains and between them and the Sierra Nevada and Cascade Mountains and extending from the Mexican boundary to central Idaho is the real arid region of the United States. Here the normal annual precipitation varies from about 2 inches

in southwestern Arizona and southeastern California to about 8 inches in southern Idaho. In this section, comprising the larger parts of Arizona, Nevada, and Utah, and considerable parts of California, Oregon, Washington and Idaho, almost no crops can be grown in the valleys without irrigation. On the higher lands in Arizona, Utah, Idaho, Oregon, and Washington the precipitation is greater and grain and forage crops are grown without irrigation. Northern Idaho, northwestern Montana, and northeastern Washington receive sufficient precipitation for growing crops without irrigation.

West of the Sierra Nevada and Cascade Mountains there is a great variation in rainfall. The western coast of Washington and Oregon receives the heaviest precipitation of any part of the United States, but there is a dry period in the late summer, during which irrigation is desirable for crops which make their growth during this period. Irrigation is practiced to a limited extent for pastures, vegetables, and fruits.

Throughout California there is a well-defined wet season in the winter months, and an equally well-defined dry season in summer. Most of the northern part of the state receives sufficient rainfall to mature crops if it were distributed throughout the year, but the growing of crops in late summer requires irrigation. On the other hand, most of the southern part of the state receives less moisture than is usually considered necessary for crop growing, but the concentration of the year's precipitation in the winter and spring makes it possible to mature crops where it would not be possible were the rainfall more widely distributed throughout the year.

Climatic conditions during the year 1919 were abnormal in many places. In eastern Montana and Wyoming and western North Dakota and South Dakota, 1919 was the third year in succession in which the precipitation was below normal. The condition not only damaged crops grown without irrigation but greatly decreased the supply of water available for irrigation, and much land was not irrigated in 1919 that would have been if water had been available. On the other hand, at the southern end of the semiarid region, in Oklahoma, Texas, and New Mexico, the precipitation in 1919 was far above normal and much land that is irrigated ordinarily was not watered in 1919 because of the heavy rainfall.

In the inter-mountain region, in Arizona, Nevada, Utah, Idaho, Oregon, and Washington, the precipitation in 1919 was far below normal, and the same condition existed in the central valleys of California. It is probable that in all of the states named in this paragraph the acreage irrigated in 1919 was smaller than it would have been had water been more plentiful.

WATER SUPPLY FOR IRRIGATION.

Streams supply the water used on by far the greater part of the land irrigated in the United States, 83 per cent of the acreage receiving its entire supply from this source in 1919, and 2 per cent additional receiving part of its supply from streams. The streams in the western states have one common characteristic—they are subject to heavy floods in the spring and early summer and become very low in late summer. This condition makes it necessary to store a part of the flood flow for use in the late summer if the largest use of the water supply is to be made.

Both flowing and pumped wells supply water to considerable areas. The use of water from these sources in most sections comes only after the supply from streams is exhausted, or nearly so, and represents a later and usually more expensive stage of development than the use of stream water. Wells furnished the entire water supply for 7 per cent of the acreage irrigated in 1919, and a part of the supply to 2 per cent of this acreage. Streams and wells combined supplied 92 per cent of the total acreage irrigated in 1919. The other sources are, therefore, almost negligible.

The water supply in the several states is discussed in detail in the state bulletins.

The northern half of the Great Plains, extending from the Rocky Mountains toward Mississippi River, is drained by Missouri River and its tributaries. In most of this area some crops can be grown without irrigation, and the irrigated land is confined almost exclusively to the stream valleys. The Missouri itself is not very largely utilized, and many of its tributaries are in the same condition. Storage has been provided for only a small part of the flood flow of the main stream and its tributaries north of the Platte, and there is in these streams a large supply of water available for future development in Wyoming, Montana, and the Dakotas.

The North Platte supplies large areas in Colorado, Wyoming, and Nebraska. Its low-water flow is largely utilized and storage has been provided in the Pathfinder Reservoir in central Wyoming for a large part of the flood water of this stream, but there is a considerable supply for additional storage, which would make it possible to extend the area irrigated considerably.

The South Platte waters a large area of land in Colorado and a small area in Nebraska. Its low-water flow is fully utilized. On this stream the flood water and winter flow is stored in many small reservoirs rather than in one large reservoir. While most of the flood water is stored there is some water available for further development of the same kind on the lower part of the stream.

Water stored on the North Platte can be used on the main Platte in Nebraska and there is water from floods, winter flow, and return seepage that could be stored on the main stream if the demand for water justified the expense. Uncertainty as to the need for irrigation and as to the water supply have retarded development in this section.

The central part of the Great Plains is drained by Arkansas River and its tributaries. The Arkansas waters a large area in Colorado and a small area in Kansas. The low-water flow of the Arkansas is all used, and a large part of the flood water is stored in small reservoirs, but there is still some water available for storage on the main stream and its tributaries.

Practically all of the land used for rice-growing in Arkansas and a considerable part of that in Louisiana and Texas is watered from wells. There is nothing to indicate that the water supply is not sufficient for a large expansion of the rice-growing area, if other conditions justify it.

The rice grown along the Gulf coast in Louisiana and Texas is supplied principally by pumping from streams entering the Gulf, which are so nearly at the Gulf level that heavy pumping at times causes the salt water of the Gulf to enter the streams. The supply of fresh water is limited unless storage is provided. This has not been done. In Texas water for rice is taken from streams at higher levels, and here the supply is insufficient in some seasons. There is ample water for storage.

Streams flowing to the Gulf of Mexico supply scattered areas throughout central Texas with water, and in northern Texas wells supply a considerable area. The water supply is sufficient for a large extension of irrigation from both sources, if other conditions justify it.

The Rio Grande and its tributaries drain south central Colorado, most of central and eastern New Mexico, and the southwestern part of Texas. Large areas are irrigated in Colorado, considerable areas in New Mexico, and a large area in Texas. The Rio Grande is subject to heavy floods and at times is dry or nearly so, and storage is necessary for permanently successful irrigation. The Elephant Butte Reservoir in south central New Mexico has sufficient capacity to store the flood water and to regulate the flow of the stream below. Water from this reservoir supplies land along the stream in New Mexico, in Texas, and in Mexico. There is little opportunity to use water from the Rio Grande below the El Paso Valley in Texas, except near the mouth of the river, where a large area is irrigated. The lower part of the river receives much of its water from tributaries in Mexico below El Paso and is not dependent on storage in Elephant Butte Reservoir. Most of the water used

for irrigation in this section is pumped from the river. At times the supply is low, but there is a good supply for storage, although reservoirs have not been built. The question of providing storage on this part of the Rio Grande is complicated by the fact that the river forms the boundary between the United States and Mexico, and until some agreement is reached between the two republics for the equitable division of the water supply, the extent of safe irrigation development on either side of the river can not be determined.

The Pecos, a tributary of the Rio Grande, drains a large part of southeastern New Mexico. It is subject to heavy floods and periods of very low discharge. Storage has been provided for a part of the flood flow, but there is opportunity for additional storage. There are many flowing wells in the valley of the Pecos in New Mexico.

The Colorado River system drains all the land west of the Rio Grande drainage area to the California boundary, and extends northward to northern Wyoming. It supplies water to land in Wyoming, Colorado, Utah, New Mexico, Nevada, Arizona, and California. In the upper states the areas of tillable land in the valleys of the tributaries of the Colorado are limited and much of the low-water flow of these streams is not yet utilized, while there is very little storage. Near the mouth of the stream very large areas are irrigated in Arizona, California, and Mexico. The low-water flow reaching this portion of the river is just about sufficient for the land now irrigated. Any considerable extension of the area watered will necessitate storage. A very large volume of flood water is available for storage, and Federal and local agencies are studying the possibilities of storing these flood waters. A compact between the states interested for the control of the river has been provided for by state and Federal legislation. Gila River, which is a tributary of Colorado River, and its tributaries drain a considerable part of western New Mexico and most of southern Arizona. All of these streams are subject to heavy floods and to periods with practically no discharge; consequently storage is necessary to make them reliable sources of water for irrigation. Little storage has been provided except on Salt River, where the Roosevelt Reservoir has sufficient capacity to store the entire flow of the stream above the reservoir. Tributaries reaching the stream below the reservoir are subject to violent floods, but no storage has been provided for these floods. In the irrigated section of the Salt River Valley ground water has come near the surface, making drainage necessary. Both wells and open ditches have been installed for the purpose of lowering the ground water and supplying additional water for irrigation. There is opportunity for more work of this kind.

North and west of the Colorado River basin lies the Great Basin, which has no outlet to the sea. This

basin includes small parts of Wyoming, Idaho, California, and Oregon, and most of Utah and Nevada. It really consists of several independent drainage basins, one with the Great Salt Lake as its low point, another centering in the "sinks" in western Nevada, and a third consisting of the Sevier River drainage in southwestern Utah. There are also small basins in northern California and southern Oregon.

The Great Salt Lake receives almost its entire inflow from the mountains lying to the east of its basin. Jordan River, carrying the discharge of Utah Lake, enters at the south end, Bear River enters at the north end, and between these there are several short streams entering the lake. These are typical mountain streams with large flow when the snow melts in the spring and a small flow during the summer. Water is stored in Utah Lake for use in the Jordan Valley and in Bear Lake for use in the Bear River Valley. Water stored in Strawberry Reservoir, in the Colorado River drainage basin, is brought into this basin through a tunnel discharging into Spanish Fork River, a tributary of Utah Lake. The low-water flow of all the streams in this drainage basin is used, but there is opportunity for much additional storage.

The sinks in western Nevada receive water from both east and west. Humboldt River and its tributaries drain most of the eastern slope of this basin. The Humboldt has a flood period in spring and most of the irrigation along this stream consists in damming the stream so that it will overflow natural meadows on its bottom lands during its flood. A much larger use of the stream could be made if a part of the flood water were stored for use in the late summer.

Walker, Carson, and Truckee Rivers flow into the sinks from the west. These streams rise in California in the Sierra Nevada Mountains. Carson and Walker Rivers water considerable areas in both states. Truckee River is the outlet of Lake Tahoe, which lies on the border between California and Nevada. Plans for using Lake Tahoe for a storage reservoir have been made, but litigation has prevented this use to any large extent. Water from both Truckee and Carson Rivers is stored in Lahontan Reservoir in Nevada. There is opportunity for additional storage on all these streams.

Throughout the Great Basin there are large valleys which have no surface water supply. In some of these a good supply of ground water has been found. It is probable that large areas can be supplied from wells, when this becomes economically feasible.

North of the Great Basin and extending from western Montana and Wyoming to the Pacific Ocean is the Columbia River drainage basin. The Columbia and its tributaries water large areas in Montana, Idaho, Oregon, and Washington.

Clark Fork of the Columbia and its tributaries, the Bitterroot and Flathead, water lands in western Mon-

tana. Water is stored in Flathead Lake for lands near the lake. There is opportunity for storage on the other tributaries.

Snake River rises near the headwaters of the Missouri and Colorado in northwestern Wyoming and waters land in Idaho, Oregon, and Washington. Its low-water flow is all used, and storage has been provided for much of the flood water in Jackson Lake in Wyoming and in reservoirs in Idaho. There is still a large volume of flood water available for storage and plans are being made to provide reservoirs to store this water.

The Columbia itself is not extensively used for irrigation. Throughout its course it is so far below the level of the adjoining lands that extensive gravity diversions have not been made but some water is pumped from the river. It carries large volumes of water that could be used if its use were feasible.

The tributaries of the Columbia coming from the Cascade Mountains in Washington supply water to most of the land irrigated in that state. Their low-water flow is used, and storage has been provided for a part of the flood water. There is opportunity for additional storage.

The tributaries of the Columbia in Oregon supply a large part of the irrigated land in that state. Irrigation development in this part of Oregon has not reached the stage where flood water is stored. The water supply is sufficient for the irrigation of a much larger area than is now watered.

West of the Cascade Mountains in Washington and Oregon there is an abundant supply of water and very little irrigation because of the heavy rainfall. However, there is a dry period in the late summer when some land is irrigated. The water supply is sufficient for a very large extension of the irrigated area.

In northern California the dry season in summer is more pronounced than it is in Oregon and Washington, and at that time there is little water in the streams. There is a large supply available for storage, but little storage has been provided. Sacramento River waters a large area, and the summer flow is fully utilized. The stream is subject to very heavy floods, and almost no storage has been pro-

vided. Both Federal and state agencies are working on plans for storing the flood water of the Sacramento and its tributaries.

The San Joaquin and its tributaries supply water to the larger part of the irrigated land in California. The low-water discharge of these streams is all used, but very little provision for storing flood water has been made. State and private agencies are working on plans for large storage projects, which will provide water for a large additional area. In the San Joaquin Valley irrigation has brought the ground water near the surface and a great many wells and pumps have been put in, in some instances to furnish a supplemental supply of water when the streams are low, and in others to provide the entire water supply.

The coast streams south of San Francisco Bay are torrential in character. On some of these streams reservoirs have been built to store flood waters, but on many reservoir sites do not exist and large quantities of flood water waste to the ocean. In the valleys of these streams there are many wells, both flowing and pumped, and the heavy draft on the ground water has lowered its level. In the absence of reservoir sites, the flood waters are spread over the gravelly soil where the streams emerge from the mountains in order that they may enter the soil and replenish the ground-water supply. There is a large supply of flood water in southern California for which there is a large demand. If some practicable way of conserving these flood waters can be found the irrigated area can be extended greatly.

Taking the western part of the United States as a whole, with few exceptions, the low-water flow of the streams is exhausted, but there is a very large supply of flood water available for storage. There is no lack of tillable land on which this water can be used. Future extension of irrigation depends on whether economic conditions are such that the value of the crops which can be produced will justify the expense of storing the flood waters. The same may be said of the use of ground water. The extent of the supply of ground water is not so well known as the amount of flood water, but there are many places where water can be obtained from wells when the expense of pumping is justified.

FARMS AND ACREAGE IRRIGATED.

TABLE 2.—NUMBER OF FARMS AND ACREAGE IRRIGATED:
1890 TO 1920.

CENSUS YEAR.	FARMS IRRIGATED.			AREA IRRIGATED.				
	Number.	Per cent of in- crease.	Per cent of all farms.	Acres.	Per cent of in- crease.	Per cent of total land area.	Per cent of land in farms.	Per cent of im- proved land in farms.
1920.....	291,541	42.3	12.1	19,191,716	33.0	1.6	3.8	8.9
1910.....	165,728	43.0	9.2	14,433,285	86.4	1.2	3.5	7.7
1900.....	113,829	110.3	8.2	7,744,467	108.4	0.7	2.2	6.2
1890.....	54,136	.....	3.8	5,715,758	.....	0.5	2.1	3.8

TABLE 3.—ACREAGE, CLASSIFIED BY DATE OF BEGINNING OF
ENTERPRISES SUPPLYING WATER FOR IRRIGATION.

DATE OF BEGINNING.	Number of enter- prises.	Area included in enterprises, 1920 (acres).	AREA IRRIGATED IN 1919.		Area enterprises were capable of irrigating in 1920 (acres).
			Acres.	Per cent of acreage in enter- prises.	
Total.....	63,298	35,890,821	19,191,716	53.5	29,020,477
Before 1890.....	696	468,636	290,784	63.9	356,573
1890-1899.....	2,179	1,915,572	1,282,705	66.9	1,432,301
1870-1879.....	3,663	4,248,245	2,588,414	61.0	3,378,758
1850-1859.....	7,854	6,256,083	4,042,391	64.6	4,890,859
1830-1839.....	6,186	4,564,393	2,538,913	55.6	3,566,098
1810-1819.....	4,908	3,840,247	2,211,749	57.6	2,993,849
1790-1799.....	5,088	5,863,374	2,540,927	43.5	3,815,217
1770-1779.....	11,000	3,938,999	1,534,644	39.1	2,460,015
1750-1759.....	12,542	3,256,554	1,165,360	35.8	1,935,204
Not reported.....	8,191	1,532,344	972,629	63.2	1,198,112

TABLE 4.—ACREAGE, CLASSIFIED BY SOURCE OF WATER SUPPLY.
1919 AND 1909.

CLASS.	AREA IRRIGATED (ACRES).				Area enter- prises were ca- pable of irrigating in 1920 (acres).	Area included in enter- prises, 1920 (acres).
	1919	1909	Increase. ¹			
			Amount.	Per cent.		
Total.....	19,191,716	14,433,285	4,758,431	33.0	29,020,477	35,890,821
Streams, gravity.....	14,527,069	12,767,351	1,759,709	13.8	19,269,136	26,040,237
Streams, pumped.....	1,226,510	608,639	617,851	101.5	2,118,942	2,885,698
Streams, pumped and gravity.....	199,595	(²)	199,595	.....	237,700	284,353
Wells, pumped.....	1,263,098	480,341	773,757	158.1	1,674,819	2,356,748
Wells, flowing.....	65,856	144,420	-78,564	-54.4	79,777	131,137
Wells, flowing and pumped.....	35,685	(²)	35,685	.....	42,703	84,379
Lakes, pumped.....	35,730	17,826	17,904	100.4	59,760	80,564
Lakes, gravity.....	100,646	59,631	41,015	68.8	149,377	312,169
Springs.....	198,068	196,186	1,822	0.9	251,792	406,528
Stored storm water.....	98,873	105,792	-6,919	-6.5	223,434	319,972
City water.....	930	(²)	930	.....	1,401	1,666
Sewage.....	2,578	(²)	2,578	.....	3,301	5,540
Streams, gravity, and pumped wells.....	344,713	(²)	344,713	.....	389,790	465,293
Streams, gravity, and flowing wells.....	82,665	(²)	82,665	.....	104,569	205,121
Other mixed.....	956,621	44,079	952,542	.....	1,398,004	2,290,890
Other and not reported.....	13,148	(²)	13,148	.....	15,972	17,566

* A minus sign (-) denotes decrease. Per cent not shown when more than 1,000.
* Not included in classification.

ACREAGE, BY CHARACTER OF ENTERPRISE.

The dates on which the different states enacted laws accepting the conditions of the Federal Carey Act (act of Aug. 18, 1894) and the dates on which they enacted their original irrigation district laws are given in the following table:

DATES OF ACCEPTING CAREY ACT AND OF ENACTING IRRIGATION
DISTRICT LAWS.

STATE.	Date of accept- ing Carey Act.	Date of original irriga- tion district laws.	STATE.	Date of accept- ing Carey Act.	Date of original irriga- tion district laws.
Arizona.....	1912	1912	New Mexico.....	1909	1907
Arkansas.....	(*)	(*)	North Dakota.....	(*)	1917
California.....	1915	1887	Oklahoma.....	(*)	1915
Colorado.....	1895	1905	Oregon.....	1901	1895
Idaho.....	1895	1895	South Dakota.....	1900	1917
Kansas.....	(*)	1891	Texas.....	(*)	1905
Louisiana.....	(*)	(*)	Utah.....	1897	1895
Montana.....	1895	1907	Washington.....	1895	1890
Nebraska.....	(*)	1895	Wyoming.....	1895	1909
Nevada.....	1895	1891			

* Carey Act does not apply.
* Has no district law.
* Has not accepted Carey Act.

The United States Reclamation Act (act of June 17, 1902) applies to all of the states included in the irrigation census except Arkansas and Louisiana, and this service supplies water to some land in all of the states to which it applies except Kansas and Oklahoma. One small project was established in Kansas but it has been disposed of. No project has been undertaken in Oklahoma.

TABLE 5.—ACREAGE, CLASSIFIED BY CHARACTER OF ENTERPRISE:
1920 AND 1910.

ITEM AND CLASS.	CENSUS OF—		INCREASE. ¹	
	1920	1910	Amount.	Per cent.
ACREAGE IRRIGATED.				
Total.....	19,191,716	14,433,285	4,758,431	33.0
Individual and partnership.....	6,848,807	6,594,614	254,193	3.9
Cooperative.....	6,581,400	4,643,539	1,937,861	41.7
Irrigation district.....	1,822,887	628,642	1,294,245	244.8
Carey Act.....	523,929	288,553	235,376	81.6
Commercial.....	1,822,001	1,809,379	12,622	0.7
U. S. Reclamation Service.....	1,254,569	395,646	858,923	217.1
U. S. Indian Service.....	284,551	172,912	111,639	64.6
State.....	5,620	(*)	5,620	.....
City.....	40,146	(*)	40,146	.....
Other and mixed.....	7,236	(*)	7,236	.....
Not reported.....	570	(*)	570	.....
ACREAGE ENTERPRISES WERE CAPABLE OF IRRIGATING.				
Total.....	26,020,477	20,285,403	5,735,074	28.3
Individual and partnership.....	9,255,756	8,086,766	1,168,990	14.5
Cooperative.....	8,403,298	6,191,577	2,211,721	35.7
Irrigation district.....	2,531,425	800,451	1,730,974	216.2
Carey Act.....	804,298	1,089,677	-285,379	-26.2
Commercial.....	2,799,563	2,954,166	-154,603	-5.2
U. S. Reclamation Service.....	1,680,643	786,190	894,453	113.8
U. S. Indian Service.....	484,486	376,576	107,910	28.7
State.....	7,379	(*)	7,379	.....
City.....	44,458	(*)	44,458	.....
Other and mixed.....	8,546	(*)	8,546	.....
Not reported.....	625	(*)	625	.....
ACREAGE INCLUDED IN ENTERPRISES.				
Total.....	35,890,821	32,245,464	3,645,357	11.3
Individual and partnership.....	13,008,415	10,621,067	2,387,348	22.5
Cooperative.....	10,628,543	8,830,197	1,798,346	20.4
Irrigation district.....	3,432,109	1,581,465	1,850,644	117.0
Carey Act.....	1,188,937	2,573,874	-1,384,937	-53.8
Commercial.....	3,999,581	5,786,777	-1,787,196	-30.9
U. S. Reclamation Service.....	2,627,176	1,973,016	654,160	33.2
U. S. Indian Service.....	932,985	879,068	53,917	6.1
State.....	9,581	(*)	9,581	.....
City.....	49,650	(*)	49,650	.....
Other and mixed.....	13,144	(*)	13,144	.....
Not reported.....	700	(*)	700	.....

¹ A minus sign (-) denotes decrease.
* Not included in classification in 1910.

In addition to supplying water to land within its own projects the Reclamation Service, under the Warren Act (act of Feb. 21, 1911), furnishes, in most cases, stored water in bulk to supplement the supply of private systems otherwise dependent on unregulated stream flow. The area receiving such supplemental supply from the Reclamation Service varies from time to time, and was somewhat in excess of 900,000 acres in 1919. This area is not included in that credited to the Reclamation Service in any of the tables in this summary.

ACREAGE, BY CHARACTER OF WATER RIGHTS.

In the United States all laws relating to the character of rights and to the use of water are enacted by the several states. In 1866 Congress passed an act providing that rights "recognized and acknowledged by local customs, laws, and the decisions of courts" shall be maintained and protected (R. S., sec. 2339), and the United States Reclamation Act (act of June 17, 1902) recognizes state control over water. The Supreme Court of the United States also has upheld the exclusive right of the states to control the waters within their boundaries, subject only to the right of Congress to preserve and improve navigation. (*Kansas v. Colorado*, 206 U. S. 46).

Every one of the states in which irrigation is generally practiced, except Arkansas and Louisiana, where irrigation is limited almost exclusively to rice growing, has assumed some measure of public control over irrigation and rights to water. In Table 6 the acreage irrigated is classified with reference to the degree to which rights under which water is received are defined and controlled by public authority, and the nature of the control exercised.

TABLE 6.—ACREAGE IRRIGATED, CLASSIFIED BY CHARACTER OF RIGHTS UNDER WHICH WATER IS RECEIVED: 1919 AND 1909.

CLASS.	1919		1909 ¹
	Acres.	Per cent of total.	Per cent of total.
Total.....	19,191,716	100.0	100.0
Appropriation and use.....	2,521,682	13.1	34.0
Notice filed and posted.....	2,765,636	14.4	10.2
Adjudicated by court.....	7,189,854	37.3	35.3
Permit from state.....	1,960,924	10.2	8.7
Certificate or license from state.....	1,288,124	6.7	5.7
Riparian rights.....	370,896	1.9	2.1
Underground.....	1,067,606	5.6	.....
Other and mixed.....	494,564	2.6	.....
Not reported.....	² 1,562,830	8.1	.....

¹ Acreage irrigated for rice growing in Louisiana, Arkansas, and Texas not included.

² Acreage for Arkansas and Louisiana included.

The laws of the states relating to water rights are summarized in the following paragraphs. The areas served under rights of the different kinds for the United States as a whole are given in Table 6, and for the several states on page 36.

Appropriation and use.—In every one of the arid states the laws recognize the right of persons needing water for irrigation or other beneficial purposes to "appropriate" water from streams and other sources. This right is limited in various ways, and all of the states prescribe some procedure which shall be followed by those appropriating water. However, all of these states have in the past recognized rights acquired by merely taking and using water, in the absence of laws, or without conforming to the laws, when there are such. All rights acquired in this way that have not been passed upon by the courts or by some official body to which has been given the right to adjudicate water rights, are reported in this class in Table 6.

Notice filed and posted.—The first step in the public regulation of the appropriation of water was the enacting of laws requiring those intending to take water from streams or other sources to post notices at the points of intended diversion and to file copies of these notices with some public official, usually the county clerk or county recorder. In some cases notices were filed only. The names of the states in which such laws were enacted with the dates of enactment and the dates at which they were superseded by other laws are shown in the following table. The practice of posting and filing notices was so general that many notices were filed in states where there was no legislation on the subject.

DATES OF LAWS REQUIRING POSTING OR FILING OF NOTICES OF APPROPRIATION.

STATE.	Date of enactment of law.	Date when law was superseded.	STATE.	Date of enactment of law.	Date when law was superseded.
Arizona.....	1871	1919	New Mexico.....	1891	1907
California.....	1872	1913	North Dakota.....	² 1881	1905
Colorado.....	1881	(¹)	Oklahoma.....	1897	1905
Idaho.....	1881	1903	South Dakota.....	² 1881	1905
Kansas.....	1886	(¹)	Texas.....	1895	1913
Montana.....	1885	(¹)	Utah.....	1897	1903
Nebraska.....	1889	1895	Washington.....	1889	1917
Nevada.....	1889	1893	Wyoming.....	1886	1890

¹ Still in force.

² Territory of Dakota.

Defining of rights.—The fact that many rights to water have been acquired without public supervision and consequently are not defined as to date or extent when they are acquired has created the necessity for the defining of such rights by some public authority. Originally rights were defined in ordinary suits between water users whose claims conflicted, but this led to such a multiplicity of suits that most of the states in which irrigation is generally practiced have enacted laws providing either some special procedure in the courts for the adjudication of rights or for adjudication by some board or official, or for a combination of the two systems in which testimony is taken, surveys

FARMS AND ACREAGE IRRIGATED.

TABLE 2.—NUMBER OF FARMS AND ACREAGE IRRIGATED:
1890 TO 1920.

CENSUS YEAR.	FARMS IRRIGATED.			AREA IRRIGATED.				
	Number.	Per cent of in- crease.	Per cent of all farms.	Acres.	Per cent of in- crease.	Per cent of total land area.	Per cent of land in farms.	Per cent of im- proved land in farms.
1920.....	231,541	42.3	12.1	19,191,716	33.0	1.6	3.8	8.9
1910.....	162,723	45.6	9.2	14,433,285	86.4	1.2	3.5	7.7
1900.....	113,829	110.3	8.2	7,744,467	108.4	0.7	2.2	6.2
1890.....	54,196		5.8	3,715,758		0.3	2.1	3.8

TABLE 3.—ACREAGE, CLASSIFIED BY DATE OF BEGINNING OF
ENTERPRISES SUPPLYING WATER FOR IRRIGATION.

DATE OF BEGINNING.	Number of enter- prises.	Area included in enterprises, 1920 (acres).	AREA IRRIGATED IN 1919.		Area enterprises were capable of irrigating in 1920 (acres).
			Acres.	Per cent of acreage in- enterprises.	
Total.....	63,298	35,890,821	19,191,716	53.5	26,020,477
Before 1890.....	696	469,006	299,784	63.9	356,576
1900-1909.....	2,170	1,915,572	1,282,705	66.9	1,452,801
1910-1919.....	3,663	4,246,246	2,586,414	61.0	2,378,738
1890-1899.....	7,854	6,256,086	4,645,391	64.6	4,869,859
1900-1909.....	6,186	4,364,393	2,338,915	53.6	3,560,098
1910-1919.....	4,408	3,841,247	2,211,749	57.6	2,963,840
1900-1909.....	5,588	5,683,374	2,540,927	43.5	3,815,217
1910-1919.....	11,600	3,938,999	1,534,644	39.1	2,404,015
1910-1919.....	12,342	2,255,554	1,185,560	52.8	1,955,204
Not reported.....	8,191	1,539,344	972,629	63.2	1,198,112

TABLE 4.—ACREAGE, CLASSIFIED BY SOURCE OF WATER SUPPLY.
1919 AND 1909.

CLASS.	AREA IRRIGATED (ACRES).				Area enterprises were capable of irrigating in 1920 (acres).	Area included in enterprises, 1920 (acres).
	1919	1909	Increase. ¹			
			Amount.	Per cent.		
Total	19,191,716	14,433,285	4,758,431	33.0	26,020,477	35,890,821
Streams, gravity.....	14,327,060	12,767,351	1,559,709	13.8	19,269,136	26,040,237
Streams, pumped.....	1,226,510	608,650	617,861	101.5	2,115,942	2,885,098
Streams, pumped and gravity.....	199,595	(²)	199,595		237,700	284,353
Wells, pumped.....	1,263,098	499,341	773,757	158.1	1,674,819	2,356,748
Wells, flowing.....	65,856	144,420	-78,564	-54.4	79,777	131,137
Wells, flowing and pumped.....	35,665	(²)	35,665		42,703	84,379
Lakes, pumped.....	35,730	17,826	17,904	100.4	59,769	80,564
Lakes, gravity.....	100,646	59,631	41,015	68.8	149,377	312,169
Springs.....	198,008	196,186	1,822	0.9	261,792	406,528
Stored storm water.....	98,873	195,792	-6,919	-6.5	223,434	319,972
City water.....	930	(²)	930		1,401	1,666
Sewage.....	2,578	(²)	2,578		3,301	5,540
Streams, gravity, and pumped wells.....	344,713	(²)	344,713		389,790	465,293
Streams, gravity, and flowing wells.....	82,665	(²)	82,665		104,569	205,121
Other mixed.....	995,621	44,079	952,542		1,398,004	2,290,850
Other and not reported.....	13,148	(²)	13,148		15,972	17,866

¹ A minus sign (-) denotes decrease. Per cent not shown when more than 1,000.
² Not included in classification.

ACREAGE, BY CHARACTER OF ENTERPRISE.

The dates on which the different states enacted laws accepting the conditions of the Federal Carey Act (act of Aug. 18, 1894) and the dates on which they enacted their original irrigation district laws are given in the following table:

DATES OF ACCEPTING CAREY ACT AND OF ENACTING IRRIGATION
DISTRICT LAWS.

STATE.	Date of accept- ing Carey Act.	Date of original irriga- tion district laws.	STATE.	Date of accept- ing Carey Act.	Date of original irriga- tion district laws.
Arizona.....	1912	1912	New Mexico.....	1909	1907
Arkansas.....	(¹)	(²)	North Dakota.....	(³)	1917
California.....	1915	1887	Oklahoma.....	(³)	1915
Colorado.....	1895	1905	Oregon.....	1901	1895
Idaho.....	1895	1895	South Dakota.....	1909	1917
Kansas.....	(¹)	1891	Texas.....	(¹)	1905
Louisiana.....	(¹)	(²)	Utah.....	1897	1895
Montana.....	1895	1907	Washington.....	1895	1890
Nebraska.....	(¹)	1895	Wyoming.....	1895	1909
Nevada.....	1895	1891			

¹ Carey Act does not apply.

² Has no district law.

³ Has not accepted Carey Act.

The United States Reclamation Act (act of June 17, 1902) applies to all of the states included in the irrigation census except Arkansas and Louisiana, and this service supplies water to some land in all of the states to which it applies except Kansas and Oklahoma. One small project was established in Kansas but it has been disposed of. No project has been undertaken in Oklahoma.

TABLE 5.—ACREAGE, CLASSIFIED BY CHARACTER OF ENTERPRISE:
1920 AND 1910.

ITEM AND CLASS.	CENSUS OF—		INCREASE. ¹	
	1920	1910	Amount.	Per cent.
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Total.....	19,191,716	14,433,285	4,758,431	33.0
Individual and partnership.....	6,848,807	6,594,614	254,193	3.9
Cooperative.....	6,581,400	4,645,539	1,935,861	41.7
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Carey Act.....	523,929	288,553	235,376	51.6
Commercial.....	1,822,001	1,809,379	12,622	0.7
U. S. Reclamation Service.....	1,254,609	895,648	358,961	217.1
U. S. Indian Service.....	284,551	172,012	111,539	64.6
State.....	5,620	(²)	5,620	
City.....	40,148	(²)	40,148	
Other and mixed.....	7,238	(²)	7,238	
Not reported.....	570	(²)	570	
ACREAGE ENTERPRISES WERE CAPA- BLE OF IRRIGATING.				
Total.....	26,020,477	20,285,403	5,735,074	28.3
Individual and partnership.....	9,255,756	8,086,766	1,168,990	14.5
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Commercial.....	2,799,563	2,954,166	-154,603	-5.2
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U. S. Indian Service.....	484,486	378,576	105,910	28.7
State.....	7,379	(²)	7,379	
City.....	44,458	(²)	44,458	
Other and mixed.....	3,546	(²)	3,546	
Not reported.....	625	(²)	625	
ACREAGE INCLUDED IN ENTERPRISES.				
Total.....	35,890,821	32,245,464	3,645,357	11.3
Individual and partnership.....	13,008,415	10,621,067	2,387,348	22.5
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Irrigation district.....	3,432,109	1,581,465	1,850,644	117.0
Carey Act.....	1,188,937	2,573,874	-1,384,937	-53.8
Commercial.....	3,909,581	5,786,777	-1,877,196	-30.9
U. S. Reclamation Service.....	2,627,178	1,973,016	654,160	33.2
U. S. Indian Service.....	932,985	879,068	53,917	6.1
State.....	9,581	(²)	9,581	
City.....	49,650	(²)	49,650	
Other and mixed.....	13,144	(²)	13,144	
Not reported.....	700	(²)	700	

¹ A minus sign (-) denotes decrease.

² Not included in classification in 1910.

In addition to supplying water to land within its own projects the Reclamation Service, under the Warren Act (act of Feb. 21, 1911), furnishes, in most cases, stored water in bulk to supplement the supply of private systems otherwise dependent on unregulated stream flow. The area receiving such supplemental supply from the Reclamation Service varies from time to time, and was somewhat in excess of 900,000 acres in 1919. This area is not included in that credited to the Reclamation Service in any of the tables in this summary.

ACREAGE, BY CHARACTER OF WATER RIGHTS.

In the United States all laws relating to the character of rights and to the use of water are enacted by the several states. In 1866 Congress passed an act providing that rights "recognized and acknowledged by local customs, laws, and the decisions of courts" shall be maintained and protected (R. S., sec. 2339), and the United States Reclamation Act (act of June 17, 1902) recognizes state control over water. The Supreme Court of the United States also has upheld the exclusive right of the states to control the waters within their boundaries, subject only to the right of Congress to preserve and improve navigation. (*Kansas v. Colorado*, 206 U. S. 46).

Every one of the states in which irrigation is generally practiced, except Arkansas and Louisiana, where irrigation is limited almost exclusively to rice growing, has assumed some measure of public control over irrigation and rights to water. In Table 6 the acreage irrigated is classified with reference to the degree to which rights under which water is received are defined and controlled by public authority, and the nature of the control exercised.

TABLE 6.—ACREAGE IRRIGATED, CLASSIFIED BY CHARACTER OF RIGHTS UNDER WHICH WATER IS RECEIVED: 1919 AND 1909.

CLASS.	1919		1909 ¹
	Acres.	Per cent of total.	Per cent of total.
Total.....	19,191,716	100.0	100.0
Appropriation and use.....	2,521,682	13.1	34.0
Notice filed and posted.....	2,765,636	14.4	16.2
Adjudicated by court.....	7,169,954	37.3	35.3
Permit from state.....	1,960,924	10.2	6.7
Certificate or license from state.....	1,288,124	6.7	5.7
Riparian rights.....	370,896	1.9	2.1
Underground.....	1,067,606	5.6	.....
Other and mixed.....	494,564	2.6	.....
Not reported.....	² 1,562,330	8.1	.....

¹ Acreage irrigated for rice growing in Louisiana, Arkansas, and Texas not included.

² Acreage for Arkansas and Louisiana included.

The laws of the states relating to water rights are summarized in the following paragraphs. The areas served under rights of the different kinds for the United States as a whole are given in Table 6, and for the several states on page 36.

Appropriation and use.—In every one of the arid states the laws recognize the right of persons needing water for irrigation or other beneficial purposes to "appropriate" water from streams and other sources. This right is limited in various ways, and all of the states prescribe some procedure which shall be followed by those appropriating water. However, all of these states have in the past recognized rights acquired by merely taking and using water, in the absence of laws, or without conforming to the laws, when there are such. All rights acquired in this way that have not been passed upon by the courts or by some official body to which has been given the right to adjudicate water rights, are reported in this class in Table 6.

Notice filed and posted.—The first step in the public regulation of the appropriation of water was the enacting of laws requiring those intending to take water from streams or other sources to post notices at the points of intended diversion and to file copies of these notices with some public official, usually the county clerk or county recorder. In some cases notices were filed only. The names of the states in which such laws were enacted with the dates of enactment and the dates at which they were superseded by other laws are shown in the following table. The practice of posting and filing notices was so general that many notices were filed in states where there was no legislation on the subject.

DATES OF LAWS REQUIRING POSTING OR FILING OF NOTICES OF APPROPRIATION.

STATE.	Date of enactment of law.	Date when law was superseded.	STATE.	Date of enactment of law.	Date when law was superseded.
Arizona.....	1871	1919	New Mexico.....	1891	1907
California.....	1872	1913	North Dakota.....	² 1881	1905
Colorado.....	1881	(¹)	Oklahoma.....	1897	1905
Idaho.....	1881	1903	South Dakota.....	² 1881	1905
Kansas.....	1886	(¹)	Texas.....	1895	1913
Montana.....	1885	(¹)	Utah.....	1897	1903
Nebraska.....	1889	1895	Washington.....	1889	1917
Nevada.....	1889	1893	Wyoming.....	1886	1890

¹ Still in force.

² Territory of Dakota.

Defining of rights.—The fact that many rights to water have been acquired without public supervision and consequently are not defined as to date or extent when they are acquired has created the necessity for the defining of such rights by some public authority. Originally rights were defined in ordinary suits between water users whose claims conflicted, but this led to such a multiplicity of suits that most of the states in which irrigation is generally practiced have enacted laws providing either some special procedure in the courts for the adjudication of rights or for adjudication by some board or official, or for a combination of the two systems in which testimony is taken, surveys

are made, and decrees are prepared by boards or officials, but the decrees are issued by the courts. In all of the states, rights were defined by the courts before any other system was adopted, and some of the states have changed their systems more than once.

The laws of the various states and the periods during which they were in force are shown in the following table:

METHODS OF DEFINING RIGHTS TO WATER AND PERIODS OF TIME DURING WHICH THEY HAVE BEEN IN FORCE.

STATE.	Defined by courts without the aid of state officials or boards.	Defined by courts on basis of information collected by state officials or boards.	Defined by state boards or officials.
Arizona.....	Until 1919.	1919 to date.	
Arkansas.....	To date.		
California.....	Until 1913.	1913 to date.	
Colorado.....	To date.		
Idaho.....	To date. ¹		
Kansas.....	To date.		
Louisiana.....	To date.		
Montana.....	To date.		
Nebraska.....	Until 1905.		1895 to date.
Nevada.....	Until 1903.	1915 to date.	1903-1915.
New Mexico.....	Until 1907.	1907 to date.	
North Dakota.....	Until 1905.	1905 to date.	
Oklahoma.....	Until 1905.	1905 to date.	
Oregon.....	Until 1909.	1909 to date.	
South Dakota.....	To date. ¹		
Texas.....	Until 1917.	1917 to date.	
Utah.....	Until 1903.	1903 to date.	
Washington.....	Until 1917.	1917 to date.	
Wyoming.....	Until 1890.		1890 to date.

¹ Law providing otherwise declared unconstitutional.

Permits, certificates, and licenses from state.—The names of the states requiring a party wishing to acquire rights to water to apply to some state board or official for a permit and providing for the issuing of a certi-

cate or license setting forth the rights acquired, with the dates of the laws, are given in the following table:

STATE.	Date of law.	STATE.	Date of law.
Arizona.....	1919	Oklahoma.....	1905
California.....	1913	Oregon.....	1909
Idaho.....	1903	South Dakota.....	1905
Nebraska.....	1895	Texas.....	1913
Nevada.....	1905	Utah.....	1903
New Mexico.....	1907	Washington.....	1917
North Dakota.....	1905	Wyoming.....	1890

Riparian rights.—The states that recognize riparian rights to some extent are as follows: California, Kansas, Montana, Oregon, South Dakota, Texas, and Washington.

ACREAGE, BY DRAINAGE BASIN.

The report of a special census taken in 1902 presented all data by drainage basins rather than by counties. The results of the census of 1920 have been tabulated on the same basis, and the data for 1902 are presented for purposes of comparison. For no other census have the results been tabulated in this form. The acreage reported for each drainage basin in 1919 comprises all the irrigated land in that drainage basin, including that watered from springs and wells. In the 1902 results the acreages irrigated from springs and wells were not reported for the smaller tributary streams, but the acreages for the tributaries were included in those reported for the main streams. This area is so small, however, that the comparison of the areas reported for the tributary streams is not seriously affected.

TABLE 7.—ACREAGE IRRIGATED, CLASSIFIED BY DRAINAGE BASIN: 1919 AND 1902.

DRAINAGE BASIN.	AREA IRRIGATED (ACRES).			Area included in enter-prises, 1920 (acres).	Area enter-prises were capable of irrigating in 1920 (acres).
	1919	1902	Per cent of increase. ¹		
Total.....	19,191,716	8,574,408	116.3	35,890,321	26,020,477
Missouri River and tributaries.....	4,147,278	2,533,237	63.7	8,483,171	5,805,680
Missouri River direct.....	27,707	20,834	33.0	62,270	62,450
Jefferson River and tributaries.....	425,085	231,788	83.7	631,898	574,672
Jefferson River direct.....	31,276	15,721	35.3	40,847	34,994
Beaverhead River.....	145,673	99,014	47.1	206,079	189,797
Big Hole River.....	184,635	67,422	173.9	306,885	227,920
Boulder River.....	7,265	9,339	-22.2	40,677	13,397
Panama River.....	34,474	21,101	63.4	76,107	48,036
Other tributaries of Jefferson River.....	32,342	19,197	68.5	71,803	50,728
Madison River.....	34,425	20,338	69.3	88,594	62,065
Gallatin River.....	95,063	58,004	63.9	228,066	182,513
Smith River.....	10,861	18,677	-9.7	38,309	26,691
Sun River.....	21,785	32,927	-3.5	244,071	95,522
Teton River.....	44,945	34,961	28.6	146,468	82,241
Marion River.....	63,738	22,188	187.4	308,188	122,431
Judith River.....	15,173	44,672	-66.0	40,993	35,450
Musselshell River.....	45,599	87,233	-47.8	141,363	113,064
Milk River and tributaries.....	108,535	59,697	91.8	249,716	179,036
Milk River direct.....	16,766	24,306	-18.7	26,358	23,442
Sage Creek.....		4,947		2,850	1,750
Snake River.....	910	2,135	-57.4	4,130	2,275
Other tributaries of Milk River.....	87,879	25,210	248.6	317,378	151,595
Missouri River and tributaries—Continued.					
Yellowstone River and tributaries.....	889,025	427,559	107.9	1,826,870	1,322,304
Yellowstone River direct.....	189,453	40,015	373.5	279,211	262,801
Clark Fork and tributaries.....	77,736	69,195	12.3	141,007	130,627
Clark Fork direct.....	72,525	67,488	7.5	130,736	121,818
Tributaries of Clark Fork.....	5,211	1,707	205.3	10,271	8,809
Shields River.....	25,940	19,836	30.8	94,238	53,082
Stillwater River.....	23,561	13,572	73.6	34,278	29,664
Big Horn River and tributaries.....	358,949	115,520	210.7	842,297	534,404
Big Horn River direct.....	93,902	4,147	162.331	123,151	123,151
Pojo Agie River.....	22,073	14,340	53.9	34,723	34,375
Wind River.....	43,620	3,787	228.338	77,122	77,122
Poison Creek.....	5	2,690	-99.8	10	10
Owl Creek.....	11,510	6,558	77.0	14,546	12,951
No Wood River.....	18,416	10,099	82.4	26,193	22,080
Graybull River.....	49,321	35,552	38.5	93,643	79,134
Shall Creek.....	11,955	4,819	176.8	24,035	22,406
Shoshone River.....	95,091	26,811	261.4	217,998	154,431
Little Horn River.....	1,408	4,761	-70.4	11,353	4,340
Other tributaries of Big Horn River.....	11,638	2,956	293.7	29,257	24,404
Roosebud River.....	365	13,618	-97.3	1,365	1,305
Tongue River and tributaries.....	54,195	48,245	12.3	100,563	80,693

¹ A minus sign (—) denotes decrease. Per cent not shown when more than 1,000.

² Includes springs and wells.

IRRIGATION.

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TABLE 7.—ACREAGE IRRIGATED, CLASSIFIED BY DRAINAGE BASIN: 1919 AND 1902—Continued.

