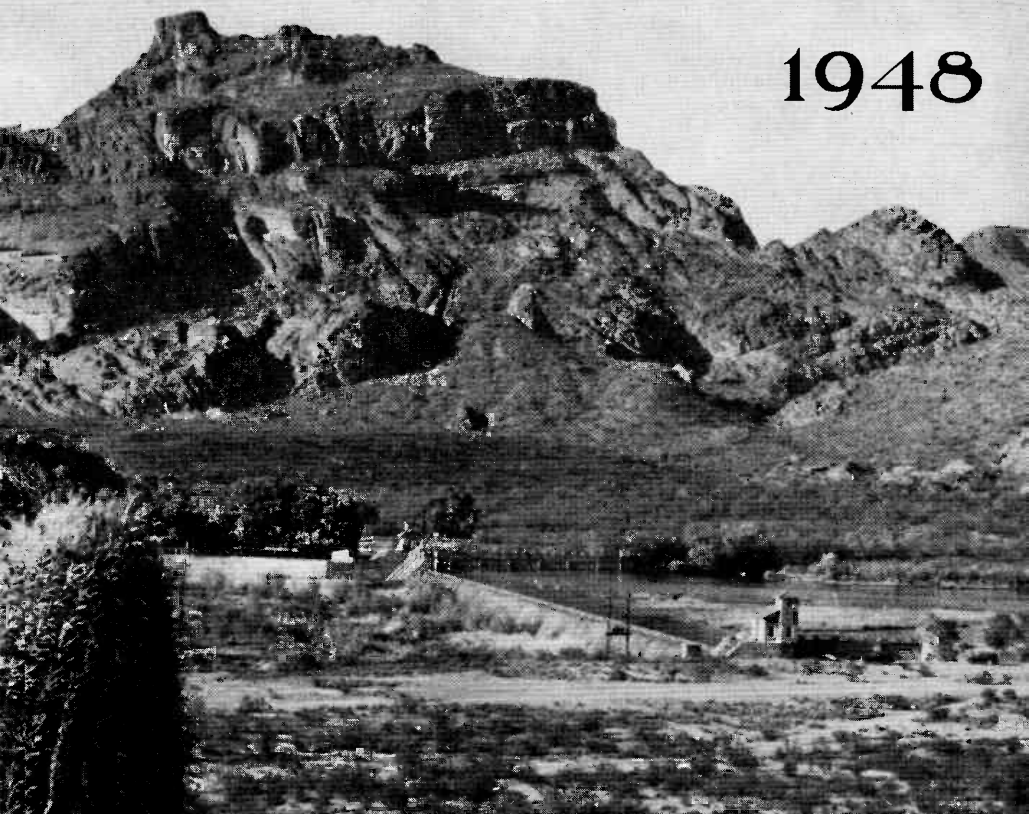


# ARIZONA AGRICULTURE 1948



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Pictures on cover: Yavapai County prize-winning pen,  
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Granite Reef Dam by *R. C. Proctor*

# ARIZONA AGRICULTURE

1948

## PRODUCTION, INCOME, AND COSTS<sup>1</sup>

By GEORGE W. BARR

Arizona farmers and stockmen gathered in more dollars during 1947 than in any previous year. The cash income amounted to 176 million dollars, compared with 160 million dollars in 1946. The major portion of the year's increase was from cotton, which provided nearly one-fourth of the total cash income (Table 1). Truck crops, including lettuce, cantaloupes, carrots, and around twenty other vegetables, accounted for 40 million dollars, or almost another one-fourth of the farm and ranch income. Other branches of the farming industry that made greater returns in 1947 than in the preceding year were dairying and grain farming. Alfalfa hay and citrus production were less profitable. Direct government payments to farmers amounted to only 1 per cent of the income, compared with nearly 7½ per cent in 1939, the peak year of government aid.

Unfortunately, the 176 million dollars received in 1947 would not buy as much goods on the market as did the 160 million dollars in 1946, or the 134 million-dollar income in 1945, or the 124 million-dollar income in each of the years 1943 and 1944. Inflation has a way of taking much of the joy out of large dollar income.

Prices for cattle, grain, and cotton continued to climb rapidly throughout much of the year 1947. In January, 1948, the prices of these commodities were about three times corresponding prices in the years 1935 to 1939 (Figures 1 and 2). On the other hand, eggs were only about twice their prewar price, and wool was only one and a half times its prewar price. Hay sold for a lower figure during much of 1947 than in the previous year, while grapefruit and alfalfa seed brought little more than prewar prices.

The amount of cotton or cattle produced in Arizona has little influence on the country-wide price, but the amount and quality of several Arizona crops are important factors in determining their price throughout America. This is particularly true of winter and spring lettuce, fall and spring carrots, alfalfa seed, Bermuda seed, sugar beet seed, and, at least insofar as the Western States are concerned, grapefruit.

On account of the generally high prices for agricultural products in 1947, little attention has been given by producers to the price support programs. The government is committed to a program

<sup>1</sup>This is the eighteenth in a series of annual agricultural summaries. Many individuals and organizations have contributed suggestions and figures. The Federal Crop and Livestock Reporting Service collected the major portion of the production figures. Agencies providing data for the map are mentioned thereon.

TABLE 1.—CASH INCOME FROM ARIZONA FARM AND RANCH PRODUCTION (In Millions of Dollars)

Commodity	1947	1946	1937-46 Average
Cotton lint and cottonseed	\$43.0	\$31.0	\$18.5
Lettuce and other truck crops <sup>a</sup>	40.0	38.0	20.2
Cattle and calves	37.0	37.0	23.3
Dairy products <sup>b</sup>	11.0	8.0	5.5
Commercial feed grains <sup>b</sup>	8.0	5.0	2.7
Alfalfa and other hay <sup>b</sup>	6.3	10.0	5.4
Sheep, lambs and wool	5.0	4.0	3.4
Eggs, chickens, and turkeys <sup>b</sup>	5.0	3.5	2.5
Citrus fruit <sup>a</sup>	4.0	7.0	3.3
Seed crops	4.0 <sup>c</sup>	4.0	2.4
Miscellaneous crops	9.0	8.0	3.9
Miscellaneous livestock and livestock products	2.0	1.5	1.3
Federal government payments	1.7 <sup>d</sup>	3.0	2.6
<b>Total cash income</b>	<b>\$176.0</b>	<b>\$160.0</b>	<b>\$95.0</b>

<sup>a</sup>Year ended August 31. Citrus fruit "on the tree" price.