DRAINAGE BASIN.	AREA IRRIGATED (ACRES).			Area included in enterprises, 1920 (acres).	Area enterprises were capable of irrigating in 1920 (acres).	DRAINAGE BASIN.	AREA IRRIGATED (ACRES).			Area included in enterprises, 1920 (acres).	Area enterprises were capable of irrigating in 1920 (acres).
	1919	1902	Per cent of increase. ¹				1919	1902	Per cent of increase. ¹		
Missouri River, etc.—Con.						Mississippi River and tributaries exclusive of Missouri River.....	958,493	393,687	143.5	1,543,004	1,152,261
Yellowstone River, etc.—Con.						Mississippi River direct.....	17,416	.....	.....	24,070	23,755
Tongue River—Con.						Arkansas River and tributaries.....	851,150	393,085	116.5	1,344,646	1,009,921
Tongue River direct.....	20,975	19,907	5.4	43,075	32,174	Arkansas River direct.....	514,702	234,594	119.4	629,409	553,690
Goose Creek.....	27,627	20,653	33.8	43,817	37,749	South Fork.....	10,401	6,422	91.3	12,374	10,430
Other tributaries of Tongue River.....	5,593	7,685	-27.2	13,671	10,770	Fountain River.....	20,465	13,870	47.6	39,224	24,984
Powder River and tributaries.....	89,631	66,747	34.3	138,856	117,181	St. Charles River.....	11,855	3,432	245.4	22,310	13,701
Powder River direct.....	3,193	2,390	33.6	10,846	9,803	Huerfano River.....	56,528	14,078	294.4	103,654	64,474
Red Fork Creek.....	3,341	2,610	28.0	4,271	3,385	Apishapa River.....	8,292	4,089	102.8	66,615	11,430
Crazy Woman Creek.....	21,965	6,950	216.0	29,684	24,161	Purgatoire or Las Animas River and tributaries.....	43,922	20,393	115.4	52,083	47,870
Clear Creek.....	50,648	47,801	6.0	71,560	63,735	Purgatoire River direct.....	43,533	19,702	121.0	51,172	47,402
Other tributaries of Powder River.....	10,434	6,996	49.9	22,495	16,107	Trinchera River.....	389	691	-43.7	911	468
Other tributaries of Yellowstone River.....	69,195	40,811	69.5	195,055	112,567	Canadian River and tributaries.....	90,876	57,412	58.3	180,804	137,882
Little Missouri River.....	1,080	3,730	-71.0	7,808	4,833	Canadian River direct.....	2,371	2,365	0.3	3,022	2,615
Moreau River.....	305	335	-9.0	3,094	1,721	Cimarron River.....	31,967	8,122	293.6	70,313	46,628
Choyenne River and tributaries.....	110,143	66,487	65.7	197,288	159,083	Vernon River.....	23,678	4,110	476.1	23,978	23,878
Choyenne River direct.....	99,333	49,547	100.5	170,715	143,847	Ocate Creek.....	4,561	1,380	252.2	13,908	13,095
North Fork (Belle Fourche).....	1,968	6,173	-68.2	5,054	3,621	Mora River.....	17,057	32,796	-48.0	36,670	29,528
South Fork and tributaries.....	8,844	10,555	-16.2	15,619	11,615	Ute Creek.....	77	4,061	-98.1	709	519
South Fork direct.....	5,906	7,906	-25.3	11,764	7,910	Other tributaries of Canadian River.....	10,865	24,578	137.3	32,199	22,619
Hat Creek.....	2,938	2,649	10.9	3,765	3,705	Cimarron River.....	8,345	20,427	-20.0	25,312	21,472
Other tributaries of Choyenne River.....	212	.....	.....	21,922	16,939	Other tributaries of Arkansas River.....	86,764	29,368	195.4	213,961	123,918
White River.....	8,008	9,706	-17.5	21,922	16,939	St. Francis River.....	4,965	(*)	.....	14,198	5,920
Niobrara River.....	6,138	8,185	-25.0	28,656	10,265	White River.....	74,018	(*)	.....	131,346	95,709
Platte River and tributaries.....	2,136,402	1,286,343	66.1	3,431,037	2,579,720	Quachita River.....	42	(*)	.....	140	105
Platte River direct.....	37,632	30,887	21.6	161,377	68,732	Red River and tributaries.....	7,149	282	.....	23,306	13,378
North Platte River and tributaries.....	872,140	548,781	58.9	1,603,305	1,172,858	Other tributaries of Mississippi River.....	2,353	2320	791.6	5,358	3,473
North Platte River direct.....	351,650	170,470	105.9	579,728	429,252	Gulf streams other than Mississippi River and Rio Grande.....	698,077	21,833	.....	1,602,169	1,157,529
Beaver Creek.....	2,621	7,370	-64.4	3,666	3,186	Atchafalaya River and tributaries.....	23,342	(*)	.....	31,020	30,885
Grand Encampment Creek.....	7,053	6,622	6.5	10,173	7,293	Vermilion River and tributaries.....	74,034	(*)	.....	138,066	120,649
Spring Creek.....	13,123	7,679	70.9	18,702	18,177	Mormontau River and tributaries.....	268,840	(*)	.....	458,463	382,755
Sage Creek.....	8,375	1,634	-77.1	10,500	11,373	Calcasieu Lake, River and tributaries.....	54,318	(*)	.....	169,193	137,178
Pass Creek.....	8,557	8,300	2.0	12,500	11,373	Sabine River and tributaries.....	26,857	(*)	.....	45,318	41,353
Medicine Bow River.....	54,500	40,061	34.0	139,699	67,103	Neches River.....	64,900	(*)	.....	149,800	82,000
Sweetwater River.....	5,448	11,403	-52.2	14,166	10,593	Trinity River.....	42,770	(*)	.....	96,320	52,720
Muddy Creek.....	6,657	1,625	-66.9	7,916	7,677	Brazos River.....	7,535	448	.....	22,896	19,580
Box Elder Creek.....	4,648	4,740	-1.9	7,916	7,677	Colorado River.....	71,278	10,402	585.2	277,268	125,693
La Prele Creek.....	9,103	4,524	101.2	21,697	15,690	San Antonio River.....	13,179	2,955	346.0	61,789	60,177
Labonte Creek.....	4,376	3,639	20.3	6,525	5,755	Nueces River.....	13,753	2,603	416.4	50,006	31,977
Laramie River and tributaries.....	156,159	138,176	13.0	373,353	298,153	Other Gulf streams.....	38,271	5,365	613.3	101,130	66,604
Laramie River direct.....	78,560	57,335	37.0	177,979	129,116	Rio Grande and tributaries.....	1,293,893	496,587	160.6	2,504,127	1,887,433
Little Laramie River.....	30,860	53,105	-41.9	42,852	33,144	Rio Grande direct.....	684,718	246,106	178.2	1,386,144	1,099,365
Sybilie Creek.....	6,183	7,234	-14.5	9,519	8,044	Saguache River.....	28,032	11,730	224.2	41,447	39,363
North Laramie River.....	6,858	5,721	19.9	20,144	11,749	San Luis River.....	51,329	3,679	.....	175,871	68,309
Chugwater Creek.....	5,914	3,907	51.4	9,853	9,258	Alamosa River.....	35,601	15,753	126.0	72,528	40,551
Other tributaries of Laramie River.....	27,784	10,874	155.5	113,006	108,842	La Jara River.....	10,627	(*)	.....	15,424	12,005
Rawhide Creek.....	2,045	4,187	-51.2	3,651	2,481	Conejos River.....	88,676	44,035	101.4	115,887	95,680
Horse Creek.....	28,369	15,524	82.7	71,188	39,702	Trinchera River.....	12,485	3,768	231.3	59,699	19,319
Blue River.....	7,376	4,929	49.6	7,391	7,391	Rio Costilla River.....	4,417	2,115	108.8	7,385	4,803
Pumpkin Creek.....	7,273	2,314	214.3	10,554	9,168	Pueblo River.....	11,780	7,075	66.5	12,443	11,791
Other tributaries of North Platte River.....	200,407	49,250	325.2	320,814	238,607	Rio Chama.....	26,166	8,549	206.1	42,235	30,237
South Platte River and tributaries.....	1,224,074	601,342	77.2	1,671,199	1,335,109	Rio Santa Cruz.....	9,171	3,059	197.2	9,863	9,221
South Platte River direct.....	362,191	229,388	57.9	519,535	398,310	Tesugue Creek.....	3,012	4,744	-36.5	3,411	3,183
Bear Creek.....	8,778	11,174	-21.4	12,093	10,373	Rio Puerco.....	14,309	2,927	388.9	42,877	25,691
Clear Creek.....	79,172	76,259	3.8	84,450	79,940	Pecos River and tributaries.....	176,458	78,855	123.8	397,443	281,150
St. Vrain Creek.....	244,831	96,583	153.5	281,467	235,731	Pecos River direct.....	119,848	34,691	245.5	274,243	198,286
Big Thompson Creek.....	96,678	68,806	40.5	105,673	98,711	Gallinas River.....	4,097	6,281	-34.8	41,810	24,201
Cachela Poudre River.....	267,197	146,280	82.7	291,702	282,307	Hondo River.....	20,561	24,608	-16.4	33,118	23,625
Lone Tree Creek.....	4,928	1,444	241.3	124,506	7,327	Penasco River.....	13,375	5,102	162.2	19,889	13,733
Crow Creek.....	4,525	3,643	24.2	13,040	7,117	Other tributaries of Pecos River.....	18,577	28,173	127.3	28,383	21,405
Big Beaver Creek.....	6,429	17,100	-62.4	11,825	10,690	Los Moras Creek.....	1,469	680	116.0	1,534	1,519
Lodgepole Creek.....	20,004	12,306	62.6	33,823	25,646	Other tributaries of Rio Grande.....	125,013	63,485	97.9	209,936	144,946
Other tributaries of South Platte River.....	130,241	23,359	359.3	193,085	148,948	Independent streams in Rio Grande drainage basin.....	18,992	8,355	127.3	34,026	26,852
Loup River.....	1,177	12,872	-90.9	4,512	2,377	Rio Mimbres.....	12,557	6,540	91.8	24,243	19,554
Other tributaries of Platte River.....	579	2,461	-76.5	644	644	Fresno River.....	1,798	209	793.0	2,331	2,331
Kansas River and tributaries.....	34,672	22,344	55.2	53,644	44,402	Rio Tularosa.....	4,547	1,568	190.0	6,085	4,877
Republican River.....	34,360	21,022	63.4	52,080	43,022	Other independent streams.....	90	21	.....	90	90
Smoky Hill River.....	278	770	-63.9	1,450	1,266						
Big Blue River.....	19	(*)	.....	44	44						
Other tributaries of Kansas River.....	15	552	-97.3	70	70						
Other tributaries of Missouri River.....	51,989	80,329	-35.3	403,076	150,161						

¹ A minus sign (-) denotes decrease. Per cent not shown when more than 1,000.² Includes springs and wells.³ Includes 65,744 acres in Colorado for which main stream was not reported.⁴ Not reported separately in 1902.

AGRICULTURE.

TABLE 7.—ACREAGE IRRIGATED, CLASSIFIED BY DRAINAGE BASIN: 1919 AND 1902—Continued.

DRAINAGE BASIN.	AREA IRRIGATED (ACRES).			Area included in enterprises, 1920 (acres).	Area enterprises were capable of irrigating in 1920 (acres).	AREA IRRIGATED (ACRES).			Area included in enterprises, 1920 (acres).	Area enterprises were capable of irrigating in 1920 (acres).
	1919	1902	Per cent of increase. ¹			1919	1902	Per cent of increase. ¹		
Colorado River and tributaries.....	2,312,047	927,183	149.4	4,064,492	2,986,937	2,313,163	1,639,473	41.1	4,238,028	2,869,858
Colorado River direct.....	495,719	18,713		728,236	551,506	848,039	534,861	58.7	1,219,721	989,919
Green River and tributaries.....	586,387	254,951	130.0	1,148,621	855,264	180,452	274,071	75.3	685,746	547,673
Green River direct.....	22,826	12,723	79.4	36,121	21,072	249,100	89,032	177.9	360,256	200,577
New Fork.....	27,743	19,978	132.8	53,918	43,614	46,541	38,592	20.6	48,358	46,890
Herse Creek.....	15,320	6,569	136.3	21,670	19,453	1,189	(²)		1,935	1,189
Cottonwood Creek.....	17,437	4,673	273.1	32,317	29,283	8,905	6,116	45.6	8,929	8,905
South Piney Creek.....	11,928	16,179	-26.3	30,924	26,397	2,973	6,581	-54.7	10,028	5,238
La Barge Creek.....	5,459	5,055	8.0	11,700	7,725	16,679	9,024	84.8	43,404	17,128
Fontenelle Creek.....	4,428	3,241	36.6	5,838	5,033	155,065	124,146	24.9	212,836	177,746
Bitter Creek.....	2,398	1,465	79.5	12,495	11,447	97,589	80,355	21.4	149,081	112,981
Blacks Creek.....	65,980	28,139	134.5	175,970	104,305	44,726	41,967	6.6	83,790	49,341
Henry's Fork.....	26,787	15,834	69.2	44,087	44,087	21,584	22,373	-2.2	27,097	26,852
Ashley Fork River.....	138,446	(³)		222,689	217,809	6,202	4,414	40.5	6,538	6,468
Duchene River.....	23,811	6,621	259.6	37,191	24,848	24,777	11,601	113.6	31,650	30,320
Prairie River.....	77,260	21,546	258.7	85,028	80,028	270,598	180,435	50.0	414,894	329,265
San Rafael River.....	51,661	76,422	6.9	142,636	102,861	48,052	32,401	48.3	90,495	55,720
Yampa River and tributaries.....	23,989	17,363	32.9	34,280	28,807	61,434	23,778	158.4	96,176	83,142
Yampa River direct.....	49,552	(⁴)		80,135	55,222	5,620	18,424	-69.5	6,589	5,446
Other tributaries of Yampa River.....	25,625	22,752	12.6	40,441	29,238	54,782	36,939	48.3	62,703	56,672
White River.....	20,753	16,004	92.2	69,836	54,370	19,146	20,446	-6.4	20,371	20,241
Other tributaries of Green River.....	595,041	304,474	95.4	1,066,252	752,334	12,144	7,673	58.3	16,898	16,691
Grand River and tributaries.....	51,698	41,721	95.8	150,637	119,778	10,991	8,813	24.7	13,207	12,271
Grand River direct.....	9,331	2,676	248.7	27,010	10,795	58,429	41,961	82.8	108,655	78,582
Muddy Creek.....	5,050	4,105	23.0	7,255	5,075	1,464,524	1,104,612	32.6	2,988,307	1,879,939
Blue River.....	10,541	2,794	277.3	16,297	11,771	325,718	131,048	148.5	630,484	402,387
Eagle River.....	15,118	10,865	39.1	28,435	15,586	153,651	59,257	159.3	351,553	226,199
Boaring Fork.....	30,738	21,050	45.0	47,305	34,104	77,616	42,502	82.6	105,519	78,348
Plateau Creek.....	26,260	13,380	98.3	40,757	25,616	7,289	5,260	38.6	7,845	7,289
Gunnison River and tributaries.....	250,913	150,254	67.0	409,934	329,756	18,325	3,495	424.3	32,620	19,170
Gunnison River direct.....	16,813	9,000	86.8	21,649	19,909	68,837	20,534	235.2	132,947	71,381
Taylor River.....	560	12,018	-95.3	620	620	28,732	15,599	84.2	53,729	46,469
Tonichi Creek.....	21,732	10,152	114.3	30,298	23,068	27,206	2,845	856.3	60,891	33,893
North Fork.....	31,006	17,174	80.5	33,891	33,891	1,983	1,515	30.9	4,326	3,446
Smith Fork River.....	15,314	5,954	157.2	31,340	25,600	3,460	990	250.4	4,599	3,639
Uncompahgre River.....	86,119	56,399	52.7	139,756	137,756	197,778	219,767	-10.0	348,573	231,251
Other tributaries of Gunnison River.....	79,349	39,557	100.6	129,082	88,912	69,186	97,742	-29.2	84,049	77,726
Rio Dolores.....	74,916	21,560	247.5	180,611	84,973	33,473	11,680	186.6	74,264	43,649
Other tributaries of Grand River.....	90,476	26,069	139.8	158,611	114,880	22,278	7,765	186.9	40,610	20,065
Fremont River.....	26,513	15,701	68.9	42,005	34,006	7,940	3,960	100.5	28,697	10,470
Virgin River.....	35,330	15,651	125.9	100,242	45,558	33,052	26,733	23.6	48,338	41,261
San Juan River and tributaries.....	140,607	55,224	154.6	251,188	167,488	3,250	1,010	221.8	3,530	3,530
San Juan River direct.....	23,031	8,232	179.8	51,021	28,443	11,178	14,906	-25.0	40,769	10,898
Maneros River.....	9,040	5,115	76.7	18,149	9,494	6,350	31,562	-79.9	6,790	6,350
Los Pinos River.....	30,022	6,593	355.4	56,586	42,033	11,071	24,409	-54.6	21,526	11,582
Animas River.....	41,174	17,391	136.8	73,413	47,974	20,002	40,541	-50.7	34,659	20,920
La Plata River.....	23,004	9,977	130.6	29,918	26,765	14,606	32,748	-55.4	28,040	15,436
Other tributaries of San Juan River.....	14,336	7,916	81.1	23,101	15,779	3,152	7,000	-55.0	3,288	3,218
Kanab Wash.....	450	700	-55.7	710	610	2,244	793	183.0	3,321	2,266
Williams River.....	1,653	1,256	31.6	3,232	1,809	75,439	74,950	0.7	233,668	104,464
Little Colorado River and tributaries.....	17,096	11,855	43.7	35,358	21,880	27,810	70,838	-60.7	35,413	30,670
Little Colorado River direct.....	10,260	7,270	41.1	20,821	14,121	47,629	4,112		198,255	73,794
Nutcracker Creek.....	636	320	98.8	1,224	932	152,625	107,030	42.6	400,232	179,562
Concho Creek.....	244	153	49.7	500	250	152,055	106,960	42.2	397,772	178,212
Other tributaries of Little Colorado River.....	5,896	4,102	43.7	12,813	6,547	570	470		2,460	1,350
Gila River and tributaries.....	491,400	233,113	72.2	658,416	544,014	6,252	4,109	52.2	13,855	7,872
Gila River direct.....	85,406	60,620	37.6	210,531	174,229	3,708	6,705	-44.7	12,069	3,628
San Francisco River.....	3,591	4,907	-26.5	11,134	3,859	12,543	4,060	208.9	18,840	15,951
San Pedro River.....	7,773	10,912	-28.8	18,959	10,861	4,190	3,818	9.7	70,377	45,760
Santa Cruz River.....	23,619	10,606	211.3	76,617	45,115	31,784	23,533	35.1	36,225	33,313
Salt River and tributaries.....	247,260	140,642	75.6	277,034	268,644	4,608	5,440	73.3	21,523	6,510
Salt River direct.....	235,825	125,007	88.6	253,603	253,308	144,024	51,902	177.5	200,147	182,748
Tonto Creek.....	1,829	72.6		2,928	720	20,899	5,040	314.1	34,974	22,263
Rio Verde.....	6,564	11,592	-42.9	9,978	7,470	14,643	(⁵)		37,604	22,282
Other tributaries of Salt River.....	4,369	2,304	80.6	10,525	7,146	9,935	38,150	-74.0	19,635	13,452
Agua Fria River.....	18,824	884		28,699	30,000	1,906	2,165	-12.0	2,118	2,088
Hassayampa River.....	956	1,091	-12.4	3,657	1,773	21,356	34,701	-38.5	54,931	27,956
Other tributaries of Gila River.....	6,571	8,461	90.4	21,785	9,533	16,819	13,608	23.6	42,779	17,394
Other tributaries of Colorado River.....	11,900	15,546	-23.4	26,942	12,469					
Whitewater Draw and tributaries.....	5,871	384		18,623	9,950					

¹ A minus sign (-) denotes decrease. Per cent not shown when base is less than 100 or when per cent is more than 1,000.² Not reported separately in 1902.³ Includes 59,059 acres in Colorado for which main stream was not reported.⁴ Includes springs and wells.

IRRIGATION.

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TABLE 7.—ACREAGE IRRIGATED, CLASSIFIED BY DRAINAGE BASIN: 1919 AND 1902—Continued.

DRAINAGE BASIN.	AREA IRRIGATED (ACRES).			Area included in enter-prises, 1920 (acres).	Area enter-prises were capable of irrigating in 1920 (acres).	DRAINAGE BASIN.	AREA IRRIGATED (ACRES).			Area included in enter-prises, 1920 (acres).	Area enter-prises were capable of irrigating in 1920 (acres).
	1919	1902	Per cent of increase.				1919	1902	Per cent of increase.		
Great Basin drainage—Con.						Columbia River, etc.—Con.					
Independent streams—Con.						Independent streams, etc.—Con.					
Silvies River.....	64,842	26,041	149.0	102,258	95,867	Other independent streams.....	1,562	2,977	-60.7	6,720	1,802
Thomas Creek.....	5,386	1,980	172.0	5,866	5,466	Walla Walla River.....	39,784	9,649	312.3	54,614	47,745
Other independent streams.....	268,707	293,974	-8.6	548,945	351,358	Klickitat River.....	12,332	372	585.0	19,241	13,440
Columbia River and tributaries.....	3,873,245	1,297,437	198.5	6,336,801	4,968,518	White Salmon River.....	6,247	912	585.0	11,958	7,277
Columbia River direct.....	24,583	782		49,432	32,615	Umatilla River.....	43,571	4,485	871.5	99,012	83,341
Kootenai River.....	5,982	2,600	130.1	14,423	9,724	Willow Creek.....	5,553	3,013	84.3	7,159	6,618
Clark Fork and tributaries.....	286,200	229,851	24.6	603,088	444,928	John Day River.....	36,141	27,604	30.9	48,191	41,492
Clark Fork direct.....	3,188	8,808	-63.8	15,834	5,786	Deschutes River.....	111,916	21,108	430.2	291,014	174,790
Missoula River and tributaries.....	238,769	221,043	8.0	433,021	325,992	Hood River.....	19,765	2,837	596.7	39,660	21,101
Missoula River direct.....	2,550	1,181	115.9	8,322	5,777	Willamette River.....	2,892	448	545.5	4,056	4,302
Heilgate River.....	77,381	78,139	-1.0	165,391	108,161	Other tributaries of Columbia River.....	25,773	8,423	206.0	59,069	35,538
Big Blackfoot River.....	40,604	36,622	10.9	83,716	61,476	Pacific Ocean streams other than the Colorado and Columbia Rivers.....	3,570,687	1,556,232	129.4	6,978,320	5,155,509
Bitter Root River.....	112,622	98,955	13.8	158,241	139,481	Dungeness River.....	6,160	685	799.3	12,660	9,860
Other tributaries of Missoula River.....	5,612	2,136	-8.5	17,351	11,097	McDowell Creek.....	38,569	13,900	177.5	131,131	52,816
Flathead River.....	44,333	(*)		154,233	113,150	Rogue River and tributaries.....	3,256	538	505.2	14,166	4,673
Colville River.....	6,960	310		18,200	13,993	Rogue River direct.....	6,706	1,208	455.1	54,383	8,417
Spokane River and tributaries.....	20,614	210		50,860	27,356	Little Butte Creek.....	8,319	2,902	186.7	28,275	14,573
Spokane River direct.....	16,453	210		40,391	21,675	Bear Creek.....	1,333	225	492.4	2,746	1,614
Coeur d'Alene Lake and River.....	4,161	(*)		10,469	5,681	Evans Creek.....	10,659	4,239	151.5	17,335	13,012
Okanogan River and tributaries.....	20,583	2,257	812.0	42,042	30,261	Applegate River.....	4,961	2,804	76.9	8,705	6,323
Okanogan River direct.....	2,357	14		3,708	2,899	Illinois River.....	3,335	1,984	68.1	5,521	4,204
Salmon Creek.....	6,729	1,065	514.5	11,478	11,238	Other tributaries of Rogue River.....	153,105	80,433	90.4	362,793	205,374
Other tributaries of Okanogan River.....	11,407	2,148	501.5	26,856	16,124	Klamath River and tributaries.....	65,720	52,814	24.4	128,763	76,075
Methow River.....	12,579	1,075	651.0	24,017	16,529	Klamath River direct.....	58,568	1,180		194,748	95,304
Entiat River.....	2,054	2,919	-29.6	2,652	2,251	Lost River.....	7,800	3,690	111.4	10,150	9,980
Wenatchee River.....	23,734	3,285	622.5	39,288	34,568	Sprague River.....	21,017	22,749	-7.6	29,132	24,015
Crab Creek.....	6,088	1,937	214.3	10,400	8,048	Other tributaries of Klamath River.....	3,045	314	899.7	12,475	4,200
Yakima River and tributaries.....	337,293	121,705	177.1	436,797	353,644	Russian River.....	640,950	203,312	210.7	1,204,769	864,605
Yakima River direct.....	254,262	66,371	283.1	345,373	269,163	Sacramento River and tributaries.....	194,397	10,942		439,169	296,748
Wilson Creek.....	11,297	6,613	70.8	12,042	11,807	Sacramento River direct.....	89,954	72,072	24.9	129,984	107,478
Naches River.....	19,804	20,232	-1.8	21,656	20,284	Pit River.....	6,068	2,321	161.4	12,488	7,446
Ahtanum River.....	9,287	3,849	141.3	9,982	9,342	Cow Creek.....	2,972	1,858	60.0	21,016	4,112
Other tributaries of Ya-kima River.....	42,583	24,640	72.8	47,744	43,048	Cottonwood Creek.....	2,968	2,642	12.3	0,590	5,108
Snake River and tributaries.....	2,712,018	807,044	236.1	4,057,747	3,376,146	Battle Creek.....	23,559	4,110	473.2	45,143	36,191
Snake River direct.....	744,006	66,367		948,252	897,088	Stony Creek.....	142,841	67,111	112.8	189,750	167,463
Gros Ventre River.....	6,718	3,523	90.7	9,866	7,493	Feather River.....	19,473	(*)		69,074	23,492
Little Gros Ventre River.....	6,243	3,599	73.5	9,167	6,967	Yuba River.....	24,541	3,756	553.4	56,498	31,212
Salt River.....	34,338	22,570	52.1	57,288	40,234	Cache Creek.....	47,156	10,112	366.3	82,695	52,842
Pierre River and tributaries.....		5,372	-100.0			American River.....	86,993	21,388	177.2	155,356	132,513
Henry's Fork.....	208,534	85,793	143.1	325,114	286,514	Other tributaries of Sacra-mento River.....	2,109,694	932,931	125.5	4,294,966	3,248,919
South Fork of Snake River.....	151,597	52,826	189.7	207,262	192,473	San Joaquin River and tribu-taries.....	642,261	129,647	395.4	1,083,862	873,300
Blackfoot River.....	53,910	9,035	490.7	77,255	60,225	San Joaquin River direct.....	200,641	116,189	72.7	432,481	299,665
Port Neuf River.....	37,996	18,528	105.1	75,923	59,270	Kern River.....	70,134	(*)		204,860	147,444
Raft River.....	23,620	28,793	-0.7	42,900	20,436	Tulare Lake.....	61,223	(*)		175,777	109,412
Goose Creek.....	25,000	2,000		50,000	50,000	Tule River.....	149,632	(*)		356,703	299,474
Salmon Falls River.....	41,330	(*)		87,260	49,920	Kaweah River.....	552,601	596,091	-7.3	1,052,406	895,293
Little Wood River.....	30,153	(*)		97,867	55,475	Kings River.....	12,414	10,729	15.7	30,004	14,016
Big Wood River.....	117,748	33,961	246.7	203,795	178,467	Fresno River.....	65,151	19,536	231.8	222,715	71,700
Bruneau River.....	22,598	13,930	62.2	37,751	25,636	Merced River.....	185,533	(*)		298,418	250,425
Owyhee River.....	104,830	21,840	380.0	239,242	116,238	Tuolumne River.....	75,359	13,840	444.5	155,453	111,192
Boise River.....	328,395	84,438	288.9	358,313	308,854	Stanislaus River.....	13,223	(*)		21,598	16,489
Malheur River.....	62,850	40,686	29.9	117,688	79,613	Calaveras River.....	36,848	5,558	563.0	155,430	72,144
Payette River.....	123,072	50,893	141.8	165,142	117,011	Gosumas River.....	3,259	(*)		9,011	6,405
Weiser River.....	58,869	26,769	119.9	79,925	69,718	Other tributaries of San Joaquin River.....	55,015	21,241	33.4	96,198	81,981
Burnt River.....	34,287	16,042	113.7	54,467	37,506	Tributaries of San Francisco Bay other than the Sacra-mento and San Joaquin Rivers.....	76,947	38,549	99.6	100,730	86,779
Powder River.....	146,036	58,482	149.7	183,469	165,826	Coyote Creek.....	25,092	8,483	195.8	30,979	26,526
Pine Creek.....	12,635	10,149	24.5	40,637	39,321	Guadalupe River.....	29,248	6,547	346.7	34,549	31,008
Imnaha River.....	4,828	3,781	27.7	10,146	6,069	Other tributaries.....	22,607	23,519	-3.9	35,202	29,245
Salmon River.....	115,108	58,403	97.1	224,527	163,036	Pajaro River.....	19,771	14,157	39.7	33,620	25,769
Grande Ronde River.....	79,257	22,628	250.3	98,912	87,317	Salinas River.....	48,097	10,604	353.6	60,989	57,456
Clearwater River.....	4,623	1,944	137.8	5,777	5,545	Santa Maria River.....	9,623	1,544	523.3	22,903	20,460
Asotin Creek.....	3,051	3,225	-5.5	4,051	4,051	Santa Ynez River.....	3,491	1,493	133.8	10,082	9,645
Patuxa River.....	1,430	619	139.1	2,362	2,209	Santa Clara River.....	28,270	14,214	98.9	43,205	30,216
Palouse River.....	1,735	508	241.5	3,645	2,020	Los Angeles River.....	59,072	5,810	276.6	82,657	73,606
Other tributaries of Snake River.....	137,711	65,810	109.3	204,724	169,549	San Gabriel River.....	127,146	33,766	163.2	161,737	145,022
Independent streams in Snake River Basin.....	109,913	44,011	149.7	353,251	182,811	Santa Ana River.....	185,508	70,492	71.8	281,630	218,735
Camas Creek.....	17,490	4,107	325.9	95,199	40,190	San Diego River.....	8,812	5,130	71.8	14,039	10,769
Beaver Creek.....	1,602	2,330	-35.5	2,590	1,970	Other Pacific Ocean streams.....	58,427	126,198	-53.7	147,934	91,258
Medicine Lodge.....	5,019	3,225	55.6	12,445	8,390						
Little Lost River.....	11,552	6,825	69.3	31,452	18,732						
Big Lost River.....	72,788	23,547	209.1	204,845	105,727						

* A minus sign (-) denotes decrease. Per cent not shown when base is less than 100 or when per cent is more than 1,000.

* Includes springs and wells.

* Not reported separately in 1902.

AGRICULTURE.

CAPITAL INVESTED AND COST OF OPERATION
AND MAINTENANCE.TABLE 8.—CAPITAL INVESTED IN IRRIGATION ENTERPRISES:
1890 TO 1920.

CENSUS YEAR.	Amount.	Percent of increase.	AVERAGE PER ACRE.	
			Amount.	Percent of increase.
1920.....	\$697,657,328	117.0	\$26.81	69.1
1910.....	321,454,006	350.2	15.88	75.3
1900.....	79,010,594	137.1	9.94	13.6
1890.....	29,333,921		7.96	

TABLE 9.—CAPITAL INVESTED, CLASSIFIED BY DATE OF BEGINNING.

DATE OF BEGINNING.	Amount.	Percent of total.	Average per acre.
Total.....	\$697,657,328	100.0	\$26.81
Before 1890.....	9,527,597	1.4	26.73
1890-1899.....	24,139,638	3.5	16.94
1900-1909.....	37,722,304	5.4	11.16
1910-1919.....	76,427,344	11.0	15.63
1920-1924.....	77,443,617	11.1	21.75
1925-1929.....	95,749,105	13.7	32.31
1930-1934.....	183,930,169	26.4	48.22
1935-1939.....	192,507,099	27.6	41.67
1940-1944.....	67,613,693	9.7	34.41
Not reported.....	22,557,063	3.2	18.83

TABLE 10.—CAPITAL INVESTED, 1920, AND COST OF OPERATION AND MAINTENANCE, 1919, CLASSIFIED BY SOURCE OF WATER SUPPLY.

[When water is pumped, cost of operation and maintenance includes cost of fuel and attendance.]

CLASS.	CAPITAL INVESTED, 1920.			OPERATION AND MAINTENANCE, 1919.	
	Amount.	Per cent of total.	Average per acre.	Area for which cost is reported (acres).	Average cost per acre.
Total.....	\$697,657,328	100.0	\$26.81	16,260,750	\$2.43
Streams, gravity.....	439,570,623	63.0	22.81	12,193,697	1.25
Streams, pumped.....	59,343,298	8.5	28.01	1,151,313	6.50
Streams, pumped and gravity.....	9,512,807	1.4	49.02	198,550	2.33
Wells, pumped.....	76,737,251	11.0	45.85	1,694,338	10.07
Wells, flowing.....	2,945,059	0.4	33.92	27,543	2.77
Wells, flowing and pumped.....	2,498,672	0.4	58.51	29,000	8.04
Lakes, pumped.....	2,274,691	0.3	38.06	45,558	5.20
Lakes, gravity.....	2,809,612	0.4	19.49	78,586	1.30
Springs.....	5,793,958	0.8	23.01	139,244	1.63
Stored storm water.....	15,075,592	2.2	67.47	87,666	2.39
City water.....	219,786	(?)	156.83	361	20.73
Sewage.....	174,444	(?)	52.85	1,031	9.05
Streams, gravity, and pumped wells.....	28,347,835	4.1	72.73	315,640	5.97
Streams, gravity, and flowing wells.....	2,883,194	0.4	27.38	79,854	1.36
Other mixed.....	48,467,251	6.9	34.67	838,622	2.71
Other and not reported.....	876,218	0.1	54.86	11,941	10.75

¹ Based on area irrigated in 1919.² Less than one-tenth of 1 per cent.

TABLE 11.—CAPITAL INVESTED, CLASSIFIED BY DRAINAGE BASIN: 1920 AND 1902.

DRAINAGE BASIN.	1920	1902	INCREASE. ¹		DRAINAGE BASIN.	1920	1902	INCREASE. ¹	
			Amount.	Per cent.				Amount.	Per cent.
Total.....	\$697,657,328	\$82,531,665	\$615,125,663	745.3	Missouri River, etc.—Con.				
Missouri River and tributaries.....	131,552,106	10,176,277	115,376,829	713.2	Yellowstone River, etc.—Con.				
Missouri River direct.....	2,306,975	121,537	2,179,438	.....	Rosebud River.....	\$9,303	\$61,708	—\$52,405	—84.9
Jefferson River and tributaries.....	5,376,454	780,328	4,610,126	860.3	Tongue River and tributaries.....	1,419,629	430,275	989,354	229.9
Jefferson River direct.....	587,388	115,895	471,593	468.4	Tongue River direct.....	734,059	262,620	471,439	178.5
Benuehead River.....	1,723,746	255,779	1,467,967	573.9	Goose Creek.....	563,518	127,100	436,418	343.4
Big Hole River.....	1,608,767	135,609	1,534,158	.....	Other tributaries of Tongue River.....	122,052	240,555	81,497	201.0
Boulder River.....	149,635	43,510	106,125	244.0	Powder River and tributaries.....	1,195,398	297,584	897,814	301.7
Pasamari River.....	559,000	122,658	436,342	355.7	Powder River direct.....	187,502	12,500	175,002	.....
Other tributaries of Jefferson River.....	680,898	286,777	394,121	684.7	Red Fork Creek.....	78,500	12,800	65,700	513.3
Madison River.....	460,823	92,986	367,837	395.6	Crazy Woman Creek.....	127,791	22,275	105,516	473.7
Gallatin River.....	977,796	454,845	522,951	115.0	Other tributaries of Powder River.....	553,465	189,375	364,090	192.3
Snake River.....	190,836	64,777	126,059	194.6	Other tributaries of Yellowstone River.....	248,140	260,634	187,506	309.2
Snake River direct.....	4,709,303	173,399	4,535,904	.....	Little Missouri River.....	1,430,417	257,569	1,172,848	455.4
Teton River.....	1,251,130	111,990	1,139,140	.....	Moreau River.....	71,608	38,437	33,171	86.3
Marais River.....	5,502,770	142,443	5,360,327	.....	Cheyenne River and tributaries.....	40,927	3,731	37,196	996.9
Judith River.....	281,842	124,513	157,329	126.4	Cheyenne River direct.....	5,605,911	447,624	5,158,287	.....
Musselshell River.....	968,755	285,868	700,887	245.2	North Fork (Belle Fourche).....	5,277,782	325,667	4,952,115	.....
Milk River and tributaries.....	7,271,098	263,993	7,007,105	.....	South Fork and tributaries.....	70,066	50,165	25,001	61.6
Milk River direct.....	154,206	119,200	35,006	29.4	South Fork direct.....	232,063	68,362	183,701	268.7
Sage Creek.....	2,400,248	16,127	2,384,121	.....	Hat Creek.....	166,820	49,272	117,548	238.6
Snake River.....	8,600	9,595	—1,335	—13.4	Other tributaries of Cheyenne River.....	85,243	20,090	66,153	346.5
Other tributaries of Milk River.....	4,708,042	217,436	4,490,606	.....	White River.....	183,349	2,440	—3,440	—100.0
Yellowstone River and tributaries.....	30,181,550	2,770,225	27,411,325	980.5	Niobrara River.....	330,439	155,924	27,425	17.6
Yellowstone River direct.....	7,508,300	303,583	7,204,717	.....	Platte River and tributaries.....	62,893,933	9,241,861	53,652,072	367.5
Clark Fork and tributaries.....	1,225,483	335,777	889,706	245.0	Platte River direct.....	438,642	565,470	—126,828	—13.6
Clark Fork direct.....	1,163,563	321,452	842,111	262.0	North Platte River and tributaries.....	25,702,212	3,337,027	22,365,185	670.1
Shields River.....	61,599	14,325	47,274	31.8	North Platte River direct.....	17,624,060	1,197,959	16,426,101	.....
Stillwater River.....	424,163	109,074	315,089	288.8	Beaver Creek.....	37,497	51,188	—13,671	—26.7
Big Horn River and tributaries.....	15,678,237	922,858	15,747,399	.....	Grand Encampment Creek.....	72,692	50,828	21,864	43.0
Big Horn River direct.....	3,635,693	25,425	3,609,668	.....	Spring Creek.....	184,290	38,406	145,794	378.7
Peyote River.....	349,546	72,264	277,282	393.7	Sage Creek.....	4,206	13,790	—9,584	—99.5
Wind River.....	2,101,819	17,804	2,084,015	.....	Paseo Creek.....	50,051	41,877	8,174	19.5
Owl Creek.....	1,000	18,700	—17,700	—94.7	Medicine Bow River.....	346,684	244,287	102,397	41.9
No Wood River.....	52,915	40,154	12,761	31.8	Sweetwater River.....	87,322	54,701	32,621	59.6
Greybull River.....	101,588	81,978	19,610	97.1	Muddy Creek.....	7,770	6,546	1,224	18.7
Shell Creek.....	608,184	204,604	403,580	145.9	Box Elder Creek.....	104,676	37,655	67,021	178.0
Shoshone River.....	380,420	32,730	347,690	.....	La Prele Creek.....	327,411	37,500	289,911	773.1
Little Horn River.....	8,702,490	378,278	8,324,212	.....	Labonte Creek.....	71,826	32,640	39,186	120.1
Other tributaries of Big Horn River.....	35,000	31,695	3,305	10.4					
Total.....	747,272	119,126	728,146	.....				

¹ A minus sign (—) denotes decrease. Per cent not shown when more than 1,000.² Includes springs and wells.³ Includes \$142,200 in Colorado for which main stream was not reported.

IRRIGATION.

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TABLE 11.—CAPITAL INVESTED, CLASSIFIED BY DRAINAGE BASIN: 1920 AND 1902—Continued.

DRAINAGE BASIN.	1920	1902	INCREASE. ¹		DRAINAGE BASIN.	1920	1902	INCREASE. ¹	
			Amount.	Per cent.				Amount.	Per cent.
Missouri River, etc.—Con.					Rio Grande and tributaries....	\$34,172,940	\$6,367,065	\$27,805,875	436.7
Platte River, etc.—Con.					Rio Grande direct.....	21,340,536	2,481,393	18,859,143	760.0
North Platte River, etc.—Con.					Saguache River.....	103,048	16,165	86,883	537.5
Laramie River and tributaries.....	\$4,886,606	\$888,096	\$3,498,600	393.9	San Luis River.....	184,312	4,220	180,092	.....
Laramie River direct.....	974,841	661,206	313,635	47.4	Alamosa River.....	566,909	27,080	529,829	.....
Little Laramie River.....	48,753	119,122	-70,369	-59.1	La Jara River.....	30,275	(*)	30,275	.....
Sybilie Creek.....	65,041	32,200	32,841	102.0	Conejos River.....	504,739	68,242	496,497	727.6
North Laramie River.....	390,708	13,886	382,822	.....	Trinchera River.....	659,890	23,650	636,240	.....
Chugwater Creek.....	83,155	30,945	52,210	168.7	Rio Castilla.....	11,471	4,097	8,374	144.2
Other tributaries of Laramie River.....	2,818,198	* 30,737	2,787,461	.....	Pueblo River.....	19,982	11,500	8,482	72.9
Rawhide Creek.....	27,330	49,445	-22,115	-44.7	Rio Chama.....	141,891	29,849	112,042	376.4
Horse Creek.....	536,475	132,547	403,628	303.8	Rio Santa Cruz.....	18,231	12,862	5,419	42.1
Blue River.....	31,050	22,620	8,430	37.3	Tesuque Creek.....	16,884	22,680	-5,816	-25.6
Pumpkin Creek.....	92,000	19,925	72,135	362.0	Rio Puerco.....	88,109	53,523	34,586	64.6
Other tributaries of North Platte River.....	1,710,136	* 273,947	1,436,189	524.3	Pecos River and tributaries.....	7,483,049	3,185,855	4,297,194	134.9
South Platte River and tributaries.....	36,076,829	4,990,435	31,686,394	634.9	Pecos River direct.....	5,514,099	2,735,221	2,778,878	101.6
South Platte River direct.....	9,199,612	2,057,210	7,142,402	347.2	Gallinas River.....	519,500	30,931	488,569	.....
Bear Creek.....	137,240	70,635	66,605	79.1	Hondo River.....	378,094	261,863	116,231	120.8
Clear Creek.....	882,209	404,775	477,434	113.0	Penasco River.....	222,093	50,363	172,730	342.2
St. Vrain Creek.....	9,998,122	398,650	8,999,472	83.7	Other tributaries of Pecos River.....	648,697	* 107,477	541,220	503.5
Big Thompson Creek.....	1,102,316	600,186	502,130	64.5	Las Moras Creek.....	192,666	7,925	184,741	.....
Cachela Poudre River.....	7,946,409	1,097,354	6,849,055	87.7	Other tributaries of Rio Grande.....	2,761,018	* 417,364	2,343,654	561.5
Lone Tree Creek.....	2,767,273	17,380	2,749,893	.....	Independent streams in Rio Grande drainage basin.....	651,171	126,550	524,621	414.6
Crow Creek.....	100,619	43,925	56,694	128.1	Rio Mimbres.....	318,092	* 112,192	205,870	183.5
Big Beaver Creek.....	52,600	98,000	-45,400	-46.3	Presno River.....	287,724	2,440	295,284	.....
Lodgepole Creek.....	445,738	87,140	358,598	411.5	Rio Tularosa.....	33,900	5,838	28,062	477.7
Other tributaries of South Platte River.....	4,764,691	* 139,200	4,625,491	.....	Other independent streams.....	1,485	* 6,050	-4,565	-75.5
Loup River.....	21,300	320,615	-299,315	-93.4	Colorado River and tributaries.....	80,696,940	11,298,671	75,398,269	667.3
Other tributaries of Platte River.....	5,000	* 27,714	-22,714	-82.0	Colorado River direct.....	22,214,932	753,973	21,460,959	.....
Kansas River and tributaries.....	57,605	437,200	100,866	23.6	Green River and tributaries.....	8,592,846	1,470,459	7,121,887	484.3
Republican River.....	600,285	404,917	95,668	23.6	Green River direct.....	547,166	57,900	489,266	845.0
Smoky Hill River.....	34,553	3,410	31,143	925.0	New Fork.....	293,043	27,253	265,790	975.3
Big Blue River.....	1,625	(*)	1,625	.....	Horse Creek.....	51,163	13,350	37,813	283.2
Other tributaries of Kansas River.....	742	28,892	-28,140	-97.4	Cottonwood Creek.....	463,827	11,000	452,827	.....
Other tributaries of Missouri River.....	2,373,982	407,772	1,966,190	482.2	South Platte Creek.....	85,728	38,761	46,967	121.2
Mississippi River and tributaries, exclusive of Missouri River.....	35,183,789	4,619,814	30,563,975	661.6	La Barge Creek.....	39,150	20,355	18,795	92.2
Mississippi River direct.....	302,385	(*)	302,385	.....	Fontanella Creek.....	33,000	9,777	23,223	237.5
Arkansas River and tributaries.....	30,241,390	4,536,655	25,654,735	559.3	Bitter Creek.....	68,153	4,590	63,563	.....
Arkansas River direct.....	15,092,972	3,320,325	11,772,647	354.6	Blacks Creek.....	566,776	68,296	498,480	729.9
South Fork.....	60,000	24,785	44,215	178.4	Henry's Fork.....	77,320	11,291	66,029	584.8
Pontmain River.....	965,287	106,240	859,047	808.0	Ashley Fork River.....	374,140	57,835	316,305	546.9
St. Charles River.....	241,884	22,060	219,824	996.5	Duchess River.....	2,428,174	(*)	2,428,174	.....
Huerfano River.....	3,204,519	72,690	3,131,829	.....	Price River.....	458,725	41,719	417,006	999.6
Apishapa River.....	1,190,695	4,970	1,185,725	.....	San Rafael River.....	288,100	205,850	-7,750	-2.6
Purgatoire or Las Animas River and tributaries.....	494,963	152,423	342,540	224.7	Yampa River and tributaries.....	1,197,975	* 569,892	628,083	110.2
Purgatoire or Las Animas River direct.....	491,450	151,413	340,037	224.6	Yampa River direct.....	162,768	(*)	162,768	.....
Trinchera River.....	3,513	1,010	2,503	247.8	Little Snake River.....	511,656	325,107	186,549	57.4
Canadian River and tributaries.....	5,155,486	435,860	4,719,626	.....	Other tributaries of Yampa River.....	523,651	(*)	523,651	.....
Canadian River direct.....	148,331	22,108	126,223	570.9	White River.....	447,141	137,005	310,136	226.4
Cimarron River.....	2,188,908	130,580	2,058,328	.....	Other tributaries of Green River.....	1,154,760	* 105,665	1,049,095	992.9
Vernon River.....	1,248,537	131,020	1,117,517	852.9	Grand River and tributaries.....	24,501,211	3,561,457	20,939,754	588.0
Ocate Creek.....	319,529	9,400	310,129	.....	Grand River direct.....	6,142,951	491,710	5,651,241	.....
Mora River.....	262,575	99,475	163,100	164.0	Fraser River.....	55,890	5,235	50,655	967.0
Ute Creek.....	7,000	10,000	-3,000	-30.0	Muddy Creek.....	33,122	8,650	24,472	282.9
Other tributaries of Canadian River.....	980,606	* 33,277	947,329	.....	Blue River.....	116,603	21,359	95,249	445.9
Cimarron River.....	416,304	83,277	333,027	399.9	Eagle River.....	109,012	75,570	33,442	44.3
Other tributaries of Arkansas River.....	3,410,280	* 364,025	3,046,255	836.8	Roaring Fork.....	407,266	163,170	244,096	149.6
St. Francis River.....	218,727	(*)	218,727	.....	Platano Creek.....	341,755	60,035	281,720	469.3
White River.....	3,992,967	(*)	3,992,967	.....	Gunnison River and tributaries.....	10,745,767	1,351,904	9,393,863	694.9
Ouachita River.....	1,100	(*)	1,100	.....	Gunnison River direct.....	1,001,819	55,380	946,439	.....
Red River and tributaries.....	398,534	3,218	395,316	.....	Taylor River.....	6,900	64,985	-58,085	-89.4
Other tributaries of Mississippi River.....	28,688	* 29,941	-1,255	-4.2	Tomichi Creek.....	129,243	28,350	100,893	355.9
Gulf streams other than Mississippi River and Rio Grande.....	29,439,808	501,272	28,938,536	.....	North Fork Creek.....	622,647	272,705	349,942	128.3
Atchafalaya River and tributaries.....	407,956	(*)	407,956	.....	Smith Fork River.....	396,075	21,600	374,675	.....
Vermilion River and tributaries.....	3,355,327	(*)	3,355,327	.....	Uncompahgre River.....	6,945,702	643,121	6,302,581	980.0
Mermentau River and tributaries.....	7,713,797	(*)	7,713,797	.....	Other tributaries of Gunnison River.....	1,643,381	* 285,765	1,357,616	518.4
Calcasieu Lake and River and tributaries.....	1,816,380	(*)	1,816,380	.....	Rio Dolores.....	4,847,569	1,156,793	3,690,776	319.1
Sabine River and tributaries.....	673,935	(*)	673,935	.....	Other tributaries of Grand River.....	1,701,801	* 227,029	1,474,772	649.4
Neches River.....	1,596,770	(*)	1,596,770	.....	Fremont River.....	567,050	189,380	377,670	199.4
Trinity River.....	1,743,621	(*)	1,743,621	.....	Virgin River.....	1,622,997	171,355	1,451,642	847.2
Brazos River.....	569,543	25,443	544,100	.....	San Juan River and tributaries.....	3,088,495	534,288	2,554,207	478.1
Colorado River.....	3,560,916	154,529	3,406,387	.....	San Juan River direct.....	1,039,358	179,619	859,739	477.7
San Antonio River.....	5,087,542	63,765	5,023,777	.....	Mancos River.....	35,477	14,910	20,567	137.9
Nueces River.....	1,326,555	56,808	1,269,747	.....	Los Pinos River.....	524,590	84,580	440,010	520.2
Other Gulf streams.....	1,587,466	200,727	1,386,739	690.9	Animas River.....	1,148,088	157,305	990,783	629.8
					La Plata River.....	142,688	61,320	81,368	132.5
					Other tributaries of San Juan River.....	198,394	36,245	162,149	447.4
					Kanab Wash.....	20,600	4,700	15,900	336.2
					Williams River.....	55,504	15,636	39,868	255.0
					Little Colorado River and tributaries.....	460,206	265,701	194,505	73.2
					Little Colorado River direct.....	146,913	218,900	-71,987	-32.9
					Nutriso Creek.....	16,500	2,600	13,900	534.6
					Concho Creek.....	49,228	860	48,368	.....
					Other tributaries of Little Colorado River.....	247,565	* 43,351	204,214	471.1

¹ A minus sign (-) denotes decrease. Per cent not shown when more than 1,000.² Includes springs and wells.³ Not reported separately in 1902.⁴ Includes \$244,785 in Colorado for which main stream was not reported.

AGRICULTURE.

TABLE 11.—CAPITAL INVESTED, CLASSIFIED BY DRAINAGE BASIN: 1920 AND 1902—Continued.