<sup>b</sup>Represents cash sales only. In addition, in 1947 hay, fed by Arizona producers, had an estimated value of 4.3 million dollars; feed grains fed, 3.3 million dollars; and dairy and poultry products consumed by producers, 2.5 million dollars.

<sup>c</sup>Alfalfa seed, 2.2 million dollars; sugar beet seed, 1.4 million dollars; also Bermuda grass, guar, and vegetable seeds.

<sup>d</sup>Direct payments to farmers in 1947 were for soil conservation purposes only.

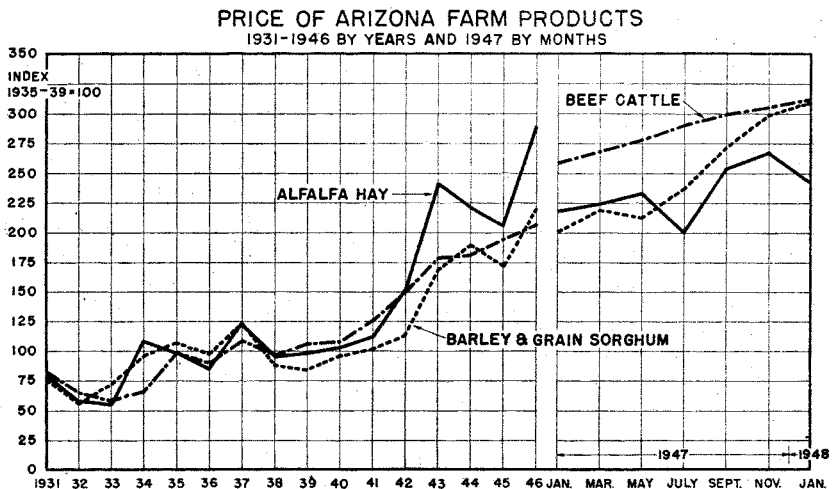


Figure 1.—Prices of beef cattle, grain, and cotton (shown in Figure 2) continued to rise throughout much of the year 1947. Hay prices have been seasonally adjusted.

of supporting cotton prices at 92½ per cent of parity until the end of 1948. Parity will be based on August 1, 1948, prices paid by farmers. At the January, 1948, level of prices, this would amount to about 28 cents per pound. A number of other Arizona commodities will likely be supported at about 90 per cent of parity. The support price of No. 1 flax for the year 1948 has been announced as \$6.25 per bushel at Los Angeles. Late in 1947 the government offered to purchase No. 1 alfalfa seed, bagged, cleaned, and in warehouses, at 17 cents a pound for the 1947 crop. Dry pinto beans were supported at \$7.90 per hundred pounds for the 1947 crop. This applied to No. 1 beans, bagged and f.o.b. cars at any shipping point.

Another government program is undergoing change. A new policy has been established for agricultural conservation payments which limits the amount that any individual farmer may receive in 1948 to \$500. In case the farmer is a tenant, both the tenant and the landlord may receive as much as \$500. The comparable limitation in 1947 was \$10,000. It appears that even a small government appropriation for direct payment to farmers for soil conservation in 1948 may be distributed more widely under this plan.

#### MAP OF IRRIGATION

Over one million acres of Arizona land have been prepared for irrigation and irrigated at some time. More than 95 per cent of this land is shown, section by section, on the map with this bulletin.<sup>2</sup> Some 100,000 acres are shown for the first time, having been developed in the four years since publication of the former map. Largest additions have been made in Pinal County, both

PRICE OF ARIZONA FARM PRODUCTS  
1931-1946 BY YEARS AND 1947 BY MONTHS

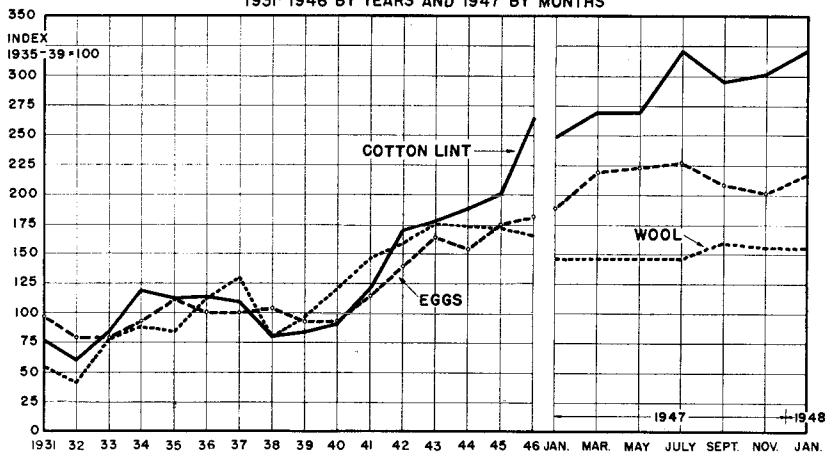


Figure 2.—Alfalfa hay, eggs, and wool were not as high when compared with their prewar prices as were cattle, cotton, and grain. The prices of eggs shown above have been seasonally adjusted.

<sup>2</sup>For footnote see next page.

north and south of Eloy and in the Stanfield area. Maricopa County also has had its points of growth in irrigated acreage, particularly in Deer Valley, in the area west of the Agua Fria and north of Luke Field, between the Agua Fria and New Rivers, and in the Queen Creek section. Yuma County farmers have developed several thousand acres of new land in the South Gila Valley. Then, too, additional land has been put into crop on Yuma Mesa. A total of 5,200 acres of Gila Project mesa lands were in crop in 1947. In one other county—Cochise—thousands of acres of new lands have been put under pump irrigation, particularly in the area north and west of Douglas.

Land actually receiving water within the state in 1947 amounted to about 825,000 acres, or about 50,000 acres in addition to that irrigated in each of the preceding two years. Newly added areas have more than equaled areas put out of irrigation by lack of water. The acreage irrigated by counties is shown in Table 5, and the acreage irrigated by areas is shown on page 17. By use of the index number, each area may be located on the map.

The long-continued period of low rainfall on Arizona watersheds (1942 to 1947 inclusive) only emphasizes the state's permanent problem of securing enough water to support its economy. The water courses and eighteen existing major dams, including six dams across the Colorado River, are shown on the key map. In addition, there are shown six proposed dams and a system of aqueducts which would enable Arizona to divert a portion of the Colorado River water into Central Arizona and at the same time to utilize the flow of its rivers more fully, according to a plan submitted to a Senate Subcommittee by the Bureau of Reclamation in 1947.

Under an act passed by Congress in 1947, the water available for the Gila Project of Yuma County is limited to 600,000 acre-feet. Areas embracing 25,000 acres on the Yuma Mesa and 75,000 acres in the Gila Valley in the vicinity of Roll and Wellton have been tentatively selected for development. The parts of these areas not now irrigated are shown in green shading on the map. A small part, north of the railroad and near Araby, will not be developed for some time, according to plans of the Bureau of Reclamation. This part is shown in black shading.

Extension of irrigation in recent years, outside of Yuma County, has been entirely by drilling additional wells. Unfortunately, these wells have not made available any new supply of water

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<sup>2</sup>The lands "irrigated" as shown on the map include all of the area in major projects entitled to receive water. In Pinal County the lands outside of the San Carlos Project shown to be irrigated are intended to include all lands that have a history of water use as determined in a study by the Phoenix Office of Project Planning, Bureau of Reclamation, in 1947. In Pima and Santa Cruz counties lands irrigated or leveled for irrigation were outlined from aerial photo maps taken by the Soil Conservation Service in July, 1946. The Yavapai County areas were taken largely from maps prepared by T. A. Hayden of the Salt River Valley Water Users' in 1940. Yuma County areas irrigated were revised late in 1947 by Gila Project engineers.

but have tapped the same reservoirs reached by older wells. The pumping lift varies from about 40 feet to 280 feet. There is much evidence to indicate that water from privately owned wells on lands irrigated entirely by pumping was lifted an average of 180 feet or more in 1947. With electric power at 1¼ cents per kilowatt-hour, this means a water cost of \$27 per acre of cotton.<sup>3</sup>

The new water code under consideration by the Arizona Legislature in January, 1948, refers chiefly to *volume* of water. Not to be overlooked, however, is the matter of *quality* of irrigation water which refers to the kind as well as the quantity of salts in the water. From the standpoint of crop production, the principal undesirable element in Arizona soils and waters is sodium. In the twenty-year period beginning with 1926, there has been a definite decrease in total salts and in the sodium carried by the water from wells located throughout a very substantial portion of the farmed area of Maricopa County. In two blocks totaling around 100,000 acres, the total salts in the water of sample wells decreased 15 per cent and the sodium 20 per cent. On the other hand, in another block of 50,000 acres, the total salts of sample wells increased 175 per cent, and sodium increased 190 per cent.<sup>4</sup>

In the plan proposed in 1947 by the Bureau of Reclamation for bringing Colorado River water into Central Arizona, provision was made for maintaining a favorable salt balance by providing for a discharge from the area of as much undesirable salt as enters the area. Failure to provide such balance, whether in connection with development of a new supply or by redistribution of the water from the present sources, will force gradual abandonment of land now being farmed.

### COTTON

Arizona made a major comeback in cotton acreage and production in 1947, growing 220,000 bales on 225,000 acres, compared with 145,000 acres in the preceding year. Pinal County had more than half the entire acreage and produced a 50 per cent larger crop than ever before in the history of that county. This new surge in the importance of cotton was due to some extent to higher prices but in no small part to new methods of controlling insects.

Cotton grown in Arizona and outside of Graham, Greenlee, and Cochise counties was almost entirely from seed of California Acala origin. Much of the cotton grown in Graham, Greenlee, and Cochise counties was from seed developed by the New Mexico Experiment Station and the United States Field Station at State College, New Mexico.

<sup>3</sup>For cost-of-pumping formula and further discussions, see *Arizona Agriculture*, 1946, p. 3.

<sup>4</sup>In the last year for which record is available, the well water in the first block mentioned contained between 0.50 and 0.60 ton of sodium per acre-foot; in the latter block nearly a ton. By comparison, Salt River diversions at Granite Reef Dam in the years 1935-44 contained 0.13 ton; Colorado River below Boulder Dam in the period 1935-42, 0.14 ton. (One ton per acre-foot is the equivalent of 735 parts per million.)

New strains are being developed for use in Arizona by the Arizona Agricultural Experiment Station in co-operation with the United States Field Station at Sacaton. Three or four of these strains in repeated tests have definitely out-yielded the strains of California origin, including the new 4-42 strain which California is releasing. They have a stronger and longer fiber than either the California or Arizona Acala now used. The seed of one of these strains will be increased as rapidly as possible. Fifty acres in 1948 should make possible the planting of 2,500 acres in 1949 and 125,000 acres in 1950.

Nine million pounds of dust were applied in the 1947 Arizona insect control program, according to W. A. Stevenson, United States Bureau of Entomology. Of this, 8 million pounds consisted of a mixture of 5 per cent DDT and 75 per cent sulphur. About  $\frac{1}{2}$  million pounds of the remainder consisted of a benzine hexachloride mixture. The amount applied provided the equivalent of two applications of 20 pounds each for the entire cotton acreage of the state. Of course, some cotton was not dusted at all, and some had four applications. Dust application definitely adds to the cost of production. With the common dust mixture costing \$8.80 per hundred pounds, and allowing 4 cents per pound for dust application, the total applied cost of four applications is a little more than \$10 per acre.