DRAINAGE BASIN.	1920	1902	INCREASE. ¹		DRAINAGE BASIN.	1920	1902	INCREASE. ¹	
			Amount.	Per cent.				Amount.	Per cent.
Colorado River, etc.—Con.					Great Basin Drainage—Con.				
Gila River and tributaries.....	\$25,236,237	\$4,205,619	\$21,030,618	500.1	Independent streams—Con.	\$2,242,944	(*)	\$2,242,944	.....
Gila River direct.....	2,988,798	1,249,896	1,688,912	131.1	Whitewater River.....	60,548	\$61,100	-10,552	-17.3
San Francisco River.....	25,224	35,040	-9,816	-28.0	Quinn River.....	6,829	6,100	729	12.0
San Pedro River.....	359,153	40,135	319,018	794.9	Deep Creek (Oregon).....	131,750	35,400	96,350	272.2
Santa Cruz River.....	5,108,324	79,685	5,028,639	.....	Donner and Blitzen River.....	26,018	21,845	4,171	19.1
Salt River and tributaries.....	14,989,054	2,697,189	12,291,865	453.9	Silver Creek.....	1,005,862	74,310	931,552	.....
Salt River direct.....	14,339,874	2,444,160	11,895,714	496.5	Slivies River.....	6,360	5,360	1,000	21.4
Tonto Creek.....	9,456	13,065	-3,617	-37.2	Thomas Creek.....	7,569,204	989,299	6,579,905	.....
Elle Verde.....	269,482	250,813	-18,669	-16.5	Other independent streams.....	145,672,382	10,851,415	134,820,967	.....
Other tributaries of Salt River.....	289,210	27,131	252,079	.....	Columbia River and tributaries.....	2,240,216	8,700	2,231,516	.....
Agua Fria River.....	1,428,077	20,998	1,407,079	.....	Columbia River direct.....	221,976	13,539	208,437	.....
Hamsyampa River.....	51,299	11,160	40,139	369.7	Kootenai River.....	8,421,384	1,308,486	7,112,898	543.6
Other tributaries of Gila River.....	376,215	21,515	354,700	426.1	Clark Fork and tributaries.....	209,549	64,591	144,958	224.4
Other tributaries of Colorado River.....	387,482	212,103	175,379	167.6	Clark Fork direct.....	3,474,524	1,249,895	2,224,629	179.3
Whitewater Draw and tributaries.....	299,368	6,735	292,633	.....	Missoula River and tributaries.....	159,771	27,367	132,404	483.8
Great Basin Drainage.....	66,589,376	10,880,199	55,699,177	511.5	Missoula River direct.....	1,849,003	392,055	1,456,948	244.2
Tributaries of Great Salt Lake.....	18,109,805	5,649,308	12,460,497	221.1	Hellgate River.....	624,291	114,450	509,841	445.5
Bear River and tributaries.....	7,438,073	3,020,499	4,417,574	146.3	Big Blackfoot River.....	1,135,329	674,130	461,199	68.9
Bear River direct.....	4,512,132	2,247,689	2,264,443	100.7	Butte River.....	202,730	35,883	166,847	465.0
Little Bear River.....	720,363	163,170	557,193	341.5	Other tributaries of Missoula River.....	4,737,311	(*)	4,737,311	.....
Malad River.....	18,087	(*)	18,087	.....	Flathead River.....	4,489,747	938	4,488,809	.....
Thomas Fork.....	25,389	16,210	9,179	56.6	Colville River.....	2,214,417	2,994	2,211,423	.....
Mill Creek.....	21,012	18,640	2,372	12.7	Spokane River and tributaries.....	1,637,743	2,994	1,634,749	.....
Little Malad Creek.....	332,175	30,945	301,230	973.4	Spokane River direct.....	1,576,674	(*)	576,674	.....
Other tributaries of Bear River.....	1,808,857	543,835	1,265,022	232.6	Coeur d'Alene Lake and River.....	2,259,018	12,374	2,246,644	.....
Weber River and tributaries.....	2,106,048	796,837	1,309,211	164.3	Okanogan River and tributaries.....	227,290	5,860	221,430	.....
Weber River direct.....	1,353,323	549,432	803,891	146.3	Okanogan River direct.....	1,069,972	9,985	1,060,887	.....
Ogden River.....	423,755	168,406	255,349	151.6	Salmon River.....	961,756	6,929	954,827	.....
East Canyon Creek.....	74,010	22,890	51,120	223.3	Other tributaries of Okanogan River.....	483,809	20,825	462,984	.....
Other tributaries of Weber River.....	254,960	56,109	198,851	354.4	Entiat River.....	73,889	17,150	56,739	330.8
Jordan River and Utah Lake and tributaries.....	8,565,682	1,822,982	6,742,700	369.9	Wenatchee River.....	1,868,541	95,755	1,772,786	.....
Jordan River direct.....	740,836	733,100	-7,264	-0.8	Crab Creek.....	859,050	5,415	853,635	.....
Spanish Fork River.....	4,126,999	123,939	4,003,060	.....	Yakima River and tributaries.....	14,849,689	1,988,595	12,861,094	654.3
Hobbs Creek.....	41,024	32,588	8,436	25.9	Yakima River direct.....	13,912,727	1,580,195	12,332,532	780.4
Provo River.....	985,979	328,601	657,378	200.0	Wilson Creek.....	45,875	17,925	27,950	155.9
American Fork River.....	302,449	162,130	140,319	86.5	Naches River.....	468,027	276,223	191,804	65.8
Little Cottonwood Creek.....	226,221	25,825	200,396	776.0	Ahtanum River.....	88,443	14,950	73,493	491.6
Big Cottonwood Creek.....	315,563	45,590	269,973	592.2	Other tributaries of Yakima River.....	344,617	79,262	265,355	334.8
Other tributaries of Jordan River and Utah Lake.....	1,820,611	351,128	1,469,483	418.5	Snake River and tributaries.....	93,625,117	6,749,247	86,875,870	.....
Independent streams.....	48,479,571	5,249,891	43,229,680	823.5	Snake River direct.....	37,728,943	578,600	37,150,343	.....
Sevier River and tributaries.....	9,509,836	808,872	8,700,964	.....	Gros Ventre River.....	31,225	14,802	16,423	111.0
Sevier River direct.....	7,002,349	445,032	6,557,317	.....	Little Gros Ventre River.....	18,746	13,330	5,416	40.6
San Pitch River.....	1,142,510	228,536	913,974	399.9	Salt River.....	149,207	41,724	107,483	257.6
Other Creek.....	151,850	18,355	133,495	727.3	Pierre River and tributaries.....	2,001,841	12,595	1,989,246	.....
South Fork.....	372,626	15,650	356,976	.....	Henrys Fork.....	6,193,701	633,699	5,560,003	877.4
Other tributaries of Sevier River.....	840,501	108,299	732,202	713.7	South Fork of Snake River.....	1,022,276	43,690	978,586	.....
Beaver River.....	842,305	65,325	776,980	.....	Blackfoot River.....	1,141,528	58,255	1,083,273	.....
Coal Creek.....	179,171	7,076	172,095	.....	Port Neuf River.....	100,928	46,635	54,293	116.4
Deep Creek (Utah).....	8,844	6,602	2,242	32.2	Goose Creek.....	393,755	3,000	390,755	.....
Grouse Creek.....	28,338	2,950	25,388	894.3	Salmon Falls River.....	4,152,745	(*)	4,152,745	.....
Humboldt River and tributaries.....	1,751,566	763,110	988,456	129.5	Little Wood River.....	1,016,699	(*)	1,016,699	.....
Humboldt River direct.....	799,995	496,790	303,205	52.0	Big Wood River.....	5,395,133	239,228	5,155,905	.....
East Fork of Humboldt River.....	202,071	7,610	194,461	.....	Bruner River.....	574,955	238,140	336,815	141.4
La Moine Creek.....	91,280	14,849	76,431	511.1	Owyhee River.....	1,411,424	1,200,881	210,543	582.2
North Fork of Humboldt River.....	57,403	10,045	47,358	471.5	Boise River.....	16,013,734	1,674,583	14,339,151	856.3
South Fork of Humboldt River.....	288,162	53,870	234,292	434.9	Malheur River.....	2,027,883	282,898	1,744,985	616.8
Pine Creek.....	2,409	2,450	-41	-1.7	Fayette River.....	2,915,780	685,232	2,230,548	325.5
Reese River.....	79,120	36,815	42,305	114.9	Weiser River.....	2,018,450	116,601	1,901,849	.....
Little Humboldt River.....	2,544	53,580	-51,036	-95.3	Burnt River.....	639,491	65,691	573,800	873.5
Other tributaries of Humboldt River.....	238,182	97,170	141,012	196.6	Powder River.....	1,552,987	268,101	1,284,886	479.3
Truckee River and tributaries.....	594,187	295,435	298,752	100.4	Pine Creek.....	97,522	36,595	60,927	166.5
Truckee River direct.....	485,960	239,470	246,490	91.7	Imnaha River.....	206,378	10,885	195,493	416.6
Steamboat Creek.....	42,670	39,670	3,000	6.0	Salmon River.....	1,175,362	227,508	947,854	481.6
Other tributaries of Truckee River.....	66,217	3,295	62,922	.....	Grande Ronde River.....	470,998	32,011	438,987	229.8
Carson River and tributaries.....	8,064,665	165,642	7,899,023	.....	Clearwater River.....	288,755	90,585	198,170	544.1
Carson River direct.....	164,395	147,157	17,238	11.7	Asotin Creek.....	606,084	94,100	511,984	.....
Other tributaries of Carson River.....	7,900,290	18,485	7,881,805	.....	Pataha River.....	47,085	1,905	45,180	.....
Walker River and tributaries.....	1,609,659	376,440	1,233,219	351.3	Palouse River.....	175,100	2,810	172,290	.....
Walker River direct.....	1,609,651	375,790	1,233,861	347.2	Other tributaries of Snake River.....	4,040,602	550,734	3,489,868	633.7
Other tributaries of Walker River.....	18,408	650	17,758	.....	River Basin.....	3,828,606	151,160	3,677,446	.....
Duck Creek.....	232,851	19,700	213,151	.....	Camas Creek.....	578,627	6,263	572,364	.....
Steptoe Creek.....	149,986	19,940	130,046	832.8	Beaver Creek.....	7,259	4,200	3,059	69.2
Long Valley Creek.....	171,642	18,545	153,097	900.1	Medicine Lodge.....	31,690	3,800	27,890	735.9
Mono Lake and tributaries.....	5,393,528	15,209	5,378,319	.....	Little Lost River.....	474,465	32,710	441,755	.....
Sierra River.....	242,426	394,295	-151,869	-19.3	Big Lost River.....	2,709,698	79,717	2,629,981	.....
Mohave River.....	5,785,132	114,890	5,670,242	437.3	Other independent streams.....	26,867	24,380	2,487	10.2
Owens River.....	2,136,267	408,875	1,727,392	176.0	Walla Walla River.....	1,171,914	31,007	1,140,907	.....
San Jacinto River.....	2,136,267	775,000	1,361,267	.....	Klickitat River.....	64,423	1,882	62,541	.....

¹ A minus sign (-) denotes decrease. Per cent not shown when more than 1,000.² Includes springs and wells.³ Not reported separately in 1902.

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TABLE 11.—CAPITAL INVESTED, CLASSIFIED BY DRAINAGE BASIN: 1920 AND 1902—Continued.

DRAINAGE BASIN.	1920	1902	INCREASE. ¹		DRAINAGE BASIN.	1920	1902	INCREASE. ¹	
			Amount.	Per cent.				Amount.	Per cent.
Pacific Ocean streams other than the Colorado and Columbia Rivers.....	\$167,398,448	\$21,693,687	\$145,704,761	671.6	Pacific Ocean streams other than the Colorado and Columbia Rivers—Continued.				
Dungeness River.....	94,010	8,000	86,010	.....	San Joaquin River and tributaries.	\$71,694,653	\$9,103,242	\$62,591,411	687.6
McDowell Creek.....		2,000	—2,000	—100.0	San Joaquin River direct.....	9,224,164	1,504,238	7,719,926	518.2
Rogue River and tributaries.....	1,783,889	147,223	1,636,666	.....	Kern River.....	17,573,637	796,340	16,777,297	.....
Rogue River direct.....	165,665	7,540	158,125	.....	Tulare Lake.....	3,910,620	(²)	3,910,620	.....
Little Butte Creek.....	604,794	10,490	594,304	.....	Tule River.....	2,842,495	(²)	2,842,495	.....
Bear Creek.....	615,878	20,895	594,983	.....	Kaweah River.....	6,186,840	(²)	6,186,840	.....
Evans Creek.....	40,836	2,075	38,761	.....	Kings River.....	8,145,446	2,976,088	5,169,358	173.6
Applegate River.....	180,894	60,325	120,569	199.9	Fresno River.....	415,385	400,514	14,871	3.7
Illinois River.....	87,966	27,748	60,218	217.0	Merced River.....	3,812,235	1,542,834	2,269,401	147.1
Other tributaries of Rogue River.....	87,956	17,550	70,406	401.2	Tuolumne River.....	7,173,802	(²)	7,173,802	.....
Klamath River and tributaries.....	5,502,890	529,456	4,973,434	939.3	Stanislaus River.....	7,840,480	968,964	6,871,522	709.2
Klamath River direct.....	1,734,090	282,996	1,451,103	512.8	Calaveras River.....	818,995	(²)	818,995	.....
Lost River.....	3,451,383	17,550	3,433,833	.....	Mokelumne River.....	1,675,137	305,239	1,369,898	448.8
Sprague River.....	32,368	26,560	5,808	21.9	Cosumnes River.....	153,899	(²)	153,899	.....
Other tributaries of Klamath River.....	285,040	202,350	82,690	40.9	Other tributaries of San Joaquin River.....	1,921,512	* 608,425	1,313,087	215.8
Russian River.....	162,630	2,463	160,167	.....	Tributaries of San Francisco Bay other than Sacramento and San Joaquin Rivers.....	4,940,061	487,451	4,452,610	913.4
Sacramento River and tributaries.....	28,833,106	1,882,227	26,950,879	.....	Coyote Creek.....	1,463,138	43,345	1,409,793	.....
Sacramento River direct.....	11,830,374	49,368	11,781,006	.....	Guadalupe River.....	1,383,049	75,795	1,307,254	.....
Pit River.....	799,913	274,671	525,242	191.2	Other tributaries.....	1,903,874	* 368,311	1,535,563	335.5
Cow Creek.....	126,946	15,246	111,700	732.7	Salinas River.....	1,248,343	108,582	1,079,750	640.4
Cottonwood Creek.....	573,601	124,473	449,128	360.8	Pajaro River.....	2,570,331	101,960	2,468,371	.....
Battle Creek.....	95,139	34,796	60,343	173.4	Santa Maria River.....	573,194	32,380	540,814	.....
Stony Creek.....	1,539,614	42,250	1,497,364	.....	Santa Ynez River.....	284,037	35,745	248,292	741.7
Feather River.....	3,937,380	869,841	3,067,539	352.7	Santa Clara River.....	2,211,473	374,151	1,837,322	491.1
Yuba River.....	2,518,770	(²)	2,518,770	.....	Los Angeles River.....	5,508,400	309,611	5,198,789	.....
Cache Creek.....	916,477	28,115	888,362	.....	San Gabriel River.....	12,882,319	772,597	12,089,722	.....
American River.....	2,890,114	112,758	2,777,356	.....	Santa Ana River.....	19,918,550	1,919,531	17,999,019	937.7
Other tributaries of Sacramento River.....	3,604,778	330,709	3,274,069	990.0	San Diego River.....	1,789,124	32,100	1,757,024	.....
					Other Pacific Ocean streams.....	7,421,338	5,786,937	1,634,401	28.2

¹ A minus sign (—) denotes decrease. Per cent not shown when more than 1,000.

² Not reported separately in 1902.

* Includes springs and wells.

In classifying capital invested by type of enterprise (Table 12) the average capital invested per acre is not presented, for the reason that it is not possible to compute this correctly from census data. The United States Reclamation Service supplies stored water to enterprises controlled by agencies of most of

the other classes shown in the table and a part of its expenditure is properly chargeable to those lands, but it is not possible to tell how much should be so charged or how it should be distributed among the various classes, since the area to which water is supplied varies from season to season.

TABLE 12.—CAPITAL INVESTED, 1920, AND COST OF OPERATION AND MAINTENANCE, 1919, CLASSIFIED BY CHARACTER OF ENTERPRISE.

[When water is pumped, cost of operation and maintenance includes cost of fuel and attendance.]

CLASS.	CAPITAL INVESTED, 1920.		OPERATION AND MAINTENANCE, 1919.		CLASS.	CAPITAL INVESTED, 1920.		OPERATION AND MAINTENANCE, 1919.	
	Amount.	Per cent of total.	Area for which cost is reported (acres).	Average cost per acre. ¹		Amount.	Per cent of total.	Area for which cost is reported (acres).	Average cost per acre. ¹
Total.....	\$697,657,328	100.0	16,260,750	\$2.43	U. S. Reclamation Service.....	\$129,509,819	18.6	1,098,573	\$2.20
Individual and partnership.....	154,634,169	22.2	5,133,421	3.02	U. S. Indian Service.....	14,851,236	2.1	254,378	1.80
Cooperative.....	183,041,500	26.2	5,754,232	1.67	State.....	344,174	(²)	1,608	4.86
Irrigation district.....	88,573,514	12.7	1,701,231	2.59	City.....	2,935,678	0.4	35,507	3.85
Carey Act.....	32,680,695	4.7	497,611	1.34	Other.....	5,310,399	0.8	6,594	3.14
Commercial.....	85,735,470	12.3	1,779,595	3.48	Not reported.....	39,574	(²)	.....	.....

¹ Based on area irrigated in 1919.

² Less than one-tenth of 1 per cent.

DRAINAGE OF IRRIGATED LAND.

The acreages reported in Table 13 relate to lands within the boundaries of irrigation projects, and do not include lands within the vicinity of these projects. "Additional acreage needing drainage" includes all lands so reported by the owners of the enterprises, and includes lands producing partial crops as well as those wholly unproductive. Data for the several states are given in County Table I at the end of this summary.

TABLE 13.—ACREAGE WITHIN IRRIGATION ENTERPRISES FOR WHICH DRAINS HAVE BEEN INSTALLED AND ADDITIONAL ACREAGE IN NEED OF DRAINAGE.

Number of enterprises reporting land drained or needing drainage.....	3,068
Acreage included in enterprises reporting land drained or needing drainage.....	8,660,760
Acreage for which drains have been installed.....	1,513,853
Additional acreage needing drainage.....	1,476,771
Per cent that acreage for which drains have been installed is of total acreage included in enterprises reporting drainage.....	17.2
Per cent that acreage for which drains have been installed is of total acreage included in irrigation enterprises.....	4.2
Per cent that acreage for which drains have been installed plus that needing drainage is of total acreage included in irrigation enterprises.....	8.3

QUANTITY OF WATER USED.

The quantity of water used in 1919 was reported on only part of the irrigation schedules, and the figures given vary greatly. In order that proper values may be assigned to the figures given, those representing measurements and those representing estimates are reported separately in Table 14. Although the data are incomplete, the reports represent sufficient acreages to serve as bases for reliable averages.

TABLE 14.—QUANTITY OF WATER USED IN 1919.

ITEM.	Total.	Measured.	Not measured.
Average volume of water entering canals.....second-feet..	234,020	109,714	124,306
Area irrigated in 1919.....acres..	9,645,331	6,560,188	3,085,143
Average number of acres per second-foot..	41	60	25
Total quantity of water entering canals.....acre-feet..	60,005,556	36,626,781	23,378,775
Area irrigated in 1919.....acres..	10,879,174	7,771,979	3,107,195
Average quantity per acre.....acre-feet..	5.5	4.7	7.5
Total quantity of water delivered.....acre-feet..	15,339,104	8,673,241	6,665,763
Area irrigated in 1919.....acres..	6,059,953	3,980,026	2,079,927
Average quantity per acre.....acre-feet..	2.5	2.2	3.2

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TABLE 15.—IRRIGATION WORKS, CLASSIFIED BY DATE OF BEGINNING.

DATE OF BEGINNING.	Number of diverting dams.	Number of storage dams.	MAIN DITCHES.			LATERAL DITCHES.		RESERVOIRS.	
			Number.	Capacity (second-feet).	Length (miles).	Number.	Length (miles).	Number.	Capacity (acre-feet).
Total.....	23,894	3,931	51,621	631,079	103,177	57,553	56,687	7,538	21,246,436
before 1880.....	603	102	846	9,539	3,236	1,313	1,454	150	113,700
1880-1889.....	2,044	153	3,400	31,956	7,031	3,297	3,013	136	259,163
1890-1899.....	3,124	203	5,737	70,068	11,782	5,615	6,367	298	422,100
1900-1909.....	5,796	662	11,033	130,074	21,873	9,277	7,825	653	1,095,125
1910-1919.....	3,578	507	7,523	89,970	15,002	11,317	7,694	672	671,008
1920-1929.....	2,054	433	4,638	54,723	9,741	4,040	6,744	641	3,929,810
1930-1939.....	2,018	592	4,284	101,707	10,976	5,691	12,334	1,048	8,232,276
1940-1949.....	1,662	587	5,238	48,342	9,198	5,953	6,536	1,063	6,174,285
1950-1959.....	1,540	481	4,887	42,202	6,689	5,407	3,650	1,495	1,266,014
not reported.....	1,406	201	4,005	22,438	6,093	2,638	1,200	871	83,145

DATE OF BEGINNING.	Pipe lines, length (miles).	FLOWING WELLS.		PUMPED WELLS.		PUMPING PLANTS.			
		Number.	Capacity (gallons per minute).	Number.	Capacity (gallons per minute).	Number.	Engine capacity (horse-power).	Number.	Capacity (gallons per minute).
Total.....	8,878.3	4,606	935,057	32,094	16,396,549	29,458	748,971	33,804	36,275,005
before 1880.....	88.0	26	3,292	37	19,028	46	684	55	28,073
1880-1889.....	79.1	58	4,309	79	38,909	43	574	44	43,439
1890-1899.....	235.9	127	32,240	82	46,174	83	3,697	108	86,287
1900-1909.....	825.2	498	38,439	327	144,829	290	14,938	407	1,476,530
1910-1919.....	674.4	340	51,819	846	400,373	663	37,387	882	4,378,623
1920-1929.....	504.7	490	100,628	1,591	745,045	1,455	59,286	1,741	3,706,532
1930-1939.....	1,349.6	763	216,806	3,304	1,741,309	2,898	98,729	3,492	4,379,501
1940-1949.....	2,334.5	741	220,667	10,467	5,436,719	9,468	226,748	10,867	8,318,741
1950-1959.....	2,136.3	629	135,326	10,071	5,861,661	10,469	242,629	11,713	10,663,654
not reported.....	600.6	934	131,441	4,390	1,962,502	4,038	64,289	4,515	3,195,625

TABLE 16.—IRRIGATION WORKS, CLASSIFIED BY CHARACTER OF ENTERPRISE: 1920.

CLASS.	Number of diverting dams.	Number of storage dams.	MAIN DITCHES.			LATERAL DITCHES.		RESERVOIRS.	
			Number.	Capacity (second-feet).	Length (miles).	Number.	Length (miles).	Number.	Capacity (acre-feet).
Total.....	23,894	3,931	51,621	631,079	103,177	57,553	56,687	7,538	21,246,436
individual and partnership.....	20,360	2,836	46,418	266,448	64,990	33,947	15,174	6,263	2,365,816
Cooperative.....	2,904	788	3,940	198,720	22,555	11,921	16,887	854	3,644,830
Irrigation district.....	252	80	457	61,847	4,907	2,502	6,160	86	1,682,577
Carey Act.....	47	29	69	18,812	1,471	550	2,574	31	393,956
Commercial.....	183	117	412	54,193	6,252	4,430	7,486	202	2,356,057
U. S. Reclamation Service.....	57	40	92	32,903	1,924	3,205	5,802	43	9,917,803
U. S. Indian Service.....	54	19	152	6,899	876	739	2,388	27	349,302
State.....	10	6	14	158	31	74	26	11	706
City.....	17	12	35	757	138	140	178	25	561
Other.....	10	4	32	342	33	45	22	6	34,828

CLASS.	Pipe lines, length (miles).	FLOWING WELLS.		PUMPED WELLS.		PUMPING PLANTS.			
		Number.	Capacity (gallons per minute).	Number.	Capacity (gallons per minute).	Number.	Engine capacity (horse-power).	Number.	Capacity (gallons per minute).
Total.....	8,878.3	4,606	935,057	32,094	16,396,549	29,458	748,971	33,804	36,275,005
Individual and partnership.....	4,795.2	3,964	826,570	30,415	14,953,276	28,336	537,381	31,564	22,563,649
Cooperative.....	2,091.1	255	62,021	1,082	1,014,138	752	82,963	1,262	3,515,742
Irrigation district.....	813.7	302	12,000	100	93,770	103	43,894	312	1,837,264
Carey Act.....	59.3	8	5,842	298	235,272	1	746	25	25
Commercial.....	845.2	58	26,185	72	46,010	15	14,423	84	6,814,220
U. S. Reclamation Service.....	174.4	17	2,339	49	7,268	14	733	25	973,170
U. S. Indian Service.....	19.4	6	14	34	9,636	16	416	21	87,243
State.....	18.7	12	35	32	27,619	18	2,225	40	60,810
City.....	53.3	4	32	12	9,570	15	281	21	411,722
Other.....	8.0	2	100	12	342	33	45	6	11,185

AGRICULTURE.

TABLE 17.—IRRIGATION WORKS, CLASSIFIED BY DRAINAGE BASIN: 1920.

DRAINAGE BASIN.	Number of diverting dams.	Number of storage dams.	MAIN DITCHES.			LATERAL DITCHES.		RESERVOIRS.	
			Number.	Capacity (second-feet).	Length (miles).	Number.	Length (miles).	Number.	Capacity (acre-feet).
Total, states included.	23,894	3,931	51,621	631,079	103,177	57,553	56,687	7,538	21,246,436
Missouri River and tributaries.	5,973	1,246	12,784	167,891	28,144	13,448	11,455	1,220	4,860,616
Missouri River direct.	45	22	106	1,617	517	236	148	22	871,819
Jefferson River and tributaries.	1,174	45	2,106	25,319	3,422	3,468	890	59	165,003
Jefferson River direct.	23	2	52	1,331	189	18	39	16	130,275
Beaverhead River.	516	15	805	5,340	1,120	954	253	10	6,171
Big Hole River.	442	8	726	7,171	1,132	2,231	490	3	11
Boulder River.	48	3	105	649	185	83	2	18	19,676
Pasamunee River.	54	7	184	1,456	298	101	61	12	8,870
Other tributaries of Jefferson River.	91	10	234	9,372	498	81	55		
Madison River.	100	10	251	2,709	560	129	112	12	4,602
Gallatin River.	88	5	410	4,243	885	146	228	2	1,200
Smith River.	66	4	285	983	325	600	124	7	181
Sun River.	91	14	109	2,467	313	168	199	16	854
Teton River.	21	7	76	2,566	266	74	112	7	145,742
Marion River.	38	15	76	2,634	227	260	719	15	22,926
Judith River.	147	5	214	1,479	811	252	84	7	85
Musselshell River.	192	35	443	4,277	886	806	286	16	34,479
Milk River and tributaries.	201	104	301	7,416	692	895	554	94	146,041
Milk River direct.	5	5	7	200	31	9	2	1	16
Sage Creek.	5	6	8	11	12	16	15	5	2,089
Snake River.	13	6	17	72	23	86	38	4	158
Other tributaries of Milk River.	178	92	269	7,133	626	784	499	84	143,778
Yellowstone River and tributaries.	1,014	160	2,678	32,064	6,662	2,018	2,171	186	516,248
Yellowstone River direct.	14	11	102	5,508	720	279	447	11	2,519
Clark Fork and tributaries.	105	5	358	3,353	797	403	224	5	2,795
Clark Fork direct.	101	5	304	3,177	719	399	223	1	91
Tributaries of Clark Fork.	4		54	176	78	4	1	4	2,704
Shields River.	88	1	208	1,620	457	210	75	5	9,018
Stillwater River.	5		128	1,284	279	40	46	2	2
Big Horn River and tributaries.	311	31	783	9,817	2,227	518	914	70	406,867
Big Horn River direct.	55	2	78	2,387	341	60	265	1	2
Pope Agie River.	37		122	605	270	20	34	1	112
Wind River.	7	1	88	1,005	233	12	13	2	2,050
Poison Creek.			1					1	3
Owl Creek.	6		12	279	89	12	16	6	276
No Wood River.	21	5	94	388	206	8	5	4	60
Graybull River.	46	1	100	1,276	327	20	71	4	181
Shell Creek.	31	5	53	433	145	10	20	5	1,637
Shoshone River.	38	9	64	3,079	327	294	448	17	460,806
Little Horn River.	2		7	46	42	15	1	1	25
Other tributaries of Big Horn River.	68	8	164	379	247	67	41	28	1,716
Rosebud River.	11	2	17	73	21	6		2	18
Tongue River and tributaries.	183	37	260	2,508	582	191	126	36	11,377
Tongue River direct.	43	12	82	1,333	231	126	35	9	150
Goose Creek.	91	21	99	874	229	30	58	16	10,579
Other tributaries of Tongue River.	49	4	79	301	122	35	33	11	648
Powder River and tributaries.	152	32	258	2,620	679	90	125	25	4,112
Powder River direct.	18	13	35	183	40	18	6	10	50
Red Fork Creek.	19		25	60	50	1	1		
Crany Woman Creek.	17	2	49	525	113	18	10	4	87
Clear Creek.	46	9	83	1,468	312	40	94	3	3,389
Other tributaries of Powder River.	52	8	66	384	164	13	14	8	636
Other tributaries of Yellowstone River.	145	41	564	5,221	900	281	214	30	19,542
Little Missouri River.	21	24	46	160	51	59	28	33	3,796
Moreau River.	3	55	29	33	24	26	4	19	2,262
Cheyenne River and tributaries.	264	137	455	6,438	778	757	679	109	212,529
Cheyenne River direct.	182	95	297	5,210	568	511	580	64	205,941
North Fork (Belle Fourche).	24	25	49	397	75	108	19	26	2,433
South Fork and tributaries.	56	17	109	831	135	138	80	19	4,155
South Fork direct.	47	15	99	806	91	137	79	13	4,048
Hat Creek.	11	2	40	25	44	1	1	6	109
White River.	63	23	81	237	131	104	66	17	1,302
Niobrara River.	30	12	51	212	92	92	36	1	13,005
Platte River and tributaries.	2,137	469	4,117	67,344	10,354	2,621	4,607	508	2,663,549
Platte River direct.	4	1	26	1,776	207	36	137	1	1
North Platte River and tributaries.	1,199	141	2,504	27,254	4,902	1,233	2,121	164	1,734,839
North Platte River direct.	52	11	154	10,496	1,058	512	1,284	13	1,247,874
Beaver Creek.	12	2	20	50	62	1	1	3	673
Grand Encampment Creek.	13	1	31	106	52	7	7	1	150
Spring Creek.	3	2	48	343	79	63	45	3	3,596
Sage Creek.	2		4		3				
Paseo Creek.	3		54	293	84	18	9	1	2,000
Medicine Bow River.	112	13	283	927	414	68	58	9	7,459
Sweetwater River.	42	1	85	174	141	37	20	9	2,474
Muddy Creek.	1		5	12	7				
Box Elder Creek.	13	3	33	44	68	5	16	3	36
La Poudre Creek.	11	3	47	326	81	13	62	2	20,012
Labonte Creek.	40		42	54	76	24	24		

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TABLE 17.—IRRIGATION WORKS, CLASSIFIED BY DRAINAGE BASIN: 1920—Continued.

DRAINAGE BASIN.	Number of diverting dams.	Number of storage dams.	MAIN DITCHES.			LATERAL DITCHES.		RESERVOIRS.	
			Number.	Capacity (second-feet).	Length (miles).	Number.	Length (miles).	Number.	Capacity (acre-feet).
Missouri River and tributaries—Continued.									
Platte River and tributaries—Continued.									
North Platte River and tributaries—Continued.									
Laramie River and tributaries.	390	41	682	6,411	972	161	345	49	390,106
Laramie River direct.	72	8	107	2,198	350	104	239	8	263,425
Little Laramie River.	42		98	435	141	26	15		
Sybilie Creek.	98	11	122	119	119	4	3	10	260
North Laramie River.	101	6	128	462	86	9	15	6	8,019
Chugwater Creek.	37	10	100	152	107	10		8	394
Other tributaries of Laramie River.	40	6	107	2,869	169	8	73	17	124,008
Rawhide Creek.	13	2	13	42	13	33	9	2	46
Horse Creek.	46	26	121	774	169	32	41	26	27,335
Blue River.	3		5	139	27				
Pumpkin Creek.	13	7	43	209	71	44	23		
Other tributaries of North Platte River.	430	29	854	6,851	1,524	215	177	43	27,078
South Platte River and tributaries.	930	321	1,578	38,215	5,226	1,347	2,343	338	927,789
South Platte River direct.	106	14	207	13,272	1,298	381	484	22	421,292
Bear Creek.	29	7	37	359	54	27	8	7	916
Clear Creek.	81	5	60	1,806	177	65	94	12	6,787
St. Vrain Creek.	171	83	195	5,600	1,649	219	356	69	123,395
Big Thompson Creek.	33	23	42	2,810	241	64	146	20	44,617
Cachela Foudre River.	107	92	267	8,582	653	313	1,016	96	267,585
Lone Tree Creek.	15	5	39	62	18	1		7	722
Crow Creek.	14	13	59	220	55	13	9	16	4,673
Big Beaver Creek.	4	1	8	226	27	1		3	103
Lodgepole Creek.	63	16	123	607	183	135	95	19	9,759
Other tributaries of South Platte River.	306	62	541	4,871	874	128	135	67	77,930
Loup River.	3	5	7	91	10	5	6	3	60
Other tributaries of Platte River.	1	1	2	8	3			2	880
Kansas River and tributaries.	58	18	87	1,333	224	116	70	9	197
Republican River.	53	16	74	1,307	216	102	69	8	192
Smoky Hill River.	5	2	10	20	7	14	1	1	5
Big Blue River.			2	5	1				
Other tributaries of Kansas River.			1	1					
Other tributaries of Missouri River.	220	82	863	4,360	1,444	623	340	81	54,796
Mississippi River and tributaries, exclusive of Missouri River.	1,704	259	2,987	41,974	4,934	5,364	3,332	381	1,163,306
Mississippi River direct.	340		241	869	174	1,553	182	6	43
Arkansas River and tributaries.	1,249	242	2,565	39,166	4,629	3,550	3,062	367	1,155,259
Arkansas River direct.	61	32	230	11,328	1,163	1,443	1,875	44	395,182
South Fork.	30		65	348	122	42	25		
Fountain River.	6	9	113	1,046	219	64	21	36	13,246
St. Charles River.	87	12	114	757	162	42	24	14	8,418
Huerfano River.	285	22	336	4,336	581	506	350	40	111,627
Apishapa River.	39	15	52	1,806	103	21	32	15	54,821
Purgatoire or Las Animas River and tributaries.	110	11	156	2,615	364	52	84	19	403,099
Purgatoire or Las Animas River direct.	101	9	147	2,606	356	38	30	18	403,099
Trinchera River.	9	2	9	9	8	14	4	1	
Canadian River and tributaries.	264	63	814	8,123	676	498	306	67	79,212
Canadian River direct.	1	2	11	59	12	17	3	6	52
Cimarron River.	60	9	63	2,035	178	37	154	7	21,235
Vermelo River.	23	10	42	2,357	98	15	52	10	18,111
Ocate Creek.	27	3	29	1,217	74	61	19	14	20,759
Mora River.	108	12	113	1,075	231	262	41	6	277
Uta Creek.	3	2	4	6	4	1	1	1	
Other tributaries of Canadian River.	42	25	52	1,874	79	60	36	23	18,777
Cimarron River.	52	9	89	642	150	228	70	9	53
Other tributaries of Arkansas River.	315	69	1,096	8,165	1,089	654	325	123	94,593
St. Francis River.			1	2					
White River.	62	14	58	1,067	49	40	11	5	
Ouachita River.	1								
Red River and tributaries.	13	8	54	183	53	103	75	3	8,004
Other tributaries of Mississippi River.	39		37	707	29	58	2		
Gulf streams other than Mississippi River and Rio Grande.	148	162	1,632	20,931	2,209	3,275	2,877	360	305,415
Atchafalaya River and tributaries.	17	1	91	728	109	62	42	1	2,041
Vermillon River and tributaries.			68	1,699	202	1,071	667	1	
Mermentau River and tributaries.	14	47	771	6,067	863	1,032	568	61	5,058
Calcasieu Lake, River and tributaries.	4	4	84	1,700	159	92	168	3	490
Sabine River and tributaries.		2	10	592	82	52	58	1	
Neches River.			7	1,380	40	30	77		
Trinity River.		1	6	1,022	77	47	102	1	25,000
Brazos River.		2	155	287	130	270	136	3	800
Colorado River.	46	53	244	3,925	324	333	639	30	8,062
San Antonio River.	4	10	50	1,782	60	80	82	24	260,346
Nueces River.	54	29	85	163	96	139	42	223	1,987
Other Gulf streams.	9	13	61	1,586	67	67	96	12	1,601

AGRICULTURE.

TABLE 17.—IRRIGATION WORKS, CLASSIFIED BY DRAINAGE BASIN: 1920—Continued.

DRAINAGE BASIN.	Number of diverting dams.	Number of storage dams.	MAIN DITCHES.			LATERAL DITCHES.		RESERVOIRS.	
			Number.	Capacity (second-feet).	Length (miles).	Number.	Length (miles).	Number.	Capacity (acre-feet).
Rio Grande and tributaries	1,535	117	2,740	36,811	5,700	2,642	3,752	333	3,233,019
Rio Grande direct	196	32	304	17,923	1,517	632	1,066	66	2,718,543
Saguache River	152	2	251	753	176	88	73	11	202
San Luis River	49	2	252	1,670	349	50	70	2	179
Alamosa River	30	2	39	1,321	142	32	56	2	31,750
La Jara River	30	2	31	390	69	9	12	2	3,001
Canon River	163	2	25	3,188	317	52	72	2	25,500
Trinchera River	27	2	52	139	43	7	4	2	150
Rio Castilla	49	2	42	434	80	7	3	2	150
Pueblo River	157	2	183	832	298	167	80	2	150
Rio Chama	11	2	32	134	52	10	3	1	150
Rio Santa Cruz	18	2	39	72	50	7	6	1	150
Tecuque Creek	30	9	50	215	237	41	20	11	44,068
Rio Puerco	30	9	50	215	237	41	20	11	44,068
Pecos River and tributaries	394	25	774	5,619	1,168	942	914	156	109,963
Pecos River direct	195	11	323	4,143	577	437	517	107	144,296
Gallinas River	38	5	42	276	83	60	9	8	26,619
Hondo River	99	2	196	547	222	196	161	13	18
Pecos River	16	2	96	245	102	152	168	28	80
Other tributaries of Pecos River	46	7	117	408	184	97	59	28	80
Las Moras Creek	2	1	4	75	8	260	67	78	239,663
Other tributaries of Rio Grande	237	40	557	3,886	1,012	338	406	78	239,663
Independent streams in Rio Grande drainage basin	84	8	150	3,613	190	134	90	18	145
Rio Mimbres	45	6	77	3,168	78	60	13	11	40
Preso River	33	3	53	295	66	17	7	5	5
Rio Tularosa	6	3	20	240	46	57	70	2	100
Colorado River and tributaries	2,465	565	7,098	66,949	14,052	5,781	8,485	768	1,675,988
Colorado River direct	5	1	53	7,290	550	668	2,211	138	86,254
Green River and tributaries	919	124	2,067	16,875	4,383	1,900	2,320	138	86,254
Green River direct	25	1	66	1,474	200	26	9	2	114
New Fork	9	2	78	1,011	241	133	86	1	114
Horn Creek	6	2	41	408	82	125	75	1	114
Cottonwood Creek	19	2	83	485	131	6	2	1	114
South Piney Creek	26	1	110	221	163	333	116	1	114
La Barge Creek	22	1	19	131	44	6	2	1	114
Fontenelle Creek	20	1	24	73	35	8	6	1	114
Bitter Creek	3	1	21	25	28	1	4	1	114
Blacks Creek	156	9	325	1,867	532	54	114	11	1,105
Henry Fork	45	22	110	801	143	74	42	3	3,333
Ashley Fork River	109	8	18	113	75	8	15	7	23
Duchene River	196	8	106	2,416	543	306	771	7	41,871
Price River	13	1	54	636	161	37	34	2	1,248
San Rafael River	11	2	30	591	170	401	570	6	8,800
Yampa River and tributaries	109	57	600	2,736	1,145	192	371	66	8,318
Yampa River direct	16	4	65	498	142	19	12	4	1,569
Little Snake River	10	6	135	873	265	17	7	8	1,346
Other tributaries of Yampa River	83	47	400	1,365	738	156	352	54	5,403
White River	43	16	265	2,883	408	114	43	19	1,703
Other tributaries of Green River	147	4	117	1,509	282	82	62	5	19,739
Grand River and tributaries	857	296	2,914	25,214	5,562	1,484	2,016	295	133,742
Grand River direct	45	10	140	2,827	493	308	257	11	13,627
Fraser River	14	2	61	352	112	2	1	2	10
Muddy Creek	49	10	50	254	64	1	1	10	1,727
Blue River	40	3	143	467	172	34	7	7	39
Eagle River	12	4	122	449	202	10	10	8	106
Hearing Fork	17	4	240	1,314	413	163	58	13	804
Platteau Creek	2	41	104	790	213	127	81	45	15,972
Gunnison River and tributaries	388	118	1,210	12,419	2,257	388	601	140	47,521
Gunnison River direct	14	1	63	1,168	151	35	19	1	120
Taylor River	157	1	4	15	6	7	5	1	120
Tumichi Creek	19	17	138	1,731	279	87	76	26	11,134
North Fork Creek	5	9	46	562	119	21	38	9	1,265
Smith Fork River	26	4	180	2,402	446	151	359	5	220
Uncompaggre River	167	86	521	5,387	950	87	104	98	34,782
Rio Dolores	87	19	255	2,622	622	143	417	21	42,988
Other tributaries of Grand River	203	28	580	3,720	1,014	309	584	38	10,948
Fremont River	148	117	43	548	121	87	65	13	4,078
Virgin River	129	13	233	773	358	224	189	26	20,009
San Juan River and tributaries	183	21	521	4,510	1,242	412	282	35	5,566
San Juan River direct	27	6	67	669	176	64	89	15	1,591
Mancos River	11	2	38	285	87	11	12	1	160
Los Pinos River	9	2	67	853	200	24	69	2	165
Animas River	45	3	144	1,094	384	130	52	4	165
La Plata River	30	3	69	612	185	47	48	2	165
Other tributaries of San Juan River	11	12	136	367	210	136	12	13	3,600
Kanab Wash	1	1	1	1	4	4	4	4	258
Williams River	5	37	40	34	34	1	1	1	4
Little Colorado River and tributaries	32	14	82	341	156	43	43	45	37,098
Little Colorado River direct	19	9	36	208	78	15	22	18	30,823
Nutcracker Creek	4	1	7	17	8	1	1	4	1,050
Canab Creek	4	2	3	3	2	1	1	2	625
Other tributaries of Little Colorado River	9	4	37	113	68	27	20	21	4,600

TABLE 17.—IRRIGATION WORKS, CLASSIFIED BY DRAINAGE BASIN: 1920—Continued.

DRAINAGE BASIN.	Number of diverting dams.	Number of storage dams.	MAIN DITCHES.			LATERAL DITCHES.		RESERVOIRS.	
			Number.	Capacity (second-feet).	Length (miles).	Number.	Length (miles).	Number.	Capacity (acre-feet).
Colorado River and tributaries—Continued.									
Colorado River and tributaries.....	231	35	1,031	10,449	1,515	866	1,327	215	1,377,432
Gila River direct.....	31	1	112	2,819	439	230	211	2	210
San Francisco River.....	64	1	90	110	66	11	2	3	.....
San Pedro River.....	30	9	114	270	162	31	15	45	894
Santa Cruz River.....	31	5	237	1,198	260	147	75	26	392
Salt River and tributaries.....	44	3	174	5,084	290	313	911	11	1,367,307
Salt River direct.....	8	1	18	4,447	111	271	898	2	1,367,300
Tonto Creek.....	9	1	34	58	26	.....	.....	1	1
Rio Verde.....	22	.....	75	359	107	29	7	5	1
Other tributaries of Salt River.....	5	1	47	220	46	13	6	3	5
Agua Fria River.....	12	5	106	525	107	105	101	16	24
Hassayampa River.....	1	1	24	46	18	.....	.....	1	180
Other tributaries of Gila River.....	28	10	174	399	173	29	12	111	8,425
Other tributaries of Colorado River.....	14	1	116	208	131	92	27	26	11,547
Whitewater Draw and tributaries.....	6	51	175	553	121	92	7	76	85,071
Great Basin Drainage.....	3,244	480	5,545	57,717	11,292	6,381	6,486	935	2,395,379
Tributaries of Great Salt Lake.....	1,128	158	1,705	19,501	4,512	2,106	2,487	208	596,859
Bear River and tributaries.....	670	104	967	10,589	2,858	913	739	92	30,708
Bear River direct.....	78	7	206	5,061	737	152	280	11	3,659
Little Bear River.....	47	6	104	1,074	195	395	183	4	4
Malad River.....	2	1	3	13	10	.....	.....	1	2
Thomas Fork.....	25	.....	29	203	63	.....	.....	.....	.....
Mill Creek.....	4	.....	8	27	38	4	2	.....	.....
Little Malad Creek.....	190	58	12	400	788	49	49	4	12,788
Other tributaries of Bear River.....	324	32	605	3,811	1,027	313	225	72	14,255
Weber River and tributaries.....	256	18	391	2,823	570	146	106	52	30,794
Weber River direct.....	72	1	101	1,417	181	53	46	5	22
Ogden River.....	27	.....	73	480	109	67	29	4	4
East Canyon Creek.....	38	1	40	179	49	5	5	2	28,004
Other tributaries of Weber River.....	119	16	177	747	231	31	26	41	2,764
Jordan River and Utah Lake and tributaries.....	202	36	347	6,089	1,084	1,047	1,642	64	535,357
Jordan River direct.....	14	4	20	1,151	296	101	26	3	600
Spanish Fork River.....	12	6	46	1,358	93	95	202	8	502,116
Hobbs Creek.....	1	.....	13	31	9	10	4	1	2
Provo River.....	31	11	99	1,752	304	416	262	21	6,881
American Fork River.....	27	.....	23	70	43	63	130	4	.....
Little Cottonwood Creek.....	21	1	36	650	60	50	45	1	750
Big Cottonwood Creek.....	32	3	27	228	58	160	31	4	300
Other tributaries of Jordan River and Utah Lake.....	64	11	83	849	221	152	942	22	24,908
Independent streams.....	2,116	302	3,840	38,216	6,780	4,275	3,999	727	1,798,520
Sevier River and tributaries.....	95	50	321	7,762	1,391	903	1,195	63	899,405
Sevier River direct.....	23	13	44	4,693	468	330	508	14	741,900
San Pitch River.....	26	20	80	970	372	254	401	21	30,698
Otter Creek.....	2	3	12	86	42	24	9	3	3,900
South Fork.....	9	.....	32	381	114	65	42	2	24,015
Other tributaries of Sevier River.....	35	14	153	1,632	395	230	235	23	68,892
Beaver River.....	36	14	128	775	210	196	229	9	40,555
Coal Creek.....	22	2	58	1,153	136	97	63	63	967
Deep Creek (Utah).....	3	.....	21	50	36	.....	.....	2	.....
Grouse Creek.....	14	3	29	35	45	.....	.....	1	10
Humboldt River and tributaries.....	715	12	1,040	1,204	1,292	965	281	27	42,791
Humboldt River direct.....	55	3	51	384	147	303	119	5	32,025
East Fork of Humboldt River.....	195	2	226	75	138	241	44	4	688
La Molla Creek.....	173	.....	196	90	193	128	41	.....	.....
North Fork of Humboldt River.....	47	.....	62	48	109	86	22	.....	.....
South Fork of Humboldt River.....	161	.....	281	297	354	96	29	4	7,974
Pine Creek.....	.....	.....	1	.....	.....	2	1	.....	.....
Rosco River.....	47	.....	170	155	237	13	4	.....	.....
Little Humboldt River.....	6	.....	4	.....	.....	.....	.....	.....	.....
Other tributaries of Humboldt River.....	31	7	49	155	60	96	21	14	2,104
Truckee River and tributaries.....	54	5	40	2,465	158	21	14	8	201
Truckee River direct.....	23	2	26	426	134	17	11	1	2
Steamboat Creek.....	6	1	8	2,001	14	4	3	1	.....
Other tributaries of Truckee River.....	25	2	6	38	10	.....	.....	6	199
Carson River and tributaries.....	143	13	113	3,905	190	193	341	16	400,064
Carson River direct.....	80	9	97	688	114	50	16	9	4
Tributaries of Carson River.....	63	4	16	3,217	76	143	325	7	400,060
Walker River and tributaries.....	77	14	184	2,192	659	99	162	9	11,503
Walker River direct.....	67	1	164	2,177	645	75	160	7	11,503
Tributaries of Walker River.....	10	13	20	15	14	24	2	2	.....
Duck Creek.....	14	.....	21	45	36	17	12	1	50
Stepoe Creek.....	14	1	17	47	48	20	13	3	4,000
Long Valley Creek.....	59	2	102	585	131	90	44	6	857
Mono Lake and tributaries.....	4	3	21	525	26	11	8	3	34,700
Susan River.....	93	7	82	1,861	215	114	45	15	63,949
Mohave River.....	2	.....	21	139	23	9	4	18	27
Owens River.....	6	4	53	1,588	138	5	5	94	26,006
San Jacinto River.....	7	11	32	251	50	28	14	2	105,688
Whitewater River.....	3	.....	12	57	47	15	2	41	50
Quinn River.....	5	1	14	98	22	20	16	2	.....
Deep Creek (Oregon).....	1	.....	10	18	11	.....	.....	.....	.....
Donner and Blitzen River.....	44	6	30	239	74	122	84	6	57,580
Silver Creek.....	24	1	24	398	39	31	2	.....	.....
Silver River.....	206	72	187	876	220	115	54	17	360
Thomas Creek.....	.....	.....	10	10	28	.....	.....	1	.....
Other independent streams.....	475	81	1,270	11,873	1,555	1,204	1,412	302	139,757

TABLE 17.—IRRIGATION WORKS, CLASSIFIED BY DRAINAGE BASIN: 1920—Continued.