Certain other costs of production have increased in the past year, particularly water costs. The long period of years of falling power rates came to an end in 1947 when hydroelectric power had to be supplemented by power from more expensive and not entirely reliable sources. Diesel power is not a cheap substitute for electricity because of higher costs for both machinery and fuel oil. A watershed run-off that would make possible the operation of power units on Arizona rivers would relieve this situation. The lowered water table is also a factor in higher water costs. Water for a cotton crop in 1948 may cost about \$22 per acre at a lift of 150 feet, about \$33 per acre at a lift of 225 feet, and \$13.50 per acre in the Salt River Valley Water Users' area. Total costs-through-harvest for land, water, seed, and culture will average in the neighborhood of \$85 per acre after crediting the return for cottonseed at \$90 per ton (Table 2). Any major decline in the price of cottonseed would greatly increase the net harvest cost.

There has been a slow but definite increase in the use of mechanical pickers in Arizona. Ten of the International-type pickers were used in the 1947 harvest: three in Pinal County, three in Pima County, three in Graham County, and one in Maricopa County. Opinion varies as to the quality of work done by these picking machines, but it is generally believed that cotton is lowered one grade below that obtainable with hand picking. The amount of use of mechanical pickers in the future will depend in part upon the availability and cost of hand labor and also, probably, upon the amount of premiums paid for quality cotton.



TABLE 2.—COST OF PRODUCING UPLAND COTTON PER ACRE,  
CENTRAL ARIZONA PUMP AREAS WITH 150- AND 225-FOOT  
WATER LIFTS, AND SALT RIVER VALLEY WATER USERS'  
AREA, 1948<sup>a</sup>

	Central Arizona pump areas		Salt River Valley Water Users' area
	150 ft. lift	225 ft. lift	
Interest, taxes, and water:			
Interest, 5% on \$300.....			\$15.00
Interest, 6% on \$100.....	\$ 6.00		
Interest, 6% on \$50.....		\$ 3.00	
Land tax.....	1.65	.90	3.10
Water (3 acre-feet).....			13.50
Water (3½ acre-feet).....	22.35	33.50	
Total .....	\$30.00	\$37.40	\$31.60
Cultural costs:			
Seed .....	\$ 2.20	\$ 2.20	\$ 2.20
Machinery operation, including machine labor <sup>b</sup> .....	14.00	14.00	14.00
Hoeing and thinning.....	6.00	6.00	6.00
Irrigation and ditch labor.....	4.00	4.00	4.00
Dusting <sup>c</sup> .....	5.10	5.10	5.10
Production credit and miscellaneous .....	2.00	2.00	2.00
Federal crop insurance <sup>d</sup> .....	4.00	4.00	4.00
Industrial insurance .....	2.00	2.00	2.00
Total .....	\$39.30	\$39.30	\$39.30
Harvest costs:			
Per bale of 479 pounds net lint from 1,400 pounds seed cotton— \$15.55 <sup>e</sup>			
Per acre net harvest costs on yield of 435 pounds net lint <sup>e</sup> .....	\$14.00	\$14.00	\$14.00
Calculated cost of producing 435 pounds net lint on 1 acre, manage- ment not included and no allowance for land depreciation.....	\$83.30	\$90.70	\$84.90

<sup>a</sup>This table represents a budget based upon typical costs of owner-operated farms, assuming average yields and wage rates as of January, 1948.

<sup>b</sup>Plowing; discing twice, once with stalk cutter before plowing and once after; floating; furrowing; planting; dragging or harrowing after planting; and five cultivations.

<sup>c</sup>Two 20-pound applications of 5% DDT, 75% sulphur at 8.8 cents per pound, and 4 cents per pound for airplane application. Four dustings, if required, would double the cost.

<sup>d</sup>Picking at \$3.00 per cwt., including 25 cents for weighing and hauling pickers, \$42.00; hauling cotton, \$1; ginning, \$5.60; bags and ties, \$2.25; insurance for twenty days and sterilizing seed, \$1.10; less return from 809 pounds cottonseed (after deducting 8 per cent trash) at \$90 per ton, \$36.40.

<sup>e</sup>Average 1942-46 yield in Pinal and Maricopa Counties.

<sup>f</sup>Available in Pinal County only. Not a cash outlay in other counties but represents a risk assumed by grower.

Federal Crop Insurance may be obtained only in Pinal County in the year 1948, and there will be but one type of coverage. The average producer in that county who insures under this program will be guaranteed 251 pounds per acre at harvest time. The premium rate for the county will be 13 pounds per acre of middling 1-1/32-inch cotton and, of course, indemnities would be paid with the same kind of cotton. Cottonseed will not be insured in 1948.

### TRUCK CROPS

An output of 47,000 carlots of vegetables was marketed from 100,000 acres in the year ended August, 1947. The return for this production, measured at the car door, amounted to 40 million dollars. Half of this value came from lettuce. While the total acreage of the truck crops grown did not change from the previous year there was a shift of about 5,000 acres from Maricopa County to Yuma County, possibly because of more favorable water supplies in the latter county.

The fall, 1947, crop of lettuce was estimated at 14,000 acres in the Salt River Valley, or about the same as the preceding year, and 7,500 acres in the Yuma area, or an increase of about 1,200 acres over the previous year. A part of the carrot acreage was shifted from Maricopa County to Yuma County in the fall of 1947; the plantings in the Yuma area being about 1,700 acres; in the Salt River Valley, 1,500 acres; in the Eloy area, 850 acres; and in the Queen Creek area, 260 acres.