DRAINAGE BASIN.	Number of diverting dams.	Number of storage dams.	MAIN DITCHES.			LATERAL DITCHES.		RESERVOIRS.	
			Number.	Capacity (second-feet).	Length (miles).	Number.	Length (miles).	Number.	Capacity (acre-feet).
Columbia River and tributaries.	6,494	603	12,614	134,536	22,700	11,986	10,099	646	5,711,783
Columbia River direct.	9	18	99	632	155	174	44	41	1,530
Kootenai River.	30	7	64	1,095	93	41	26	13	324
Clark Fork and tributaries.	715	103	2,106	14,618	3,136	1,747	1,103	62	93,705
Clark Fork direct.	6	1	87	1,399	85	10	1	3	50
Missoula River and tributaries.	609	79	1,863	11,998	2,655	1,217	367	40	8,640
Missoula River direct.	5	1	15	200	116	11	1	1	1
Hellgate River.	246	27	777	4,623	1,195	455	142	24	527
Big Blackfoot River.	137	10	310	2,378	364	193	48	3	200
Bitter Root River.	173	37	644	4,073	870	424	158	10	7,634
Other tributaries of Missoula River.	48	4	117	724	110	134	19	8	279
Flathead River.	100	23	156	1,221	396	520	735	13	85,015
Colville River.	40	1	101	393	174	131	21	3	1
Spokane River and tributaries.	34	11	76	912	120	92	156	36	6,262
Spokane River direct.	15	8	61	802	101	74	134	31	5,682
Coeur d'Alene Lake and River.	19	3	15	110	19	18	22	5	600
Okanogan River and tributaries.	12	11	124	552	158	60	132	19	24,138
Okanogan River direct.	1	1	39	45	24	25	4	8	2,211
Salmon Creek.	1	3	15	143	32	3	67	5	16,550
Other tributaries of Okanogan River.	10	5	70	364	102	41	61	6	5,375
Methow River.	52	11	166	1,230	231	59	45	19	209
Entiat River.	5	1	32	85	41	18	18	8	1
Wenatchee River.	41	6	87	553	195	66	18	10	2,000
Crab Creek.	24	9	67	100	34	18	9	10	4,501
Yakima River and tributaries.	105	10	459	7,486	1,070	477	1,156	10	423,810
Yakima River direct.	12	7	88	4,823	473	446	1,079	7	423,800
Wilson Creek.	20	1	50	103	62	6	5	1	10
Naches River.	2	1	63	724	113	7	21	1	1
Ahtanum River.	10	1	49	180	82	3	1	1	1
Other tributaries of Yakima River.	61	3	209	1,596	340	15	50	2	1
Snake River and tributaries.	3,398	304	6,510	89,418	12,728	5,722	6,188	321	4,832,921
Snake River direct.	60	11	206	19,056	998	1,459	2,443	12	2,641,746
Gros Ventre River.	20	1	29	118	64	1	1	1	1
Little Gros Ventre.	14	1	32	103	50	1	1	1	1
Balt River.	50	2	169	1,355	297	116	54	1	80
Henry's Fork.	236	25	274	12,693	750	340	437	20	8,482
South Fork of Snake River.	112	7	146	8,609	431	161	620	7	15,332
Blackfoot River.	43	3	45	1,214	182	136	172	3	200,060
Fort Neud River.	101	7	149	1,274	345	58	76	10	59,226
Raft River.	101	2	99	642	133	42	30	1	1
Goose Creek.	35	1	100	100	100	35	70	3	30,000
Salmon Falls River.	40	6	48	1,857	102	56	250	6	206,600
Little Wood River.	53	9	107	1,893	234	22	7	2	40,000
Big Wood River.	188	15	284	4,765	421	108	443	13	191,993
Bruneau River.	141	18	171	826	204	140	58	12	10,772
Owyhee River.	945	27	432	2,508	573	188	106	25	27,295
Boise River.	79	14	198	6,669	801	744	191	18	573,203
Malheur River.	256	34	350	2,022	540	92	84	31	368,446
Payette River.	51	12	207	4,450	645	63	140	17	63,284
Weiser River.	30	9	134	1,822	389	81	89	10	95,796
Burnt River.	213	8	318	781	400	20	14	14	12,331
Powder River.	291	19	651	3,754	1,133	287	202	37	13,484
Pine Creek.	51	4	83	176	107	18	3	3	10,350
Imnaha River.	34	1	86	102	73	16	13	1	200
Salmon River.	393	12	980	4,747	1,423	898	270	14	2,183
Grande Ronde River.	207	19	482	1,894	491	329	138	6	205,230
Clearwater River.	2	2	13	69	23	8	1	6	4
Asotin Creek.	2	1	1	1	1	1	1	1	100
Patuxa River.	10	1	33	377	24	31	1	1	1
Palouse River.	13	5	21	219	31	42	11	2	4
Other tributaries of Snake River.	443	32	749	5,322	1,764	241	249	46	56,740
Independent streams in Snake River Basin.	303	17	429	6,428	867	490	288	14	144,312
Camas Creek.	81	6	97	3,042	165	159	112	5	65,179
Beaver Creek.	27	1	34	72	23	2	4	1	35
Medicine Lodge.	62	1	72	266	61	127	44	2	412
Little Lost River.	33	2	59	774	101	15	7	2	22,000
Big Lost River.	98	7	160	2,237	491	183	119	4	56,686
Other independent streams.	2	1	7	87	26	4	2	1	1
Walla Walla River.	236	14	412	1,453	1,205	1,905	150	8	15,000
Klickitat River.	19	3	30	352	66	17	4	1	1
White Salmon River.	19	3	28	478	99	21	15	3	1
Umatilla River.	139	10	229	2,007	318	201	143	4	54,700
Willow Creek.	71	7	94	110	94	18	11	1	1
John Day River.	504	8	670	1,052	655	151	52	10	39,236
Deschutes River.	361	25	390	4,023	768	226	333	8	52,927
Hood River.	34	5	72	435	88	86	132	5	13
Willamette River.	15	1	40	148	53	15	5	2	1
Other tributaries of Columbia River.	128	22	329	976	352	260	59	50	16,197

IRRIGATION.

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TABLE 17.—IRRIGATION WORKS, CLASSIFIED BY DRAINAGE BASIN: 1920—Continued.

DRAINAGE BASIN.	Number of diverting dams.	Number of storage dams.	MAIN DITCHES.			LATERAL DITCHES.		RESERVOIRS.	
			Number.	Capacity (second-foot).	Length (miles).	Number.	Length (miles).	Number.	Capacity (acre-foot).
Pacific Ocean streams, other than the Colorado and Columbia Rivers.....	2,221	460	5,926	100,804	13,835	8,450	10,304	2,771	1,815,714
Dungeness River.....	6		7	570	36	75	32		
McDowell Creek.....									
Rogue River and tributaries.....	257	18	645	1,978	837	169	117	47	35,882
Rogue River direct.....	8		26	149	38	2	3	9	1
Little Butte Creek.....	13	2	58	161	108	86	50	3	5,350
Bear Creek.....	29	6	99	512	159	18	37	10	30,507
Evans Creek.....	22		34	66	41	11	3		
Applegate River.....	55	4	164	434	241	17	8	15	16
Illinois River.....	87	3	135	400	127	19	10	4	1
Other tributaries of Rogue River.....	43	3	129	256	123	16	6	6	7
Klamath River and tributaries.....	505	41	1,046	8,878	1,289	543	437	90	1,022,365
Klamath River direct.....	452	23	947	5,778	1,101	287	113	70	95,054
Lost River.....	8	13	39	1,889	71	113	232	14	925,923
Sprague River.....	9	5	15	212	34	6	8	6	1,388
Other tributaries of Klamath River.....	36		45	999	83	137	84		
Russian River.....	9	10	18	23	8	25	364	10	142
Sacramento River and tributaries.....	859	200	1,821	23,514	4,574	1,743	1,955	220	348,435
Sacramento River direct.....	6	3	192	5,803	586	559	693	24	285
Pit River.....	322	63	489	5,160	730	160	78	63	202,877
Cow Creek.....	40		64	367	118	80	23	1	
Cottonwood Creek.....	16	1	41	147	78	19	30	8	6,300
Battle Creek.....	26		71	358	114	17	4		
Stony Creek.....	44		63	1,590	81	22	130		51,001
Feather River.....	221	52	332	4,399	455	424	130	12	243
Yuba River.....	41	33	136	1,235	481	65	96	32	56,672
Cacho Creek.....	6	3	20	1,197	87	30	115	4	181
American River.....	51	31	109	1,264	1,498	135	374	53	30,682
Other tributaries of Sacramento River.....	36	9	304	1,994	347	292	282	19	194
San Joaquin River and tributaries.....	269	85	1,452	55,628	5,995	4,394	6,904	1,419	329,522
San Joaquin River direct.....	23	2	176	11,431	1,237	1,203	2,103	120	1,937
Kern River.....	17	11	142	6,273	427	156	140	188	80,469
Tulare Lake.....	26		67	562	101	200	601	671	110,553
Tule River.....	44	2	115	2,465	426	209	155	118	523
Kaweah River.....	19	1	95	5,133	339	271	497	72	2,348
Kings River.....	27	5	128	17,104	892	465	981	67	6,116
Fresno River.....	5		7	314	5	6	107	19	263
Merced River.....	17	1	159	2,171	476	597	290	9	8,019
Tuolumne River.....	17	15	110	5,834	626	835	907	12	86,007
Stanislaus River.....	12	13	59	1,444	190	142	813	17	42,526
Calaveras River.....	22	8	120	224	86	33	12	25	17
Mokelumne River.....	31	25	126	1,598	1,024	62	153	33	678
Cosumnes River.....	6		13	103	55	2	15		
Other tributaries of San Joaquin River.....	3	2	126	882	111	213	130	66	10,066
Tributaries of San Francisco Bay other than Sacramento and San Joaquin Rivers.....	26	9	78	381	45	149	40	44	235
Coyote Creek.....	6		6	24	5			3	1
Guadalupe River.....	8		12	271	21	4	20		
Other tributaries.....	12	9	60	86	19	145	20	41	234
Pajaro River.....	29	9	94	278	66	81	29	19	5,995
Salinas River.....	7	4	140	553	117	403	98	21	73
Santa Maria River.....	1		16	69	13	25	3	8	86
Santa Ynez River.....	9	6	18	227	10	10	4	16	2,532
Santa Clara River.....	15	3	38	191	49	50	30	30	2,741
Los Angeles River.....	11	3	79	256	81	191	78	164	4,950
San Gabriel River.....	18	1	54	3,940	89	61	47	123	7,108
Santa Ana River.....	39	12	123	2,096	302	139	34	139	3,514
San Diego River.....	4	2	11			5	4	63	18,904
Other Pacific Ocean streams.....	137	54	286	2,212	324	381	128	352	33,250

AGRICULTURE.

TABLE 17.—IRRIGATION WORKS, CLASSIFIED BY DRAINAGE BASIN: 1920—Continued.

TABLE 17.—IRRIGATION WORKS, CLASSIFIED BY DRAINAGE BASIN.										
DRAINAGE BASIN.	Pipe lines, length (miles).	FLOWING WELLS.		PUMPED WELLS.		PUMPING PLANTS.				Average lift (feet).
		Number.	Capacity (gallons per minute).	Number.	Capacity (gallons per minute).	Number.	Engine capacity (horse-power).	Pumps.		
								Number.	Capacity (gallons per minute).	
Total, states included	8,878.3	4,606	935,067	32,094	16,396,549	29,458	748,971	33,804	36,275,005	41
Missouri River and tributaries	89.5	41	4,271	385	171,464	593	18,329	889	800,218	22
Missouri River direct	4.3					31	6,602	45	168,725	32
Jefferson River and tributaries	0.1	2	2			3	135	4	4,968	24
Jefferson River direct	0.1					2	25	2	1,968	24
Beaverhead River		1				1	110	2	3,000	24
Boulder River			2							
Other tributaries of Jefferson River		1								
Gallatin River	0.5					4	70	4	5,320	16
Smith River						1	18	1	6,000	9
Sun River	1.2					16	326	20	20,210	15
Teton River	0.5	3	1,000	1	10	8	130	8	13,410	17
Marais River	1.6			3	8,000	22	623	22	37,165	15
Judith River	2.4			1	1,500	8	72	16	10,600	11
Musselshell River						10	178	12	16,250	19
Milk River and tributaries	1.2	1	50			22	377	23	24,345	16
Milk River direct						4	70	4	2,570	18
Other tributaries of Milk River	1.2	1	50			18	307	19	21,775	16
Yellowstone River and tributaries	13.1	21	194	6	1,005	101	3,965	120	182,508	25
Yellowstone River direct	2.0	3	69			35	2,501	45	127,002	24
Clark Fork						2	10	2	470	8
Shields River				1	40					
Big Horn River and tributaries	10.0	1		1	950	20	406	25	11,800	38
Big Horn River direct	4.5			1	950	16	357	20	8,840	40
Popo Agie River	2.0					1	3	1	175	12
Owl Creek	0.1									
No Wood River	0.2					1	26	1	1,200	58
Shell Creek	0.2									
Shoshone River	2.5									
Little Horn River	0.5					2	20	3	1,585	10
Other tributaries of Big Horn River		1								
Tongue River and tributaries	0.3			2		18	361	18	19,275	18
Tongue River direct	0.1					16	286	16	14,575	15
Goose Creek						1	50	1	3,000	38
Other tributaries of Tongue River	0.2			2		1	25	1	1,700	22
Powder River and tributaries	0.3	17	125	2	15	15	570	19	14,670	30
Powder River direct		15	119	1	10	11	245	15	14,265	16
Clear Creek	0.3					2	208	2	200	54
Other tributaries of Powder River		2	6	1	5	2	27	2	205	70
Other tributaries of Yellowstone River	0.5					11	117	11	8,631	12
Little Missouri River	0.1					4	175	4	8,000	32
Moreau River	0.3					3	60	3	1,800	30
Cheyenne River and tributaries	7.0	4	2,750	2	2,800	19	292	19	14,041	...
Cheyenne River direct	6.8	4	2,750	1	800	14	173	14	9,550	16
North Fork (Belle Fourche)				1	2,000	4	103	4	3,391	20
South Fork	0.2					1	16	1	1,100	10
White River	0.4			2	2,200	3	53	3	4,000	35
Niobrara River	0.1					1	8	1	480	8
Platte River and tributaries	50.8	6	270	313	143,904	282	3,889	307	220,040	22
Platte River direct				14	10,551	13	180	14	14,580	31
North Platte River and tributaries	2.6	2	40	9	4,330	20	410	34	24,030	21
North Platte River direct	0.7			2	3,180	15	311	16	21,002	22
Grand Encampment Creek	0.1									
Spring Creek		1		2		1		1		
Medicine Bow River	1.0			3		5	33	12	787	18
Muddy Creek	0.5									
Box Elder Creek		1	40							
Laramie River and tributaries	0.4			2	1,150	3	6	3	1,650	13
Laramie River direct	0.3					1		1	500	10
North Laramie River				1	700	1		1	700	16
Chugwater Creek				1	450	1	6	1	450	...
Other tributaries of Laramie River	0.1									
Horne Creek	0.1									
Other tributaries of North Platte River	0.3					2	60	2	600	28
South Platte River and tributaries	46.9	4	230	290	129,023	233	3,220	248	176,680	21
South Platte River direct	9.8	3	170	94	44,302	78	1,132	80	52,662	22
Bear Creek	1.0					1	7	5		40
Clear Creek	0.1									
St. Vrain Creek	12.7			1		4	100	4	1,000	22
Big Thompson Creek	1.9					6	106	6	5,831	17
Catche la Poudre River	17.3	1	60	123	53,643	107	1,886	107	74,943	21
Lone Tree Creek	0.5			20	6,968	13	172	20	10,160	24
Big Beaver Creek				7	15,250	4	65	6	15,250	26
Lodgepole Creek				3	2,835	5	90	5	8,567	11
Other tributaries of South Platte River	3.4			41	4,825	15	171	15	8,267	20
Loup River	0.3					7	49	7	4,280	17
Other tributaries of Platte River	2.5					3	21	4	461	30
Kansas River and tributaries	2.0			45	10,600	22	844	37	39,903	33
Republican River	0.1			14	8,500	13	491	13	32,703	28
Smoky Hill River	0.1			31	2,100	6	303	21	5,350	18
Big Blue River	0.4					2	30	2	1,000	25
Other tributaries of Kansas River						1	20	1	850	...
Other tributaries of Missouri River	3.4	4	5	12	1,445	34	512	40	22,444	18

IRRIGATION.

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TABLE 17.—IRRIGATION WORKS, CLASSIFIED BY DRAINAGE BASIN: 1920—Continued.

DRAINAGE BASIN.	Pipe lines, length (miles).	FLOWING WELLS.		PUMPED WELLS.		PUMPING PLANTS.				
		Number.	Capacity (gallons per minute).	Number.	Capacity (gallons per minute).	Number.	Engine capacity (horse- power).	Pumps.		Average lift (feet).
								Number.	Capacity (gallons per minute).	
Mississippi River and tributaries, exclusive of Missouri River.	148.3	27	6,240	2,085	1,876,540	1,539	73,739	1,715	2,237,441	46
Mississippi River direct.	6.2					67	2,346	74	102,500	12
Arkansas River and tributaries.	140.9	24	3,640	1,354	934,452	768	34,404	872	1,119,743	42
Arkansas River direct.	13.8	2	315	572	641,744	503	27,146	526	798,285	47
Fountain River.	11.7	3	30	19	7,700	8	126	8	8,200	21
St. Charles River.	0.4			3	515	2	18	2	475	32
Huerfano River.	4.6			11	2,070	6	36	6	2,045	40
Apishapa River.	0.3			1	144	1	20	1	144	14
Purgatoire or Las Animas River.	0.1					1	7	1	500	7
Canadian River and tributaries.	19.0			20	6,417	21	259	26	6,663	79
Canadian River direct.	4.2			15	3,106	15	193	19	5,141	88
Cimarron River.	4.8					1	10	1	1,500	22
Vermejo River.	1.1			2		1	50	2		100
Ocate Creek.	1.6									
Mora River.				1	3,300	2	5	2	10	35
Other tributaries of Canadian River.	7.4			2	11	2	1	2	12	72
Cimarron River.	0.2	6	500	12	5,321	10	221	11	4,817	26
Other tributaries of Arkansas River.	90.9	13	2,795	716	270,541	216	6,573	291	298,604	29
Red River and tributaries.		3	2,600	49	48,950	63	3,444	67	55,760	76
St. Francis River.				56	73,050	52	2,223	64	78,450	31
White River.				626	820,388	584	30,537	633	858,638	50
Ouachita River.	0.4									
Other tributaries of Mississippi River.	0.8					5	285	5	22,300	15
Gulf streams, other than Mississippi River and Rio Grande.	158.9	127	57,009	1,615	2,072,580	2,335	136,953	3,208	9,202,748	37
Atchafalaya River and tributaries.	42.2	1		42	59,080	105	4,070	171	230,675	19
Vermilion River and tributaries.		2	425	82	67,007	136	7,052	222	604,044	29
Mermentau River and tributaries.	0.1			594	1,209,750	800	56,300	1,293	2,927,213	35
Calcasieu Lake, River, and tributaries.	0.4	5	5,800	92	243,400	123	13,933	161	937,294	30
Sabine River and tributaries.				2	27,500	12	2,805	22	241,500	20
Neches River.						6	5,850	23	1,929,500	24
Trinity River.	1.5					11	7,683	20	445,100	34
Brazos River.	2.2	3	3,500	150	136,332	166	6,276	175	153,585	63
Colorado River.	8.5	3	5,400	57	30,667	311	13,500	359	912,048	30
San Antonio River.	10.9	25	15,465	43	12,864	77	1,438	80	31,039	39
Nueces River.	02.6	81	26,065	275	72,937	321	6,533	342	160,472	47
Other Gulf streams.	0.5	7	354	278	212,143	262	11,408	340	540,278	42
Rio Grande and tributaries.	81.5	1,015	401,081	416	239,199	522	28,867	617	2,670,187	39
Rio Grande direct.	42.8	329	13,595	31	13,381	134	22,115	202	2,398,079	46
Saguache River.		83	2,672	1		1		1		
San Luis River.	0.2	22	175							
Alamosa River.	0.1	8	207							
Conejos River.	0.1	1	20							
Trinchera River.	4.0									
Rio Santa Cruz.	0.1									
Rio Puerco.						1		1		96
Pecos River and tributaries.	18.8	563	384,325	287	174,938	282	5,174	309	221,289	31
Pecos River direct.	6.1	300	207,465	138	92,107	144	3,098	159	124,701	34
Gallinas River.	0.5			1	3	1		1	2	75
Hondo River.	11.0	176	125,606	79	46,585	74	1,041	79	57,275	21
Penasco River.	0.5	51	30,132	10	7,210	11	216	11	9,000	29
Other tributaries of Pecos River.	0.7	36	21,122	59	29,033	52	819	59	30,310	36
Las Moras Creek.						1	6	1	250	20
Other tributaries of Rio Grande.	15.4	9	87	97	50,880	103	1,572	103	50,639	53
Independent streams in Rio Grande drainage basin.	8.8	1	75	87	46,944	89	2,074	92	46,779	57
Rio Mimbres.	1.1	1	75	85	46,825	86	2,065	90	46,660	57
Fresno River.	7.7									
Rio Tularosa.				2	119	3	9	2	119	68
Colorado River and tributaries.	168.5	370	34,057	803	974,258	621	24,194	881	1,069,324	43
Colorado River direct.	0.4			4	1,050	9	487	12	82,200	23
Green River and tributaries.	1.5	2		1	1,350	18	647	23	44,920	16
Green River direct.	0.4			1	1,350	10	559	14	13,085	29
Bitter Creek.		2								
Duchesne River.						1		2	27,000	70
Price River.	0.6									
Yampa River and tributaries.	0.3					4	48	4	3,200	15
Yampa River direct.						4	48	4	3,200	15
Little Snake River.	0.1									
Other tributaries of Yampa River.	0.2									
White River.	0.2					1	10	1	900	10
Other tributaries of Green River.						2	30	2	735	17
Grand River and tributaries.	45.9	1				38	3,728	46	40,688	27
Grand River direct.	12.5					18	2,872	24	32,882	29
Muddy Creek.	0.1									
Blue River.	1.2									
Eagle River.	5.2					2	33	2	1,000	58
Roaring Fork.	0.3									
Plateau Creek.	0.1									

TABLE 17.—IRRIGATION WORKS, CLASSIFIED BY DRAINAGE BASIN: 1920—Continued.

DRAINAGE BASIN.	Pipe lines, length (miles).	FLOWING WELLS.		PUMPED WELLS.		PUMPING PLANTS.				
		Number.	Capacity (gallons per minute).	Number.	Capacity (gallons per minute).	Number.	Engine capacity (horse-power).	Pumps.		Average lift (feet).
								Number.	Capacity (gallons per minute).	
Colorado River and tributaries—Continued.										
Grand River and tributaries—Continued.						17	822	19	6,806	22
Gunnison River and tributaries.	18.1					13	759	15	5,706	20
Gunnison River direct.	1.0									
Tonichi Creek.	0.4					1	8	1	300	14
North Fork River.	2.8									
Smith Fork River.	5.1					1	40	1		53
Uncompahgre River.	4.5					2	15	2	800	16
Other tributaries of Gunnison River.	4.3									
Rio Dolores.	1.2					1	1	1		15
Other tributaries of Grand River.	7.2	1								
Fremont River.	1.0									
Virgin River.	7.6	4	106	8	1,730	9	75	10	3,145	39
San Juan River and tributaries.	7.2	10	1,035	1		4	27	4	1,200	128
San Juan River direct.	7.1	2	90			2	22	2	1,200	85
Los Pinos River.	0.1									
Animas River.		4	100							
Other tributaries of San Juan River.		4	845	1		2	5	2		170
Kanab Wash.	1.3									
Williams River.	10.1			5	2,015	6	39	8	2,590	20
Little Colorado River and tributaries.		2		2	1,000	1	1	2	1,000	30
Little Colorado River direct.		2								
Tributaries of Little Colorado River.				2	1,000	1	1	2	1,000	30
Gila River and tributaries.	90.4	298	14,044	774	965,338	527	19,091	767	890,248	45
Gila River direct.	1.3			78	78,531	80	2,382	84	92,581	34
San Francisco River.	1.4			4	225	12	70	13	6,110	19
San Pedro River.	5.1	183	6,195	25	11,474	27	285	29	12,949	30
Santa Cruz River.	35.0			365	576,234	241	8,073	366	528,649	44
Salt River and tributaries.	4.3	1		132	150,874	75	2,553	124	153,184	68
Salt River direct.	1.5			72	75,319	14	629	60	75,719	54
Tonto Creek.				1	500	2	25	2	1,500	16
Rio Verde.	1.8	1		3		11	96	11	1,070	63
Other tributaries of Salt River.	1.0			56	75,055	48	1,903	51	74,895	75
Agua Fria River.	34.3	1		114	120,685	41	4,749	100	68,575	47
Hasayampa River.	4.1			15	6,420	13	204	13	5,810	35
Other tributaries of Gila River.	4.9	163	8,849	41	20,895	38	675	38	22,390	48
Other tributaries of Colorado River.	3.1	53	18,872	8	1,175	9	99	9	3,333	32
Whitewater Draw and tributaries.	5.1	10	503	209	72,787	198	2,403	209	73,967	44
Great Basin Drainage.	945.5	1,861	165,497	1,431	461,393	1,173	27,361	1,270	1,236,708	46
Tributaries of Great Salt Lake.										
Bear River and tributaries.	108.9	432	42,248	68	16,067	144	10,490	175	701,160	37
Bear River direct.	23.3	171	12,635	57	11,567	104	3,016	111	118,285	40
Little Bear River.	7.7			2	902	29	2,208	32	80,025	37
Malad River.	2.0	29	3,025			4	50	4	3,740	18
Little Malad Creek.		57	7,468							
Other tributaries of Bear River.	13.6	83	1,923	55	10,685	71	758	75	34,520	42
Weber River and tributaries.	8.2	33	1,358	6	1,640	23	232	25	27,145	16
Weber River direct.	1.3	12	388			9	106	10	6,615	14
Ogden River.	1.8	9	320	1	230	1	7	1	230	33
Other tributaries of Weber River.	5.1	12	650	5	1,410	13	119	14	20,300	17
Jordan River and Utah Lake and tributaries.	77.4	248	28,255	5	2,830	17	7,242	39	555,730	33
Jordan River direct.	0.3	9	130			5	4,300	20	388,500	19
Spanish Fork River.	9.8	21	1,390							
Hobbs Creek.		18	766	1		1	6	1		14
Provo River.	1.2	61	11,716	1	830	1	20	1	900	45
American Fork River.	2.2	27	2,665	1	900	3	23	3	1,830	21
Big Cottonwood Creek.	2.0	9	92			1	1	1	500	25
Other tributaries of Jordan River and Utah Lake.	61.9	103	11,496	2	1,100	6	2,892	13	164,000	65
Independent streams.	836.6	1,409	123,249	1,363	445,326	1,029	16,871	1,095	535,546	48
Sevier River and tributaries.	9.0	258	38,863	8	178	8	117	10	18,318	30
Sevier River direct.	1.9	184	27,127			1		2	11,250	
San Pitch River.	3.4	16	3	1	150	1	5	1	450	4
Other Creek.		6	112							
Other tributaries of Sevier River.	3.7	52	11,621	2	28	6	112	7	6,618	35
Beaver River.	1.5	1		11	3,610	9	91	9	4,010	21
Coal Creek.	0.7	135	9,955	41	10,500	20	270	24	10,400	47
Grouse Creek.				1	265	1	6	3	265	240
Humboldt River and tributaries.	15.7	12	805	18	2,540	18	71	19	22,495	30
Humboldt River direct.	2.0	2		8	1,495	8	34	8	2,345	32
East Fork of Humboldt River.				1	25	1		1	25	12
North Fork of Humboldt River.	0.4			1		1		1		30
South Fork of Humboldt River.				1		1	8	1		12
Pine Creek.				1	100	1	5	1	100	
Reese River.		4	190	1	10	1	10	1	10	
Other tributaries of Humboldt River.	13.3	6	615	4	910	3	14	4	20,015	39
Truckee River and tributaries.	0.9			1	250	1	6	1	250	8
Truckee River direct.	0.7									
Tributaries of Truckee River.	0.2			1	250	1	6	1	250	8

IRRIGATION.

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TABLE 17.—IRRIGATION WORKS, CLASSIFIED BY DRAINAGE BASIN: 1920—Continued.

DRAINAGE BASIN.	Pipe lines, length (miles).	FLOWING WELLS.		PUMPED WELLS.		PUMPING PLANTS.				
		Number.	Capacity (gallons per minute).	Number.	Capacity (gallons per minute).	Number.	Engine capacity (horse-power).	Pumps.		Average lift (feet).
								Number.	Capacity (gallons per minute).	
Great Basin Drainage—Continued.										
Independent streams—Continued.										
Carson River and tributaries.....	4.6	3	22	1	50	12	134	13	1,650	12
Carson River direct.....	1.1			1	50	4	53	4	50	13
Tributaries of Carson River.....	3.5	3	22			8	81	9	1,600	11
Walker River and tributaries.....		26	242	71	5	2	2	2		10
Walker River direct.....		17	240	70	5	2	2	2		10
Tributaries of Walker River.....		9	2	1						
Duck Creek.....	0.1	2	704	6	2,285	5	56	8	2,465	20
Stapoe Creek.....				4	503	4	17	3	1,203	23
Long Valley Creek.....	2.1			1	450	3	24	4	1,130	17
Susan River.....	2.0			1	75	4	9	3	3,460	23
Mohave River.....	23.8	31	4,874	88	45,477	98	2,145	86	45,960	80
Owens River.....	383.5	23	537	9	4,088	12	137	12	4,558	24
San Jacinto River.....	145.0	9	115	236	66,833	183	3,546	203	76,386	73
Whitewater River.....	77.6	242	36,860	325	121,466	235	3,212	247	126,356	41
Quinn River.....				10	50	3	4	5		25
Deep Creek (Oregon).....		1				1	6	2	1,000	10
Donner and Blitzen River.....			10			1		1		16
Silver Creek.....		1	2	2	450	3	6	3	550	15
Silvies River.....				2	1,200	2	26	2	1,285	22
Other independent streams.....	180.2	664	30,170	532	185,021	416	6,976	434	213,775	40
Columbia River and tributaries.....	1,125.2	176	27,135	752	277,555	1,547	62,451	1,745	2,522,910	50
Columbia River direct.....	164.7	8	4,390	175	58,401	334	6,493	359	233,881	66
Kootenai River.....	3.6	2	30			1		1	5	10
Clark Fork and tributaries.....	27.8	11	3,333	3	80	27	283	27	12,447	32
Clark Fork direct.....	2.5									
Missoula River and tributaries.....	17.2	1	2,250	3	80	11	106	11	3,282	24
Missoula River direct.....	3.8			2		6	52	6	1,096	29
Hellgate River.....	3.2	1	2,250	1	80	2	10	2	130	29
Big Blackfoot River.....	0.4					1	16	1	650	12
Bitter Root River.....	3.4					1	12	1	1,406	7
Other tributaries of Missoula River.....	6.4					1	16	1		
Flathead River.....	8.1	10	1,083			16	177	16	9,165	37
Colville River.....	14.6			1	40	5	23	5	8,450	55
Spokane River and tributaries.....	163.5			47	58,504	89	4,468	104	118,684	77
Spokane River direct.....	132.7			47	58,504	83	3,476	93	68,643	79
Coeur d'Alene Lake and River.....	30.8					6	992	11	50,041	51
Okanogan River and tributaries.....	20.9			48	13,278	111	1,599	119	47,993	40
Okanogan River direct.....	14.9			44	12,428	97	930	104	38,258	40
Salmon Creek.....	0.6					5	607	6	7,385	58
Other tributaries of Okanogan River.....	5.4			4	850	9	62	9	2,350	26
Methow River.....	4.8	1		2	115	9	44	9	1,318	56
Entiat River.....	1.5					4	18	4	310	59
Wenatchee River.....	26.0			7	1,300	40	337	38	21,114	67
Crab Creek.....	34.9	3	60	111	36,285	137	2,321	147	66,270	65
Yakima River and tributaries.....	161.1	3	285	45	9,680	74	3,492	87	78,975	38
Yakima River direct.....	154.6	3	285	41	7,870	66	3,447	78	75,715	39
Wilson Creek.....	1.0									
Naches River.....	4.1			1	335	2	8	3	1,285	55
Ahtanum River.....				1	125	1	2	1	125	18
Other tributaries of Yakima River.....	1.4			2	1,350	5	35	5	1,850	18
Snake River and tributaries.....	261.6	105	9,887	130	40,957	362	39,327	469	1,661,834	30
Snake River direct.....	81.4	10	890	40	13,855	134	32,689	225	1,340,211	39
Henry's Fork.....	0.8									
Blackfoot River.....	1.1									
Port Neuf River.....	2.8					1	18	1		20
Salmon Falls River.....	0.1					1	6	1	440	15
Little Wood River.....	0.2	3	1,900			1	30	1	50	10
Big Wood River.....	7.0			1	2,500	1		1	4,000	19
Bruneau River.....	0.8	38	1,628			7	457	7	27,465	24
Owyhee River.....	2.5			3	285	61	1,318	61	80,303	28
Boise River.....	30.6	8	76	2	900	9	324	10	9,550	30
Malheur River.....	2.0			2	80	10	521	10	30,010	17
Payette River.....	5.2	1	36	3	9,000	11	608	13	18,258	28
Weiser River.....	15.1					3	620	3	31,100	76
Burnt River.....	1.0					3	24	3	965	17
Powder River.....	7.9	8	315	13	4,780	14	1,601	14	69,132	33
Imnaha River.....	0.1					4	23	4	500	40
Salmon River.....	1.9					2	38	2	10,875	56
Grande Ronde River.....	1.1			20	4,203	35	189	35	10,743	12
Clearwater River.....	35.9			28	2,750	33	394	36	9,945	21
Asotin Creek.....	48.0									
Pataha River.....	1.0			2	350	3	37	3	3,250	52
Palouse River.....	1.4	8	1,100			2	40	3	4,400	16
Other tributaries of Snake River.....	13.8	25	3,166	15	2,287	25	388	31	10,339	25

TABLE 17.—IRRIGATION WORKS, CLASSIFIED BY DRAINAGE BASIN: 1920—Continued.

DRAINAGE BASIN.	Pipe lines, length (miles).	FLOWING WELLS.		PUMPED WELLS.		PUMPING PLANTS.				
		Number.	Capacity (gallons per minute).	Number.	Capacity (gallons per minute).	Number.	Engine capacity (horse-power).	Pumps.		Average lift (feet).
								Number.	Capacity (gallons per minute).	
Columbia River and tributaries—Continued.										
Independent streams in Snake River Basin.....	2.4					9	326	9	96,250	8
Camas Creek.....	0.4					9	326	9	96,250	8
Medicine Lodge.....	1.9									
Little Lost River.....	0.1									
Big Lost River.....										
Walla Walla River.....	80.0	34	6,080	124	51,835	143	1,148	155	40,205	24
Klickitat River.....	2.9					5	26	5	3,870	28
White Salmon River.....	2.5			2	24	4	42	4	3,270	83
Umatilla River.....	14.3	2		6	171	13	115	13	4,246	34
Willow Creek.....	0.3					1	2	1	200	12
John Day River.....	5.7			6	475	45	413	47	41,280	25
Deschutes River.....	8.5			3	386	22	764	26	30,564	38
Head River.....	38.6	3	10	1	17	5	36	5	7,755	70
Willamette River.....	3.2			15	1,369	30	220	32	7,813	24
Other tributaries of Columbia River.....	82.2	4	3,080	26	4,638	77	954	79	40,061	88
Pacific Ocean streams, other than the Colorado and Columbia Rivers.....										
	6,147.0	978	239,189	24,311	10,203,529	20,841	372,600	23,378	16,414,755	41
Dungannon River.....										
McDowell Creek.....	1.0									
	3.1									
Rogue River and tributaries.....										
	20.5	3	10,000	23	11,409	102	723	111	38,147	26
Rogue River direct.....	7.1			11	6,904	44	347	44	10,597	30
Little Butte Creek.....	0.2					1	9	1		23
Bear River.....	0.3			9	1,133	28	120	36	8,138	23
Evans Creek.....	0.5					8	93	8	1,175	29
Applegate River.....	2.1					7	32	8	3,200	26
Illinois River.....	1.0			2	402	9	45	9	3,067	11
Other tributaries of Rogue River.....	2.7	3	10,000	1	3,000				5,970	25
Klamath River and tributaries.....										
	22.1	4	35	16	5,975	74	3,996	83	174,184	25
Klamath River direct.....	20.5	3		14	4,375	57	3,148	62	142,484	28
Lost River.....	0.5			2	1,600	14	786	16	21,100	22
Other tributaries of Klamath River.....	0.7	1	35			3	62	5	10,600	30
Russian River.....										
	27.2	1		89	30,234	128	1,058	128	51,239	23
Sacramento River and tributaries.....										
	361.2	36	2,987	3,508	1,473,602	3,430	64,183	3,898	4,184,240	26
Sacramento River direct.....	61.2			514	279,456	655	28,625	807	2,610,658	24
Pit River.....	2.9	14	693	4	395	36	440	36	32,886	18
Cow Creek.....	0.4					11	87	11	8,955	14
Cottonwood Creek.....	0.6					9	100	10	7,565	33
Battle Creek.....	0.3			2	750	3	63	4	3,300	25
Stony Creek.....	17.5			68	40,451	61	750	66	45,969	26
Feather River.....	117.3	9	1,284	845	341,583	728	8,425	828	394,677	22
Yuba River.....	6.2	2	30	8	2,725	9	1,572	11	2,751	35
Cache Creek.....	0.4			144	91,211	75	1,524	76	92,391	24
American River.....	77.8			163	83,664	172	2,358	190	95,838	26
Other tributaries of Sacramento River.....	76.6	11	950	1,780	623,337	1,671	20,210	1,859	883,260	30
San Joaquin River and tributaries.....										
	1,396.6	145	48,828	11,149	4,911,280	9,973	136,911	10,951	7,400,131	34
San Joaquin River direct.....	184.8	49	15,155	1,531	668,420	1,431	30,086	1,639	1,295,475	25
Kern River.....	83.1	17	13,850	441	219,674	334	6,676	495	223,606	47
Tulare Lake.....	261.9	24	8,253	1,100	434,565	906	12,841	1,089	1,330,434	59
Tule River.....	162.7	2	251	1,146	493,272	974	11,329	1,083	995,319	45
Kaweah River.....	299.7	3	17	2,136	842,085	1,734	21,932	1,930	876,254	41
Kings River.....	239.8	34	10,000	2,547	1,183,710	2,283	25,426	2,397	1,225,007	23
Fresno River.....	6.3	1	200	145	79,255	134	1,520	144	82,738	33
Merced River.....	5.2	1	75	216	120,465	213	2,774	235	157,865	21
Tachumna River.....	14.4	1	400	63	53,880	66	1,231	69	69,360	33
Stanislaus River.....	41.0			34	26,490	36	1,188	41	73,140	26
Calaveras River.....	29.4	6	220	585	186,181	544	4,358	585	200,337	26
Mokelumne River.....	82.2	2	25	709	356,156	694	8,309	765	451,434	33
Cosumnes River.....	5.5			117	60,870	111	1,788	131	84,740	28
Other tributaries of San Joaquin River.....	11.1	5	382	399	196,257	413	7,483	458	343,822	28
Tributaries of San Francisco Bay other than Sacramento and San Joaquin Rivers.....										
	264.6	74	13,075	2,451	705,510	1,897	36,219	2,102	862,987	55
Coyote Creek.....	60.2	14	3,450	821	246,463	657	12,407	725	312,320	50
Guadalupe River.....	99.3	51	7,700	725	242,912	512	13,480	572	278,221	67
Other tributaries.....	105.1	9	1,925	905	216,115	728	10,332	805	272,446	50
Pajaro River.....										
	83.2	17	2,000	688	186,255	370	7,083	417	203,845	35
Salinas River.....	106.6	18	3,808	697	422,195	239	10,085	286	424,002	25
Santa Maria River.....	28.9	13	2,700	118	66,393	62	2,934	78	204,534	47
Santa Ynez River.....	28.7	7	1,510	60	16,401	61	1,611	84	199,630	30
Santa Clara River.....	154.0	1	700	130	92,049	125	5,126	161	102,184	67
Los Angeles River.....	528.2	45	24,963	849	443,036	745	16,208	825	458,932	52
San Gabriel River.....	832.9	160	28,363	1,034	557,934	825	25,675	951	579,153	72
Santa Ana River.....	824.5	369	62,093	1,816	1,002,743	1,523	45,345	1,836	1,048,090	61
San Diego River.....	145.2	1	8	533	54,216	319	2,313	374	65,462	56
Other Pacific Ocean streams.....	1,155.5	93	37,549	1,144	224,207	968	13,150	1,093	417,995	59

IRRIGATION.

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CROPS.

TABLE 18.—ACREAGE, YIELD, AND VALUE OF PRINCIPAL CROPS GROWN ON IRRIGATED LAND, AND COMPARISONS WITH TOTALS FOR THE STATES INCLUDED: 1919 AND 1909.

[Totals for the states included, used in making comparisons, are reported in the state bulletins on agriculture.]

CROP.		AREA HARVESTED.				QUANTITY HARVESTED.							
		1919		1909		Per cent of in-crease. ¹	Unit.	1919		1909		Per cent of in-crease. ¹	
		Acres.	Per cent of total for states in-cluded.	Acres.	Per cent of total for states in-cluded.			Amount.	Per cent of total for states in-cluded.	Amount.	Per cent of total for states in-cluded.		
1	Cereals:												
2	Corn.....	263,312	1.2	133,560	0.5	97.1	Bu.....	7,525,354	1.6	3,168,973	0.6	137.5	
3	Oats.....	325,523	2.7	739,632	7.4	-56.0	Bu.....	9,361,125	2.9	27,213,262	9.8	-65.6	
4	Winter wheat.....	381,127	1.4	548,173	2.1	129.6	Bu.....	7,115,303	1.8	14,045,117	3.6	70.5	
5	Spring wheat.....	877,411	5.0				Bu.....	17,679,328	12.2				
6	Barley.....	280,287	6.9	239,928	5.4	16.8	Bu.....	7,202,430	9.8	6,985,841	7.2	3.1	
7	Rye.....	19,014	0.5	5,986	2.0	217.6	Bu.....	168,977	0.6	95,885	3.9	76.2	
8	Kafir, milo, etc.....	152,768	4.2	(²)			Bu.....	4,100,338	5.7	(²)			
9	Rough rice ³	892,701	99.7	(²)			Bu.....	35,032,275	99.9	(²)			
10	Other grains and seeds:												
11	Clover and alfalfa seed ⁴	39,431	25.0	31,948	28.1	23.4	Bu.....	161,587	48.7	104,610	39.9	54.5	
12	Dry beans, navy, etc.....	177,752	24.8	17,798	9.1	898.7	Bu.....	2,862,567	34.0	314,271	8.8	810.9	
13	Dry peas, Canada.....	51,464	33.0	18,422	20.2	179.4	Bu.....	637,660	38.0	254,219	32.0	156.7	
14	Hay and forage:												
15	Timothy alone.....	140,607	16.5	202,763	18.8	-30.7	Tons.....	178,112	18.7	349,920	23.8	-49.1	
16	Timothy and clover mixed.....	392,280	40.8	183,308	14.5	114.0	Tons.....	569,591	40.1	333,851	17.0	70.6	
17	Clover alone.....	40,879	17.7	20,001	10.4	104.4	Tons.....	63,465	17.6	46,472	14.9	38.6	
18	Alfalfa.....	3,151,675	42.2	2,216,628	50.1	42.2	Tons.....	8,430,766	51.6	6,524,498	58.3	29.2	
19	Other tame grasses.....	254,313	15.9	219,035	14.1	16.1	Tons.....	316,803	15.2	335,977	16.4	-5.7	
20	Wild, salt, or prairie grasses.....	1,034,507	7.8	1,530,669	11.7	32.4	Tons.....	951,245	8.7	1,627,804	12.5	-41.6	
21	Small grains cut for hay.....	291,607	7.0	208,634	7.4	39.8	Tons.....	372,739	9.5	305,060	8.4	22.2	
22	Annual legumes cut for hay.....	19,851	9.8	(²)			Tons.....	28,334	11.4	(²)			
23	Silage crops.....	56,424	9.2	(²)			Tons.....	388,830	13.3	(²)			
24	Corn cut for forage.....	36,689	1.6	(²)			Tons.....	87,389	2.5	(²)			
25	Kafir, sorghum, etc., for forage.....	51,981	1.2	(²)			Tons.....	106,035	1.5	(²)			
26	Root crops for forage.....	2,631	9.4	(²)			Tons.....	19,543	6.5	(²)			
27	Vegetables:												
28	Potatoes.....	154,194	23.0	148,712	21.2	3.7	Bu.....	22,978,730	40.7	22,267,845	30.3	3.2	
29	Cantaloupes and muskmelons.....	20,874	60.3	(²)									
30	Tomatoes.....	20,649	41.6	(²)									
31	Orchard fruits:												
32	Grapes.....	573,675,084	46.7	(²)			Lbs.....	1,131,270,429	54.4	(²)			
33	Apples.....	9,085,320	35.2	(²)			Bu.....	22,406,306	44.0	(²)			
34	Peaches.....	7,062,692	35.6	(²)			Bu.....	13,224,500	47.2	(²)			
35	Pears.....	1,849,420	35.9	(²)			Bu.....	3,479,806	43.2	(²)			
36	Plums and prunes.....	4,306,976	29.7	(²)			Bu.....	7,074,240	40.9	(²)			
37	Cherries.....	607,907	22.5	(²)			Bu.....	578,354	29.0	(²)			
38	Subtropical fruits:												
39	Oranges.....	8,711,152	84.1	(²)			Boxes.....	18,774,366	86.4	(²)			
40	Lemons.....	2,299,716	79.6	(²)			Boxes.....	5,776,149	88.1	(²)			
41	Miscellaneous:												
42	Sugar beets grown for sugar.....	377,655	81.0	174,071	68.0	117.0	Tons.....	3,567,522	82.8	2,074,301	70.5	72.0	
43	Cotton.....	214,576	1.5	(²)			Bales.....	113,862	2.8	(²)			

¹ A minus sign (-) denotes decrease.

² Not reported separately in 1909.

³ Quantity harvested and value given for irrigated land were not tabulated separately. The totals given include small amounts representing rice grown without irrigation.

⁴ Not including red clover seed.

⁵ Number of vines of bearing age.

⁶ Number of trees of bearing age.

AGRICULTURE.

CROPS.

TABLE 18.—ACREAGE, YIELD, AND VALUE OF PRINCIPAL CROPS GROWN ON IRRIGATED LAND, AND COMPARISONS WITH TOTALS FOR THE STATES INCLUDED: 1919 AND 1909—Continued.

[Totals for the states included, used in making comparisons, are reported in the state bulletins on agriculture.]

CROP.		AVERAGE YIELD PER ACRE, 1919.						VALUE.					
		Unit.	For states included.	On nonirrigated land.	On irrigated land.			1919		1909		Per cent of increase. ¹	
					Average.	Per cent of average for states included.	Per cent of average on non-irrigated land.	Amount.	Per cent of total for states included.	Amount.	Per cent of total for states included.		
1	Cereals:												
2	Corn.....	Bu.....	21.9	21.8	28.6	130.6	131.2	\$11,692,813	1.8	\$2,421,420	0.8	383.1	
3	Oats.....	Bu.....	26.5	26.5	28.8	108.7	108.7	9,534,495	3.7	14,055,424	12.4	-32.2	
4	Winter wheat.....	Bu.....	14.1	14.1	18.7	132.6	132.6	15,269,840	1.8				
	Spring wheat.....	Bu.....	8.2	7.6	20.1	245.1	204.5	37,556,853	11.4	12,839,582	3.5	311.4	
5	Barley.....	Bu.....	17.9	17.3	25.7	143.6	148.6	10,775,076	11.2	4,395,928	8.4	145.1	
6	Rye.....	Bu.....	7.4	7.4	8.9	120.3	120.3	295,967	0.7	70,065	4.4	322.4	
7	Kafir, milo, etc.....	Bu.....	19.9	19.6	26.8	134.7	136.7	6,725,581	7.5	(²)			
8	Rough rice.....	Bu.....	39.2	4.1	39.2	100.0	956.0	96,368,090	99.9	(²)			
9	Other grains and seeds:												
10	Clover and alfalfa seed.....	Bu.....	21.0	1.4	4.1	19.5	292.9	3,461,762	46.8	765,775	37.5	352.1	
11	Dry beans, navy, etc.....	Bu.....	11.8	10.3	16.1	136.4	150.3	12,986,298	34.6	570,193	8.3		
	Dry peas, Canada.....	Bu.....	10.8	10.0	12.4	114.8	124.0	2,042,455	36.6	358,568	29.3	409.6	
12	Hay and forage:												
13	Timothy alone.....	Tons.....	1.12	1.09	1.27	113.4	116.5	4,582,905	23.0	3,210,820	26.2	42.7	
14	Timothy and clover mixed.....	Tons.....	1.48	1.50	1.45	98.0	96.7	13,782,635	42.5	3,071,935	18.8	348.7	
15	Clover alone.....	Tons.....	1.56	1.56	1.55	99.4	99.4	1,334,600	18.8	381,763	14.0	240.6	
	Alfalfa.....	Tons.....	2.19	1.84	2.68	122.4	145.7	186,391,209	54.0	50,850,633	59.6	266.5	
16	Other tame grasses.....	Tons.....	1.31	1.32	1.25	95.4	94.7	6,473,377	17.4	2,564,966	17.5	152.4	
17	Wild, salt, or prairie grasses.....	Tons.....	0.83	0.82	0.92	110.8	112.2	17,954,630	11.2	11,734,258	18.4	53.0	
18	Small grains cut for hay.....	Tons.....	0.95	0.92	1.28	134.7	139.1	8,448,901	9.8	2,983,171	7.2	183.2	
19	Annual legumes cut for hay.....	Tons.....	1.22	1.20	1.43	117.2	119.2	494,052	10.1	(²)			
20	Silage crops.....	Tons.....	4.75	4.54	6.89	145.1	151.8	3,831,525	14.6	(²)			
21	Corn cut for forage.....	Tons.....	1.52	1.51	2.38	156.6	157.6	1,121,730	2.8	(²)			
22	Kafir, sorghum, etc., for forage.....	Tons.....	1.09	1.68	2.04	120.7	121.4	1,614,325	1.6	(²)			
23	Root crops for forage.....	Tons.....	10.77	11.11	7.43	69.0	68.9	340,329	6.7	(²)			
24	Vegetables:												
25	Potatoes.....	Bu.....	84.3	64.9	149.0	176.7	229.6	50,778,993	40.3	8,965,658	27.1	466.4	
26	Cantaloupes and muskmelons.....							5,853,037	66.6	(²)			
	Tomatoes.....							2,701,968	30.1	(²)			
27	Orchard fruits:												
28	Grapes.....	Lbs.....	^b 13.2	^c 11.3	^d 15.4	116.7	136.3	36,304,252	53.8	(²)			
29	Apples.....	Bu.....	^e 2.0	^f 1.7	^g 2.5	125.0	147.1	24,566,584	28.6	(²)			
	Peaches.....	Bu.....	^h 1.4	ⁱ 1.2	^j 1.9	135.7	158.3	24,670,264	49.2	(²)			
30	Pears.....	Bu.....	^k 1.6	^l 1.4	^m 1.9	118.8	135.7	4,695,848	32.9	(²)			
31	Plums and prunes.....	Bu.....	ⁿ 1.2	^o 1.0	^p 1.6	133.3	160.0	15,188,490	41.1	(²)			
32	Cherries.....	Bu.....	^q 0.7	^r 0.6	^s 0.9	128.6	150.0	2,139,891	29.4	(²)			
33	Subtropical fruits:												
34	Oranges.....	Boxes.....	^t 2.1	^u 1.8	^v 2.2	104.8	122.2	58,244,422	86.4	(²)			
	Lemons.....	Boxes.....	^w 2.3	^x 1.3	^y 2.5	108.7	192.3	16,750,832	88.1	(²)			
35	Miscellaneous:												
36	Sugar beets grown for sugar.....	Tons.....	9.24	8.38	9.45	102.3	112.8	38,831,339	82.2	10,042,721	69.8	286.7	
	Cotton.....	Bales.....	0.28	0.28	0.53	189.3	189.3	30,457,881	4.3	(²)			

¹ A minus sign (-) denotes decrease. Per cent not shown when more than 1,000.² Not reported separately in 1909.³ Quantity harvested and value given for irrigated land were not tabulated separately. The totals given include small amounts representing rice grown without irrigation.⁴ Not including red clover seed.⁵ Yield per vine.⁶ Yield per tree.

IRRIGATION.

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STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES.

ARIZONA.

THE STATE.	PRINCIPAL CROPS.											
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Kafir and milo.	Alfalfa.	Other tame grasses.	Annual legumes cut for hay.	Small grains cut for hay.	Wild, salt, or prairie grasses.	Silage crops.
	8,612	4,448	28,895	3,250	19,811	20,316	97,094	5,108	792	10,424	1,050	5,634
	1205,909	1130,227	1682,332	186,378	1600,52	1609,333	2323,052	29,655	11,081	214,457	21,096	236,130
	401,523	150,661	1,609,304	152,609	871,090	914,000	7,914,774	181,545	21,620	339,740	15,344	343,235
	ACRES HARVESTED.											
	COUNTIES.											
	Apache.....	552	1,907	134	430	234	2,736	245	400	261		
	Cochise.....	1,010	36	128		167	741	2,563	401	159	507	2
	Cocconino.....	52	32					476	2		24	
	Gila.....	148	1	23		2	5	202			140	
	Graham.....	1,470	96	6,306		3,845	61	11,930	67		286	
Greenlee.....	1,286	386	208	139	223	30	1,607	128	20	144	8	
Maricopa.....	1,481	1,192	15,123	1,767	12,121	15,515	57,360	2,957	146	2,430	124	
Mohave.....	47		22	42	55		460	55		93		
Navajo.....	310	494	24	273	6	5	1,765	112		257	147	
Pima.....	510		325		57	208	1,586	267	180	2,112		
Pinal.....	425	2	6,107	115	2,419	1,204	6,339	141	228	1,950		
Santa Cruz.....	199				3		181	207	8	1,006		
Yavapai.....	1,050	291	13	119	395	313	3,140	290	3	770	486	
Yuma.....	72	11	482	365	284	2,234	6,749	176	48	305	22	

	PRINCIPAL CROPS.											
	Corn cut for forage.	Kafir, sorghum, etc., for forage.	Cantaloupes and muskmelons.	Watermelons.	Potatoes.	Clover and alfalfa seed.	Dry beans.	Cotton.	Grapes.	Apples.	Peaches.	Oranges.
THE STATE.												
Acres harvested.....	3, 074	12, 245	3, 123	807	1, 011	4, 217	1, 295	101, 080	*14, 072	430, 749	432, 880	432, 106
Production.....	27, 461	223, 183	128, 193	137, 371	93, 428	592, 053	19, 878	56, 567	*139, 690	154, 643	149, 942	748, 764
Value.....dollars..	82, 071	347, 745	428, 855	80, 501			46, 417	19, 176, 213	8, 381	131, 143	127, 352	195, 056
ACRES HARVESTED.												
COUNTIES.												
Apache.....	216	99	46	60	40		81			620	139	
Cochise.....	226	2, 979	37	105	84		406		2, 538	2, 645	4, 720	
Cocconino.....	183		1	26	406		1			770	488	
Gila.....	26	25		2			5			16	389	592
Graham.....	74	113	4	20	16		45	469	188	4, 740	1, 051	
Greenlee.....	79	121	11	20	24		59		404	1, 579	1, 981	
Maricopa.....	1, 482	5, 092	2, 846	402	87	1, 231	52	72, 296	9, 910	5, 928	13, 092	32, 152
Mohave.....	48	57			2		3			527	441	
Navajo.....	191	45	2	6	64	18	12			175	20	
Pima.....	265	462	8	66	21	200	242	755	274	178	4, 862	
Pinal.....		1, 743	167	32	5		59	1, 321		4, 950	2, 071	20
Santa Cruz.....	28	295					260					
Yavapai.....	225	198		16	261		60		108	8, 217	3, 016	
Yuma.....	31	1, 016	1	51	1	2, 768	10	26, 239	634	25	407	24

¹ Bushels.

² Tons.

³ Number of vines.

⁴ Number of trees.

⁵ Bales.

⁶ Pounds.

⁷ Boxes.

CALIFORNIA.

	PRINCIPAL CROPS.												
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Kafir, milo, etc.	Rough rice.	Clover and alfalfa seed.	Dry beans.	Dry peas.	Sugar-beet seed.	Flower and vegetable seeds.
THE STATE.													
Acres harvested.....	56,958	9,359	85,245	48,330	128,812	2,546	124,092	130,367	2,319	148,379	1,504	503	3,234
Production.....	1,964,828	260,878	1,636,503	1,717,549	13,299,308	29,294	13,253,711	16,920,813	19,702	12,459,350	124,850	138,000	2,056,610
Value.....dollars..	3,340,208	266,878	3,583,942	1,571,432	5,278,893	54,194	5,531,809	20,432,027	203,742	11,558,944	88,218	96,600	2,056,610
ACRES HARVESTED.													
COUNTIES.													
Alameda.....	6		184		10					10			
Alpine.....		21											
Amador.....	4												
Butte.....	113	377	1,464	109	991		107	24,007		1,263	48		
Calaveras.....	32		5	1	5		21			27			

¹ Bushels.

² Pounds.

AGRICULTURE.

STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

CALIFORNIA—Continued.

	ACRES HARVESTED.												
COUNTIES—continued.	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Kafir, milo, etc.	Rough rice.	Clover and alfalfa seed.	Dry beans.	Dry peas.	Sugar-beet seed.	Flower and vegetable seeds.
Colusa.....	944	—	331	—	431	—	199	44,842	20	110	—	—	20
Contra Costa.....	6,117	76	119	—	1,390	—	—	—	15	4,936	—	—	—
Eldorado.....	17	—	1	—	—	—	1	—	—	1	—	—	—
Fresno.....	2,148	298	6,600	1,657	15,763	15	4,107	60	282	118	2	—	—
Glenn.....	219	30	789	33	4,373	20	1,966	38,803	—	—	—	—	—
Humboldt.....	13	—	—	1	10	—	—	—	429	2	1	—	—
Imperial.....	2,682	338	18,370	6,296	17,221	20	62,392	—	36	14	—	—	—
Inyo.....	1,499	173	242	800	159	—	—	—	138	96	—	—	1
Kern.....	1,999	494	8,816	10,907	10,051	12	11,842	708	57	—	—	—	—
Kings.....	1,960	237	12,576	15,621	10,535	525	5,132	—	—	—	—	—	—
LaSalle.....	—	637	1,304	3,434	474	197	—	—	283	—	—	—	—
Los Angeles.....	2,908	185	682	275	1,259	20	1,490	—	48	24,620	4	—	11
Madera.....	509	15	238	—	2,151	8	1,650	275	—	140	—	—	—
Mendocino.....	—	—	—	—	9	—	—	—	10	3,238	5	—	—
Merced.....	1,529	176	1,068	299	6,540	276	3,356	437	—	—	—	—	—
Modoc.....	3	89	1,530	1,291	780	449	—	—	147	5	—	—	—
Mono.....	4	30	1	52	70	—	—	—	—	2,981	121	503	—
Monterey.....	8	10	1,450	1,793	1,928	—	—	—	—	—	—	—	—
Napa.....	25	22	27	—	48	—	—	—	—	3	—	—	—
Nevada.....	29	2	—	—	—	2	8	—	—	—	—	—	—
Orange.....	964	147	—	—	260	—	26	—	—	11,020	194	—	30
Piacer.....	—	—	6	—	2	—	13	395	—	—	—	—	—
Plumas.....	—	430	158	375	5	280	—	—	—	—	—	—	—
Riverside.....	721	43	962	68	3,748	4	3,834	7	355	400	70	—	8
Sacramento.....	1,082	262	1,645	62	2,718	—	168	100	7	7,285	352	—	776
San Benito.....	9	—	70	80	133	—	—	—	—	—	—	—	319
San Bernardino.....	760	155	201	—	3,412	13	2,086	—	20	260	214	—	—
San Diego.....	337	29	47	174	35	4	116	—	—	1,170	2	—	—
San Joaquin.....	24,473	232	2,538	800	18,217	164	2,355	45	—	15,597	—	—	1,391
San Luis Obispo.....	32	—	100	—	205	5	—	—	—	63	—	—	35
San Mateo.....	—	29	1	20	23	—	—	—	—	—	—	—	—
Santa Barbara.....	2	—	—	—	40	—	—	—	—	373	—	—	419
Santa Clara.....	496	6	30	—	1,039	—	—	—	—	1,271	—	—	110
Santa Cruz.....	2	—	—	—	—	—	—	—	—	5	—	—	—
Shasta.....	177	18	318	72	169	5	27	257	—	73	3	—	—
Sierra.....	—	125	—	37	25	10	—	—	—	—	—	—	—
Siskiyou.....	108	580	395	1,381	727	1	—	—	50	27	—	—	—
Solano.....	1,146	473	130	257	644	—	—	113	—	2,311	200	—	—
Sonoma.....	5	11	—	—	—	—	—	—	—	13	—	—	—
Stanislaus.....	1,574	2,882	8,501	221	942	348	11,030	1,246	187	15,506	55	—	24
Sutter.....	212	208	349	173	3,166	20	390	7,112	38	852	186	—	—
Tehama.....	32	98	4,555	67	5,456	—	692	150	5	308	3	—	—
Trinity.....	43	26	20	38	8	—	—	—	—	18	2	—	—
Tulare.....	1,720	325	8,561	1,665	9,513	148	10,498	22	20	110	—	—	2
Tuolumne.....	22	4	5	4	—	—	—	—	—	8	—	—	—
Ventura.....	25	—	—	—	30	—	20	—	—	52,628	42	—	—
Yolo.....	133	30	719	307	2,731	—	—	9,611	202	1,158	—	—	88
Yuba.....	161	13	122	—	366	—	536	2,277	—	330	—	—	—

PRINCIPAL CROPS.

THE STATE.	Timothy alone.	Timothy and clover mixed.	Clover alone.	Alfalfa.	Other tame grasses.	Annual legumes cut for hay.	Small grains cut for hay.	Wild, salt, or prairie grasses.	Silage crops.	Corn cut for forage.	Kafir, sorghum, etc., for forage.	Root crops for forage.	Potatoes.
Acres harvested.....	2,919	38,786	4,882	556,656	15,863	3,055	145,337	85,603	10,244	5,069	7,418	634	29,698
Production.....	14,966	54,806	16,396	1,967,529	22,676	13,726	1,190,432	1,967,222	1,119,291	12,946	14,667	15,712	4,502,597
Value..... dollars.....	93,784	1,013,911	118,326	44,260,402	396,830	74,520	4,686,652	1,354,108	1,133,264	181,244	220,005	94,248	10,355,973

ACRES HARVESTED.

COUNTIES.	Alameda.	Alpine.	Amador.	Butte.	Calaveras.	Colusa.	Contra Costa.	Eldorado.	Fresno.	Glenn.	Alameda.	Alpine.	Amador.	Butte.	Calaveras.	Colusa.	Contra Costa.	Eldorado.	Fresno.	Glenn.
Alameda.....	—	25	—	—	—	—	—	—	—	—	146	372	5	—	—	—	—	—	—	—
Alpine.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Amador.....	—	—	—	—	—	—	—	—	—	—	20	—	—	—	—	—	—	—	—	—
Butte.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Calaveras.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Colusa.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Contra Costa.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Eldorado.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fresno.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Glenn.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Tons.

* Bushels.

IRRIGATION.

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STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

CALIFORNIA—Continued.

COUNTIES—continued.	ACRES HARVESTED.												
	Timothy alone.	Timothy and clover mixed.	Clover alone.	Alfalfa.	Other tame grasses.	Annual legumes cut for hay.	Small grains cut for hay.	Wild, salt, or prairie grasses.	Silage crops.	Corn cut for forage.	Kafir, sorghum, etc., for forage.	Root crops for forage.	Potatoes.
Humboldt.....		4		146	44		36		17			7	
Imperial.....	45		170	48,053	377	281	6,931	20	1,222	949	1,951		6
Inyo.....	143	718	150	6,944	263	2	91	777	409	20	110		124
Kern.....			12	28,461	197	72	8,645	41	694	190	697		521
Kings.....			79	24,911	77	5	6,594		461	270	2		17
Lake.....		65		151			17					1	12
Lassen.....	135	2,152	2,610	10,553	190		987	22,780	50			8	
Los Angeles.....	4	4	95	21,774	284	353	15,953	54	2,359	1,132	526	297	7,594
Madera.....				10,850	37	28	2,066		34	82	192		46
Marin.....							10						
Mendocino.....				976	51		40	15				1	2
Merced.....				68,102	113	147	5,234	4,441	1,625	142	163	2	231
Modoc.....	516	19,484	129	8,429	2,552	57	1,068	28,855					72
Mono.....	60	840	181	1,461			52	493		7			
Monterey.....				14,775	12	5	2,779			3	4	23	
Napa.....				369			194		28				10
Nevada.....	2	122	229	468	533		84	131	25	73	14	4	83
Orange.....	5		32	2,553	135	192	7,771	36	217	93	55	24	174
Placer.....		10	32	514	11	2	674	7		3	3	1	7
Plumas.....	130	3,315	75	591	265		163	5,484				1	54
Riverside.....	8	70	2	15,430	202	39	10,080	1	462	348	1,116	45	261
Sacramento.....			1	7,431	55	49	3,269	35	164	70	25	11	848
San Benito.....			17	3,423			867	41	80			72	
San Bernardino.....	86			10,325	728	149	7,706		1,184	280	254	3	990
San Diego.....			2	3,583	56	787	2,620	2	452	109	21	31	207
San Joaquin.....		44	1	30,655	77	145	6,596	496	403	44	102	2	11,089
San Luis Obispo.....				2,759		5	191		22	28			17
San Mateo.....				259			846						257
Santa Barbara.....				1,670		4	678		160				16
Santa Clara.....	34	1	61	6,773	301	56	4,211	1	259	23		51	162
Santa Cruz.....				208			53		4			1	8
Shasta.....	541	3,851	132	4,956	2,008	90	837	7,836	85	82	42	21	121
Sierra.....		830	36	563	318		158	6,358					20
Siskiyou.....	599	5,660	110	16,837	4,637		2,308	6,418	16	19		2	155
Solano.....				6,479	5		344				8		76
Sonoma.....				318		1	2						
Stanislaus.....	70	50	12	55,732	298		9,120	49	1,820	120	178	6	142
Sutter.....		25	27	3,118	60	16	1,374		94	8	4	2	1
Tehama.....		119	9	3,773	338	61	2,330	24	19	25	106		25
Trinity.....	177	850	45	1,847	85	2	373	82		9		3	58
Tulare.....		5		40,046	215	10	9,892	140	1,287	477	986	6	78
Tuolumne.....	15		37	384	11		148	78		9			34
Ventura.....				1,846		17	1,320		17		5	2	
Yolo.....			28	6,769	89		1,272		131	80	44	3	
Yuba.....	35	47	212	816	158	25	1,237	178		73	32	1	24

THE STATE.	PRINCIPAL CROPS.										
	Sweet potatoes and yams.	Cabbages.	Cantaloupes and muskmelons.	Celery.	Cucumbers.	Beans (green).	Peas (green).	Lettuce.	Onions.	Corn (sweet).	Potatoes.
Acres harvested.....	5,858	3,279	13,800	2,605	477	1,564	2,258	4,266	5,801	2,219	16,997
Production..... bushels..	659,734										
Value..... dollars..	1,517,388	547,205	2,763,155	721,521	87,701	202,953	387,079	1,190,363	2,009,151	197,015	2,121,514

COUNTIES.	ACRES HARVESTED.										
	Sweet potatoes and yams.	Cabbages.	Cantaloupes and muskmelons.	Celery.	Cucumbers.	Beans (green).	Peas (green).	Lettuce.	Onions.	Corn (sweet).	Potatoes.
Alameda.....		4		3	16	5	5	4	5	149	577
Amador.....	1	1	1			1			1	3	3
Butte.....	3	5	4	5	2	5		2	3	13	22
Calaveras.....		4	1	1	2	5	4	2	6	5	3
Colusa.....		1					1				
Contra Costa.....		1		1,014	2	1		3	263	1	113
Eldorado.....	2		1			3				1	1
Fresno.....	43	4	25	3	8	17	1	6	11	3	65
Glenn.....		2	21						1	3	6
Humboldt.....				1		1		1	1	1	
Imperial.....	7	2	5,734		10		285	1,230	20	8	216
Inyo.....			2				1		1	6	
Kern.....	27	21	179	10	19	12	11	12	21	54	131
Kings.....	13	2	5		62	3	2	1	6	1	4
Los Angeles.....	1,035	1,931	1,375	335	215	753	671	2,603	196	1,361	5,277

AGRICULTURE.

STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

CALIFORNIA—Continued.

COUNTIES—continued.	ACRES HARVESTED.										
	Sweet potatoes and yams.	Cabbages.	Canta- loupes and musk- melons.	Celery.	Cucum- bers.	Beans (green).	Peas (green).	Lettuce.	Onions.	Corn (sweet).	Tomatoes.
Madera.....	2		354							9	
Marin.....		3		1		2	3	5	2	6	2
Mendocino.....								1	1		
Merced.....	2,710	1	435	1			1	1	9	1	32
Monterey.....		14		2	1	1		33	6	4	2
Nevada.....		1	2							7	4
Orange.....	300	429	22	104	27	74	77	20	8	55	1,099
Piacer.....			1						1	1	17
Pumas.....		1									
Riverside.....	110	9	68		2	24	10	2	694	16	942
Sacramento.....	4	69	16	143	10	26	26	102	44	80	473
San Benito.....		1				1		1	1	1	467
San Bernardino.....	190	45	30	2	1	4	5	6	14	50	453
San Diego.....	133	84	85	22	45	279	527	71	13	128	339
San Joaquin.....		50	246	880	9	43	5	15	4,285	27	368
San Luis Obispo.....		7	2	1	1	2	2	6	2	6	4
San Mateo.....		221		6	2	62	247	36	21	47	277
Santa Barbara.....	6		2			3	15		16		1
Santa Clara.....		23	11	52	17	189	45	26	85	88	4,548
Santa Cruz.....		3	1	2		1	2	2	1	5	5
Shasta.....	6	1	5	1	2	4			1	7	3
Sierra.....		1									
Sierraville.....		1				1					
Solano.....		164	6	1	1	3	2	3	5	17	185
Sonoma.....		10	1	1	1	5	2	14	7	12	94
Stanislaus.....	1,234	49	5,120	3	3	8	290	5	58	10	353
Sutter.....	5	6	5	2	1	4	4	8	3	3	18
Tehama.....			6			2				2	3
Trinity.....		1	1							1	
Tulare.....	27	8	20	5	2	7	3	2	4	9	16
Tuolumne.....		3	4		1	4	1	1	2	10	5
Ventura.....		88	2	1	11	2	5		4	4	58
Yolo.....		5	5	1	4	7	3	41	8	4	839
Yuba.....		2	2	1			1	2	1	2	6

PRINCIPAL CROPS.											
</											

Tons.

Bales.

Pounds.

Quarts.

IRRIGATION.

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STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

CALIFORNIA—Continued.

COUNTIES—continued.	ACRES HARVESTED.										
	Water-melons.	Asparagus.	Cauliflower.	Peppers (green.).	Pumpkins.	Spinach.	Sugar beets grown for sugar.	Cotton.	Broom corn.	Hops.	Strawberries.
San Joaquin.....	147	62	7	32	167	91			5		
San Luis Obispo.....		1	1				1,663				1
San Mateo.....	2		230	3		6					
Santa Barbara.....	1		1				3,209				5
Santa Clara.....	2	1	19	2	5	50	95				171
Santa Cruz.....											21
Shasta.....	9			1	1						14
Siskiyou.....											1
Solano.....		1,553									
Sonoma.....			13			50					
Stanislaus.....	1,537	1		1	51		86	2	4		
Sutter.....	2		1		10		880				
Tehama.....	1										
Trinity.....	1										2
Tulare.....	26			1	24			9	21		1
Tuolumne.....	1										10
Ventura.....	3	1					1,365				
Yolo.....	4		4	1		17	120			348	
Yuba.....	1									749	

THE STATE.	PRINCIPAL CROPS.									
	Grapes.	Apples.	Peaches.	Pears.	Plums and prunes.	Cherries.	Apricots.	Quinces.	Oranges.	Lemons.
Acres harvested.....	¹ 73,217,234	² 804,683	² 5,662,250	¹ 1,017,060	² 3,841,678	² 284,560	² 1,630,763	² 12,403	² 8,678,956	² 2,299,716
Production.....	¹ 1,128,175,200	¹ 1,335,057	¹ 10,318,362	¹ 1,783,951	¹ 6,542,548	¹ 326,449	¹ 2,608,136	¹ 18,315	¹ 18,725,002	¹ 5,776,149
Value.....dollars..	36,101,608	2,069,338	19,088,970	3,211,112	14,066,478	1,305,796	5,216,272	36,630	58,049,366	10,760,832

COUNTIES.	ACRES HARVESTED.									
	Grapes.	Apples.	Peaches.	Pears.	Plums and prunes.	Cherries.	Apricots.	Quinces.	Oranges.	Lemons.
Alameda.....		2	402	756	7,455	6,171	14,072			
Amador.....	8,000	251	1,544	112	1,067	53				
Butte.....	5,017	3,521	95,888		52,565			7	67,244	1,959
Calaveras.....	10,887	3,812	1,970	592	629	103	644		20	7
Colusa.....		11	32	16	2,703				18	
Contra Costa.....	65	95	8,568	15,257	9,519	2,363	18		32	2
Eldorado.....		12,878	40,329	91,627	31,666	961	12	6	25	
Fresno.....	51,883,387	54,755	1,713,499	11,288	94,141	405	138,822	594	114,431	13,579
Gleann.....	4,804	1,175	6,254	955	14,491	304	3,928	9	10,369	815
Humboldt.....	186	283	230	72	110	79				
Imperial.....	65,697	129	430	466	124	73	1,030	21	1,635	299
Inyo.....	2,522	16,188	5,892	3,277	414	212				
Kern.....	250,457	9,700	21,257	40,811	18,480	691	10,737	58	50,806	958
Kings.....	931,528	4,184	217,009	4,624	34,137	90	58,337		24	6
Lake.....		100	30		300					
Lassen.....		373	84	24	36	8				
Los Angeles.....	92,872	95,854	209,330	173,433	38,699	8,385	72,941	1,735	2,209,046	753,104
Madera.....	2,180,823	1,466	93,962	850	2,535	29	13,441	18	142	14
Marin.....		124	42	112	29					
Mendocino.....		638	110	1,532	625	9				
Merced.....		1,192	173,483	4,014	5,447	101	6,456	425	2,371	109
Modoc.....	831,821	4,647	797	262	333	343				
Mono.....		587	47	55	43	28				
Monterey.....		28,002	1,577	2,908	5,922	196	8,596		5	8
Napa.....	10	3,512	770	3,107	31,755	3,223	1			
Nevada.....	20	5,881	6,132		3,501			8	284	8
Orange.....	12,166	17,484	16,081	2,830	4,006	19	46,016	33	1,275,248	437,370
Placer.....	248,033	26,281	653,654	176,181	608,301	38,324	431	5,922	16,971	414
Riverside.....	102,337	80,135	152,693	28,765	43,712	10,697	283,247	35	929,624	309,867
Sacramento.....	3,931,111	7,958	107,356	175,678	132,710	19,746	2,361	260	22,456	1,529
San Benito.....	1,055	4,088	23,213	15,391	79,448	7,589	60,365		13	2
San Bernardino.....	1,470,497	240,167	424,579	17,998	8,441	6,729	102,422	24	2,236,541	286,140
San Diego.....	175,257	3,750	48,825	4,413	2,984	737	6,611	46	65,537	200,994
San Joaquin.....	4,889,665	4,481	232,342	13,537	71,804	55,145	13,899	2,221	1,971	39
San Luis Obispo.....		1,945	629	771	161	132	55	1	38	626
San Mateo.....		111	20	29	40	25				
Santa Barbara.....		243	84	25	17	11	18		2,648	49,908
Santa Clara.....	105,160	55,651	158,574	175,242	1,884,152	91,996	624,078	854	1,379	379
Santa Cruz.....				8	44					1
Shasta.....	5,397	14,550	34,883	2,376	19,073	324	200	8	87	1

¹ Number of vines of bearing age.

² Number of trees of bearing age.

³ Pounds.

⁴ Bushels.

⁵ Boxes.

AGRICULTURE.

STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

CALIFORNIA—Continued.

COUNTIES—Continued.	ACRES HARVESTED.									
	Grapes.	Apples.	Peaches.	Pears.	Plums and prunes.	Cherries.	Apricots.	Quinces.	Oranges.	Lemons.
Imperial		65		15		7				
Siskiyou	15	7,417	2,171	551	1,068	519	14			
Solano		59	26,478	1,965	4,971	8,800	19,431			
Sonoma				1,783	37,531	85				
Stanislaus	530,310	5,887	197,535	3,787	6,491	5,567	18,943	25	3,435	
Butter	1,184,095	5,838	430,201	9,504	121,455	2,648	2,157	16	1,307	
Tehama		9,764	58,820	12,593	38,881	957	1,616		505	
Trinity	110	842	250	142	328	70	1			
Tulare	4,238,152	42,795	455,902	9,306	385,687	4,071	28,374	74	1,564,276	73,302
Tuolumne	38,920	23,024	7,111	1,109	532	174	24	2	11	
Ventura		1,184	2,872	178	117	14	57,342	1	99,126	168,111
Yolo	16,798	167	15,868	3,176	27,752	6,347	25,069		261	15
Yuba		977	12,030	3,163	5,206	45	54		68	17

THE STATE.	PRINCIPAL CROPS.									
	Grapefruit (pomelos).	Figs.	Alligator pears (avocados).	Dates.	Olive.	Japanese persimmons.	Pomegranates.	Almonds.	Walnuts (Persian or English).	
Acres harvested	1 193,819	1 246,884	1 10,674	1 14,406	1 536,543	1 5,510	1 14,710	1 464,071	1 618,372	
Production	2 393,623	2 10,674,552	2 47,294	2 118,311	2 12,264,764	2 9,500	2 590,091	2 3,190,813	2 30,210,494	
Value	787,846	1,607,455	58,352	23,662	981,181	38,000	35,405	797,703	9,063,145	

COUNTIES.	ACRES HARVESTED.									
	Grapefruit (pomelos).	Figs.	Alligator pears (avocados).	Dates.	Olive.	Japanese persimmons.	Pomegranates.	Almonds.	Walnuts (Persian or English).	
Alameda					2				265	
Amador										
Butte	1,115	5,764	5		74,109			20,302	1,545	
Calaveras	2	67			2			17	70	
Colusa		2							45	
Contra Costa		15			8			2,495	1,847	
El Dorado		13			1,000				65	
Fresno	421	111,472			21,542	445	2,363	2,686	1,918	
Glenn	161	4,970			1,725			45,053	190	
Humboldt		24						6	436	
Imperial	16,306	1,607		1,498	256		11	13	400	
Inyo									8	
Kern	1,481	1,359			472		1	7,395	58	
Kings	1	174			4		2	80	56	
Los Angeles	24,708	13,542	6,762		133,046	1,167	24	7,353	303,883	
Madera	2	6,338			15,895		55	2,974	926	
Mendocino								1	3	
Merced	1	28,813	100		7,531		41	14,922	210	
Monterey	1	7						2,044	30	
Napa		2						3	116	
Nevada	5	66						21	336	
Orange	3,714	2,394	1,362		2,013	1,135	500	26	177,539	
Placer	465	828			14,149	2,644	10	57	13	
Riverside	25,268	3,303	17	12,908	28,862	4		52,436	20,589	
Sacramento	3,178	2,273			40,123	27	74	74,769	2,478	
San Benito		1						17	15	
San Bernardino	71,459	2,116	1,375		19,228	21	8	3,311	21,139	
San Diego	4,205	2,143	15		28,297	47		669	678	
San Joaquin		1,515			10,245		55	66,653	5,895	
San Luis Obispo	3	2						22	1,849	
Santa Barbara	255	49	250		1,500				12,255	
Santa Clara	42	479	2		135		3	12,915	26,364	
Santa Cruz									10	
Shasta		321	650		6,065			16	143	
Siskiyou									2	
Solano	4	104			225			13,525	10	
Sonoma	2	80			200				1,063	
Stanislaus	22	7,657			853			41,446		
Butter	13	5,553			618		1,000	55,761	2,298	
Tehama	2	609			4,737			1,923	17	
Trinity		5						3	7	
Tulare	38,693	41,149			121,346	17	10,560	12,360	1,875	
Tuolumne		164						31	303	
Ventura	1,163	162	136		1,300		6	405	29,049	
Yolo	5	1,535			453			22,347	142	
Yuba		276			2			12	229	

1 Number of trees of bearing age.

2 Boxes.

3 Pounds.

4 Crates.

5 Bushels.

IRRIGATION.

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STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

COLORADO.

THE STATE.	PRINCIPAL CROPS.										
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Clover and alfalfa seed.	Dry beans.	Dry peas.	Potatoes.	Sugar beets grown for sugar.
Acres harvested.....	52,617	97,618	112,548	139,214	58,125	2,757	5,949	10,627	24,841	50,631	137,329
Production.....	1,316,478	3,037,305	2,577,277	2,994,897	1,383,619	34,217	21,363	120,629	285,449	7,475,618	1,409,560
Value.....dollars..	1,843,069	2,885,440	5,309,191	6,169,488	1,798,575	49,615	491,349	410,139	653,622	16,446,360	14,800,330
COUNTIES.	ACRES HARVESTED.										
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Clover and alfalfa seed.	Dry beans.	Dry peas.	Potatoes.	Sugar beets grown for sugar.
Adams.....	566	1,522	5,110	6,627	336	25	.....	40	.....	606	3,942
Alamosa.....	.....	2,601	44	1,490	848	2	94	327	1,806	1,856	5
Arapahoe.....	766	670	2,141	1,555	518	10	.....	6	.....	152	875
Archuleta.....	85	603	35	156	101	.....	.....	9	10	23	.....
Baca.....	23	.....	295	85	12	.....	.....	.....	.....	.....	.....
Bent.....	2,302	1,375	10,796	291	1,171	52	279	101	.....	.....	5,716
Boulder.....	313	531	3,989	3,974	888	.....	.....	.....	.....	93	4,779
Chaffee.....	.....	2,188	6	2,125	1,096	8	.....	2	2,177	653	.....
Cheyenne.....	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clear Creek.....	.....	8	.....	11	.....	.....	.....	.....	.....	13	.....
Conchos.....	14	4,125	230	8,496	9,505	11	3,081	460	8,073	2,294	.....
Costilla.....	43	2,396	985	4,927	2,678	138	.....	326	8,436	189	.....
Crowley.....	3,807	1,738	532	1,690	1,815	7	2	135	.....	29	3,761
Custer.....	96	1,281	75	490	379	34	1	.....	13	47	.....
Delta.....	2,758	4,024	1,036	4,452	460	30	40	38	7	2,898	2,602
Denver.....	30	56	52	199	6	10	.....	.....	.....	8	.....
Dolores.....	.....	10	5	.....	5	.....	.....	.....	.....	.....	.....
Douglas.....	340	211	505	203	50	45	.....	.....	.....	6	.....
Eagle.....	6	2,418	202	701	303	.....	.....	14	.....	1,299	.....
El Paso.....	1,300	197	310	236	79	10	.....	32	.....	16	41
Elbert.....	14	18	88	.....	6	10	.....	.....	.....	13	.....
Framont.....	2,444	859	849	412	284	22	11	34	13	.....	9
Garfield.....	456	3,041	380	6,051	681	36	78	33	.....	2,636	1
Grand.....	.....	480	103	26	115	8	.....	.....	.....	.....	.....
Gunnison.....	.....	571	28	95	217	6	1	.....	.....	292	.....
Hinsdale.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18	.....
Huerfano.....	480	962	223	698	1,253	77	11	171	128	5	.....
Jackson.....	.....	88	2	.....	46	42	.....	.....	.....	29	.....
Jefferson.....	957	1,652	4,774	5,289	903	110	39	1	.....	232	586
Kiowa.....	10	.....	50	.....	.....	.....	.....	.....	.....	.....	.....
Kit Carson.....	65	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
La Plata.....	339	5,051	490	10,142	1,355	31	119	14	2	431	.....
Larimer.....	319	3,089	7,613	8,919	2,390	.....	11	50	.....	210	501
Las Animas.....	1,459	1,796	833	1,402	462	12	.....	1,127	15	15	.....
Lincoln.....	45	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Logan.....	2,584	2,387	9,723	1,719	1,548	169	.....	10	.....	99	10,973
Mesa.....	3,964	2,756	2,379	2,556	549	11	1,343	180	44	1,403	2,620
Mineral.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	.....
Moffat.....	3	864	61	407	143	61	.....	.....	.....	52	.....
Montezuma.....	1,206	3,288	276	3,545	330	9	.....	6	.....	.....	.....
Montrose.....	2,196	5,336	3,026	9,646	494	46	278	132	.....	6,698	.....
Morgan.....	4,901	2,339	3,172	1,334	2,161	263	.....	190	.....	607	19,441
Otero.....	4,479	3,194	6,414	550	634	38	205	1,859	14	27	11,864
Oursay.....	.....	764	198	787	46	.....	.....	.....	2	153	.....
Park.....	.....	100	.....	.....	8	.....	.....	.....	.....	49	.....
Pitkin.....	.....	1,265	21	598	204	30	.....	.....	.....	700	.....
Prowers.....	2,041	1,970	11,657	407	1,294	343	137	18	.....	5	6,368
Pueblo.....	7,672	1,675	2,222	1,732	939	109	64	1,029	.....	19	3,076
Rio Blanco.....	10	1,426	722	736	58	.....	.....	.....	.....	44	.....
Rio Grande.....	4	8,602	265	9,584	4,836	38	.....	61	2,656	12,203	.....
Routt.....	.....	918	522	331	459	30	.....	.....	.....	39	.....
Saguache.....	57	5,275	260	3,535	2,689	16	.....	2	859	2,093	.....
San Miguel.....	21	705	130	609	340	.....	.....	.....	.....	.....	.....
Sedgwick.....	312	320	805	1,059	305	97	.....	.....	.....	426	3,987
Summit.....	.....	120	4	3	75	52	.....	.....	.....	.....	.....
Teller.....	.....	70	.....	.....	19	20	.....	.....	.....	8	.....
Washington.....	180	318	351	278	471	190	10	.....	.....	.....	1,459
Weld.....	3,823	10,397	28,509	29,206	11,843	499	85	4,461	536	11,880	54,143
Yuma.....	115	10	100	.....	60	.....	.....	.....	.....	28	.....

THE STATE.	PRINCIPAL CROPS.										
	Timothy alone.	Timothy and clover mixed.	Clover alone.	Alfalfa.	Other tame grasses.	Annual legumes cut for hay.	Small grains cut for hay.	Wild, salt, or prairie grasses.	Silage crops.	Corn cut for forage.	Kafir, sorghum, etc., for forage.
Acres harvested.....	33,588	106,664	3,095	659,912	46,110	9,386	26,630	290,693	19,015	14,547	12,123
Production.....tons..	46,568	188,616	4,893	1,568,038	60,535	14,194	33,250	280,332	119,656	34,234	24,349
Value.....dollars..	977,928	4,149,552	83,181	29,008,703	969,360	212,910	688,500	4,905,810	1,196,560	445,042	316,537

1 Bushels.

* Tons.

AGRICULTURE.

STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES AND ACRES HARVESTED, BY COUNTIES—Continued.

COLORADO—Continued.

COUNTIES.	ACRES HARVESTED.											
	Timothy alone.	Timothy and clover mixed.	Clover alone.	Alfalfa.	Other tame grasses.	Annual legumes cut for hay.	Small grains cut for hay.	Wild, salt, or prairie grasses.	Silage crops.	Corn cut for forage.	Kaffir, sorghum, etc., for forage.	Root crops for forage.
Adams.....	10	26	35	13,539	88	330	214	190	539	148	40	33
Alamosa.....	15	33	38	15,799	320	330	330	18,136	48	245	25	40
Arapahoe.....	191	4,843	7	6,863	73	38	141	25	511	2	5	5
Archuleta.....				3,595	341	13	323	876			53	
Baca.....				756								
Bent.....			28	22,382	100	12	81	382	515	235	1,583	19
Boulder.....	22	289		8,301	75		88	545	539	52	15	38
Chaffee.....	1,561	1,898	13	5,685	179	118	256	1,769	43	3		6
Cheyenne.....				200						10		
Clear Creek.....	80	155		11			26			4		
Conejos.....		88	392	13,164	11,727	2,518	2,997	7,020	20			
Costilla.....	73	62	103	4,791	106	259	1,017	4,435	1,167	381	825	3
Crowley.....				15,236	108		58	45		172	5	
Custer.....	131	591	41	2,142	3,298	50	254	599	549	396		50
Delta.....	295		79	30,061	249	8	1,102	212				
Denver.....		45		623			9		67			
Dolores.....	80	20	50	370			114	60				
Douglas.....	18	437		2,822			103		100	40	1	
Eagle.....	1,202	4,037	10	5,629	4,522		1,107	356		1		5
El Paso.....	85	866		8,424	98	15	309	2,834	233	283	114	
Elbert.....		176		789			32	102	25	32	4	
Freemont.....	128	1,239	5	7,044	405	9	533	608	187	1,466	22	41
Garfield.....	824	619		31,202	3,099	8	877	153	66	222	22	12
Gilpin.....		25				26	35	62				
Grand.....	1,401	13,444	118	300	330		285	11,497				
Gunnison.....	1,739	10,885	23	1,928	2,638	32	659	24,274				12
Hinsdale.....	24	1,192	1	46			120	1,184			60	
Huerfano.....	649	1,279	6	14,331	1,496	146	107	1,099	22	87		
Jackson.....	2,782	5,881		2,091	2,091		60	71,265		1,687	5	86
Jefferson.....	118	687	15	15,532	205	41	543	107	400			
Kiowa.....				822	20				50		30	
Kit Carson.....				235				340	80		40	
La Plata.....	946	1,229	54	24,846	371	129	978	609	162	80	15	5
Lake.....	110	214	7		295		137	3,218			2	10
Larimer.....	191	519	107	39,854	77	195	586	8,420	1,300	100		42
Las Animas.....	3,764	177	300	20,640	632	12	721	2,251	139	169	490	
Lincoln.....				44					156	804	476	20
Logan.....	5	29		14,350	205			1,699	542	2,524	557	73
Mesa.....	224	595	15	34,087	238	22	1,286	88				
Mineral.....	80	210			110		304	1,907				
Monte Vista.....	1,534	2,447	1	5,126	1,653	22	701	2,753		2		4
Montezuma.....	653	114	8	20,650	153	6	984	498	140	139	17	3
Montrose.....	481	1,176	143	23,384	24	45	931	194	602	191	20	47
Morgan.....			5	23,506	187		204	610	359	417	735	2
Otero.....			53	24,938	92	78	83	45	2,542	970	1,260	14
Ouray.....	748	5,434	55	1,864	222	16	264	659				1
Park.....	48	45		21	75		701	29,419				2
Pitkin.....	2,421	3,862	2	2,002	28		153	70				
Prowers.....			145	37,612	112	90	266	505	1,662	1,593	4,643	43
Pueblo.....	70	733	35	26,159	233	324	378	1,699	1,382	1,348	701	10
Rio Blanco.....	3,693	839	45	13,597	656	42	923	5,381				
Rio Grande.....	273	2,119	246	9,229	1,063	581	2,304	13,002	194			6
Routt.....	1,947	32,914	292	2,169	750	400	507	1,650				
Saguache.....	1,731	410	440	6,459	572	3,734	969	63,663		5		2
San Miguel.....	1,831	423	35	5,689	16		397	200		95	19	
Sedgwick.....				2,444	58		15	575	19	80	20	
Summit.....	510	4,036	52	47	59		41	1,110				1
Teller.....				42	115		336	819				
Washington.....				1,553				25			42	
Weir.....		2		78,820	437	67	780	1,379	4,699	766	126	5
Yuma.....				898			15	100			86	

THE STATE.	PRINCIPAL CROPS.									
	Cabbages.	Cantaloupes.	Cucumbers.	Tomatoes.	Grapes.	Apples.	Peaches.	Pears.	Plums and prunes.	Cherries.
Acres harvested.....	2,791	3,539	1,284	1,693	135,688	879,087	238,370	97,783	26,582	194,365
Production.....					173,660	1,842,018	490,404	210,944	19,264	101,271
Value.....dollars..	544,649	616,437	198,241	234,779	13,894	3,030,330	851,747	464,077	46,234	329,131

1 Number of vines of bearing age.

2 Number of trees of bearing age.

3 Pounds.

4 Bushels.

IRRIGATION.

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STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

COLORADO—Continued.

COUNTIES.	ACRES HARVESTED.									
	Cabbages.	Cantaloupes.	Cucumbers.	Tomatoes.	Grapes.	Apples.	Peaches.	Pears.	Plums and prunes.	Cherries.
Adams.....	670	12	98	102	.....	925	.....	.....	100	20
Alamosa.....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arapahoe.....	89	5	8	12	.....	3,774	6	2	200	174
Bent.....	.....	12	9	1	.....	.....	.....	.....	.....	.....
Boulder.....	2	.....	.....	1	80	1,609	.....	4	391	1,754
Chaffee.....	10	.....	.....	.....	.....	8,931	.....	24	219	116
Clear Creek.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Costilla.....	3	.....	.....	.....	.....	108	.....	11	2	3
Crowley.....	3	1,163	120	134	3,492	18,295	252	14	580	23,372
Custer.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Delta.....	4	15	1	11	.....	.....	.....	.....	.....	.....
Douglas.....	.....	.....	.....	.....	.....	258	.....	.....	.....	13
Eagle.....	1	.....	2	.....	.....	50	.....	4	1	5
El Paso.....	2	.....	.....	.....	250	200	.....	.....	.....	.....
Fremont.....	19	4	28	65	7,406	177,879	1,553	1,285	3,193	40,686
Garfield.....	3	4	2	4	8,562	63,752	7,390	1,139	2,022	3,709
Gunnison.....	3	.....	.....	.....	.....	1,901	.....	15	9	18
Huerfano.....	3	1	1	.....	.....	.....	.....	.....	.....	.....
Jefferson.....	816	.....	31	181	320	28,244	41	110	4,458	29,969
La Plata.....	2	.....	.....	2	.....	.....	.....	.....	.....	.....
Larimer.....	40	13	6	13	150	40,251	92	395	2,752	55,364
Las Animas.....	1	6	2	4	.....	.....	.....	.....	.....	.....
Mesa.....	11	30	1	507	4,747	412,282	220,557	92,624	3,600	6,318
Moffat.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Montezuma.....	1	5	.....	2	552	21,963	3,509	615	1,018	528
Montrose.....	3	1	1	5	1,399	51,811	4,195	1,373	1,549	2,250
Morgan.....	43	.....	10	1	.....	1,022	12	16	1,371	1,580
Otero.....	4	2,231	796	258	6,454	26,560	503	45	2,512	21,898
Ouray.....	1	.....	.....	.....	.....	130	12	3	38	17
Pitkin.....	1	.....	.....	.....	.....	34	.....	.....	.....	.....
Prowers.....	2	1	1	2	.....	386	38	10	27	26
Pueblo.....	79	22	38	40	2,276	9,645	34	42	1,340	5,630
Rio Blanco.....	2	.....	.....	2	.....	.....	.....	.....	.....	.....
Rio Grande.....	12	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Miguel.....	3	.....	.....	.....	.....	366	4	39	26	56
Sedgewick.....	.....	.....	4	.....	.....	49	1	12	162	76
Weld.....	1,451	5	124	340	.....	2,532	10	21	1,008	771
Yuma.....	.....	.....	.....	.....	.....	130	101	.....	.....	20

IDAHO.

THE STATE.	PRINCIPAL CROPS.										
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Red clover seed.	Other clover and alfalfa seed.	Timothy seed.	Dry beans.	Dry peas.
Acres harvested.....	10,994	42,487	20,306	299,360	19,667	2,414	14,814	8,955	537	10,150	9,443
Production..... bushels.....	383,740	1,232,896	860,211	7,364,943	540,749	19,751	57,195	33,442	1,286	183,086	153,017
Value..... dollars.....	652,858	1,294,540	738,433	15,098,133	811,124	36,639	1,544,265	769,166	7,459	658,301	719,180
COUNTIES.	ACRES HARVESTED.										
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Red clover seed.	Other clover and alfalfa seed.	Timothy seed.	Dry beans.	Dry peas.
Ada.....	809	2,982	1,809	25,174	1,763	233	4,147	485	500	1	.....
Adams.....	55	417	100	842	46	.....	.....	2	.....	.....	.....
Bannock.....	8	2,069	1,047	7,134	835	48	15	.....	.....	22	.....
Bear Lake.....	.....	1,160	642	2,244	305	25	.....	5	.....	.....	.....
Bingham.....	30	4,890	1,159	20,371	1,135	.....	.....	.....	.....	.....	.....
Blaine.....	2	904	307	4,260	331	.....	.....	.....	.....	.....	.....
Boise.....	8	351	219	377	22	4	14	40	.....	.....	10
Bonner.....	.....	83	.....	21	4	.....	.....	.....	.....	.....	.....
Bonneville.....	8	4,001	2,180	23,413	316	.....	37	14	23	81	1,283
Boundary.....	41	801	178	209	10	6	.....	.....	.....	1	6
Butte.....	6	1,115	424	4,701	466	21	.....	.....	.....	.....	5
Canyon.....	5,555	3,414	2,011	33,535	3,321	124	2,882	858	.....	31	4
Caribou.....	.....	42	.....	25	4	.....	.....	.....	.....	.....	.....
Cassia.....	30	1,873	1,573	14,899	836	104	461	408	.....	5	5
Clark.....	.....	15	.....	89	.....	.....	.....	.....	.....	.....	.....
Custer.....	2	1,799	412	1,136	396	.....	.....	5	.....	.....	.....
Elmore.....	80	15	.....	147	21	2	57	.....	.....	.....	.....
Franklin.....	4	108	1,141	1,368	70	.....	.....	.....	.....	.....	.....
Fremont.....	.....	1,064	785	9,782	135	.....	.....	.....	.....	.....	4,720
Gem.....	766	587	482	1,570	579	41	108	48	.....	9	.....
Gooding.....	328	807	314	9,711	170	519	427	259	.....	.....	.....
Idaho.....	8	.....	17	12	3	.....	.....	.....	.....	.....	.....
Jefferson.....	19	3,107	267	12,958	312	5	.....	119	.....	4	1,761
Jerome.....	45	1,577	783	19,483	397	42	378	132	.....	5	.....

AGRICULTURE.

STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

IDAHO—Continued.