Shipments of principal vegetables for the year ended August 31, 1947, were as follows: fall lettuce, 10,700 carlots; spring lettuce, 12,400; cantaloupes, 8,600; honeydews and similar melons, 3,000; fall carrots, 2,500; spring carrots, 4,800; cauliflower, 1,700; watermelons, 1,500; celery, 900; broccoli, 500.

### LIVESTOCK

#### Beef Cattle

The year 1947, insofar as Arizona cattlemen are concerned, was one of great risks and large profits for those who took the risk. The cattle feeder paid what he felt was a very high price for calves and feeder steers in the fall of 1946 — 15 to 16 cents per pound, but rapidly rising meat prices during the year enabled the feeders to sell the best of the finished stock at 23 cents in May and 25 to 26 cents in the months October to December. In any period when meat prices are rising, cattle feeders' margins are wide, but in a period of falling prices losses also can be very large. Stockmen were taking an even greater risk in paying as much as 23 to 24 cents a pound for cattle to put in feed lots in December, 1947.

The net outward movement of cattle was 356,000 head in the year ended November 30, 1947, compared with about 410,000 head in the previous year. This 1947 outward movement was made up of 393,000 head, shown by the records of the Livestock Sani-

tary Board as going out of the state, and 126,000 head slaughtered within the state; from this was subtracted 163,000 head shipped into Arizona during the twelve-month period ended June 30, 1947. These cattle shipped in were heavier and more costly than the in-shipments from Mexico in past years. After the value of the imported cattle was deducted from total cattle income, the net cash income in 1947 was 37 million dollars or the same as in 1946 (Table 1). There has been no change in the general direction of the outward movement of Arizona cattle for twenty years. In the period 1941-46, 60 to 80 per cent went to California, and this was also true of the period 1925-29.

The quarantine on Mexican cattle has strengthened the market for Arizona range cattle. In the past, large numbers of cattle have moved into Arizona from Mexico. Out of one million head of cattle shipped into Arizona from all sources in the six years ended with 1946, 650,000 or 65 per cent came from Old Mexico. In 1946 this number from Mexico amounted to 95,000 head, or about half of all the cattle moved into Arizona. In 1947 such shipments were entirely cut off, and presumably there will be none in 1948. A drought in Texas and the Old South, however, brought about a shipment of cattle from that part of the country, especially in September, October, and November, 1947. The total in-movement of cattle was about normal in 1947, but most of these cattle moved in late in the year. The number of cattle in feed lots in the Salt River Valley was considerably larger than normal on December 1, 1947.

Reduction in the size of breeding herds on Arizona ranches, except in Navajo and Apache counties, was brought about by drought in 1947. Replacement of ranch cows is slow by the natural process or costly by purchase from other states.

Uncertainties in the Arizona cattle business in 1948 center around not only the usual rainfall problems but also the problems of American foreign policy — exports to European and other countries and the effect of lowered import duties under a late 1947 presidential proclamation. It should be noted that American meat prices have been supported by large outward movement — gifts — of evaporated milk, cheese, eggs, meat and lard totaling 10 pounds for every American in the year ended June, 1947, compared with 18 pounds in the preceding year but less than a 3-pound annual average in the eight years immediately before World War II. On the other hand, imports of similar products: live beef, canned and corned beef, and cheese, have normally amounted to about 1 pound of the finished product per capita, and in the year ended June 30, 1947, only ½ pound. Of course, paralleling this export movement has been greater ability to buy on the part of the average American family.

#### **Sheep, Wool, and Mohair**

The number of sheep on Arizona ranges changed but little in 1947 after a long period of years of declining numbers. There may have been some reduction in farm flocks. In spite of the dry sum-

mer there were no extraordinary losses in connection with the sheep business. February lambs sold in October brought about 22½ cents per pound. Early lambs, heavier than usual and weighing more than 100 pounds on the average in Central Arizona valleys, brought 21½ cents, according to Harry Embach, Secretary of the Arizona Wool Growers Association.

The 1947 wool crop of non-Indian-owned sheep brought the growers at the ranch between 38 and 40 cents a pound. There was such a large demand for wool in late 1947 that it appeared the reduction in import duties may not seriously affect growers' prices in 1948. The tariff changes in late 1947 amounted to a reduction from 34 to 25½ cents a pound on clean wool. The 8½-cent reduction amounts to about 3 cents per pound on a grease basis. Production of wool in Arizona in 1947 has been estimated at a little under 3 million pounds, compared with 5 million pounds in 1937, and 6 million pounds in 1927.

Mohair prices have not increased in proportion to the increase in price of other products of the range — beef and lambs. The largest sale this fall was that arranged by the Arizona Mohair Growers Association in Yavapai County, where the adult clip brought 56 cents a pound and kid 76 cents a pound. Mohair produced on Indian-owned goats is sold at Gallup, Holbrook, and Winslow to wool buyers.

#### Dairying

The rate of increase in Arizona milk production during 1947 has seldom, if ever, been exceeded. The increase in production which began with October, 1946, and continued into January, 1948, has resulted from increasing cow numbers in established dairies, heavier feeding of cows, and the beginning of a rather large number of new dairy businesses. From the quantity of milk passing through processing plants, it appears that cow numbers must now be between 48,000 and 50,000 head. This increase in numbers has been made possible by a reduction in the number of young cows which normally have been shipped from Arizona to California, by the importation of some cows from outside the state, and by the growing out of more heifers.

Practically all the increase in milk production has been in Grade A milk. The much larger output of Grade A milk is illustrated by city health inspections. Grade A milk purchased by distributors under the inspection of the city of Phoenix health department increased more than one-third in the eleven-month period ended with November, 1947, to a total of 844,000 gallons in the latter month. A 20 per cent increase in the amount of milk handled by distributors inspected by the city of Tucson occurred in the twelve-month period ended with December, 1947. The war-induced scarcity of milk and cream in the city of Tucson came to an end with September, 1947. Dairies classed as Grade A have developed recently in many parts of the state: in the Sulphur Springs Valley, in the Safford area, in the Holbrook and Winslow vicinities, and in the Upper Verde Valley supplying Flagstaff.