		ACRES HARVESTED.										
		Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Red clover seed.	Other clover and alfalfa seed.	Timothy seed.	Dry beans.	Dry peas.
COUNTIES—continued.												
Lemhi.....			1,706	102	1,297	516	11	25	10	4	36	335
Lincoln.....	82	1,121	122	6,785	232				187		2	
Madison.....						483	119	698	755		38	1,250
Minidoka.....	306	1,629	512	5,643								4
Nez Perce.....			203	140		20			150			
Oneida.....		55	75	196					136			
Owyhee.....	387	654	14	3,530	934	67		10				
Payette.....	717	736	236	4,562	793	791		39	87			
Power.....	22	168	596	894	63	28					9,911	5
Twin Falls.....	913	2,779	1,035	77,270	4,070	117		5,508	5,243	10	3	16
Valley.....		22						6			1	
Washington.....	559	276	1,519	5,582	1,079	107		2	17			

		PRINCIPAL CROPS.									
		Timothy.	Timothy and clover mixed.	Clover alone.	Alfalfa.	Other tame grasses.	Wild, salt, or prairie grasses.	Small grains cut for hay.	Annual legumes cut for hay.	Silage crops.	Corn cut for forage.
THE STATE.		17,686	48,603	14,715	515,301	8,762	53,371	13,402	544	4,453	1,527
Acres harvested.....		22,399	62,010	23,743	1,510,380	13,066	53,515	17,056	762	37,908	4,969
Production..... tons.		648,440	1,612,260	474,860	32,473,170	274,386	1,016,804	469,040	16,002	379,080	54,669
Value..... dollars.											

		ACRES HARVESTED.									
COUNTIES.											
Ada.....	388	690	5,612	29,417	231	128	649			1,620	169
Adams.....	570	5,232	103	3,715	413	205	745			24	38
Bannock.....	1,955	4,961	39	25,727	1,009	7,110	534	50		31	3
Bear Lake.....	2,942	2,546	63	8,337	1,583	14,770	436	13			
Bingham.....	450	146	384	37,672	691	1,887	596	17		15	6
Blaine.....	710	645	90	13,980	94	1,663	448				
Boise.....	729	1,630	66	2,745	12	12	85				3
Bonner.....		507		5	7	31	102				
Bonneville.....	245	152	230	25,178	220	659	639	25			28
Boundary.....	838	385	142	39	237	4,782	347	1		14	5
Butte.....	50	200		13,130	20	539	271	10			
Canyon.....	148	148	2,769	48,825	133	78	604	103		1,016	468
Caribou.....	240	405		168	65	202					
Cassia.....	607	1,403	378	35,364	671	4,000	622			35	6
Clark.....				130							
Custer.....	1,761	4,683	9	13,765	342	3,735	850				
Elmore.....	8	160	33	1,600	20	160	71			21	7
Franklin.....	112	59		4,795	27	110	86			30	22
Fremont.....	1,701	1,497	27	10,124	588	1,903	353	139			
Gem.....	3	321	366	10,483	211	79	300			407	145
Gooding.....	28	35	382	28,485	47	90	218			233	60
Idaho.....	96	261	33	1,191		48	219				
Jefferson.....	135	197	60	17,440	58	613	1,122	10			2
Jerome.....		10	226	22,017			170	30		49	18
Lemhi.....	1,364	18,188	301	12,195	1,103	3,771	544	30		7	2
Lincoln.....		95	109	19,805	39		167				1
Minidoka.....	200	33	544	22,997	17		411			21	31
Nez Perce.....			6	561			167	20			35
Oneida.....	99	35		2,903	50	383	12				
Owyhee.....	471	2,911	85	22,114	478	3,804	299			23	124
Payette.....	20	127	83	12,260	36	150	253			110	176
Power.....	7	65		5,420	20	1,359	285	41			1
Shoshone.....	13						5				
Twin Falls.....	1,563	343	2,457	51,701	94	1,002	571	52		368	109
Valley.....	155	241		11	220		40				
Washington.....	68	292	68	11,002	26	98	1,181	3		429	78

		PRINCIPAL CROPS.							
		Potatoes.	Sugar beets grown for sugar.	Grapes.	Apples.	Peaches.	Pears.	Plums and prunes.	Cherries.
THE STATE.		32,044	32,270	10,809	852,307	71,890	20,290	273,303	31,136
Acres harvested.....		5,400,108	222,128	104,166	1,211,790	138,442	15,455	291,495	19,769
Production.....		11,629,582	2,332,344	7,291	2,120,632	249,196	34,001	641,289	68,203
Value..... dollars.									

1 Number of vines of bearing age.

1 Number of trees of bearing age.

1 Bushels.

1 Tons.

1 Pounds.

IRRIGATION.

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STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND, FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

IDAHO—Continued.

COUNTIES.	ACRES HARVESTED.							
	Potatoes.	Sugar beets grown for sugar.	Grapes.	Apples.	Peaches.	Pears.	Plums and prunes.	Cherries.
Ada.....	400		634	201,166	5,247	3,229	180,929	11,010
Adams.....	31		191	113,455	19,806	4,456	548	416
Bannock.....	984	2,343						
Bear Lake.....	174			2,315		198	341	19
Bingham.....	7,168	9,760		62,550	31	1,183	4,129	1,703
Blaine.....	106			1,393		197	119	137
Boise.....				548	103	37	44	59
Bonner.....	3							
Bonneville.....	7,640	1,720						
Boundary.....	123			54,487	350	917	758	571
Butte.....	165							
Canyon.....	3,336	1	5,922	121,554	10,238	1,708	25,954	5,102
Cassia.....	3,176	3,096		4,410	644	439	1,512	426
Clark.....	15							
Clearwater.....	7							
Custer.....	111							
Elmore.....	41			53,426	2,264	452	13,869	267
Franklin.....	162	1,518		1,195	28	16	50	10
Fremont.....	346	486		2,976		72	285	126
Gem.....	84		845	40,452	15,155	1,431	21,943	3,186
Gooding.....	145							
Idaho.....	19		50	842	59	42	64	52
Jefferson.....	2,349	2,444		10,058		376	798	577
Jerome.....	276	537		16,855	857	627	822	867
Lemhi.....	227			4,919	21	338	608	365
Lincoln.....	178			1,636	48	146	917	148
Madison.....		2,268						
Minidoka.....	1,217	3,412	6	10,946	230	532	1,183	806
Nex Perce.....	24			200	5		7	18
Onelda.....	9	347		30			10	1
Owyhee.....	125		5	7,450	637	414	1,176	202
Payette.....	265							
Power.....	85	15		1,345	33	95	71	52
Shoshone.....	9							
Twin Falls.....	3,010	4,323	3,155	95,198	13,825	3,190	9,283	4,240
Valley.....	1							
Washington.....	53		1	42,892	2,309	195	7,883	686

KANSAS.

THE STATE.	PRINCIPAL CROPS.											
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Alfalfa.	Wild, salt, or prairie grasses.	Silage crops.	Corn cut for forage.	Kafir, sorghum, etc., for forage.	Kafir, milo, feterita, durra.	Sugar beets grown for sugar.
Acres harvested.....	238	1,238	4,029	234	1,370	14,962	615	491	186	1,238	2,050	851
Production.....	14,090	124,022	145,340	12,592	118,483	120,397	11,146	12,668	1500	13,033	136,835	24,036
Value.....dollars..	5,930	19,218	97,934	5,599	19,407	531,948	14,325	21,344	4,000	30,330	49,727	42,399
COUNTIES.	ACRES HARVESTED.											
Barber.....						80						
Barton.....	7				5	7	5	10	1			
Cheyenne.....	45					255	350		30			
Cowley.....						20						
Finney.....	48	1,073	3,328	118	1,223	9,760	200	261	145	1,036	1,709	821
Ford.....		10				30						
Gray.....					6	355		10		30	15	
Greenwood.....	35	63	36			197						
Hamilton.....			25		10	1,813				188	3	
Hodgeman.....			100									
Kearny.....	19	12	170	116	78	248				14	293	30
Nemaha.....					8	14						
Pawnee.....	30	77	250		15	1,226	10	210	10			
Pottawatomie.....						19						
Reno.....						9						
Republic.....						5						
Scott.....					20	872					26	
Sherman.....	24	3	120			45						
Thomas.....					5							
Wallace.....	30						50				4	
Wichita.....						7						

¹ Bushels.

¹ Tons.

AGRICULTURE.

STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

MONTANA.

THE STATE.	PRINCIPAL CROPS.										
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Clover and alfalfa seed.	Dry beans.	Dry peas.	Flaxseed.	Sugar-beet seed.
Acres harvested.....	2,436	45,153	39,396	121,804	10,286	1,370	3,330	1,022	12,070	3,740	965
Production..... bushels	24,132	1,183,068	331,668	1,551,685	185,866	6,825	8,824	14,576	143,042	22,534	508,385
Value..... dollars	58,024	1,183,068	792,687	3,708,527	278,799	11,263	211,776	61,219	443,430	100,276	305,031
											4,903
											568,008
											1,384,819
COUNTIES.	ACRES HARVESTED.										
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Clover and alfalfa seed.	Dry beans.	Dry peas.	Flaxseed.	Sugar-beet seed.
Beaverhead.....		3,230	248	1,628	873				74		
Big Horn.....	120	1,490	925	3,262	116		238	1			573
Blaine.....	17	761	147	1,855	24	13	840			520	
Broadwater.....		232		453	75						
Carbon.....	260	2,828	1,226	14,428	416		667	298	10		
Carter.....											
Cascade.....	5	459	495	1,572	47		111			25	
Custer.....	288	598	11	218	15	37	7	4			
Dawson.....											
Deer Lodge.....		676	123	263	5	28					
Fergus.....	98	292	999	1,556	106	82	2		1		
Flathead.....	12	435	1,914	1,938	182	90					
Gallatin.....	45	5,765	4,406	12,462	2,569	12		120	3,737		
Glacier.....										201	
Hill.....		20		249							
Jefferson.....	8	646	76	978	64	15	3	2	30		
Lincoln.....		1,023	601	1,651	30					5	
Madison.....		163	113	574	73						
Meagher.....	2	4,078	1,179	6,576	538	9	21	1	1,375		
Mineral.....		755	534	153	140	50					
Missoula.....											
Musselshell.....	61	2,509	8,747	6,861	250	109	6	11	207		
Park.....		25		20			15				
Phillips.....	3	1,245	943	2,874	551	5	6		1,585		
Pondera.....		495	435	1,707	28	151	2			141	
Powell.....		2,998	438	23,882	974	416	305			2,416	
Prairie.....		1,410	2,938	1,652	99	43	30		27		
Rawlins.....	80	5,228	820	8,583	1,914	71	3	59	4,657		
Richland.....	95	579		2,730	145	68	97	9		141	
Roosevelt.....		14		199		100				155	
Rosebud.....	10	20					314				
Sanders.....	1	212	221	151	8						
Sheridan.....											
Silver Bow.....		68		37	4	12					
Stillwater.....	365	1,173	8,930	5,355	93	30	125	174	9		
Sweet Grass.....		832	249	2,524	99		38		28	6	
Teton.....		20	5	194	82						
Treasure Valley.....	667	78	10	164							
Valley.....		140		563	12						
Wheatland.....		210	645	245		16					
Yellowstone.....	279	4,136	2,628	14,007	724	29	500	343	40	100	392

THE STATE.	PRINCIPAL CROPS.										
	Timothy alone.	Timothy and clover mixed.	Clover alone.	Alfalfa.	Other tame grasses.	Wild, salt, or prairie grasses.	Small grains cut for hay.	Annual legumes cut for hay.	Silage crops.	Sugar beets grown for sugar.	Apples.
Acres harvested.....	35,781	91,912	5,576	220,281	39,254	177,385	25,349	770	620	7,686	1,761,904
Production..... bushels	35,613	1,108,845	15,967	408,993	39,523	131,652	18,194	1,184	3,357	67,297	477,796
Value..... dollars	1,060,584	3,175,340	205,626	11,247,308	1,047,360	3,096,822	436,656	28,416	40,284	740,267	788,363
											1,47,600
											9,595
											39,819
COUNTIES.	ACRES HARVESTED.										
	Timothy alone.	Timothy and clover mixed.	Clover alone.	Alfalfa.	Other tame grasses.	Wild, salt, or prairie grasses.	Small grains cut for hay.	Annual legumes cut for hay.	Silage crops.	Sugar beets grown for sugar.	Apples.
Beaverhead.....	4,470	7,325	9	14,102	8,904	102,621	1,113	27			
Big Horn.....	166	834	126	8,996	716	2,444	915	15			
Blaine.....	585		192	5,437	495	3,643	638	21		697	62
Broadwater.....	15	58		2,515	685		70		30		
Carbon.....	1,261	5,376	423	15,981	2,953		1,450	116	56	666	35,535
Carter.....											
Cascade.....											
Chouteau.....	545	317	19	288	100	65	30				
Custer.....				7,865	101	1,036	499	80			
Dawson.....		29	14	15		34					
Deer Lodge.....				4,633	195	329	1,408		147	239	
Fergus.....	2,118	903		288							
Flathead.....	1,984	262	105	1,183	237	2,868	72				
Gallatin.....	1,582	1,070	6	3,875	714	434	899				30
Glacier.....	5,429	6,614	3,313	1,076	47	220	1,122		36	145	8,244
Garfield.....				16,892	2,146	1,839	997	3			524

1 Number of trees of bearing age.

2 Tons.

3 Bushels.

IRRIGATION.

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STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

MONTANA—Continued.

COUNTIES—continued.	ACRES HARVESTED.											
	Timothy alone.	Timothy and clover mixed.	Clover alone.	Alfalfa.	Other tame grasses.	Wild, salt, or prairie grasses.	Small grains cut for hay.	Annual legumes cut for hay.	Silage crops.	Sugar beets grown for sugar.	Apples.	Cherries.
Glacier.....				42		50	295					
Granite.....	6											
Hill.....	10	40		435			228		7			
Jefferson.....	508	408		6,128	307	1,931	258	2	100			
Lewis and Clark.....	816	1,987	4	9,927	597	2,720	1,008	104				
Lincoln.....	1,076	903	8	456		14	297	2			5,007	83
McCone.....						90						
Madison.....	1,556	7,690	47	19,554	6,979	10,391	1,986	164	13		6,720	49
Meagher.....	3,469	4,050		2,370	3,289	4,847	703	10				
Mineral.....	70	22		67			19					
Missoula.....	2,954	7,640	274	4,241	272	825	1,423	50	18	400	24,059	1,946
Musselshell.....	55	150		2,294		245	119					
Park.....	2,607	8,644	106	13,075	694	1,148	638				1,280	
Phillips.....			27	5,382	3,973	11,630	1,313					
Pondera.....	511	319	17	4,011	194	1,324	2,121	3				
Powder River.....				305			5					
Powell.....	576	16,931	1	5,089	246	19,622	642					
Prairie.....				8								
Ravalli.....	2,521	15,016	617	11,072	1,323	1,030	752	83	26	1,460	666,899	42,802
Richland.....	12	8		3,783	41	69	314		13	343		
Roosevelt.....				126			393					
Rosebud.....				138			10					
Sanders.....	179	981	4	348		95	159				2,637	243
Sheridan.....					50		57					
Silver Bow.....	526	1,695	20	810	20	2,166	239					
Stillwater.....	620	1,433	167	6,684	524	72	745	28	12	625	2,883	14
Sweet Grass.....	1,424	844	1	14,324	547	1,180	1,074	16			876	
Teton.....				333	10	150						
Treasure Valley.....				852	25		12			243		
Wheatland.....			1	850	1,845	870	150					
Yellowstone.....	220	90		3,341	980	743	93	30				
	10	82	75	21,069	45	236	1,083	16	162	2,868	7,829	37

NEBRASKA.

THE STATE.	PRINCIPAL CROPS.												
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Alfalfa.	Other tame grasses.	Small grains cut for hay.	Wild, salt, or prairie grasses.	Corn cut for forage.	Kafir, sorghum, etc., for forage.	Sugar beets grown for sugar.
Acres harvested.....	26,798	12,875	15,321	9,748	3,610	1,403	60,476	1,205	942	14,956	1,459	1,392	42,959
Production.....	626,064	364,083	321,419	158,405	105,958	17,630	135,942	1,506	867	12,797	2,923	3,385	445,521
Value.....dollars..	845,186	273,062	691,050	340,671	110,554	24,682	2,582,898	18,825	11,271	172,760	30,692	32,158	4,677,971
COUNTIES.	ACRES HARVESTED.												
Antelope.....	165						15			109	59	92	
Boone.....													
Brown.....													
Buffalo.....	323				15		57		1				10
Cass.....										10			
Cheyenne.....													7
Custer.....		25											
Dawes.....										1,080			
Dawson.....	7,921	882	4,885	706	168	47	3,098	16		12	67	458	25
Deuel.....	590	10	450	20	50	245	1,289	15		683		7	246
Douglas.....													180
Dundy.....	200	84	93		60		1,491			522	51	43	
Gage.....													3
Garden.....	120	108				36	180						
Hitchcock.....	1,698	92	2,017	15	88	43	1,064	179	28	178	215	241	35
Keith.....													22
Kimball.....	2,269		1,056		12	10	922			45	246	19	
Lancaster.....	95	25		214	12		239						346
Lincoln.....	1,804	278	198	491	4	90	2,440	29	11	804	101	232	183
Madison.....													86
Morrill.....	4,238	2,990	2,467	1,991	165	250	7,963	212	107	4,624	607	164	1
Red Willow.....	491	10	10		70		179	4				48	934
Saline.....		120											8,701
Scotts Bluff.....	5,679	6,964	3,625	5,313	1,940	504	28,854	601	240	4,809	78	75	3,480
Seward.....		20											29,963
St. Louis.....	1,170	1,317	520	998	1,028	178	12,680	149	555	2,080	35	13	1,692
Valley.....	35						5						

¹ Bushels.

¹ Tons.

AGRICULTURE.

STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

NEVADA.

	PRINCIPAL CROPS.												
	Oats.	Winter wheat.	Spring wheat.	Barley.	Timothy alone.	Timothy and clover mixed.	Clover alone.	Alfalfa.	Other tame grasses.	Annual legumes cut for hay.	Small grains cut for hay.	Wild, salt, or prairie grasses.	Potatoes.
THE STATE.													
Acres harvested.....	2,501	2,921	17,062	5,155	4,229	14,059	487	112,166	29,114	706	5,504	134,389	2,823
Production.....	164,873	160,220	1,377,243	1,138,793	4,855	19,351	768	318,906	31,303	2,545	26,272	122,146	1,410,001
Value.....dollars.	74,604	138,506	867,670	242,988	111,665	445,073	16,896	6,537,573	641,773	9,810	116,032	2,259,701	918,402
	ACRES HARVESTED.												
COUNTIES.													
Churchill.....	121	325	2,825	92	.....	.....	40	18,565	.....	.....	689	20	73
Clark.....	102	1,068	214	151	.....	.....	.....	1,420	7	4	75	.....	1
Douglas.....	218	404	2,674	1,395	318	2,742	.....	8,761	2,105	.....	130	688	96
Elko.....	541	168	1,067	273	2,611	6,248	305	12,068	18,486	682	1,000	70,556	187
Esmeralda.....	28	1	190	39	.....	.....	.....	1,077	.....	.....	11	.....	.....
Eureka.....	50	.....	38	100	770	.....	.....	1,203	4,065	.....	300	5,961	57
Humboldt.....	168	5	947	35	.....	135	.....	5,101	1,297	.....	368	25,393	37
Lander.....	.....	.....	111	9	133	290	.....	2,593	137	.....	40	6,772	30
Lincoln.....	110	78	16	33	121	.....	.....	1,821	30	.....	65	2,087	.....
Lyon.....	24	159	3,206	1,065	100	.....	.....	17,720	280	.....	253	635	1,161
Mineral.....	.....	.....	254	111	.....	1,090	.....	3,032	427	.....	.....	1,120	215
Nye.....	52	44	72	199	.....	57	16	2,577	1,164	.....	109	6,451	43
Ormsby.....	6	28	85	45	7	547	.....	376	6	3	6	110	79
Pershing.....	18	60	2,139	787	.....	.....	.....	17,956	306	.....	857	804	33
Storey.....	.....	.....	50	.....	.....	.....	.....	340	.....	.....	5	.....	15
Washoe.....	155	416	2,637	231	8	2,410	.....	11,217	804	.....	1,495	6,501	526
White Pine.....	908	168	537	601	161	550	128	6,339	.....	17	161	7,291	270
	Bushels.						Tons.						

1 Bushels.

1 Tons.

NEW MEXICO.

THE STATE.	PRINCIPAL CROPS.									
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Clover and alfalfa seed.	Kafir, milo, etc.	Dry beans.	Dry peas.	Cotton.
Acres harvested.....	38,954	8,880	9,059	22,251	2,889	2,583	2,205	5,630	3,606	7,527
Production.....	1,948,594	1,250,162	1,185,479	1,395,679	1,62,070	16,354	166,683	1,63,269	1,51,202	1,4,077
Value.....dollars.	1,422,891	262,607	379,958	791,358	80,691	127,080	83,354	221,442	128,005	913,248
ACRES HARVESTED.										
COUNTIES.										
Bernalillo.....	2,077	178	272	1,109	26	8		134	26	
Chaves.....	3,739	975	701	99	344	1,733	112	14		43
Colfax.....	3,311	3,382	1,068	4,321	698	126		743	1	
Doña Ana.....	5,896	239	2,345	1,772	453	27		451	5	
Eddy.....	2,182	224	75							
Grant.....	2,358	100	141	27	219	616	441	57		7,484
Guadalupe.....	341	4	31	8			20	61	5	
Hidalgo.....	965	171	103	211	12			106		
Lea.....	58	60	42				5	13		
Lincoln.....	890	15	78	79	131			19		
Luna.....	743		76		153		1	28		
McKinley.....	855	263	17	374	13		1,226	1,121	12	
Mora.....	15		32					134	1	
Otero.....	548	57	318	106	92		166	18		
Rio Arriba.....	1,849	1,118	744	2,966	220			488	770	
San Juan.....	4,102	299	163	535	74	73		108	3	
San Miguel.....	660	296	377	275	11			91	6	
Sandoval.....	2,255	490	108	2,237	70			218	138	
Santa Fe.....	870	43	128	894				186	61	
Sierra.....	1,320	5	283	92	3					
Socorro.....	1,937	51	248	1,001	21		14	230	12	
Taos.....	1,346	755	613	3,484	289		3	271	1	
Valencia.....	2,879	245	408	2,618	60			728	2,565	

1 Bushels.

1 Bales.

THE STATE.	PRINCIPAL CROPS.										
	Timothy alone.	Timothy and clover mixed.	Clover alone.	Alfalfa.	Other tame grasses.	Annual legumes cut for hay.	Small grains cut for hay.	Wild, salt, or prairie grasses.	Silage crops.	Corn cut for forage.	Kafir, sorghum, etc., for forage.
Acres harvested.....	1,766	1,338	321	87,106	4,015	701	6,459	8,513	1,188	3,455	5,748
Production.....	2,658	2,074	1,581	211,351	5,356	1,011	10,287	6,337	8,409	5,805	10,845
Value.....dollars.	53,160	37,332	25,296	4,861,073	112,476	15,165	200,597	101,392	79,886	69,660	162,720

IRRIGATION.

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STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

NEW MEXICO—Continued.

COUNTIES.	ACRES HARVESTED.										
	Timothy alone.	Timothy and clover mixed.	Clover alone.	Alfalfa.	Other tame grasses.	Annual legumes cut for hay.	Small grains cut for hay.	Wild, salt, or prairie grasses.	Silage crops.	Corn cut for forage.	Kafir, sorghum, etc., for forage.
Bernalillo.....			38	3,178	69	477	176	304	81	274	99
Chaves.....	13		13	15,292	80	8	287	27	417	373	1,457
Colfax.....	666	230	247	7,876	868	10	1,736	3,187	175	157	284
De Baca.....				1,019							292
Doña Ana.....			365	11,854	193	2	620	237	214	305	577
Eddy.....				7,865	23		30			207	1,529
Grant.....				1,374	234		15			17	21
Guadalupe.....	3			570			6	3		91	34
Hidalgo.....				441	11		7				18
Lea.....				64	2					129	103
Lincoln.....			3	1,895			161			60	167
Luna.....			10	879	254		23	2,181	58	101	557
McKinley.....				512	32		19			10	
Mora.....				556			38	100			
Otero.....				1,685	127		113		15	41	324
Rio Arriba.....	778	964	15	4,939	899	97	1,182	558		50	2
Roosevelt.....										20	
San Juan.....			4	9,287	80	2	228	15	136	494	82
San Miguel.....	109	16		2,227	75	10	399	22	58	128	30
Sandoval.....	8	18		2,982	47		283	163		462	1
Santa Fe.....	3	10	2	1,931	162	6	113	10	34	140	4
Sierra.....				841	23		33			90	120
Socorro.....	5	6	3	2,656	201	5	110	44		120	1
Taos.....	179	90	20	3,859	551	63	800	992		73	11
Torrance.....											22
Valencia.....	2	4	101	3,323	84	21	80	720		114	33

THE STATE.	PRINCIPAL CROPS.								
	Potatoes.	Peppers (green).	Cantaloupes and muskmelons.	Grapes.	Apples.	Peaches.	Pears.	Plums and prunes.	Cherries.
Acres harvested.....	504	400	421	1,176,520	321,233	56,464	21,681	9,351	8,204
Production.....	19,650			630,440	487,878	93,140	26,007	11,123	5,878
Value.....dollars..	46,178	58,290	54,590	50,435	780,605	200,251	45,512	23,914	19,978

COUNTIES.	ACRES HARVESTED.									
	Potatoes.	Peppers (green).	Cantaloupes and muskmelons.	Grapes.	Apples.	Peaches.	Pears.	Plums and prunes.	Cherries.	
Bernalillo.....	3	72	17	10,528	10,205	6,482	1,885	1,210	1,538	
Chaves.....	6	2	12	4,561	192,749	24,110	4,401	966	1,829	
Colfax.....					30		1	3	3	
Curry.....					150	200	10	45	175	
Doña Ana.....	2	45	346	12,578	12,896	4,866	9,254	1,030	78	
Grant.....		27			120	125	16	10		
Hidalgo.....	30				183	162	55	104	15	
Lea.....				212	629	1,534	59	273	102	
Lincoln.....					15,852	1,175	470	592	276	
Luna.....	22	10	14	273	965	3,270	385	216	30	
McKinley.....	11		2							
Rio Arriba.....	236	85			4,200	866	276	885	623	
San Juan.....	114		18	9,261	47,453	3,626	2,847	1,227	1,699	
San Miguel.....		2	1		1,256	594	156	365	157	
Sandoval.....	2		1	136,567	2,105	2,646	440	718	575	
Santa Fe.....		116	5	1,000	21,354	1,956	546	655	659	
Sierra.....		12	2	25	2,348	1,671	259	531	80	
Socorro.....	13	9	2	310	852	559	170	127	12	
Taos.....	59				3,365	32	40	136	89	
Torrance.....					65	35	2	11	4	
Valencia.....	6	20	1	1,205	4,456	2,555	409	247	260	

¹ Number of vines of bearing age.

² Number of trees of bearing age.

³ Bushels.

⁴ Pounds.

AGRICULTURE.

STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

NORTH DAKOTA.

THE STATE.	PRINCIPAL CROPS.						
	Oats.	Spring wheat.	Barley.	Rye.	Other tame grasses.	Small grains cut for hay.	Wild, salt, or prairie grasses.
Acres harvested.....	2,870	15,713	1,188	2,040	1,028	1,664	779
Production.....	180,555	180,292	110,565	18,673	453	1,906	1,301
Value.....dollars..	24,444	192,701	12,150	12,576	7,474	13,137	4,666
COUNTIES.	ACRES HARVESTED.						
	Oats.	Spring wheat.	Barley.	Rye.	Other tame grasses.	Small grains cut for hay.	Wild, salt, or prairie grasses.
Dunn.....	2,700	15,348	1,176	2,007	1,001	1,608	609
Williams.....	170	365	10	33	27	56	170

1 Bushels.

1 Tons.

OREGON.

THE STATE.	PRINCIPAL CROPS.										
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Timothy alone.	Timothy and clover mixed.	Clover alone.	Alfalfa.	Other tame grasses.
Acres harvested.....	1,764	7,980	4,511	21,799	7,602	1,929	5,340	23,377	5,275	102,409	7,094
Production.....	162,167	1,235,637	1,78,649	1,387,487	1,216,493	118,470	1,7,068	1,33,484	1,9,795	1,309,206	1,9,759
Value.....dollars..	102,576	229,855	166,949	817,598	335,564	38,787	176,650	770,132	200,797	6,493,328	175,662
COUNTIES.	ACRES HARVESTED.										
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Timothy alone.	Timothy and clover mixed.	Clover alone.	Alfalfa.	Other tame grasses.
Baker.....	118	955	281	941	444	140	332	4,227	9	10,097	747
Clackamas.....	2	9	5	456	70	82	1	45	8	1	642
Coos.....	21	130	285	753	38	210	100	58	66	4,138	57
Crook.....	21	476	8	753	38	210	44	173	462	8,541	57
Deschutes.....	4	252	4	240	68	37	3	20	103	139	54
Douglas.....	1	321	57	176	122	83	947	8,210	62	2,805	193
Grant.....	129	184	129	169	25	157	104	496	22	1,733	600
Harney.....	297	27	348	92	310	8	471	1,205	306	5,544	920
Hood River.....											
Jackson.....											
Jefferson.....	65	21	38	34	99	2	52	619	47	120	701
Josephine.....		2,650	209	5,425	1,236	891	931	3,018	20	14,494	300
Klamath.....		144	1,142	2,566	504	97	83	438		353	610
Lake.....		37					14				
Lane.....											
Malheur.....	977	663	133	2,291	878	163	70	889	183	17,879	1,394
Marion.....											
Morrow.....	30		38		5					2,439	13
Multnomah.....											
Polk.....											
Tillamook.....											
Umatilla.....	99	41	102	1,158	570	120	2	12	21,630	36	36
Union.....	21	481	411	641	370	30	696	1,064	75	2,536	255
Walla Walla.....		1,590	1,316	6,827	2,863	65	582	1,172	3,010	6,089	112
Wasco.....									20	20	
Washington.....			5						8	8	
Wheeler.....							706	1,290		606	395

THE STATE.	PRINCIPAL CROPS.										
	Small grains cut for hay.	Annual legumes cut for hay.	Wild, salt, or prairie grasses.	Silage crops.	Potatoes.	Grapes.	Apples.	Peaches.	Pears.	Plums and prunes.	Cherries.
Acres harvested.....	23,022	1,523	51,453	1,432	1,880	18,525	177,789	25,953	115,520	21,604	6,556
Production.....	1,26,695	1,219	1,49,792	6,878	1,181,986	110,395	1,402,912	1,50,692	1,141,258	1,36,930	17,803
Value.....dollars..	560,595	24,390	796,672	65,780	382,171	6,624	543,931	78,573	226,013	81,246	27,310
COUNTIES.	ACRES HARVESTED.										
	Small grains cut for hay.	Annual legumes cut for hay.	Wild, salt, or prairie grasses.	Silage crops.	Potatoes.	Grapes.	Apples.	Peaches.	Pears.	Plums and prunes.	Cherries.
Baker.....	832	1	3,560		41						
Clackamas.....					18						
Coos.....	71	10	45	20	3						
Crook.....	2,129		437	250							
Deschutes.....	2,606	264	610	194	733						
Douglas.....	188		3	31	20	18	8,909	365	657	3,637	170
Grant.....	1,040	3	1,183		61						
Harney.....	1,794		15,920								
Hood River.....	604		34	21	278		35,282	53	2,408	30	14
Jackson.....	1,172	38	299	44	122	550	47,491	15,326	107,687	587	2,052

1 Bushels.

1 Tons.

1 Number of vines of bearing age.

1 Number of trees of bearing age.

1 Pounds.

IRRIGATION.

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STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

OREGON—Continued.

COUNTIES—continued.	ACRES HARVESTED.										
	Small grains cut for hay.	Annual legumes cut for hay.	Wild, salt, or prairie grasses.	Silage crops.	Potatoes.	Grapes.	Apples.	Peaches.	Pears.	Plums and prunes.	Cherries.
Jefferson.....	32				1						
Josephine.....	326	19	55	29	68						
Klamath.....	5,885	1,181	7,173		203		607	6	3	63	29
Lake.....	900		6,289		4						
Lane.....	48						172	10	18	23	20
Malheur.....	1,652		15,219	313	47	14	1,512	25	11	14	23
Marion.....	37						70	4	32	18	4
Morrow.....	349			11	18						
Multnomah.....											
Polk.....					5						
Tillamook.....	15				4						
Umatilla.....	845			67	93	7,943	80,599	10,092	4,641	17,029	4,126
Union.....	560	4	311	393	45		2,667	72	56	213	198
Wallowa.....	1,937		150	82	78		363		7	50	16
Wasco.....	3				1						
Washington.....				7	2		108				
Wheeler.....			165		5						

SOUTH DAKOTA.

THE STATE.	PRINCIPAL CROPS.											
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Clover and alfalfa seed.	Timothy alone.	Timothy and clover mixed.	Alfalfa.	Small grains cut for hay.	Wild, salt, or prairie grasses.	Sugar beets grown for sugar.
Acres harvested.....	2,178	3,026	759	10,949	1,026	1,040	539	1,989	38,519	1,708	3,825	1,052
Production.....	139,667	171,662	17,335	113,341	17,841	12,358	1,506	21,853	74,193	1,720	3,020	11,782
Value.....dollars.	51,567	53,769	16,357	297,350	21,409	53,055	8,490	33,201	1,595,150	28,880	39,338	117,820

COUNTIES.	ACRES HARVESTED.											
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Clover and alfalfa seed.	Timothy alone.	Timothy and clover mixed.	Alfalfa.	Small grains cut for hay.	Wild, salt, or prairie grasses.	Sugar beets grown for sugar.
Brookings.....											35	
Brown.....				1,220							300	
Butte.....	1,477	2,660	665	8,054	880	526	67	56	24,388	1,423	813	1,062
Charles Mix.....		15		80					80		50	
Custer.....	205			114	20	8			2,202		1,340	
Day.....						4						
Fall River.....	86	6	5	409	1	287			449		264	
Hughes.....											1	
Lawrence.....	122	173	10	496	26		172	178	1,422	157	192	166
McPherson.....	41										35	
Meade.....	137	101	75	237	47				2,517	104	18	
Pennington.....	108	71	4	339	52	215	300	1,765	7,461	24	778	36

¹ Bushels.

² Tons.

TEXAS.

THE STATE.	PRINCIPAL CROPS.									
	Corn.	Oats.	Winter wheat.	Kafir, milo, etc.	Dry beans.	Rough rice.	Broom corn.	Cotton.	Potatoes.	Sweet potatoes and yams.
Acres harvested.....	36,736	3,494	6,146	6,310	694	164,301	12,199	22,006	553	603
Production.....	1,207,132	53,895	190,536	1,200,459	16,781	5,287,169	5,144,047	8,537	135,317	159,223
Value.....dollars.	1,629,628	43,116	187,407	230,528	29,836	14,832,073	257,202	1,476,901	79,441	106,601

COUNTIES.	ACRES HARVESTED.									
	Corn.	Oats.	Winter wheat.	Kafir, milo, etc.	Dry beans.	Rough rice.	Broom corn.	Cotton.	Potatoes.	Sweet potatoes and yams.
Anderson.....									35	
Atascosa.....	407			12	8				50	48
Bailey.....	210	20		185						
Bexar.....	1,783	112		9	10				342	
Borden.....				27					7	
Bosque.....										
Brazoria.....				3			629			
Brewster.....										
Cameron.....										
Chambers.....	10,917			10	51			686	7,513	424
						19,915				120

¹ Bushels.

² Pounds.

³ Bales.

AGRICULTURE.

STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

TEXAS—Continued.

COUNTIES—continued.	ACRES HARVESTED.									
	Corn.	Oats.	Winter wheat.	Kafir, milo, etc.	Dry beans.	Rough rice.	Broom corn.	Cotton.	Potatoes.	Sweet potatoes and yams.
Cherokee								15		
Coke				610	1					
Colorado						9,004				
Crockett	8									
Dallas	15									
De Witt	10							8		4
Deaf Smith	132	40	78	3,011						
El Paso	2,406	1,962	2,173	446	418				20	241
Fisher				27						
Fort Bend						230				
Frio	201			192	6				7	25
Galveston						200				
Gillespie	92	40	6	6						
Hale	12		944	1,224						
Harris						6,638				
Hemphill	10	10	10	100			30	10		
Hidalgo	14,677		9	8	98		11,419	6,646	54	82
Irion	49	2	22					107		
Jackson						6,045		37		
Jefferson						42,939				
Kerr									2	3
Kinney	258			100				140		
Lampasas		22						4		
Liberty						10,410				
Matagorda						37,927				
Maverick	230		455	5						2
Medina	2,545	7						595		3
Menard	432	221	911	38				331		15
Musces	6							100		
Orange						9,223				
Palo Pinto	36									
Presidio	465		750	22	90			12		10
Reeves	68	86	359	57	8		33	3,480		
Runtels	3	5	2	15				682	1	
Rusk										
Smith		4						11		
Stephens								48		
Taylor	2		298	201						
Tom Green	205	852					1	1,594		40
Travis	42									
Uvalde	50	14						1		
Val Verde	70									
Victoria						100				2
Webb	88									
Wharton							8	81	5	7
Wichita	24	17	100			20,441		110		
Zavalla	226			29	4		22	45		1

THE STATE.	PRINCIPAL CROPS.									
	Alfalfa.	Other tame grasses.	Small grains cut for hay.	Wild, salt, or prairie grasses.	Corn cut for forage.	Kafir, sorghum, etc., for forage.	Cabbages.	Onions.	Beans (green).	Tomatoes.
Acres harvested	19,456	4,612	1,145	690	582	11,817	1,976	942	478	614
Production.....tons.	55,544	8,790	1,244	691	631	20,670				
Value.....dollars.	1,638,548	202,170	29,886	12,784	11,989	504,830	394,883	424,783	74,620	176,800

COUNTIES.	ACRES HARVESTED.									
	Alfalfa.	Other tame grasses.	Small grains cut for hay.	Wild, salt, or prairie grasses.	Corn cut for forage.	Kafir, sorghum, etc., for forage.	Cabbages.	Onions.	Beans (green).	Tomatoes.
Atascosa		12	26	1		98				
Bailey	160	4								
Bexar		512	61	9	29	237				
Borden			2							
Bosque		37		46	4	648				
Brewster										
Caldwell										
Cameron									1	
Childress	542	394	3	52	75	1,563	1,254	16	350	499
Coke			212	32		30				
Collin						760				
Crockett										
Dallas						2				
Deaf Smith				100		3				
Dimmit	831	3			102	1,382				
								56		3

IRRIGATION.

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STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

TEXAS—Continued.

COUNTIES—continued.	ACRES HARVESTED.									
	Alfalfa.	Other tame grasses.	Small grains cut for hay.	Wild, salt, or prairie grasses.	Corn cut for forage.	Kafir, sorghum, etc., for forage.	Cabbages.	Onions.	Beans (green).	Tomatoes.
El Paso.....	10,044	211	517		109	1,617	14	11	21	157
Floyd.....	112									
Frio.....	8	102				97		309	3	1
Gillespie.....					95	20				
Grayson.....							2			
Hale.....	703	22	2			279	1		1	
Hemphill.....		5				30				
Hidalgo.....	646	1,083		18	29	2,150	692	118	93	34
Irion.....	106	330		3		18				
Jack.....					10	197				
Kinney.....						152				
Lampasas.....				9						
McLennan.....		2			15		2	1	1	2
Matagorda.....		1					1			
Maverick.....	28	141								
Medina.....	25	27				224				
Menard.....	454	84	61		19	182	5			
Nueces.....						120	4			
Palo Pinto.....						3				
Potter.....		50			30	100				
Presidio.....	31	30	47			312				
Rains.....		14		6						
Reeves.....	4,854	21	26	10	43	376	1		1	
Runnels.....						176				
Sherman.....					12	560				
Smith.....	89									
Terrell.....	7	30								
Throckmorton.....						47				
Tom Green.....	932	807	62			263				
Travis.....	18	20				7				
Uvalde.....	38	200				22				
Val Verde.....		216	11	4	3	1				
Ward.....		35				233				
Washington.....					2					
Webb.....	327	26			5	41				
Wichita.....		60	40	400		28				
Wood.....										8
Zavalla.....		134	85			35		431		

UTAH.

THE STATE.	PRINCIPAL CROPS.								
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Clover and alfalfa seed.	Potatoes.	Sugar beets grown for sugar.
Acres harvested.....	9,028	52,695	41,289	91,533	11,884	3,892	9,692	10,758	92,439
Production.....	1 193,560	1 1,560,574	1 548,706	1 1,895,241	1 309,724	1 27,915	1 46,125	1 1,559,886	1 921,418
Value.....dollars	377,442	1,872,689	1,207,153	4,169,530	526,531	57,226	922,500	3,305,898	9,951,314
COUNTIES.	ACRES HARVESTED.								
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Clover and alfalfa seed.	Potatoes.	Sugar beets grown for sugar.
Beaver.....	132	673	281	1,296	290	8	53	107	5
Box Elder.....	112	2,539	6,517	7,158	1,357	238	241	319	13,247
Cache.....	90	2,327	6,382	8,367	566	47	42	699	18,248
Carbon.....	77	378	74	474	26		112	117	136
Daggett.....	1	420	21	133				16	
Davis.....	98	453	1,844	2,526	645	3	2	1,017	5,397
Duchesne.....	586	3,472	1,111	3,877	240	28	1,859	1,054	3
Emery.....	244	4,165	83	4,458	139		1,763	213	3
Garfield.....	14	1,992	57	1,053	98	398		38	
Grand.....	714	75	19	168				36	
Iron.....	596	1,067	201	1,844	272		180	119	
Juab.....	140	364	2,011	796	161	234	225	93	252
Kane.....	832	578	242	197	4	146	60	54	
Millard.....	315	1,309	4,472	2,697	488	1,489	4,062	137	5,885
Morgan.....	3	834	470	2,410	360		91	139	167
Pluta.....	8	1,309	7	1,540	35	47	18	109	5
Rich.....		1,377	133	758	288		8	57	
Salt Lake.....	839	1,852	2,599	7,247	975	39	12	1,438	6,957
San Juan.....	617	578	235	211	11		8	26	
Sanpete.....	95	6,198	2,295	12,307	1,436	660	16	480	4,041

1 Bushels.

* Tons.

AGRICULTURE.

STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

UTAH—Continued.

COUNTIES—continued.	ACRES HARVESTED.							
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Clover and alfalfa seed.	Sugar beets grown for sugar.
Sevier.....	76	4,856	607	4,689	463	162	3	5,529
Summit.....	1	1,294	291	1,225	404	18	190	296
Tooele.....	105	459	3,994	817	680	226	120	23
Uintah.....	463	3,264	445	2,120	161	23	144	20,153
Utah.....	1,619	4,672	4,399	12,408	1,489	5	155	307
Wasatch.....		1,621	114	2,818	189	5	18	130
Washington.....	892	153	1,126	614	234	1	7	117
Wayne.....	53	1,682	52	1,309	440	65	45	1,199
Weber.....	376	2,725	1,207	4,016	432			11,785

THE STATE.	PRINCIPAL CROPS.									
	Timothy alone.	Timothy and clover mixed.	Clover alone.	Alfalfa.	Other tame grasses.	Wild, salt, or prairie grasses.	Small grains cut for hay.	Annual legumes cut for hay.	Silage crops.	Root crops for forage.
Acres harvested.....	11,972	31,284	2,136	342,635	22,341	67,344	9,320	1,596	3,377	733
Production.....	19,200	50,953	3,383	738,746	29,999	78,886	14,985	3,601	27,284	7,024
Value.....	508,860	1,324,778	74,426	18,538,023	629,979	1,498,834	299,700	72,020	272,840	136,968

COUNTIES.	ACRES HARVESTED.									
	Timothy alone.	Timothy and clover mixed.	Clover alone.	Alfalfa.	Other tame grasses.	Wild, salt, or prairie grasses.	Small grains cut for hay.	Annual legumes cut for hay.	Silage crops.	Root crops for forage.
Beaver.....	158	1,384	62	8,105	240	247	55	12	7	2
Box Elder.....	640	910	32	25,132	2,359	4,793	715	140	140	66
Cache.....	1,515	2,613	42	16,955	985	1,463	739	26	285	240
Carbon.....	15	360		4,139	160	261	47	16	1	1
Daggett.....	27			1,774	58	571	18			
Davis.....	386	325	31	9,619	2,103	358	249	4	570	16
Duchesne.....	379	168	635	34,629	405	176	614	10	1	21
Emery.....	3		156	14,938	401	321	140		195	16
Garfield.....	581			8,716	643	1,281	681	41		9
Grand.....		10		3,298	107	257	48		176	
Iron.....	150	298	22	12,932	195	302	181		77	103
Juab.....	182			4,961	71	948	255	1	77	4
Kane.....	36			2,232	58	724	287		46	4
Millard.....	12		28	23,254	1	760	742		2	12
Morgan.....	879	1,362	2	1,545	236	1,159	133	95	3	10
Platte.....	319	96	44	6,845	240	1,204	130	2		8
Rich.....	315	1,590		3,766	585	25,470	41	47		
Salt Lake.....	472	371	140	21,584	333	1,100	402	36	478	98
San Juan.....	16	180		7,890	70	107	104		50	180
Sanpete.....	698	510	48	27,665	4,062	6,257	1,221	33	87	10
Sevier.....	659	598	15	26,335	1,141	2,415	229	8	51	4
Summit.....	1,311	9,868	123	1,198	4,592	5,225	135	12	129	1
Tooele.....	20	80		5,133	510	1,498	127		10	15
Uintah.....	380	251	89	19,235	368	552	523	48	19	30
Utah.....	610	544	444	23,711	1,359	5,741	621	145	1,026	15
Wasatch.....	843	7,325	127	3,239	204	1,612	315	159	47	10
Washington.....	113	50	10	7,897	92	13	55	8	10	
Wayne.....		298	25	6,014	335	1,106	203	19		112
Weber.....	1,368	2,193	51	10,673	428	1,423	360	746	81	319

THE STATE.	PRINCIPAL CROPS.							
	Peas (green).	Tomatoes.	Grapes.	Apples.	Peaches.	Pears.	Plums and prunes.	Cherries.
Acres harvested.....	2,065	3,428	193,344	594,168	519,350	46,261	55,925	94,612
Production.....			535,807	756,624	854,342	65,861	44,112	107,238
Value.....	133,299	483,659	32,148	1,361,923	1,366,947	136,015	77,196	348,524

COUNTIES.	ACRES HARVESTED.							
	Peas (green).	Tomatoes.	Grapes.	Apples.	Peaches.	Pears.	Plums and prunes.	Cherries.
Beaver.....				854	179	93	339	66
Box Elder.....	44	128	5,050	79,547	122,577	1,147	6,008	13,949
Cache.....	1	8	143	27,174	6,247	457	1,087	696
Carbon.....		5	89	4,389	2,086	894	1,012	259
Davis.....	266	1,605	10	35,022	30,799	1,353		24,314
Duchesne.....		1	53	4,150	510	225	472	275
Emery.....		3	100	25,956	2,548	2,555	1,813	640
Garfield.....				118	67	10		
Grand.....		1	4	5,359	573	1,335	208	165
Iron.....				2,075	593	242	998	155

1 Number of vines of bearing age.

1 Number of trees of bearing age.

1 Pounds.

1 Bushels.

IRRIGATION.

91

STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

UTAH—Continued.

COUNTIES—continued.	ACRES HARVESTED.							
	Peas (green).	Tomatoes.	Grapes.	Apples.	Peaches.	Pears.	Plums and prunes.	Cherries.
Juab.....		4	11	11,513	3,781	106	278	182
Kane.....			35	1,731	287	169	291	103
Millard.....		1		6,945	1,679	529	679	49
Morgan.....	655			4,426		561	227	39
Plute.....				1,633	449	86	381	306
Rich.....				1,617		168	147	106
Salt Lake.....	250	216	3,188	86,463	44,809	7,117	7,938	14,326
San Juan.....			7	639	398	131	239	100
Sanpete.....	52			11,482	4,458	427	2,768	499
Sevier.....		2		8,939	3,853	1,122	3,650	459
Summit.....	146			59		13	7	4
Tooele.....				4,640	2,022	594	1,521	
Uintah.....		3	4	12,223	968	693	1,991	444
Utah.....	198	525	5,380	192,909	172,586	19,419	14,536	20,772
Wasatch.....	144			4,611	1	9	883	64
Washington.....		15	36,956	7,897	30,839	2,148	2,482	1,181
Wayne.....	1			1,073	798	226	438	74
Weber.....	298	911	42,314	48,124	86,464	4,432	4,495	15,385

WASHINGTON.

THE STATE.	PRINCIPAL CROPS.												
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Red clover seed.	Hops.	Potatoes.	Sugar beets grown for sugar.	Timothy alone.	Timothy and clover mixed.	Clover alone.
Acres harvested.....	13,203	7,215	8,236	35,694	5,761	544	897	507	8,186	4,635	8,142	8,647	2,254
Production.....	1,487,154	1,337,056	1,154,116	1,923,493	1,193,568	1,5,646	1,3,925	1,870,769	1,526,353	1,40,286	1,18,406	1,18,140	1,4,128
Value.....dollars..	876,877	337,056	824,201	2,013,215	290,352	11,292	117,750	391,846	3,205,341	435,089	468,980	444,430	99,072
COUNTIES.	ACRES HARVESTED.												
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Red clover seed.	Hops.	Potatoes.	Sugar beets grown for sugar.	Timothy alone.	Timothy and clover mixed.	Clover alone.
Adams.....				3,910									
Asotin.....	2					225							
Benton.....	1,399	15	949	680	105				584		77	5	23
Chelan.....	74	4	4	108					147		161	108	23
Chillam.....												10	
Clarke.....							3				1	6	
Columbia.....			1,080						1				
Douglas.....			60	200	30				10		5		
King.....												18	1
Kittitas.....											5		
Kittitas.....	31	3,916	945	9,686	1,441	76			185		5,170	5,602	419
Klickitat.....	36	903	161	550	12	7			74		455	1,081	451
Lewis.....		44		10					2			62	
Lincoln.....		5	110	205	30	7					660		
Mason.....									1				
Okanogan.....	346	78	73	246	52				183		213	363	102
Pend Oreille.....									5			572	3
Pierce.....									10			2	
Spokane.....	47	72	274			10			198		41	38	111
Stevens.....													
Wahkikum.....	27	103	52	63	1	8			34		464	162	35
Walla Walla.....	293												
Yakima.....	11,008	2,074	265	115	167				241	303		79	
			4,283	19,921	3,933	211	894	507	6,506	4,332	890	539	1,086

THE STATE.	PRINCIPAL CROPS.										
	Alfalfa.	Other tame grasses.	Wild, salt, or prairie grasses.	Small grains cut for hay.	Silage crops.	Corn cut for forage.	Root crops for forage.	Grapes.	Apples.	Peaches.	Plums and prunes.
Acres harvested.....	148,409	17,014	1,047	11,650	2,645	2,001	628	118,892	4,633,119	455,526	530,834
Production.....	1,494,066	1,35,054	1,2,075	1,15,214	1,23,762	1,6,046	1,2,619	1,410,072	1,5,823,446	1,1,259,178	1,1,236,330
Value.....dollars..	11,857,584	735,873	39,425	418,385	261,382	78,598	55,104	112,806	13,697,378	2,707,228	580,118

1 Bushels.

1 Pounds.

1 Tons.

1 Number of vines of bearing age.

1 Number of trees of bearing age.

AGRICULTURE.

STATE TABLE L.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

WASHINGTON—Continued.

COUNTIES.	ACRES HARVESTED.											
	Alfalfa.	Other tame grasses.	Wild, salt, or prairie grasses.	Small grains cut for hay.	Silage crops.	Corn cut for forage.	Root crops for forage.	Grapes.	Apples.	Peaches.	Pears.	Plums and prunes.
Adams.....	148			527		2						
Asotin.....	25				294	259	10	38,469	370,732	70,920	65,269	9,683
Benton.....	16,630	11	7	608		219	12	4,115	1,214,195	50,761	52,817	8,271
Chelan.....	7,606	7		472					35	2		0
Columbia.....	3			45								
Douglas.....	1,028	2		153		16		350	289,838	24,358	8,005	2,240
Ferry.....	49								12			
Franklin.....	5											
Gardfield.....	82							40	19,960	1,565	3,615	34
Grant.....												
King.....	145			23		12			12	12	260	15
Kitsap.....				23			2	79	9,884	359	531	325
Kittitas.....	12,003	16,095	341	1,420	222		7	736	29,840	452	261	293
Klickitat.....	254	31	130	878	37	49						
Lewis.....		24		35			5					
Lincoln.....	110								490	1,700	262	284
Mason.....									69	1	3	6
Okanogan.....	12,902	109	298	1,229	334	378	454	1,082	384,425	4,403	3,410	839
Pend Oreille.....		45	15	55					82			10
Pierce.....	4			1					1,302	7	108	257
Spokane.....	693	2		550	72	180	10	3,317	622,158	4,622	9,837	2,026
Stevens.....	1,667	192	5	184	7	33	10		10,656			
Walla Walla.....	8,882	2		372	212	177	70					
Yakima.....	86,682	494	251	4,865	1,467	676	48	70,704	1,679,429	296,364	386,456	50,825

WYOMING.

	PRINCIPAL CROPS.								
	Corn.	Oats.	Winter wheat.	Spring wheat.	Barley.	Rye.	Clover and alfalfa seed.	Potatoes.	Sugar beets grown for sugar.
THE STATE.									
Acres harvested.....	2,738	23,684	2,466	40,470	3,099	541	2,380	4,532	2,714
Production.....	151,839	1512,262	135,513	1630,098	158,741	14,415	17,534	1532,611	23,067
Value.....dollars..	85,534	563,488	76,708	1,361,012	91,049	7,726	144,096	1,251,401	242,204
	ACRES HARVESTED.								
COUNTIES.									
Albany.....		1,100	105	92	176	102		180	
Big Horn.....	80	3,289	192	6,268	192		866	547	40
Carbon.....		1,773	419	265	272	59		129	
Converse.....		43		35	110				
Crook.....								10	
Fremont.....	2	998	58	931	90	4			
Goshen.....	1,991	1,666	229	4,228	246	45		1,699	1,091
Hot Springs.....	9	156	18	43	50	40		68	
Johnson.....						8			
Laramie.....		15	2	15	11	15		27	
Lincoln.....		2,566	246	920	485	60		90	
Natrona.....		10		5				27	
Park.....	44	5,328	275	15,721	343		985	1,345	697
Platte.....	483	1,326	272	3,556	323	107	453	4	271
Sheridan.....	37	1,798	435	6,552	376		48	85	217
Sweetwater.....		1,125		118	39			40	
Uinta.....		1,821	160	1,051	308	101	24	143	
Washakie.....	87	565	40	456	78			131	588
Weston.....	5	5	15	214			10	7	

THE STATE.	PRINCIPAL CROPS.									
	Timothy.	Timothy and clover mixed.	Clover alone.	Alfalfa.	Other tame grasses.	Wild, salt, or prairie grasses.	Small grains cut for hay.	Annual legumes cut for hay.	Silage crops.	Corn cut for forage.
Acres harvested.....	18,645	25,691	1,638	176,295	50,923	142,750	9,081	778	653	951
Production.....	18,824	32,359	1,811	284,423	37,483	116,188	7,160	1,011	3,787	2,317
Value.....dollars..	489,424	776,616	36,220	6,541,729	1,044,648	2,729,943	150,360	19,209	37,870	34,755

¹ Bushels.¹ Tons.

IRRIGATION.

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STATE TABLE I.—ACRES HARVESTED AND PRODUCTION AND VALUE OF PRINCIPAL CROPS IN 1919 ON IRRIGATED LAND FOR THE STATES, AND ACRES HARVESTED, BY COUNTIES—Continued.

WYOMING—Continued.

COUNTIES.	ACRES HARVESTED.								
	Timothy.	Timothy and clover mixed.	Clover alone.	Alfalfa.	Other tame grasses.	Wild, salt, or prairie grasses.	Small grains cut for hay.	Annual legumes cut for hay.	Corn cut for forage.
Albany.....	881	21	10	5,375	3,463	34,748	683	50	1
Big Horn.....	93	504	47	30,771	804	268	1,352	12	30
Campbell.....				418		30	50		
Carbon.....	4,665	7,864	65	10,810	7,362	27,301	118	27	1
Converse.....	10	33		1,161		42			
Crook.....				60			30		
Fremont.....	22	63	147	4,471		197	551	9	
Goshen.....	40	15		13,047	369	2,264	595	27	186
Hot Springs.....	160	1		8,488	283	80		20	12
Laramie.....	41	314		1,559		4,775	40	218	48
Lincoln.....	5,866	6,414	72	13,186	20,057	52,511	2,205	99	
Natrona.....				4,653	50	295	195		
Park.....	3,554	631	241	29,330	1,130	690	1,267	28	6
Platte.....	22	123	157	25,555	1,963	6,360	393	56	637
Sheridan.....	1,873	6,786	29	14,155	2,325	280	709	5	23
Sweetwater.....	585	23		1,875	1,011	1,426	146	65	
Uinta.....	833	2,713	795	6,904	12,101	10,686	599	221	5
Washakie.....		91		1,422			85		
Weston.....			75	3,055	25	797	63		2

STATE TABLE II.—LAND IN IRRIGATION ENTERPRISES REPORTED AS AVAILABLE FOR SETTLEMENT, BY STATE, COUNTY, AND TERMS: 1920.

COUNTY.	Class of enterprise.	Source of water.	Acreage available for settlement.	Price of land, per acre.	Cost of preparing land for irrigation, per acre.	Price of water rights, per acre.	Terms, etc.
ARIZONA.							
Cochise	Cooperative	San Pedro River	800	\$10.00	\$40.00	\$4.00	One-half cash, balance 3 to 5 years, 10 per cent interest.
Cochise	Cooperative	San Pedro River	1,300	10.00	25.00	4.00	No report.
Graham	Cooperative	Marylla Canyon	400	25.00	50.00	14.00	No report.
Graham	Cooperative	Gila River	100	25.00	79.00	2.00	No report.
Graham	Individual	Wells	430			20.00	Government land.
Graham	Cooperative	Gila River	1,000	50.00	30.00	5.00	No report.
Graham	Cooperative	Oregon Canal	200	50.00	100.00	2.00	No report.
Graham	Cooperative	Gila River	1,050		40.00	10.00	No report.
Graham	Individual	Wells	125	25.00	30.00		Cash.
Graham	Individual	Wells	102		20.00		No report.
Maricopa	Individual	Gila River	980	50.00			No report.
Maricopa	Cooperative	Gila River	5,000	30.00	60.00	22.00	Cash.
Pima	Individual	Rillito Creek	100	20.00	60.00		8 per cent interest.
Pima	Individual	Wells	147	25.00	50.00		8 per cent annually.
Pima	Partnership	Wells and Sabino Canyon	461	25.00	60.00		8 per cent annually.
Pima	Individual	Rillito Creek	120	150.00	50.00		8 per cent annually.
Pima	Individual	Wells	465	80.00	90.00		8 per cent annually.
Pima	Partnership	Wells	143	30.00	60.00		8 per cent annually.
Pima	Partnership	Wells	120	75.00	50.00		8 per cent annually.
Pima	Individual	Wells	120	60.00	40.00		8 per cent annually.
Pima	Individual	Wells	148	10.00	50.00		No report.
Pima	Commercial	Santa Cruz River	3,000	100.00	40.00	6.00	25 per cent cash, balance 2, 3, and 4 years, 6 per cent interest.
Pima	Individual	Wells	310	60.00	40.00		8 per cent interest.
Pinal	Commercial	Gila River	1,000	40.00	50.00	3.00	One-half cash, balance 8 per cent interest.
Pinal	Commercial	Gila River	6,000	50.00	40.00	3.00	One-half cash, balance 8 per cent interest.
Pinal	Individual	Wells	320	200.00		12.00	One-fourth cash, balance 5 payments, 6 per cent interest.
Pinal	Cooperative	Gila River	400	50.00	40.00	10.00	One-half cash, balance 8 per cent interest.
CALIFORNIA.							
Butte	Irrigation district	Little Butte Creek	4,000	\$60.00	\$75.00	\$4.00	No report.
Butte	Cooperative	Butte Canal	500	200.00	10.00	1.00	No report.
Calaveras	Commercial	Mokelumne River	2,980	40.00	25.00		No report.
Contra Costa	Cooperative	San Joaquin River	8,000				No report.
Fresno	Commercial	Kings River	2,000	117.00	25.00		10 per cent down, 10 per cent annually.
Fresno	Commercial	San Joaquin River	41,667				5 years, 6 per cent interest.
Fresno	Commercial	San Joaquin River	24,000	175.00	40.00	38.00	10 equal payments, 6 per cent interest.
Glenn	U. S. Reclamation Serv.	Stony Creek	3,000	150.00	40.00	55.00	5 to 10 years, 7 per cent interest.
Glenn	Cooperative	Wells	300		50.00		No report.
Glenn	Cooperative	Sacramento River	345	125.00	15.00		10 years, 6 per cent interest.
Glenn	Partnership	Sacramento River	1,100	200.00	17.00		3 to 5 years, 6 per cent interest.
Imperial	Cooperative	Imperial Irrig. Dist.	1,800	50.00	40.00	10.00	No report.
Inyo	Cooperative	Bulls Creek	1,300	150.00	25.00		One-fourth cash, balance 10 years, 6½ per cent interest.
Inyo	Cooperative	Owens River	3,000	50.00	40.00		No report.
Kern	Cooperative	Canyon Creek	524	300.00	25.00	100.00	One-fourth cash, balance 2, 3, and 4 years, 6 per cent interest.
Kings	Cooperative	Kings River	14,000				No report.
Lassen	Individual	Buckhorn River	2,000	30.00	10.00	30.00	6 years, 10 per cent interest.
Los Angeles	City	Sawpit and Monrovia Canyon	250	500.00			Cash.
Los Angeles	Cooperative	Wells	2,500	100.00	150.00		One-fifth cash, one-fifth annually.
Los Angeles	Cooperative	Dead Mans Canyon	1,200	5.00	15.00		No report.
Los Angeles	Partnership	San Gabriel River	300	50.00	15.00		No report.
Los Angeles	Commercial	Pacoma Creek	600	500.00	20.00		No report.
Los Angeles	Cooperative	Wells	250	250.00	200.00	100.00	One-third cash, 7 per cent interest.
Merced	Commercial	Merced River	180,000	100.00	40.00	10.00	No report.
Merced	Commercial	San Joaquin River	62,500				5 years, 6 per cent interest.
Mono	Cooperative	Rush Creek	40,000		10.00	1.00	No report.
Riverside	Cooperative	Wells	200	300.00			One-half cash, 7 per cent interest.
Riverside	Cooperative	Wells	2,500	200.00	20.00		One-tenth cash, balance 9 equal payments.
Riverside	Cooperative	Wells	2,510	250.00	25.00		Cash.
Riverside	Commercial	Whitewater River	1,250	325.00	20.00		7 per cent interest.
Riverside	Individual	Wells	1,000	70.00	50.00		One-third cash, 7 per cent interest.
Riverside	Cooperative	Wells	2,000	150.00	100.00	100.00	No report.
Riverside	Commercial	Edgar Canyon	980	100.00	30.00		One-fourth cash, balance 3 years, 6 per cent interest.
Riverside	Partnership	Springs	100	300.00	25.00		Cash.
Riverside	Cooperative	Wells	700	350.00	12.00	15.00	One-fourth down, balance 1 to 5 years, 7 per cent interest.
Sacramento	Cooperative	Sacramento River	9,583	125.00			One-fifth cash, 8 per cent annually, 6 per cent interest.
Sacramento	Cooperative	American River	4,295	150.00			One-fifth cash, 10 years, 6 per cent interest.
Sacramento	Cooperative	Sacramento River	1,208	185.00	3.00		One-fifth cash, 8 per cent annually, 6 per cent interest.
San Benito	Partnership	Los Veronas	1,700	100.00			No report.
San Diego	Individual	Agua Tigua and Marias Creek	1,000				No report.
San Diego	Commercial	Sweetwater River	6,500	300.00		19.00	No report.
Shasta	Individual	North Fork Cottonwood Creek	15,000	35.00	50.00		6 and 8 per cent interest.
Sierraville	Cooperative	Big Springs	2,300	150.00	60.00	3.00	10 years, 6 per cent interest.
Stanislaus	Irrigation district	Tuolumne River	5,000	150.00	75.00	2.00	One-fourth down, 6 per cent interest.
Stanislaus	Commercial	San Joaquin River	20,833				5 years, 6 per cent interest.

IRRIGATION.

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STATE TABLE II.—LAND IN IRRIGATION ENTERPRISES REPORTED AS AVAILABLE FOR SETTLEMENT, BY STATE, COUNTY, AND TERMS: 1920—Continued.

COUNTY.	Class of enterprise.	Source of water.	Acreage available for settlement.	Price of land, per acre.	Cost of preparing land for irrigation, per acre.	Price of water rights, per acre.	Terms, etc.
CALIFORNIA—Continued.							
Stanislaus	Cooperative	San Joaquin River	2,000	\$300.00	\$40.00	\$7.00	One-fifth down, 10 payments, 6 per cent interest.
Stanislaus	Irrigation district	Stanislaus River	40,000	75.00	50.00	33.00	No report.
Stanislaus	Irrigation district	Tuolumne River	10,000	200.00	75.00		No report.
Tehama	Commercial	Los Molinos River	2,000	200.00	25.00		One-tenth cash, 15 per cent yearly, 6 per cent interest.
Tehama	Cooperative	Thomas Creek	900		40.00		No report.
Tulare	Irrigation district	Wells	2,700	150.00	35.00	7.00	No report.
Tulare	Commercial	Cacho Creek and Clear Lake	20,908	75.00		20.00	No report.
Yolo	Commercial	Dry Creek	4,400	125.00	50.00		5 years, 6 per cent interest.
Yuba	Individual	Feather River	800	150.00	60.00		10 years, 7 per cent interest.
Yuba	Cooperative	Yuba and Feather Rivers	1,520	150.00	50.00	18.00	10 years, 7 per cent interest.
COLORADO.							
Alamosa	Cooperative	Rio Grande	8,000	\$20.00		\$3.00	One-fourth cash, 6 per cent interest.
Alamosa	Cooperative	Rio Grande	64,000	25.00	\$15.00		No report.
Bent	Partnership	Dry Creek	640	5.00	2.00		No report.
Bent	Cooperative	Arkansas River	1,000		8.00	75.00	No report.
Bent	Partnership	Culebra Creek	4,000	5.00	6.00		No report.
Crowley	Cooperative	Horse Creek	5,000	25.00	10.00		No report.
Delta	U. S. Reclamation Serv.	Gunnison River	1,500	75.00	15.00	100.00	One-half cash, balance 3 to 5 years, 7 per cent interest.
Delta	Cooperative	Cottonwood Creek	1,400	15.00	25.00	50.00	No report.
Delta	Cooperative	Gunnison River	4,000		45.00		No report.
Delta	Partnership	Dirty Gorge	1,440	50.00	15.00		8 per cent interest.
Delta	Cooperative	Gunnison River	700	75.00	20.00	22.00	One-fifth cash, 6 per cent interest.
Dolores	Carey Act	Creeks	20,000	1.25	20.00	25.00	No report.
El Paso	Individual	Turkey Creek	200				No report.
El Paso	Cooperative	Fountain River	2,000	25.00		75.00	One-third cash, balance 3 years, 7 per cent interest.
Elbert	Partnership	Bljow Creek	1,800	50.00	10.00	50.00	No report.
Fremont	Commercial	Beaver Creek	1,200	15.00	10.00	3.00	One-tenth down, 9 payments, 6 per cent interest.
Fremont	Cooperative	Arkansas River	3,350	25.00	90.00	3.00	One-twentieth cash, balance 5 years.
Garfield	Cooperative	West Druide Creek	5,000	10.00	10.00	23.00	No report.
Garfield	Cooperative	White River	1,000	15.00	10.00	115.00	No report.
Grand	Partnership	St. Louis Creek	800	10.00			No report.
Huerfano	Cooperative	Huerfano River	1,500	10.00	25.00	42.00	No report.
Huerfano	Irrigation district	Arapahoe Creek	900	20.00	6.00		No report.
Huerfano	Partnership	South Abeyta	120	75.00	9.00		No report.
Jackson	Individual	Big Grizzly	400	10.00			No report.
Jackson	Individual	Norris Creek	240	25.00	15.00		No report.
Jackson	Cooperative	Wellar Creek	7,000				Homestead lands.
Jackson	Commercial	Michigan River	20,000				Homestead lands.
La Plata	Partnership	Draw	280				No report.
La Plata	Partnership	Spring Hollow	200				No report.
La Plata	Partnership	La Plata River	195	5.00	50.00		No report.
La Plata	Partnership	Florida River	630	15.00	20.00		No report.
La Plata	Partnership	Stevens Creek	100	20.00	100.00		No report.
La Plata	Cooperative	Florida River	5,000	12.00	8.00	30.00	No report.
La Plata	Cooperative	Las Animas River	800	15.00	10.00	7.00	No report.
La Plata	Partnership	La Plata River	202	20.00	20.00		No report.
La Plata	Cooperative	Los Pinos River	500				No report.
Mesa	Cooperative	Kannah Creek	1,200	10.00	50.00	50.00	No report.
Mesa	Cooperative	Deer and Indian Creeks	4,000	8.00	30.00		No report.
Mesa	U. S. Reclamation Serv.	Grand River	32,500	35.00	20.00		20 years, without interest.
Mesa	Cooperative	Grand River	1,500	15.00	10.00	20.00	No report.
Montezuma	Irrigation district	Dolores River	13,000	25.00		27.00	One-tenth down, 18 annual payments, 8 per cent interest.
Montrose	Cooperative	San Miguel River	2,000	10.00	13.00	30.00	One-fifth down, 15 years, 7 per cent interest.
Montrose	Cooperative	Creeks	8,000	15.00	5.00	50.00	10 years, 8 per cent interest.
Montrose	U. S. Reclamation Serv.	Gunnison River	3,000	75.00	15.00	100.00	One-half cash, balance 3 to 5 years, 8 per cent interest.
Montrose	Cooperative	Cimarron River	500	15.00	20.00	20.00	No report.
Pueblo	Cooperative	Huerfano River	3,000	25.00		10.00	No report.
Pueblo	Cooperative	Huerfano River	17,000		2.00		No report.
Pueblo	Individual	St. Charles River	2,000		5.00		No report.
Pueblo	Partnership	Mustang Creek	1,800	10.00	5.00		No report.
Pueblo	Cooperative	Apishapa River	4,285	25.00	6.00	45.00	Cash.
Pueblo	Partnership	Mustang Creek	2,500	20.00	2.00		No report.
Pueblo	Individual	Saunders Arroyo	1,000	10.00			No report.
Saguache	Cooperative	Saguache Creek	8,000			20.00	No report.
San Miguel	Cooperative	Naturita Creek	3,000	10.00	13.00	30.00	One-fifth down, 15 years, 7 per cent interest.

AGRICULTURE.

STATE TABLE II.—LAND IN IRRIGATION ENTERPRISES REPORTED AS AVAILABLE FOR SETTLEMENT BY STATE, COUNTY, AND TERMS: 1920—Continued.

COUNTY.	Class of enterprise.	Source of water.	Acreage available for settlement.	Price of land, per acre.	Cost of preparing land for irrigation, per acre.	Price of water rights, per acre.	Terms, etc.
IDAHO.							
Ada	Cooperative	Indian Creek	800	\$40.00			No report.
Bannock	Carey Act	Port Neuf River, Topons Creek	7,690	50.00	\$20.00	\$35.00	10 equal payments, 6 per cent interest.
Bannock	Partnership	Bear River	9,090		10.00		No report.
Bingham	Carey Act	Snake River	12,688	0.50	35.00	40.00	No report.
Blaine	Partnership	Silver Creek	800	25.00	10.00	50.00	20 years, 7 per cent interest.
Boise	Partnership	Elk Creek	193		50.00		No report.
Cassia	Partnership	Cassia Creek	212	42.00	20.00		8 per cent interest.
Cassia	U. S. Reclamation Serv.	Snake River	154	58.00	6.00	50.00	No report.
Cassia	Irrigation district	Raft River	1,247	15.00	15.00		No report.
Cassia	Partnership	Raft River	540	20.00	15.00		No report.
Cassia	Individual	Six Mile Creek	348	100.00	20.00		No report.
Cassia	Irrigation district	Raft River	680	15.00	15.00		No report.
Clark	Partnership	Birch Creek	3,000		300.00	5.00	No report.
Clark	Partnership	Spring Creek	120				No report.
Custer	Carey Act	Big Lost River	1,350	50.00	15.00	40.00	10 years, 6 per cent interest.
Custer	Irrigation district	Salmon River	125		10.00	23.00	No report.
Elmore	Irrigation district	Snake River	2,000	100.00	15.00	35.00	No report.
Elmore	Irrigation district	Malad River	185	50.00	25.00	65.00	No report.
Gooding	Cooperative	Snake River	32,353		25.00	65.00	10 payments, 6 per cent interest.
Gooding	Cooperative	Dry Creek	1,000	10.00	20.00		No report.
Jefferson	Carey Act	Crystal Lake	15,800	75.00		35.00	10 payments, 10 per cent interest.
Jefferson	Cooperative	Snake River	6,000	75.00	38.00	10.00	10 years, 7 per cent interest.
Jefferson	Partnership	Snake River	425		60.00		No report.
Jerome	Cooperative	Snake River	17,647		25.00	65.00	10 payments, 6 per cent interest.
Lemhi	Carey Act	Timber Creek	3,650	0.50	10.00	14.00	No report.
Lincoln	Carey Act	Big Wood River	26,000	0.50	20.00	42.00	Water, \$10 cash, 12 payments, 6 per cent interest.
Lincoln	Individual	Little Wood River	100	10.00	15.00		No report.
Lincoln	Individual	Little Wood River	150	5.00			No report.
Minidoka	U. S. Reclamation Serv.	Snake River	178	67.00	6.00	50.00	No report.
Owyhee	Individual	Flat Creek	100	50.00	25.00		No report.
Owyhee	Partnership	Deer Creek	280	25.00	25.00	25.00	No report.
Owyhee	Partnership	Deer Creek	245	25.00	25.00		No report.
Owyhee	Individual	Cherry Creek	160	50.00	25.00		No report.
Owyhee	Individual	Deadwood River	100	50.00	25.00		No report.
Owyhee	Irrigation district	Snake River	2,756		25.00	55.00	10 years, bonds, 6 per cent interest.
Owyhee	Partnership	Snake River	140	25.00	35.00		No report.
Owyhee	Irrigation district	Malad River	177	50.00	25.00	65.00	No report.
Payette	Cooperative	Snake River	3,000	75.00		20.00	No report.
Payette	Cooperative	Payette River	1,000			100.00	No report.
Payette	Irrigation district	Payette River	1,356	75.00	15.00	10.00	One-half cash.
Twin Falls	Cooperative	Deep Creek	4,600	1.00	20.00	200.00	No report.
Twin Falls	Individual	Comal Creek	130		35.00		No report.
Twin Falls	Cooperative	Snake River	200	40.00	20.00	55.00	No report.
Twin Falls	Cooperative	Devil Creek	2,500		15.00		No report.
Washington	Irrigation district	Crane Creek	1,500	34.00	30.00	50.00	One-half cash, 8 per cent interest.
MONTANA.							
Beaverhead	Individual	Steel Creek	100				No report.
Beaverhead	Partnership	Willard Creek	500		\$10.00		No report.
Beaverhead	Individual	Red Rock River	1,200	\$40.00	30.00		No report.
Blaine	U. S. Reclamation Serv.	Milk River	46,697	25.00	10.00		20 years, without interest.
Blaine	Individual	Snake Creek	1,000	12.00	10.00		No report.
Broadwater	Partnership	Missouri River	300	25.00	15.00		No report.
Broadwater	Partnership	Missouri River	150	25.00	1.00		No report.
Cascade	U. S. Reclamation Serv.	Sun River	168	35.00		\$36.00	20 years, without interest.
Chouteau	Partnership	Missouri River	150		12.00		No report.
Dawson	U. S. Reclamation Serv.	Yellowstone River	793	20.00	25.00	50.00	20 years, without interest.
Deer Lodge	Partnership	Klondike Creek	560	80.00			No report.
Fergus	Individual	Armella Creek	2,480				No report.
Gallatin	Individual	Madison River	270	30.00			No report.
Gallatin	Cooperative	West Gallatin River	3,000	100.00			One-fourth cash, balance 5 payments, 7 per cent interest.
Jefferson	Cooperative	Pipestone Creek	800		5.00		No report.
Madison	Cooperative	Jefferson River	500		6.00	2.00	No report.
Madison	Individual	Jefferson River	300	25.00	8.00		No report.
Madison	Partnership	Jefferson River	1,300	35.00			No report.
Madison	Cooperative	Luby River	1,159	15.00	25.00		No report.
Madison	Partnership	Wolf Creek	250				No report.
Mineral	Partnership	Thompson Creek	110	50.00	20.00		No report.
Musselshell	Individual	Musselshell River	435	10.00	25.00		No report.
Musselshell	Partnership	Musselshell River	175	3.00	100.00		No report.
Phillips	U. S. Reclamation Serv.	St. Marys River	34,655	25.00	10.00		20 years, without interest.
Pondera	Carey Act	Birch Creek	7,478	1.00	10.00	60.00	14 payments, 6 per cent interest.
Pondera	Individual	Dupuyer Creek	300	15.00			No report.
Pondera	Cooperative	Teton River	15,000		1.00		No report.
Pondera	Partnership	Sheep Creek	200	15.00			No report.
Pondera	Cooperative	Pondera Coulee	4,220	20.00			No report.
Powell	Individual	Cottonwood Creek	500		10.00		Three assessments.
Powell	Individual	Deer Lodge River	100				6 years, 8 per cent interest.
Richland	U. S. Reclamation Serv.	Yellowstone River	23,535	20.00	25.00	50.00	No report.
Rosebud	Partnership	Tongue River	200	25.00	75.00		20 years, without interest.
Sweet Grass	Carey Act	Sweet Grass Creek	10,000	50.00	10.00	80.00	No report.
							One-fourth cash, balance to suit, 6 per cent interest.

IRRIGATION.

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STATE TABLE II.—LAND IN IRRIGATION ENTERPRISES REPORTED AS AVAILABLE FOR SETTLEMENT, BY STATE, COUNTY, AND TERMS: 1920—Continued.

COUNTY.	Class of enterprise.	Source of water.	Acreage available for settlement.	Price of land, per acre.	Cost of preparing land for irrigation, per acre.	Price of water rights, per acre.	Terms, etc.
MONTANA—Continued.							
Teton.....	Cooperative.....	Teton River.....	15,000	.....	.....	.....	No report.
Teton.....	U. S. Reclamation Serv.	Sun River.....	12,000	\$35.00	.....	\$35.00	20 years, without interest.
Valley.....	U. S. Reclamation Serv.	St. Marys River.....	18,848	25.00	\$10.00	.....	20 years, without interest.
Yellowstone.....	U. S. Reclamation Serv.	Yellowstone River.....	3,317	4.00	.....	50.00	7 years, without interest.
NEVADA.							
Churchill.....	U. S. Reclamation Serv.	Truckee River.....	87,451	\$20.00	\$50.00	\$60.00	20 years, without interest.
Clark.....	Cooperative.....	Virgin River.....	289	50.00	50.00	6.00	No report.
Clark.....	Partnership.....	Colorado River.....	110	50.00	50.00	.....	No report.
Clark.....	Individual.....	Well, flowing.....	115	100.00	25.00	.....	No report.
Clark.....	Individual.....	Well, flowing.....	116	50.00	25.00	.....	No report.
Clark.....	Partnership.....	Well, flowing.....	100	3.00	25.00	.....	No report.
Clark.....	Partnership.....	Well, flowing.....	125	50.00	30.00	.....	No report.
Clark.....	Cooperative.....	Virgin River.....	375	40.00	10.00	10.00	No report.
Douglas.....	Partnership.....	West Walker River.....	19,220	75.00	.....	.....	No report.
Esmeralda.....	Partnership.....	Cheatoovich Creek.....	550	.....	.....	.....	No report.
Humboldt.....	Partnership.....	Humboldt River.....	360	30.00	15.00	.....	No report.
Humboldt.....	Partnership.....	Pomponickie River.....	200	.....	.....	.....	No report.
Humboldt.....	Partnership.....	Humboldt River.....	640	15.00	.....	.....	No report.
Humboldt.....	Partnership.....	Rock Creek.....	564	20.00	.....	.....	No report.
Lincoln.....	Cooperative.....	Pahranagat Lake.....	2,000	100.00	6.00	25.00	One-fourth cash, 5 years, 6 per cent interest.
Lincoln.....	Cooperative.....	Ash Springs.....	300	50.00	10.00	20.00	No report.
Lyon.....	Individual.....	Walker River.....	4,000	.....	.....	.....	No report.
Lyon.....	Partnership.....	Walker River.....	10,490	75.00	.....	.....	No report.
Lyon.....	Partnership.....	Walker River.....	260	75.00	45.00	.....	No report.
Lyon.....	U. S. Reclamation Serv.	Truckee River.....	1,787	20.00	50.00	60.00	20 years, without interest.
Nye.....	Individual.....	Reese River.....	300	2.00	15.00	.....	No report.
Nye.....	Partnership.....	Hinorgoss River.....	920	.....	12.00	.....	No report.
Nye.....	Partnership.....	Cottonwood and Turney Creeks	400	2.00	40.00	.....	No report.
Ormsby.....	Partnership.....	Clear Creek.....	200	2.00	10.00	.....	No report.
Ormsby.....	Individual.....	Clear Creek.....	180	2.00	40.00	.....	No report.
Ormsby.....	Cooperative.....	Carson River.....	1,000	32.00	60.00	.....	5 years, 6 per cent interest.
Washoe.....	Commercial.....	Truckee River.....	7,000	50.00	10.00	7.00	5 years, 6 per cent interest.
White Pine.....	Individual.....	Willow Creek.....	300	20.00	.....	.....	No report.
NEW MEXICO.							
Bernalillo.....	Cooperative.....	Rio Grande.....	650	\$25.00	\$25.00	\$4.00	No report.
Colfax.....	Cooperative.....	Cimarron River.....	550	15.00	4.00	.....	One-third cash.
Colfax.....	Commercial.....	Rayado River.....	4,979	100.00	5.00	.....	One-fourth cash.
Colfax.....	Commercial.....	Eagle Nest Dam.....	22,200	35.00	27.00	50.00	One-fifth cash, 9 years, 6 per cent interest.
Eddy.....	Individual.....	Pecos River.....	2,000	300.00	100.00	.....	No report.
Eddy.....	Cooperative.....	Black River.....	550	20.00	.....	.....	No report.
Hidalgo.....	Cooperative.....	Gila River.....	500	20.00	60.00	100.00	No report.
McKinley.....	Cooperative.....	Springs.....	380	72.00	10.00	.....	No report.
San Juan.....	Cooperative.....	Animas River.....	350	13.00	42.00	75.00	Cash or note, 6 to 8 per cent interest.
San Juan.....	Cooperative.....	Animas River.....	200	25.00	.....	2.00	No report.
San Juan.....	Partnership.....	San Juan River.....	460	20.00	25.00	50.00	Cash or note, 8 per cent interest.
San Juan.....	Cooperative.....	San Juan River.....	1,300	60.00	10.00	10.00	No report.
San Juan.....	Cooperative.....	Animas River.....	900	50.00	25.00	2.00	No report.
San Miguel.....	Individual.....	Red River.....	940	10.00	.....	.....	No report.
Socorro.....	Cooperative.....	Rio Grande.....	300	50.00	30.00	90.00	\$4 per acre per year.
Socorro.....	Cooperative.....	Rio Grande.....	200	200.00	30.00	38.00	No report.
Socorro.....	Cooperative.....	Rio Grande.....	4,140	50.00	15.00	.....	No report.
Taos.....	Cooperative.....	Arroyo.....	4,400	10.00	10.00	.....	No report.
Union.....	Partnership.....	Cimarron River.....	1,500	50.00	60.00	.....	No report.
Valencia.....	Commercial.....	Hermosa River.....	20,000	3.00	.....	.....	No report.
OREGON.							
Baker.....	Individual.....	Goose Creek.....	1,000	\$25.00	\$25.00	.....	No report.
Baker.....	Commercial.....	Powder River.....	1,002	75.00	40.00	\$30.00	30 per cent cash, balance 5 years, 7 per cent interest.
Crook.....	Carey Act.....	Deschutes River.....	1,278	2.50	30.00	50.00	No report.
Deschutes.....	Carey Act.....	Deschutes River.....	8,966	2.50	25.00	40.00	One-fifth down.
Deschutes.....	Carey Act.....	Deschutes River.....	9,709	2.50	30.00	50.00	No report.
Deschutes.....	Cooperative.....	Deschutes River.....	5,000	10.00	.....	26.25	7 per cent interest.
Harney.....	Individual.....	Riddle Creek.....	2,000	15.00	70.00	.....	No report.
Hood River.....	Cooperative.....	Middle Fork, Hood River.....	5,000	85.00	150.00	.....	7 per cent interest.
Hood River.....	Cooperative.....	Sand Creek.....	3,700	150.00	150.00	20.00	8 per cent interest.
Hood River.....	Cooperative.....	Hood River.....	1,000	400.00	50.00	30.00	No report.
Hood River.....	Irrigation district.....	East Fork, Hood River.....	4,010	50.00	125.00	22.00	No report.
Hood River.....	Cooperative.....	West Fork, Hood River.....	1,350	90.00	175.00	40.00	One-fourth cash, three years, 7 per cent interest.
Jackson.....	Cooperative.....	Rogue River.....	2,200	.....	.....	.....	No report.
Josephine.....	Cooperative.....	Applegate River.....	394	100.00	75.00	.....	No report.
Klamath.....	Irrigation district.....	Lost River.....	2,000	20.00	30.00	10.00	No report.
Malheur.....	Irrigation district.....	Malheur River.....	10,000	100.00	30.00	70.00	Ten years, 6 per cent interest.
Umatilla.....	Commercial.....	Umatilla River.....	6,000	.....	20.00	40.00	One-tenth cash, ten years, 6 per cent interest.
Wasco.....	Commercial.....	Several creeks.....	34,000	50.00	15.00	60.00	6 per cent interest.

STATE TABLE II.—LAND IN IRRIGATION ENTERPRISES REPORTED AS AVAILABLE FOR SETTLEMENT, BY STATE, COUNTY, AND TERMS: 1920—Continued.

COUNTY.	Class of enterprise.	Source of water.	Acres available for settlement.	Price of land, per acre.	Cost of preparing land for irrigation, per acre.	Price of water rights, per acre.	Terms, etc.
TEXAS.							
Cameron	Irrigation district	Rio Grande	15,000	\$200.00	\$65.00	\$2.00	No report.
Cameron	Irrigation district	Rio Grande	19,000	250.00	50.00		One-third cash, balance 3 years.
Cameron	Partnership	Rio Grande	2,000				No report.
Cameron	Irrigation district	Rio Grande	14,650	150.00	50.00	6.00	One-third cash, balance 5 years, 6 per cent interest.
Dimmit	Partnership	Nueces River	4,650	50.00	40.00		One-half cash, balance 2 years, 10 per cent interest.
Dimmit	Partnership	Wells	200				No report.
Dimmit	Individual	Wells and lake	400	40.00	20.00		One-fourth cash, 5 years, 7 per cent interest.
El Paso	U. S. Reclamation Serv.	Rio Grande	25,000	95.00	65.00	81.00	No report.
Hidalgo	Cooperative	Rio Grande	10,000	300.00	35.00		One-third down, 2 and 3 years, 8 per cent interest.
Hidalgo	Irrigation district	Rio Grande	11,000	400.00	40.00	6.00	Cash.
Hidalgo	Commercial	Rio Grande	8,000	350.00	20.00	75.00	5, 6, and 7 years, 6 per cent interest.
Jefferson	Partnership	Taylor's Bayou	500	40.00	18.00		No report.
Jefferson	Partnership	Pine Island Bayou	1,500	25.00	20.00	8.00	One-fourth cash, 8 per cent interest.
Jefferson	Partnership	Hillebrand Bayou	1,900	50.00	5.00	9.00	One-fourth cash, 3 years, 7 per cent interest.
Jefferson	Partnership	Hillebrand Bayou	1,200	35.00			No report.
Jefferson	Commercial	Pine Island Bayou	6,000	25.00	20.00	8.00	One-fifth cash, balance 4 payments, 7 and 8 per cent interest.
Kinney	Partnership	Rio Grande	1,450				No report.
Liberty	Cooperative	Trinity River	500	20.00	10.00		7 and 8 per cent interest.
Loving	Cooperative	Pecos River	2,600	10.00	25.00		No report.
McMullen	Partnership	Frio River	1,900	100.00	40.00		One-third cash, balance 7 per cent interest.
Matagorda	Partnership	Blue Creek	8,500	50.00	20.00		One-third cash, balance 5 payments, 7 per cent interest.
Matagorda	Partnership	Colorado River	6,675	50.00	2.00		No report.
Matagorda	Cooperative	Tres Palacios Creek	3,400	40.00		100.00	No report.
Matagorda	Commercial	Colorado River	12,000	40.00	6.00		No report.
Matagorda	Commercial	Colorado River	12,000	40.00	6.00	10.00	10 per cent interest.
Matagorda	Commercial	Colorado River	30,000	40.00	6.00	15.00	No report.
Matagorda	Commercial	Colorado River	17,000	40.00	6.00		No report.
Maverick	Cooperative	Rio Grande	1,250	100.00	20.00		One-fifth cash, balance 7 years, 7 per cent interest.
Maverick	Cooperative	Rio Grande	1,500		25.00		No report.
Orange	Individual	Cow Bayou	2,068	30.00	27.00		4 years, 6 to 8 per cent interest.
Orange	Commercial	Adams Bayou	4,000	25.00			No report.
Orange	Cooperative	Adams Bayou	2,500	30.00	30.00		No report.
Pecos	Individual	Cynoste	900	10.00	10.00		One-half cash, balance 2 years, 8 per cent interest.
Pecos	Partnership	Leon Springs	1,500	225.00	25.00	2.00	One-fourth cash, balance 8 years, 6 per cent interest.
Pecos	Commercial	Pecos River	24,400	10.00	10.00	80.00	One-fourth cash, balance 6 years, 6 per cent interest.
Pecos	Individual	Santa Rosa	1,720	25.00	25.00		One-third cash, balance 8 per cent interest.
Presidio	Irrigation district	Rio Grande	300	5.00	5.00	15.00	No report.
Reeves	Cooperative	Pecos River	7,000	50.00	15.00		One-fourth cash, balance 6 to 8 per cent interest.
Reeves	Cooperative	Springs	2,960		17.00		No report.
Val Verde	Cooperative	Rio Grande	2,125		50.00	2.00	No report.
Ward	Irrigation district	Pecos River	14,600	75.00	25.00	2.00	6 to 8 per cent interest.
Ward	Irrigation district	Pecos River	35,000	50.00			Part cash, balance in 5 to 6 years. Interest not shown.
Wharton	Individual	Colorado River	6,000	40.00	20.00		No report.
Wharton	Commercial	Colorado River	25,000	50.00	1.00	10.00	No report.
UTAH.							
Beaver	Cooperative	Beaver River	480	\$10.00	\$10.00	\$1.00	2 years, 6 per cent interest.
Beaver	Cooperative	North Creek	500	12.00	8.00	35.00	No report.
Box Elder	Commercial	Bear River and Lake	12,000	100.00		100.00	One-sixth cash, 6 per cent interest.
Box Elder	Irrigation district	West Fork Grouse Creek	910	25.00	15.00		No report.
Box Elder	Commercial	Bear River	3,000	75.00	10.00	60.00	5 payments, 7 per cent interest.
Carbon	Cooperative	Price River	700		10.00		No report.
Carbon	Cooperative	Price River	10,000	138.00	10.00		8 per cent interest.
Daguerre	Cooperative	Sheep Creek	3,750	20.00	15.00	15.00	5 years, 8 per cent interest.
Duchesne	Cooperative	Duchesne River	27,000	25.00	10.00	30.00	10 years, 7 per cent interest.
Duchesne	Cooperative	Green River	3,000	5.00		5.00	No report.
Duchesne	Cooperative	Lake Fork River	200	6.00	15.00	5.00	No report.
Emery	Cooperative	Price River	580		10.00		No report.
Emery	Cooperative	Price River	840	5.00	50.00		No report.
Emery	Cooperative	Muddy Creek	11,000	30.00	10.00		No report.
Emery	Cooperative	Huntington Creek	6,000	63.00	58.00		No report.
Emery	Cooperative	Huntington Creek	700	10.00	15.00		No report.
Grand	Irrigation district	Mill Creek	500	20.00	12.00	37.00	No report.
Millard	Cooperative	Sevier River	15,000	40.00	20.00	100.00	One-fifth cash, balance in 4 to 10 years, 6 to 8 per cent interest.
Millard	Cooperative	Big Spring	700		8.00	175.00	No report.
Millard	Partnership	Pole Canyon	2,000	100.00	10.00	20.00	No report.
Millard	Cooperative	Sevier River	800	30.00	10.00	60.00	Cash.
Millard	Cooperative	Sevier River	5,000	40.00	10.00	40.00	10 years, 6 per cent interest.
Millard	Cooperative	Sevier River	6,000	80.00	20.00	40.00	One-fifth cash, 5 to 7 years, 6 per cent interest.
Salt Lake	Cooperative	Butterfield Creek	160	50.00	10.00	50.00	No report.
San Juan	Irrigation district	Lake Fork River	1,980	10.00	20.00		Cash.
San Juan	Partnership	Montezuma Creek	1,000			7.00	No report.
San Juan	Cooperative	Springs	1,000		20.00		No report.
Sevier	Cooperative	Sevier River	2,000	22.00			No report.
Sevier	Cooperative	Sevier River	656	2.00	40.00		No report.
Uintah	Cooperative	Uinta River	1,750	10.00	10.00	12.00	Crop payments or 5 annual payments.

IRRIGATION.

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STATE TABLE II.—LAND IN IRRIGATION ENTERPRISES REPORTED AS AVAILABLE FOR SETTLEMENT, BY STATE, COUNTY, AND TERMS: 1920—Continued.

COUNTY.	Class of enterprise.	Source of water.	Acreage available for settlement.	Price of land, per acre.	Cost of preparing land for irrigation, per acre.	Price of water rights, per acre.	Terms, etc.
U T A H—Continued.							
Utah.....	Cooperative.....	Summit Creek.....	2,500	\$25.00	\$15.00	\$50.00	Cash or terms, 8 per cent interest.
Utah.....	Commercial.....	Utah Lake.....	4,000	100.00	.....	.....	No report.
Washington.....	Cooperative.....	Santa Clara River.....	321	12.00	20.00	2.00	No report.
Washington.....	Cooperative.....	Virgin River.....	300	100.00	38.00	10.00	No report.
Washington.....	Cooperative.....	Virgin River.....	150	20.00	45.00	75.00	No report.
Washington.....	Cooperative.....	Shoal Creek.....	2,000	35.00	15.00	25.00	No report.
Washington.....	Partnership.....	Ash Creek.....	3,000	25.00	15.00	100.00	One-tenth cash, balance 9 years, 8 per cent interest.
Wayne.....	Cooperative.....	Fish Creek.....	100	2.00	25.00	50.00	10 years.
Wayne.....	Cooperative.....	Fish Creek.....	100	2.00	25.00	50.00	10 years.
Wayne.....	Cooperative.....	Dirty Devil River.....	600	2.00	10.00	.....	No report.
W A S H I N G T O N.							
Benton.....	Commercial.....	Columbia River.....	7,500	\$60.00	\$130.00	\$7.00	One-fifth cash, balance one-fifth annually, 7 per cent interest.
Benton.....	District.....	Yakima River.....	0,000	50.00	25.00	2.00	One-fifth cash, balance 5 years, 7 per cent interest.
Benton.....	U. S. Reclamation Serv.....	Yakima River.....	1,666	60.00	75.00	64.00	Various terms, 8 per cent interest.
Benton.....	Cooperative.....	Columbia River.....	260	100.00	.....	.....	No report.
Chelan.....	Commercial.....	Chewawah River.....	1,400	.....	.....	.....	No report.
Chelan.....	Commercial.....	Creeks.....	2,200	15.00	.....	5.00	No report.
Chelan.....	Cooperative.....	Grade Creek.....	1,200	150.00	25.00	5.00	Various terms.
Chelan.....	Commercial.....	Snow Creek.....	1,000	10.00	.....	3.00	\$100 per acre for ½ miner's inch of water.
Chelan.....	Cooperative.....	Chelan Lake.....	200	.....	.....	150.00	No report.
Clallam.....	Irrigation district.....	Dungeness River.....	2,000	35.00	100.00	1.00	Various terms, 6 per cent interest.
Clallam.....	Cooperative.....	Dungeness River.....	500	62.00	150.00	14.00	No report.
Douglas.....	Cooperative.....	Columbia River.....	529	50.00	.....	14.00	One-third cash, balance 3 years, 8 per cent interest.
Douglas.....	Individual.....	Columbia River.....	400	75.00	20.00	10.00	No report.
Douglas.....	Cooperative.....	Wells.....	200	.....	100.00	20.00	No report.
Franklin.....	Irrigation district.....	Columbia and Snake Rivers.....	10,500	82.00	50.00	45.00	One-tenth to one-fifth cash, balance 10 years, 6 per cent interest.
Klickitat.....	Individual.....	Springs.....	400	25.00	75.00	.....	No report.
Klickitat.....	Cooperative.....	Alder Creek.....	100	200.00	25.00	.....	One-third cash, balance 5 years, 6 per cent interest.
Okanogan.....	Partnership.....	Methow River.....	300	50.00	75.00	.....	No report.
Okanogan.....	Irrigation district.....	Twisp Creek.....	1,500	50.00	15.00	60.00	One-third cash, 3 years, 8 per cent interest.
Okanogan.....	Partnership.....	Methow River.....	150	50.00	100.00	.....	No report.
Okanogan.....	Cooperative.....	Okanogan.....	130	50.00	200.00	.....	No report.
Okanogan.....	Commercial.....	Toats Coulee Creek.....	6,000	40.00	12.00	7.00	10 years, 7 per cent interest.
Spokane.....	Cooperative.....	Deer Lake and Loon Lake.....	1,500	.....	.....	2.00	Various terms.
Spokane.....	Cooperative.....	Well.....	238	300.00	200.00	.....	One-third cash, 6 per cent interest.
Spokane.....	Cooperative.....	Well.....	300	500.00	200.00	12.00	No report.
Spokane.....	Commercial.....	Spokane River.....	1,420	119.00	35.00	88.00	5 payments, 7 per cent interest.
Stevens.....	Partnership.....	Hunters Creek.....	615	100.00	.....	.....	No report.
Thurston.....	Irrigation district.....	Nisqually River.....	2,000	100.00	50.00	4.00	One-third cash, 7 per cent interest.
Walla Walla.....	Partnership.....	Columbia River.....	295	100.00	10.00	.....	10 years, 7 per cent interest.
Walla Walla.....	Partnership.....	Wells.....	125	700.00	90.00	.....	No report.
Walla Walla.....	Irrigation district.....	Snake River.....	8,000	100.00	50.00	7.00	No report.
Walla Walla.....	Irrigation district.....	Walla Walla River and Columbia River.....	1,400	100.00	100.00	10.00	No report.
Yakima.....	U. S. Reclamation Serv.....	Yakima River.....	3,334	60.00	75.00	64.00	Various terms, 6 per cent interest.
W Y O M I N G.							
Albany.....	Irrigation district.....	James Lake.....	1,000	.....	\$12.00	\$35.00	No report.
Big Horn.....	Cooperative.....	Shoshone River.....	3,100	.....	.....	28.00	No report.
Big Horn.....	Carey Act.....	Shell Creek.....	6,000	.....	.....	60.00	No report.
Big Horn.....	Cooperative.....	Greybull River.....	6,000	.....	8.00	50.00	One-fourth cash, balance 5 years, 7 per cent interest.
Big Horn.....	Cooperative.....	Big Horn River.....	4,800	.....	.....	50.00	No report.
Carbon.....	Commercial.....	Platte River.....	4,500	.....	5.00	35.00	No report.
Fremont.....	Partnership.....	Cottonwood River.....	940	.....	.....	25.00	10 payments, 6 per cent interest.
Fremont.....	U. S. Reclamation Serv.....	Wind River.....	70,000	\$25.00	25.00	.....	20 years, without interest.
Fremont.....	Cooperative.....	Wind River.....	1,500	35.00	25.00	42.00	No report.
Goshute.....	U. S. Reclamation Serv.....	N. Platte River.....	14,019	90.00	.....	90.00	20 years, without interest.
Goshute.....	Carey Act.....	Horse and Bear Creeks.....	12,334	25.00	15.00	85.00	Cash or terms, 10 per cent interest.
Goshute.....	Individual.....	N. Platte River.....	1,100	.....	15.00	75.00	No report.
Lincoln.....	Partnership.....	La Barge and Muddy Creeks.....	1,000	.....	0.00	.....	No report.
Lincoln.....	Partnership.....	N. and S. Beaver Rivers.....	213	30.00	1.00	.....	5 years, 10 per cent interest.
Platte.....	Commercial.....	Laramie River.....	16,000	60.00	12.00	60.00	One-fourth cash, 6 per cent interest.
Platte.....	Commercial.....	Laramie River.....	30,000	.....	12.00	65.00	7 years, 6 per cent interest.
Sweetwater.....	Carey Act.....	Big Sandy Creek.....	12,480	40.00	8.00	.....	One-tenth cash, 6 per cent interest.
Sweetwater.....	Commercial.....	Boulder Creek.....	6,000	25.00	10.00	15.00	No report.
Sweetwater.....	Partnership.....	Burntfork River.....	2,000	2.00	10.00	.....	No report.
Uinta.....	Partnership.....	Bear River.....	1,140	.....	25.00	2.00	No report.
Washakie.....	Cooperative.....	Big Horn River.....	8,200	.....	.....	50.00	No report.