## PRICE OF MILK COMPARED WITH INDEX OF FEED AND LABOR COST

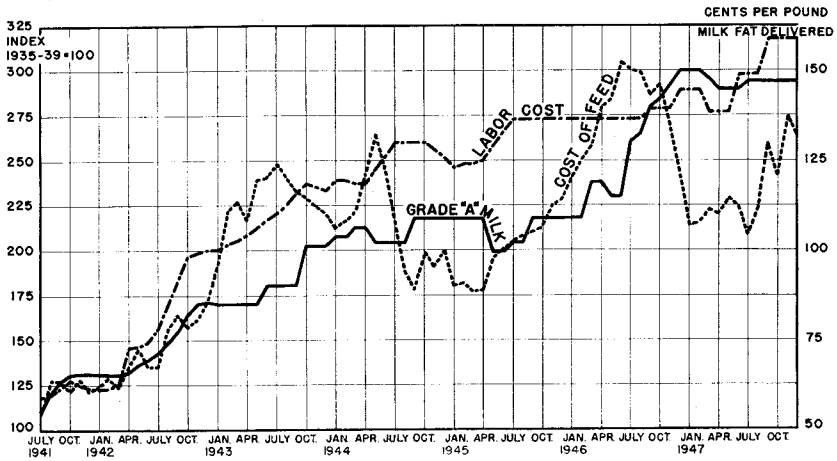


Figure 3.—Beginning with the fall of 1946, a favorable relationship between prices received for Grade A milk and the cost of feed and labor existed for a year or more. By the beginning of 1948, the cost of feed and labor had caught up with the price of milk and threatened to rise above it.

A period of price relationships favorable to the production of Grade A milk began with September, 1946. This period, extending through September, 1947, was one in which the cost of feed and the cost of labor, considered together, were rather low, compared with the price of Grade A milk (Figure 3). The war drives to get dairymen to produce more milk with a restriction on price were not as effective as the favorable price relationships in 1947. By January, 1948, dairymen were viewing with alarm the rising costs of feed grain and replacement cows. Low productivity of pastures due to water shortage was a further cause for worry.

The greater amount of Grade A milk available in Arizona in January, 1948, compared with the same month a year earlier, in part was the result of a conversion of many Grade D into Grade A dairies. This conversion was encouraged by the high premium paid for Grade A. In the 1935-39 period, the Grade A premium over Grade D, as paid by Salt River Valley processing plants, averaged 34 per cent. In the twelve months of 1947 the premium averaged 46 per cent.

Looking into the months ahead, Grade A dairymen may anticipate some difficulty in marketing all of their milk at the Grade A price, and they may also anticipate higher-standard requirements and closer inspection by health authorities. These new factors, along with a possible narrowing of the spread between Grade D and Grade A prices, may cause a reverse movement. Some dairies now classified as Grade A may be reclassified as Grade D.

### ALFALFA

The 210,000-acre crop of alfalfa in 1947 was about 10 per cent less than that of the preceding year. This reduction was principally in Maricopa County. The reduced acreage does not tell the whole story. The amount harvested as hay was estimated at only 514,000 tons. Shortage of water resulting in low yield and prices (low relative to prices of commodities competing for the land) brought about shifts to other crops.

Normally, about one-third of the state production of alfalfa hay grows in the Salt River Valley Water Users' area. Water shortages brought about both decreased acreages and yield. The shortage of water and the good prospects for high grain prices indicate a further reduction of alfalfa acreage in the Salt River Project in 1948.

The establishment of new plants to produce dehydrated alfalfa meal made possible an increase in production within the state from about 10,000 tons in 1946 to about 18,000 tons in 1947. On the other hand, the production of meal from sun-cured hay was much less in 1947 than in the preceding year. The market for alfalfa meal was slow in the early part of the year but responded in the latter part with the increasing scarcity of grain.

The cost of producing alfalfa hay will be higher in 1948 than it was in 1947. The increased cost is mainly the result of much higher water costs, but labor and taxes are also higher. It appears that it will cost about \$18 a ton to produce alfalfa in the Salt River Valley Water Users' area in 1948 (Table 3). This assumes that the producer will be able to secure 4 acre-feet of water per acre. If it is necessary for him to let a portion of his land lie idle in order to irrigate another portion of it, his cost of production actually will be much higher.

### CITRUS

Production of Arizona grapefruit for the 1946-47 season was estimated at a little over 4 million packed boxes. In the entire history of the Arizona grapefruit industry, that season was the least profitable. The severe drop in grapefruit prices may be attributed to over-production and to loss of the wartime market. Due to the low prices, poor quality, and the fact that the juice canneries closed early, nearly one-quarter of the Arizona 1946-47 grapefruit crop was left on the trees or dumped.

In an effort to deal with the unmarketable supply, a volume proration program was requested by a committee of growers, and after the required hearings and voting, became effective December 1, 1947. Its primary purpose is the restriction of shipments to that amount which each market will take at a price profitable to growers. Considerable opposition arose in regard to this program, and the legality of the prorate act itself is being questioned in the courts.

Orange production in Arizona in 1946-47 was estimated at more than 1 million boxes. The season was marked by declining orange prices following an early profitable navel market. The cold

TABLE 3.—COST OF PRODUCING ALFALFA PER ACRE, SALT RIVER VALLEY WATER USERS' AREA AND CENTRAL ARIZONA PUMP AREAS WITH 100- AND 200-FOOT WATER LIFTS, 1948<sup>a</sup>

	Salt River Valley Water Users' area	Central Arizona pump areas	
		100-ft. lift	200-ft. lift
Interest, taxes, and water:			
Interest, 5% on \$300.....	\$15.00	.....	.....
Interest, 6% on \$200.....	.....	\$12.00	.....
Interest, 6% on \$50.....	.....	.....	\$ 3.00
Land tax .....	3.10	1.70	.90
Water (4 acre-feet).....	17.00	17.00	34.10
Total .....	\$35.10	\$30.70	\$38.00
Cultural costs:			
One-fourth of seed cost.....	\$ 1.50	\$ 1.50	\$ 1.50
One-fourth of land preparation and planting cost .....	3.50	3.50	3.50
Irrigation and ditch labor.....	6.00	6.00	6.00
Fertilizer <sup>b</sup> .....	1.60	1.60	1.60
Industrial Insurance .....	.30	.30	.30
Total .....	\$12.90	\$12.90	\$12.90
Harvesting costs:			
Mowing and raking—four cuttings <sup>c</sup>	\$ 9.00	\$ 9.00	\$ 9.00
Baling—4 tons .....	16.00	16.00	16.00
Total .....	\$25.00	\$25.00	\$25.00
Total cost per acre, through harvest....	\$73.00	\$68.60	\$75.90
Total cost per ton.....	\$18.25	\$17.15	\$19.00

<sup>a</sup>These calculations represent anticipated costs during 1948 on owner-operated farms, assuming a yield of 4 tons per acre. No item was included for farm automobile expense or for management and no return credited for pasture.

<sup>b</sup>Cost of application on one-fourth of the land in alfalfa. One application of 150 pounds of 47 per cent treble superphosphate applied broadcast costs \$6.65 per acre, and drilled \$7.65.

<sup>c</sup>Based on prevailing custom rates. Where the farmer does the work the cost may be lower.

weather which came late in December, 1946, and early in January, 1947, resulted in serious freeze damage to the remaining navels and to some of the sweets and Valencias. As a result of the freeze, higher marketing costs, and reduced consumer demand, returns to growers for Arizona oranges in 1946-47 averaged only about half those of the year previous.

#### FEED GRAINS

An excellent crop of barley helped many farmers solve their water problem because the winter-growing grain uses less water than most summer-growing crops. This crop also provided some

of the pasture and the grain needed so much in Arizona in a year when other feeds were scarce. The crop of 92,000 tons from 104,000 acres was the largest on record. The principal variety now grown is Arivat, although the Vaughn variety is used for pasture purposes. At prices prevailing in January, 1948, a barley crop would bring \$90 to \$100 per acre, compared with a cost of production of \$55 (Table 4).

TABLE 4.—CALCULATED COST OF PRODUCING BARLEY AND GRAIN SORGHUMS PER ACRE UNDER SINGLE-CROP PLAN, SALT RIVER VALLEY WATER USERS' AREA, 1948<sup>a</sup>

	Barley	Grain sorghums
Interest, taxes, and water:		
Interest, 5% on \$300.....	\$15.00	\$15.00
Land tax .....	3.10	3.10
Water (2½ acre-feet for barley; 2¾ for sorghum).....	11.75	12.63
Total .....	\$29.85	\$30.73
Cultural costs:		
Cost of seed.....	\$ 4.75	\$ .25
Plowing .....	3.00	3.00
Discing and dragging.....	2.00	2.00
Bordering .....	.75	.75
Discing, harrow attached.....	1.25	1.25
Drilling or planting.....	2.00	2.00
Irrigation labor and ditch work.....	3.00	3.00
Cultivating .....	.....	1.75
Total .....	\$16.75	\$14.00
Harvesting costs: <sup>b</sup>		
Combining .....	\$ 6.00	\$ 6.00
Hauling (10-25 miles).....	2.50	2.50
Total .....	\$ 8.50	\$ 8.50
Total cost per acre.....	\$55.10	\$53.23
Cost per ton.....	\$44.08	\$42.58

<sup>a</sup>These calculations represent anticipated costs during 1948, assuming a yield of 2,500 pounds of grain per acre. No item is included for management, farm automobile, or fencing. No income is credited for pasture.

<sup>b</sup>Figured on bulk basis. Where sacks are used, there will be an additional cost of \$6.00 per acre, offset in part in additional price received by the producer.

The grain sorghum crop amounted to about 60,000 tons, which is a little better than the average production of recent years. The size of this crop is probably influenced to a greater extent by the amount of irrigation water available than almost any other crop. In a number of areas, farmers plant sorghum in June and July in an acreage which depends upon how much water they have available after supplying the needs of their other crops. The cost of production in the Salt River Project is indicated in Table 4.



## MISCELLANEOUS CROPS

### Alfalfa Seed

Alfalfa seed growers broke another record by producing a far larger crop in 1947 than ever before. The water shortage encouraged alfalfa hay farmers to let their stands "go to seed." Production from about 60,000 acres was estimated at 12 million pounds, or a little less than one-eighth of the total United States production.

Movement of alfalfa seed from farms was at the slowest rate in many years. This resulted in Arizona producers being caught with a larger-than-usual amount of seed on hand when the price broke early in the fall. In July, 1947, alfalfa seed was quoted at 33 cents per pound. By September the price had dropped to 17½ cents per pound, and the market price offered in December was reported to be below the Commodity Credit Corporation support price of 17 cents.

### Sugar Beet Seed

Arizona continues to be the principal producing state in respect to sugar beet seed the state's production in 1947 being about 10.8 million pounds. Incidentally, some of this seed probably goes to export because the United States' consumption of sugar beet seed is only about 9 million pounds annually. The yield in the Phoenix area was nearly 3,100 pounds per acre, and in the Safford area 2,500 pounds per acre. The 1947 plantings, for harvest in 1948, amounted to 3,157 acres in the Phoenix area and 676 acres in the Safford area. Contract price established for the 1948 crop was 14 cents compared with 13 cents for the 1947 crop.

### Dates

Dates were produced on 550 acres (27,500 palm trees) in 1947. The year's crop of ½ million pounds, reduced from earlier estimates because of unfavorable growing and harvesting weather, brought satisfactory returns to many growers. A number of small growers who have raised, processed, and retailed their own dates have been successful over a period of years.

The principal difficulties of the date industry have had to do with marketing, where the product is wholesale, and with technical problems. The Arizona Date Institute, organized in 1947, represents a cooperative undertaking on the part of growers to improve the production, handling, and marketing of dates.