STATE TABLE III.—ACREAGE IRRIGATED, 1919 AND 1909; AND ACREAGE IN ENTERPRISES, IRRIGATION WORKS, AND CAPITAL INVESTED IN IRRIGATION ENTERPRISES, 1920 AND 1910.

[A minus sign (—) denotes decrease. Per cent not shown when more than 1,000.]

		STATES INCLUDED.	Arizona.	Arkansas.	California.	Colorado.	Idaho.
1	Number of all farms in 1920.....	1,916,301	9,975	232,604	117,670	59,934	42,106
2	Number of farms irrigated in 1919.....	231,541	6,605	1,166	67,391	28,756	25,283
3	Per cent of all farms.....	12.1	66.2	0.5	57.3	48.0	60.0
4	Number of farms irrigated in 1909.....	162,723	4,841	232	39,352	25,857	16,439
5	Per cent of increase, 1909-1919.....	42.3	36.4	402.0	71.3	11.2	53.8
LAND AND FARM AREA.							
6	Approximate land area.....acres.	1,223,986,120	72,838,400	33,616,000	99,617,280	66,341,120	53,346,560
7	All land in farms.....acres.	505,440,954	5,802,126	17,456,750	29,365,667	24,462,014	8,376,873
8	Improved land in farms.....acres.	214,696,819	712,803	9,210,556	11,878,339	7,744,757	4,511,680
9	Area irrigated in 1919.....acres.	19,191,716	467,565	143,946	4,219,040	3,348,385	2,488,806
10	Per cent of improved land in farms.....	8.9	65.6	1.6	35.5	43.2	55.2
11	Area irrigated in 1909.....acres.	14,433,285	320,051	27,753	2,604,104	2,792,032	1,430,848
12	Per cent of increase, 1909-1919.....	33.0	46.1	418.7	58.4	19.9	73.9
13	Area enterprises were capable of irrigating in 1920.....acres.	26,020,477	627,303	179,013	5,894,466	3,855,348	3,092,810
14	Area enterprises were capable of irrigating in 1910.....acres.	20,285,403	387,655	47,136	3,619,378	3,990,166	2,388,959
15	Per cent of increase, 1910-1920.....	28.3	61.8	279.8	62.9	-3.4	29.5
16	Area included in enterprises in 1920.....acres.	35,890,821	813,153	246,480	7,805,207	5,220,588	3,780,048
17	Area included in enterprises in 1910.....acres.	32,245,464	944,090	52,853	5,490,300	5,917,457	3,540,573
18	Per cent of increase, 1910-1920.....	11.3	-13.9	366.1	42.2	-11.8	6.6
19	Area of irrigated land reported as available for settlement.....acres.	2,257,981	24,341	.....	533,981	274,232	118,334
IRRIGATION WORKS.							
Independent enterprises:							
20	Number, 1920.....	63,298	1,388	944	24,115	6,634	3,620
21	Number, 1910.....	56,858	1,209	310	13,970	9,065	3,092
Main ditches:							
22	Number, 1920.....	51,621	1,295	84	6,040	8,867	4,553
23	Number, 1910.....	40,677	891	217	8,590	8,405	3,209
24	Length, 1920.....miles.	103,177	1,769	68	14,437	19,022	11,144
25	Length, 1910.....miles.	88,927	1,727	131	12,620	17,564	7,662
26	Capacity, 1920.....second-feet.	631,079	11,707	1,205	115,237	119,558	86,273
27	Capacity, 1910.....second-feet.	618,097	17,200	.....	89,507	148,483	80,458
Laterals:							
28	Number, 1920.....	57,553	1,174	50	9,190	6,185	5,265
29	Number, 1910.....	36,513	313	.....	6,143	5,612	3,359
30	Length, 1920.....miles.	56,687	1,599	18	12,947	8,571	6,154
31	Length, 1910.....miles.	39,003	870	.....	8,509	5,006	5,097
Reservoirs:							
32	Number, 1920.....	7,538	340	16	3,030	879	249
33	Number, 1910.....	6,956	402	19	1,583	1,084	243
34	Capacity, 1920.....acre-feet.	21,246,436	1,510,856	20	1,091,394	2,406,372	3,493,511
35	Capacity, 1910.....acre-feet.	12,602,924	1,349,938	3	743,269	2,646,593	1,742,303
Flowing wells:							
36	Number, 1920.....	4,606	310	.....	1,415	470	142
37	Number, 1910.....	5,071	214	.....	2,361	313	62
38	Capacity, 1920.....gallons per minute.	935,057	14,547	.....	287,187	20,139	15,133
39	Capacity, 1910.....gallons per minute.	1,345,676	9,953	.....	477,343	41,989	7,200
Pumped wells:							
40	Number, 1920.....	32,094	999	1,089	25,401	527	53
41	Number, 1910.....	15,971	470	307	10,724	121	24
42	Capacity, 1920.....gallons per minute.	16,396,549	1,042,590	1,470,147	10,608,476	210,094	17,749
43	Capacity, 1910.....gallons per minute.	7,248,699	768,921	208,829	4,119,575	53,564	2,829
Pumping plants:							
44	Number, 1920.....	29,458	744	1,041	21,561	406	143
45	Number, 1910.....	15,803	429	315	9,297	206	58
46	Engine capacity, 1920.....horsepower.	748,971	22,014	58,332	386,200	8,635	28,384
47	Engine capacity, 1910.....horsepower.	261,480	37,258	12,440	128,143	7,969	7,065
48	Pump capacity, 1920.....gallons per minute.	36,275,005	1,048,030	1,654,067	16,773,692	299,720	1,397,031
49	Pump capacity, 1910.....gallons per minute.	19,355,864	851,873	436,402	5,270,298	290,937	278,669
50	Average lift, 1920.....feet.	41	44	50	41	23	29
CAPITAL INVESTED.							
51	Capital invested to Jan. 1, 1920.....dollars.	697,657,328	33,498,094	7,183,322	194,886,388	88,302,442	91,501,009
52	Capital invested to July 1, 1910.....dollars.	321,454,008	17,677,966	587,834	72,580,030	56,636,443	40,977,688
53	Per cent of increase, 1910-1920.....	117.0	89.5	188.5	168.5	55.9	123.3
54	Average cost per acre based on area enterprises were capable of supplying with water in 1920.....dollars.	26.81	53.40	40.13	33.06	22.90	29.59
55	Average cost per acre based on area enterprises were capable of supplying with water in 1910.....dollars.	15.85	45.00	12.47	20.05	14.19	17.15
ESTIMATED FINAL COST.							
56	Estimated final cost of existing enterprises in 1920.....dollars.	819,778,005	34,615,064	7,283,522	225,799,123	95,198,423	97,019,717
57	Estimated final cost of existing enterprises in 1910.....dollars.	437,948,823	24,828,863	612,834	84,362,344	76,443,239	58,451,106
58	Per cent of increase, 1910-1920.....	87.2	39.4	.....	167.6	24.5	66.0
59	Average cost per acre based on estimated final cost and area included in enterprises in 1920.....dollars.	22.84	42.57	29.55	28.93	18.24	25.67
60	Average cost per acre based on estimated final cost and area included in enterprises in 1910.....dollars.	13.58	26.30	11.59	15.37	12.92	16.47
DRAINAGE OF IRRIGATED LAND.							
61	Number of enterprises reporting land drained or needing drainage.....	3,068	31	134	545	420	206
62	Acreage included in enterprises reporting land drained or needing drainage.....	8,860,760	382,928	37,574	1,623,330	1,526,311	734,405
63	Acreage for which drains have been installed.....	1,519,853	25,173	27,350	819,573	113,899	81,187
64	Additional acreage needing drainage.....	1,476,771	71,357	2,821	409,933	220,711	94,384
65	Per cent that acreage for which drains have been installed is of total acreage included in enterprises reporting drainage.....	17.2	6.6	72.8	19.7	7.5	11.1
66	Per cent that acreage for which drains have been installed is of total acreage included in irrigation enterprises.....	4.2	3.1	11.1	4.1	2.2	2.1
67	Per cent that acreage for which drains have been installed, plus that needing drainage is of total acreage included in irrigation enterprises.....	8.3	11.9	12.2	9.3	6.4	4.7

IRRIGATION.

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STATE TABLE III.—ACREAGE IRRIGATED, 1919 AND 1909; AND ACREAGE IN ENTERPRISES, IRRIGATION WORKS, AND CAPITAL INVESTED IN IRRIGATION ENTERPRISES, 1920 AND 1910—Continued.

[A minus sign (—) denotes decrease. Per cent not shown when base is less than 100.]

	Kansas.	Louisiana.	Montana.	Nebraska.	Nevada.	New Mexico.	North Dakota.
1 Number of all farms in 1920.....	165,286	135,463	57,677	124,417	3,163	29,844	77,690
2 Number of farms irrigated in 1919.....	504	6,471	10,807	3,021	2,718	11,390	840
3 Per cent of all farms.....	0.3	4.8	18.7	2.4	85.9	38.2	0.4
4 Number of farms irrigated in 1909.....	1,006	2,690	8,970	1,852	2,406	12,795	69
5 Per cent of increase, 1909-1919.....	-49.9	140.6	20.5	63.1	13.0	-11.0	.....
LAND AND FARM AREA.							
6 Approximate land area.....acres..	52,335,360	29,061,760	93,523,840	49,157,120	70,285,440	78,401,920	44,917,120
7 All land in farms.....acres..	45,425,179	10,019,822	35,070,656	42,225,475	2,357,163	24,409,683	36,214,751
8 Improved land in farms.....acres..	30,600,700	5,029,226	11,007,278	23,109,624	594,741	1,717,224	24,563,178
9 Area irrigated in 1919.....acres..	47,312	454,882	1,681,729	442,680	561,447	538,377	12,072
10 Per cent of improved land in farms.....	0.2	8.1	15.3	1.9	94.4	81.4	(1)
11 Area irrigated in 1909.....acres..	37,479	380,300	1,679,084	255,950	701,833	461,713	10,248
12 Per cent of increase, 1909-1919.....	26.2	19.6	0.2	73.0	-20.0	16.6	17.8
13 Area enterprises were capable of irrigating in 1920.....acres..	67,853	728,742	2,753,498	562,468	704,708	696,119	34,235
14 Area enterprises were capable of irrigating in 1910.....acres..	139,995	553,220	2,205,155	429,225	840,962	644,970	21,917
15 Per cent of increase, 1910-1920.....	-51.5	31.7	24.9	31.0	-16.2	7.9	56.2
16 Area included in enterprises in 1920.....acres..	102,562	851,211	4,329,148	766,768	1,382,036	961,879	57,476
17 Area included in enterprises in 1910.....acres..	181,300	581,965	3,515,602	680,133	1,232,142	1,102,297	38,173
18 Per cent of increase, 1910-1920.....	-36.4	46.3	23.1	12.7	12.2	-12.7	50.6
19 Area of irrigated land reported as available for settlement.....acres..	.....	.....	207,530	.....	139,352	66,479	.....
IRRIGATION WORKS.							
Independent enterprises:							
20 Number, 1920.....	209	1,373	6,035	470	1,015	2,391	30
21 Number, 1910.....	716	1,237	5,534	474	1,347	2,786	49
Main ditches:							
22 Number, 1920.....	139	1,298	8,819	513	2,032	2,228	32
23 Number, 1910.....	89	515	6,673	420	994	2,101	47
24 Length, 1920.....miles..	271	1,584	16,411	1,780	3,123	4,469	58
25 Length, 1910.....miles..	274	729	12,990	1,459	1,938	4,684	52
26 Capacity, 1920.....second-feet..	1,667	11,859	94,429	11,665	10,554	23,432	836
27 Capacity, 1910.....second-feet..	2,000	.....	83,849	9,378	17,579	29,646	2,161
Laterals:							
28 Number, 1920.....	374	3,908	10,080	913	2,064	2,158	58
29 Number, 1910.....	39	180	8,307	1,083	1,531	1,280	46
30 Length, 1920.....miles..	147	1,659	6,085	1,545	1,245	1,463	93
31 Length, 1910.....miles..	42	439	5,944	1,269	1,213	1,190	74
Reservoirs:							
32 Number, 1920.....	36	74	463	59	134	328	9
33 Number, 1910.....	42	104	827	44	109	522	22
34 Capacity, 1920.....acre-feet..	391	7,632	1,571,720	197,880	504,428	2,980,718	1,110
35 Capacity, 1910.....acre-feet..	31,024	19,482	580,261	2,098	325,953	454,102	132,187
Flowing wells:							
36 Number, 1920.....	6	9	41	.....	123	556	.....
37 Number, 1910.....	3	.....	15	.....	19	673	.....
38 Capacity, 1920.....gallons per minute..	500	6,255	4,608	.....	21,942	376,222	.....
39 Capacity, 1910.....gallons per minute..	30	.....	22,185	.....	1,302	669,268	.....
Pumped wells:							
40 Number, 1920.....	710	812	22	84	129	461	.....
41 Number, 1910.....	939	606	10	60	6	466	1
42 Capacity, 1920.....gallons per minute..	266,797	1,607,637	11,085	24,701	6,708	265,618	.....
43 Capacity, 1910.....gallons per minute..	73,362	1,108,236	5,293	3,363	1,349	180,690	15
Pumping plants:							
44 Number, 1920.....	198	1,250	253	51	64	472	4
45 Number, 1910.....	698	1,007	125	75	18	413	4
46 Engine capacity, 1920.....horsepower..	6,946	85,628	10,341	959	409	8,488	2,068
47 Engine capacity, 1910.....horsepower..	1,517	57,429	3,511	140	693	14,226	2,038
48 Pump capacity, 1920.....gallons per minute..	297,975	4,908,695	453,231	73,686	35,266	304,789	51,250
49 Pump capacity, 1910.....gallons per minute..	128,276	5,064,173	281,199	5,308	24,295	216,355	182,115
50 Average lift, 1920.....feet..	30	32	20	24	22	40	38
CAPITAL INVESTED.							
51 Capital invested to Jan. 1, 1920.....dollars..	2,067,381	14,063,181	52,143,363	13,909,185	14,754,280	18,210,412	1,857,118
52 Capital invested to July 1, 1910.....dollars..	1,365,563	6,859,166	22,970,958	7,798,310	6,721,924	9,154,897	836,482
53 Per cent of increase, 1910-1920.....	51.4	105.0	127.0	78.4	119.5	98.9	122.0
54 Average cost per acre based on area enterprises were capable of supplying with water in 1920.....dollars..	30.47	19.30	18.94	24.73	20.94	26.16	54.25
55 Average cost per acre based on area enterprises were capable of supplying with water in 1910.....dollars..	9.75	12.40	10.42	18.17	7.99	14.19	38.17
ESTIMATED FINAL COST.							
56 Estimated final cost of existing enterprises in 1920.....dollars..	2,195,981	14,264,178	70,079,028	18,030,154	22,648,747	20,440,646	2,072,766
57 Estimated final cost of existing enterprises in 1910.....dollars..	1,365,563	6,814,166	32,382,077	9,485,231	12,188,756	11,640,091	836,482
58 Per cent of increase, 1910-1920.....	60.8	106.3	116.4	90.1	85.8	75.6	147.8
59 Average cost per acre based on estimated final cost and area included in enterprises in 1920.....dollars..	21.41	16.76	16.19	23.51	16.39	21.25	36.06
60 Average cost per acre based on estimated final cost and area included in enterprises in 1910.....dollars..	6.47	11.88	9.21	13.95	9.89	10.56	21.91
DRAINAGE OF IRRIGATED LAND.							
61 Number of enterprises reporting land drained or needing drainage.	5	406	276	24	58	203	8
62 Acreage included in enterprises reporting land drained or needing drainage.....	3,610	283,476	751,274	376,518	537,417	212,853	49,581
63 Acreage for which drains have been installed.....	250	167,138	62,872	10,793	34,175	74,783	1,013
64 Additional acreage needing drainage.....	1,320	21,202	50,901	26,006	98,249	60,277	659
65 Per cent that acreage for which drains have been installed is of total acreage included in enterprises reporting drainage.....	6.9	59.0	8.4	2.9	6.4	35.2	3.3
66 Per cent that acreage for which drains have been installed is of total acreage included in irrigation enterprises.....	0.2	19.6	1.5	1.4	2.5	7.8	2.8
67 Per cent that acreage for which drains have been installed plus that needing drainage is of total acreage included in irrigation enterprises.....	1.5	22.1	2.6	4.9	9.6	14.0	4.0

1 Less than one-tenth of 1 per cent.

STATE TABLE III.—ACREAGE IRRIGATED, 1919 AND 1909; AND ACREAGE IN ENTERPRISES, IRRIGATION WORKS, AND CAPITAL INVESTED IN IRRIGATION ENTERPRISES, 1920 AND 1910—Continued.

[A minus sign (—) denotes decrease.]

	Oklahoma.	Oregon.	South Dakota.	Texas.	Utah.	Washington.	Wyoming.
1 Number of all farms in 1920.....	191,968	50,206	74,637	436,033	25,682	66,288	15,748
2 Number of farms irrigated in 1919.....	73	9,154	1,198	14,726	22,218	13,271	6,449
3 Per cent of all farms.....	(1)	18.2	1.6	3.4	86.8	20.0	41.0
4 Number of farms irrigated in 1909.....	137	6,669	500	5,238	19,709	7,664	6,297
5 Per cent of increase, 1909-1919.....	-46.7	37.3	139.6	181.1	12.7	73.2	2.4
LAND AND FARM AREA.							
6 Approximate land area.....acres	44,424,960	61,188,480	49,195,520	167,934,720	52,597,760	42,776,040	62,430,720
7 All land in farms.....acres	31,951,804	13,542,318	34,636,491	114,020,621	5,050,410	13,244,720	11,809,351
8 Improved land in farms.....acres	18,128,321	4,913,851	18,199,250	31,227,503	1,715,380	7,129,343	2,102,005
9 Area irrigated in 1910.....acres	2,969	986,162	100,682	586,120	1,371,651	529,899	1,207,982
10 Per cent of improved land in farms.....	(1)	20.1	0.6	1.9	80.0	7.4	57.5
11 Area irrigated in 1909.....acres	4,388	686,139	63,248	451,130	999,410	334,378	1,133,302
12 Per cent of increase, 1909-1919.....	-32.3	43.7	59.2	29.9	37.2	58.5	6.6
13 Area enterprises were capable of irrigating in 1920.....acres	9,872	1,344,046	150,914	1,150,542	1,700,550	637,151	1,831,039
14 Area enterprises were capable of irrigating in 1910.....acres	6,397	530,526	128,481	690,991	1,250,246	470,514	1,039,510
15 Per cent of increase, 1910-1920.....	51.2	61.8	17.5	65.5	36.0	35.4	11.7
16 Area included in enterprises in 1920.....acres	11,742	1,925,987	188,882	1,687,447	2,350,244	836,795	2,564,068
17 Area included in enterprises in 1910.....acres	8,528	2,527,296	201,625	1,253,173	1,847,625	817,032	2,224,298
18 Per cent of increase, 1910-1920.....	37.7	-23.8	-6.6	34.7	21.1	2.4	15.3
19 Area of irrigated land reported as available for settlement.....acres		98,009		846,446	189,563	61,738	197,326
IRRIGATION WORKS.							
Independent enterprises:							
20 Number, 1920.....	33	4,710	292	1,371	2,403	2,692	3,564
21 Number, 1910.....	114	3,745	395	2,772	2,472	1,934	5,577
Main ditches:							
22 Number, 1920.....	18	5,252	370	820	2,381	1,873	5,007
23 Number, 1910.....	47	3,582	348	861	2,495	1,600	5,593
24 Length, 1920.....miles	38	7,115	653	1,624	6,343	3,851	9,617
25 Length, 1910.....miles	54	5,539	631	1,479	5,887	2,594	10,833
26 Capacity, 1920.....second-feet	344	28,897	5,427	28,261	29,447	16,242	39,009
27 Capacity, 1910.....second-feet	155	39,686	3,598	12,818	26,081	13,178	42,630
Laterals:							
28 Number, 1920.....	72	2,784	632	2,022	4,068	3,179	2,777
29 Number, 1910.....	106	2,518	332	1,357	1,357	1,180	2,340
30 Length, 1920.....miles	19	1,956	605	2,949	5,334	1,794	2,534
31 Length, 1910.....miles	31	2,032	625	1,224	1,822	1,298	2,298
Reservoirs:							
32 Number, 1920.....	8	266	119	368	476	205	374
33 Number, 1910.....	11	271	314	809	489	156	414
34 Capacity, 1920.....acre-feet	52	1,905,037	212,264	392,999	1,600,505	477,789	2,911,748
35 Capacity, 1910.....acre-feet	22	1,024,266	216,205	74,361	588,317	121,643	2,560,937
Flowing wells:							
36 Number, 1920.....	1	65	4	135	1,256	60	7
37 Number, 1910.....		51	42	123	1,138	55	2
38 Capacity, 1920.....gallons per minute	100	11,968	2,750	62,384	96,371	14,625	46
39 Capacity, 1910.....gallons per minute		3,035	14,382	37,019	42,794	13,928	250
Pumped wells:							
40 Number, 1920.....	19	208	1	901	192	520	16
41 Number, 1910.....	65	92	4	1,912	27	128	8
42 Capacity, 1920.....gallons per minute	3,643	47,026	800	538,665	39,059	227,744	8,020
43 Capacity, 1910.....gallons per minute	1,791	20,883	24	567,126	4,827	60,320	835
Pumping plants:							
44 Number, 1920.....	22	573	25	1,369	250	975	57
45 Number, 1910.....	68	229	8	2,351	66	391	34
46 Engine capacity, 1920.....horsepower	184	13,769	498	80,511	11,392	22,929	1,304
47 Engine capacity, 1910.....horsepower	107	3,095	63	69,094	2,143	13,847	705
48 Pump capacity, 1920.....gallons per minute	7,698	600,045	23,320	6,825,998	783,588	636,552	39,725
49 Pump capacity, 1910.....gallons per minute	4,541	118,514	5,289	5,362,665	315,057	365,411	142,529
50 Average lift, 1920.....feet	59	28	21	45	25	60	31
CAPITAL INVESTED.							
51 Capital invested to Jan. 1, 1920.....dollars	151,325	28,929,151	5,465,248	35,072,739	32,037,351	29,299,011	34,320,328
52 Capital invested to July 1, 1920.....dollars	47,200	12,760,214	3,043,140	13,487,347	14,028,717	10,219,149	17,700,980
53 Per cent of increase, 1910-1920.....	220.6	126.7	79.6	100.0	128.4	80.6	93.9
54 Average cost per acre based on area enterprises were capable of supplying with water in 1920.....dollars	15.65	21.52	36.21	30.48	18.84	45.98	18.75
55 Average cost per acre based on area enterprises were capable of supplying with water in 1910.....dollars	7.38	15.36	23.60	19.52	11.22	34.47	10.80
ESTIMATED FINAL COST.							
56 Estimated final cost of existing enterprises in 1920.....dollars	162,775	41,585,742	5,500,748	39,860,871	33,835,641	37,684,591	51,500,288
57 Estimated final cost of existing enterprises in 1910.....dollars	47,200	39,216,619	3,800,556	14,754,172	17,840,775	22,822,856	20,426,890
58 Per cent of increase, 1910-1920.....	244.9	6.0	44.7	170.2	89.7	68.8	152.1
59 Average cost per acre based on estimated final cost and area included in enterprises in 1920.....dollars	13.86	21.59	29.20	23.62	14.34	45.03	20.08
60 Average cost per acre based on estimated final cost and area included in enterprises in 1910.....dollars	5.53	15.52	18.85	11.77	9.16	27.32	9.18
DRAINAGE OF IRRIGATED LAND.							
61 Number of enterprises reporting land drained or needing drainage.....	3	176	17	166	143	103	144
62 Acreage included in enterprises reporting land drained or needing drainage.....	1,699	347,750	106,129	650,822	503,212	218,763	513,347
63 Acreage for which drains have been installed.....		93,799	2,109	272,437	85,448	79,168	68,086
64 Additional acreage needing drainage.....	1,820	46,115	4,714	154,532	91,976	43,461	75,183
65 Per cent that acreage for which drains have been installed is of total acreage included in enterprises reporting drainage.....		27.0	2.0	41.9	17.0	36.2	13.3
66 Per cent that acreage for which drains have been installed is of total acreage included in irrigation enterprises in the state.....		4.9	1.1	10.1	3.6	9.5	2.7
67 Per cent that acreage for which drains have been installed plus that needing drainage is of total acreage included in irrigation enterprises in the state.....	15.5	7.3	3.6	25.3	7.5	14.7	5.6

1 Less than one-tenth of 1 per cent.

IRRIGATION.

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STATE TABLE IV.—TOTAL ACREAGE IRRIGATED IN 1919, AND CAPITAL INVESTED IN IRRIGATION ENTERPRISES TO 1920, CLASSIFIED BY DATE OF BEGINNING, CHARACTER OF ENTERPRISE, SOURCE OF WATER SUPPLY, AND CHARACTER OF WATER RIGHTS.

		STATES INCLUDED.	Arizona.	Arkansas.	California.	Colorado.	Idaho.
AREA IRRIGATED, 1919.							
Total.....		19,191,716	487,565	143,946	4,219,040	3,348,385	2,488,804
Date of beginning:							
Before 1880.....		299,784	332	-----	108,200	37,742	931
1880-1889.....		1,282,705	720	-----	88,485	634,865	43,536
1890-1899.....		2,538,414	55,327	-----	1,039,852	647,771	144,031
1870-1879.....		4,043,391	41,358	-----	347,685	1,155,088	755,533
1880-1889.....		2,538,913	19,975	1,640	404,133	294,498	283,053
1890-1899.....		2,211,749	10,944	470	456,261	210,673	619,677
1900-1904.....		2,549,927	260,639	11,840	290,086	215,729	354,143
1905-1909.....		1,638,044	18,692	49,100	649,875	80,674	90,870
1910-1914.....		1,165,560	42,595	64,474	541,500	19,886	60,355
1915-1919.....		972,629	16,983	16,422	202,963	51,465	31,677
Not reported.....		-----	-----	-----	-----	-----	-----
Character of enterprise:							
Individual and partnership.....		6,848,807	80,511	140,471	1,502,870	1,014,412	513,350
Cooperative.....		6,581,400	114,482	1,075	1,215,696	1,789,385	938,421
Irrigation district.....		1,822,887	300	-----	577,168	248,409	355,995
Carey Act.....		623,920	-----	-----	-----	2,430	383,833
Commercial.....		1,822,001	14,500	2,400	873,499	212,138	6,503
U. S. Reclamation Service.....		1,254,569	248,814	-----	36,022	71,145	253,759
U. S. Indian Service.....		284,551	8,733	-----	697	4,266	36,775
State.....		5,620	-----	-----	2,935	80	10
City.....		40,146	200	-----	6,213	5,825	160
Other and mixed.....		7,236	25	-----	3,064	-----	-----
Not reported.....		570	-----	-----	275	295	-----
Source of water supply:							
Streams, gravity.....		14,527,000	189,782	120	2,564,445	3,028,787	2,274,959
Streams, pumped.....		1,226,510	6,071	6,009	295,673	12,747	107,181
Streams, pumped and gravity.....		199,595	-----	-----	60,278	9,430	1,870
Wells, pumped.....		1,263,098	39,694	135,230	826,846	10,114	414
Wells, flowing.....		65,850	1,558	-----	17,653	4,191	1,131
Wells, pumped and flowing.....		35,685	553	-----	23,561	85	-----
Lakes, pumped.....		35,730	5	450	4,168	871	4,912
Lakes, gravity.....		100,646	-----	-----	48,084	2,867	2,492
Springs.....		198,008	2,578	-----	27,698	10,856	33,537
Stored storm water.....		98,873	510	40	20,351	10,909	2,590
City water.....		930	-----	-----	515	11	-----
Sewage.....		2,578	195	-----	1,385	195	80
Streams, gravity, and pumped wells.....		344,713	217,799	250	87,897	16,258	357
Streams, gravity, and flowing wells.....		82,665	525	-----	4,255	67,880	1,627
Other mixed.....		996,621	7,690	1,817	228,424	165,825	54,601
Other and not reported.....		13,148	-----	-----	7,807	1,369	2,955
Character of water rights:							
Appropriation and use.....		2,521,682	226,846	(1)	479,361	114,616	130,774
Notice filed and posted.....		2,705,636	97,130	-----	704,603	269,262	238,637
Adjudicated by court.....		7,159,954	84,978	-----	982,187	2,918,383	1,104,807
Permit from state.....		1,900,924	10	-----	80,484	-----	490,979
Certificate or license from state.....		1,288,124	-----	-----	25,484	-----	338,953
Riparian rights.....		370,896	-----	-----	240,512	-----	18,389
Underground.....		1,067,606	41,624	-----	863,613	14,538	1,834
Other and mixed.....		494,564	525	-----	399,703	12,275	55,595
Not reported.....		1,562,380	16,452	143,946	440,118	79,291	109,033
CAPITAL INVESTED, 1920.							
Total.....		\$697,657,328	\$33,498,094	\$7,183,322	\$194,886,388	\$88,362,442	\$91,501,009
Date of beginning:							
Before 1880.....		9,527,597	2,958	-----	6,802,109	265,660	3,137
1880-1889.....		24,130,038	9,770	-----	2,539,615	14,410,037	881,963
1870-1879.....		37,722,304	1,881,284	-----	16,475,201	8,150,179	1,024,629
1880-1889.....		76,427,344	921,806	-----	19,046,449	17,150,419	13,791,700
1890-1899.....		77,443,017	645,399	-----	31,330,101	7,043,688	9,088,738
1900-1904.....		95,749,105	437,719	98,111	19,106,808	14,101,894	25,892,006
1905-1909.....		183,980,169	20,951,874	25,026	15,252,678	14,192,932	34,081,217
1910-1914.....		102,507,009	3,778,003	2,276,584	41,785,878	11,479,877	3,795,869
1915-1919.....		67,613,693	4,419,044	3,302,492	32,996,398	550,890	2,227,426
Not reported.....		22,557,052	451,167	1,026,567	9,521,261	959,896	714,324
Character of enterprise:							
Individual and partnership.....		154,634,169	5,598,625	7,073,297	57,610,716	11,599,883	5,747,004
Cooperative.....		183,041,500	3,171,408	60,013	48,899,448	42,911,035	36,576,664
Irrigation district.....		88,573,514	100,000	-----	33,985,301	16,269,026	11,954,046
Carey Act.....		32,680,695	-----	-----	-----	1,205,988	17,772,590
Commercial.....		85,735,470	3,693,400	50,012	44,996,723	5,711,887	698,179
U. S. Reclamation Service.....		129,509,819	20,277,819	-----	2,398,220	10,253,231	17,804,839
U. S. Indian Service.....		14,851,236	585,028	-----	55,556	220,079	932,387
State.....		344,174	-----	-----	224,909	3,994	1,000
City.....		2,936,078	71,500	-----	1,401,320	117,665	14,300
Other.....		5,310,399	-----	-----	5,277,490	-----	-----
Not reported.....		39,674	215	-----	30,705	8,754	-----
Source of water supply:							
Streams, gravity.....		439,570,623	11,537,884	3,874	78,139,147	68,852,489	81,823,379
Streams, pumped.....		59,343,298	521,852	96,450	16,267,561	2,490,900	5,108,912
Streams, pumped and gravity.....		9,512,907	-----	-----	3,084,038	397,392	183,200
Wells, pumped.....		76,737,251	3,417,339	7,028,773	54,057,185	375,277	24,935
Wells, flowing.....		2,493,672	115,936	-----	807,853	55,251	33,652
Wells, pumped and flowing.....		2,274,601	64,700	-----	1,776,156	5,300	-----
Lakes, pumped.....		2,908,612	400	9,500	90,081	27,530	544,981
Lakes, gravity.....		5,793,088	271,358	-----	674,320	84,935	276,837
Springs.....		15,075,592	11,000	1,500	1,298,308	188,920	980,189
Stored storm water.....		219,783	-----	-----	6,593,659	1,467,459	246,257
City water.....		174,444	63,408	-----	61,055	97	200
Sewage.....		28,347,835	17,092,890	8,500	59,959	1,648	59,700
Streams, gravity, and pumped wells.....		2,833,194	27,500	-----	10,001,650	190,454	39,150
Streams, gravity, and flowing wells.....		48,467,251	333,227	34,725	1,264,530	1,033,076	2,191,837
Other mixed.....		876,218	-----	-----	19,906,271	13,084,359	12,730
Other and not reported.....		-----	-----	-----	805,115	47,355	-----

1 1919 acreage in Arkansas not classified by character of water rights.

STATE TABLE IV.—ACREAGE IRRIGATED IN 1919, AND CAPITAL INVESTED IN IRRIGATION ENTERPRISES TO 1920, CLASSIFIED BY DATE OF BEGINNING, CHARACTER OF ENTERPRISE, SOURCE OF WATER SUPPLY, AND CHARACTER OF WATER RIGHTS—Continued.

	Kansas.	Louisiana.	Montana.	Nebraska.	Nevada.	New Mexico.	North Dakota.
AREA IRRIGATED, 1919.							
Total.....	47,312	454,882	1,681,729	442,690	561,447	538,377	12,072
Date of beginning:							
Before 1860.....			4,586	30	4,782	28,062	
1860-1869.....			110,225		171,317	26,697	
1870-1879.....			114,804	1,090	124,723	33,720	
1880-1889.....	50	40	470,529	104,100	83,582	71,909	1,595
1890-1899.....	15,413	2,050	361,563	191,229	9,081	55,223	458
1900-1909.....	13,226	151,983	148,075	21,580	60,897	27,312	955
1910-1914.....	3,617	34,531	272,239	98,704	18,770	71,848	8,766
1915-1919.....	3,719	59,919	59,280	19,788	24,833	89,720	285
Not reported.....	7,109	126,831	38,556	2,746	13,937	60,919	330
Total.....	4,148	29,165	101,872	8,423	49,545	73,067	683
Character of enterprise:							
Individual and partnership.....	14,546	259,673	976,615	68,140	355,901	151,351	3,306
Cooperative.....	22,516	10,635	393,257	55,408	69,877	264,610	
Irrigation district.....			35,153	206,206	80,000	16,008	
Carey Act.....			54,771				
Commercial.....	150	184,674	34,115	25,335	5,990	19,871	
U. S. Reclamation Service.....			88,291	87,558	44,324	77,078	8,766
U. S. Indian Service.....			98,887		5,321	9,072	
State.....	100		20		12	77	
City.....			320		22	600	
Other and mixed.....			300	43		110	
Not reported.....							
Source of water supply:							
Streams, gravity.....	30,807	10,226	1,515,212	425,567	466,812	432,478	9,030
Streams, pumped.....	730	245,306	15,743	1,115	2,847	1,890	2,469
Streams, pumped and gravity.....	600	12,620	19,872	850			
Wells, pumped.....	13,235	154,304	139	546	265	15,709	
Wells, flowing.....		196	212		811	30,030	
Wells, pumped and flowing.....	50	1,075			65	0,556	
Lakes, pumped.....		3,225	79				
Lakes, gravity.....			16,653		445	1,945	
Springs.....			14,945	2,050	21,087	10,791	
Stored storm water.....		84	3,280	1,209	17,348	6,448	508
City water.....			15	7	14	40	
Sewage.....			245	120	88		
Streams, gravity, and pumped wells.....	1,540	10,045	155	115	4,957	1,341	
Streams, gravity, and flowing wells.....			6,068		82	685	
Other mixed.....	350	7,635	89,070	1,120	45,176	29,787	65
Other and not reported.....			41			677	
Character of water rights:							
Appropriation and use.....	26,435	(*)	229,887	42,141	200,556	152,746	0,348
Notice filed and posted.....	4,218		666,305	16,517	52,027	54,356	2,328
Adjudicated by court.....	458		701,015	9,280	161,175	91,807	
Permit from state.....			595	234,806	106,857	108,459	2,936
Certificate or license from state.....				117,960	6,666	20,096	
Riparian rights.....	30		5,500	618		400	
Underground.....	13,480		482	546	1,244	52,325	
Other and mixed.....	938		8,561	13	1,705	8	
Not reported.....	1,753	454,882	69,384	20,509	31,217	63,180	460
CAPITAL INVESTED, 1920.							
Total.....	\$2,087,381	\$14,063,181	\$52,143,363	\$13,909,185	\$14,754,280	\$18,210,412	\$1,857,118
Date of beginning:							
Before 1860.....			55,527	500	55,645	268,876	
1860-1869.....			1,323,315		2,400,682	384,754	
1870-1879.....			2,063,841	21,583	1,599,890	482,843	
1880-1889.....	736	1,000	5,085,794	1,659,094	1,026,933	2,568,298	1,800
1890-1899.....	1,058,962	24,800	7,045,284	2,075,677	1,202,916	1,202,916	17,069
1900-1909.....	88,719	5,487,222	3,005,519	321,927	8,149,026	1,122,232	37,714
1910-1914.....	200,085	1,171,166	26,592,156	8,083,843	244,493	4,692,515	1,777,570
1915-1919.....	176,286	1,502,682	2,756,019	444,144	576,638	4,594,735	2,000
Not reported.....	407,876	3,848,622	3,631,564	180,314	234,932	2,021,448	11,207
Total.....	134,997	680,167	1,584,344	520,103	331,547	811,795	2,958
Character of enterprise:							
Individual and partnership.....	775,065	7,943,252	15,543,287	1,146,227	4,014,570	5,589,372	81,693
Cooperative.....	1,289,737	161,658	6,612,877	547,104	1,019,047	3,558,863	
Irrigation district.....			1,708,851	2,811,474	1,246,611	914,479	
Carey Act.....			4,894,407			1,877,842	
Commercial.....	1,549	5,958,271	676,535	726,500	340,659	262,713	
U. S. Reclamation Service.....			14,351,318	8,674,250	7,953,637	5,020,230	1,775,425
U. S. Indian Service.....			8,193,390		178,536	691,194	
State.....	1,000		100		1,000	18,544	
City.....			105,538		420	276,299	
Other.....			7,060	3,570		876	
Not reported.....							
Source of water supply:							
Streams, gravity.....	1,184,674	318,934	47,010,339	13,619,775	12,493,231	13,524,889	1,299,951
Streams, pumped.....	22,142	7,338,954	900,216	35,581	119,900	36,620	552,007
Streams, pumped and gravity.....	50,000	172,000	1,612,316	18,700	8,000		
Wells, pumped.....	741,583	5,366,948	16,285	23,250	19,900	925,003	
Wells, flowing.....		5,000	10,007		50,575	1,220,519	
Wells, pumped and flowing.....	4,000	22,500			5,500	358,165	
Lakes, pumped.....		356,960	8,250				
Lakes, gravity.....	1,000	112,740	271,730	100,300	234,851	18,750	
Springs.....			247,694		568,000	257,179	
Stored storm water.....		1,500	298,392	40,429	184,350	686,047	4,660
City water.....				1,000	300	1,000	
Sewage.....				313	620		
Streams, gravity, and pumped wells.....	50,592	247,595	3,000	5,035	181,887	175,000	
Streams, gravity, and flowing wells.....			433,000	6,902	3,400	14,000	
Other mixed.....	13,450	120,050	1,318,598	29,403	903,766	958,740	500
Other and not reported.....			1,382			4,600	

* Dakota territory.

* Acreage in Louisiana not classified by character of water rights.

IRRIGATION.

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STATE TABLE IV.—ACREAGE IRRIGATED IN 1919, AND CAPITAL INVESTED IN IRRIGATION ENTERPRISES TO 1920, CLASSIFIED BY DATE OF BEGINNING, CHARACTER OF ENTERPRISE, SOURCE OF WATER SUPPLY, AND CHARACTER OF WATER RIGHTS—Continued.

	Oklahoma.	Oregon.	South Dakota.	Texas.	Utah.	Washington.	Wyoming.
AREA IRRIGATED, 1919.							
Total.....	2,969	986,162	100,682	582,120	1,341,651	529,899	1,207,988
Date of beginning:							
Before 1860.....		8,206			106,132	461	330
1860-1869.....		46,917			144,957	798	9,288
1870-1879.....		90,950	11,302	23,006	201,840	22,650	77,228
1880-1889.....		198,653	11,441	13,073	300,415	65,791	406,196
1890-1899.....	2,392	123,043	2,065	45,411	113,385	126,359	230,300
1900-1904.....	108	123,648	58,570	134,832	81,407	42,534	163,543
1905-1909.....	55	142,756	8,927	161,770	250,048	175,383	169,976
1910-1914.....	298	91,425	5,633	141,118	67,468	30,663	55,288
1915-1919.....	36	62,458	1,126	84,656	44,989	24,466	18,642
Not reported.....	80	98,106	718	32,256	61,061	40,794	68,201
Character of enterprise:							
Individual and partnership.....	969	590,626	31,664	110,680	166,887	142,215	724,020
Cooperative.....	2,000	186,037	10,080	103,378	1,014,649	93,192	286,702
Irrigation district.....		92,081		88,671	21,143	79,918	22,935
Carey Act.....		30,665			16,000		36,230
Commercial.....		27,338	2,280	262,892	70,911	21,705	57,800
U. S. Reclamation Service.....		54,951	56,038	20,284	26,285	122,869	63,555
U. S. Indian Service.....		4,000	20		25,270	69,510	22,000
State.....				65		200	2,120
City.....		330		250	24,206		2,020
Other and mixed.....		104			3,300	290	
Not reported.....							
Source of water supply:							
Streams, gravity.....	2,522	786,354	92,491	73,982	1,105,661	352,199	1,155,596
Streams, pumped.....	188	64,576	869	421,538	10,389	26,244	1,525
Streams, pumped and gravity.....		253		350	50	92,702	
Wells, pumped.....	107	1,993		39,483	7,308	17,504	147
Wells, flowing.....	18	72	130	3,255	4,908	1,671	19
Wells, pumped and flowing.....		340		1,727	178	1,490	
Lakes, pumped.....		1,620		597	11,400	4,662	
Lakes, gravity.....		5,750	170		15,218	3,442	355
Springs.....	6	9,584	326	8,686	41,310	7,809	5,985
Stored storm water.....		3,703	2,312	11,572	977	129	10,862
City water.....	3	258			25	42	
Sewage.....		10		200			
Streams, gravity and pumped wells.....		105	500	454	125	2,415	400
Streams, gravity and flowing wells.....		200	20	45	537	441	
Other mixed.....	125	111,137	3,804	24,170	173,495	19,027	33,043
Other and not reported.....		147			40	62	60
Character of water rights:							
Appropriation and use.....	35	143,623	1,774	69,334	469,944	196,700	25,662
Notice filed and posted.....	215	150,332	62,054	105,069	171,855	109,831	60,762
Adjudicated by court.....	2,200	298,913	7,651	2,755	581,080	66,309	162,136
Permit from state.....	310	131,540	17,500	229,753	56,061	39,038	466,026
Certificate or license from state.....		217,228	8,612	11,898	60,778	17,496	457,038
Riparian rights.....	80	14,277	1,599	72,396		17,095	
Underground.....	120	3,235	130	44,649	8,631	20,850	276
Other and mixed.....	3	12,159	190	694	4,077	561	667
Not reported.....	6	14,955	1,172	49,672	13,125	11,630	35,345
CAPITAL INVESTED, 1920.							
Total.....	\$151,325	\$28,929,151	\$5,465,248	\$35,072,739	\$32,027,351	\$29,299,011	\$34,326,328
Date of beginning:							
Before 1860.....		151,216			1,883,633	37,986	1,250
1860-1869.....		398,603		30,000	1,639,394	10,174	45,731
1870-1879.....		1,072,943	261,476	1,108,104	2,495,342	104,885	978,308
1880-1889.....		2,321,551	149,465	295,723	4,728,282	1,130,394	5,459,654
1890-1899.....	54,378	1,636,226	94,851	687,951	2,333,821	4,883,671	3,109,641
1900-1904.....	3,403	4,193,262	4,543,349	4,903,055	507,149	2,907,222	4,844,972
1905-1909.....	4,085	10,876,802	221,514	7,762,497	10,322,803	12,627,690	14,962,407
1910-1914.....	67,101	2,741,335	106,127	14,010,412	6,113,078	5,697,725	1,621,916
1915-1919.....	17,009	4,759,181	63,308	2,747,036	1,803,298	1,993,364	2,337,484
Not reported.....	5,349	748,032	25,158	3,227,361	550,451		964,905
Character of enterprise:							
Individual and partnership.....	110,658	6,584,382	743,880	8,256,568	2,736,804	4,733,970	8,738,886
Cooperative.....	40,667	3,143,698	240,030	3,821,844	20,254,212	3,951,207	6,701,990
Irrigation district.....		6,313,753		5,440,142	265,484	6,114,035	1,441,312
Carey Act.....		3,231,298			1,323,779		2,434,791
Commercial.....		3,281,034	15,053	13,825,409	2,374,991	2,342,028	780,562
U. S. Reclamation Service.....		6,956,950	4,464,780	3,673,476	3,567,057	10,444,717	12,863,870
U. S. Indian Service.....		230,033	1,500		765,354	1,657,386	1,339,887
State.....		16,107		6,802		55,668	15,050
City.....		171,068		39,498			9,980
Other.....		823			729,090	20,580	
Not reported.....							
Source of water supply:							
Streams, gravity.....	90,040	20,028,187	5,122,271	5,631,241	26,503,462	19,305,396	33,025,460
Streams, pumped.....	4,210	2,807,806	93,340	19,432,010	733,077	2,677,946	99,914
Streams, pumped and gravity.....		8,700		60,000	5,100	3,933,461	
Wells, pumped.....	47,075	118,306		2,783,260	153,091	1,678,581	10,460
Wells, flowing.....	5,000	8,900	5,000	340,538	167,152	117,546	4,630
Wells, pumped and flowing.....		2,600		163,057	18,571	58,123	
Lakes, pumped.....		26,583		176,700	555,000	468,616	
Lakes, gravity.....		783,702	2,100		75,251	285,101	4,935
Springs.....	1,900	165,946	18,421	316,664	869,214	520,899	66,299
Stored storm water.....		124,499	155,121	4,785,276	81,503	5,985	407,055
City water.....	1,500	153,650			800		
Sewage.....		1,500		40,072			
Streams, gravity, and pumped wells.....		11,500	3,000	34,680	22,000	243,642	16,770
Streams, gravity, and flowing wells.....		1,000	480	5,000	11,822	23,334	
Other mixed.....	2,500	4,691,072	65,515	1,304,241	2,828,242		690,705
Other and not reported.....		2,200			2,736		100