### Flaxseed

Production of flaxseed amounted to 530,000 bushels from 20,000 acres in 1947. The crop brought growers more than three million dollars. Since the government has guaranteed a price of \$6.25 per bushel f.o.b. Los Angeles for No. 1 flaxseed in 1948, it is likely that a larger acreage will be planted. While the major portion of this crop has been grown in Yuma County, some extension of acreage in Maricopa County is anticipated.

## IRRIGATED AREAS IN ARIZONA

Area reference numbers are shown on map in dotted outline

	Approximate acreage irrigated in 1947
<b>YAVAPAI COUNTY:</b>	
1. Chino Valley	4,200
2. Bridgeport area	1,300
3. Oak Creek Canyon	2,000
4. Camp Verde area	3,400
<b>YUMA COUNTY:</b>	
5. Colorado River Indian Reservation lands irrigated	6,000
6. Colorado River Indian Reservation lands proposed for irrigation—90,000 to 100,000 acres including land now irrigated	
7. Yuma County Water Users' Association	46,000
8. Yuma Reclamation Project, Unit B	2,100
9. Gila Project, Yuma Mesa Division, irrigated in 1947	5,200
10. Gila Project, Yuma Mesa Division, proposed for development—25,000 acres including land now irrigated	
11. North Gila Valley Irrigation District	5,500
12. Yuma Irrigation District (South Gila Valley) and adjacent areas	10,000
13. Mohawk Municipal Water Conservation District and adjacent areas	6,000
14. Gila Project, Wellton-Mohawk Division, proposed for development—75,000 acres including land now irrigated	
14a. Yolo Farm	870
<b>COCONINO COUNTY:</b>	
3. Oak Creek Canyon	300
15. Fredonia area	1,400
15b. Hay Lake	1,000
<b>MARICOPA COUNTY:</b>	
16. Private farming along the Gila in Maricopa County, below the Enterprisé Canal, including Dendora	6,000
17. Maricopa County Southern Water Conservation District—Gillespie Land & Irrigation Co.	15,000
18. Enterprise Canal	930
19. Arlington Canal Company	3,900
20. Roosevelt Irrigation District	33,200
21. Buckeye Water Conservation & Drainage District	16,200
22. Maricopa County Municipal Water Conservation District No. 1	18,200
23. Private pumping north of Luke Field and west of the Agua Fria River	20,650
24. Goodyear Farms at Litchfield	8,500
25. Adaman Municipal Water Company	2,500
26. Pumping plants between New and Agua Fria rivers including Marinette Ranch	9,000
27. St. Johns Irrigation District	1,100
28. Gila River Indian Reservation—lands lying along the Gila River in Maricopa County and south of the Salt River, farmed by Indians	2,150
29. Peninsula Water Company	2,300
30. Maricopa Garden Farms Company	
31. Deer Valley (north of Salt River Project and between New River and Cave Creek)	10,800
32. Salt River Valley Water Users' Association	215,000
33. Arcadia Water Company	900
34. Paradise Valley, north of Arizona Canal	1,300
35. Broadacres	1,375

36.	Lone Butte Farm	1,800
37.	Leases on Gila River Indian Reservation in Maricopa County exclusive of Broadacres and Lone Butte Farm	3,300
38.	Ocotillo Pumps (not including Indian land leases)	5,000
39.	Salt River Indian Reservation, including the Lehi District, within which 1,140 acres are leased to whites	4,540
40.	Roosevelt Water Conservation District	32,000
41.	Private pumping east of R.W.C.D. and north of the Queen Creek area	3,500
42.	Queen Creek Irrigation District and adjacent area, not including about 3,000 acres in Pinal County	10,000
43.	Chandler Heights Irrigation District	1,000
PINAL COUNTY:		
42.	Queen Creek area in Pinal County	3,000
44.	Gila River Indian Reservation, including 27,170 acres in the San Carlos Project	27,400
45.	San Carlos Irrigation & Drainage District	32,000
46.	Magma area	3,800
47.	Pinal County Electrical District No. 2	} 100,000*
48.	Pinal County Electrical District No. 4	
48a.	Pinal County Electrical District No. 5 and surrounding areas	
49.	Stanfield District, including 4,390 acres of land in Maricopa Indian Reservation leased to whites and 300 acres farmed by Indians	29,000
50.	Papago Indian lands under pump	350
PIMA COUNTY:		
51.	Marana-Cortaro area	15,400
52.	Flowing Wells Irrigation District and surrounding area	1,450
53.	Midvale area	1,900
54.	San Xavier Indian Reservation	800
55.	Sahuarita-Continental area	9,000
SANTA CRUZ COUNTY:		
56.	Santa Cruz River Valley	} 3,500
56a.	Santa Cruz River Valley near Nogales	
NAVAJO COUNTY:		
57a.	St. Joseph-Holbrook	1,100
57b.	Snowflake-Taylor-Shumway	3,000
57c.	Showlow and Lakeside (mapped area includes some lands west of Showlow ordinarily dry farmed)	1,400
APACHE COUNTY:		
57d.	Lyman Dam Project and surrounding area	3,500
57e.	Round Valley	3,000
GRAHAM COUNTY:		
58.	Upper Gila Valley in Graham County, comprising these canal companies, in order of decreed acreages: Union, Montezuma, Graham, San Jose, Ft. Thomas, Dodge-Nevada, Smithville, Curtis, Brown, Tidwell, Fourness, Colvin-Jones	33,000
GREENLEE COUNTY:		
59.	Upper Gila Valley, including the following canal companies in Greenlee County, in order of decreed acreage: Moddle, Valley, Colemenero, York, Black McCluskey, Duncan and Sunset	5,500
COCHISE COUNTY:		
60.	Stewart District	4,800
61.	Pomerene Canal Company	1,000
62.	St. David Canal Company	1,100
63.	Hereford area	500
64.	Lower Sulphur Springs Valley (Webb, Elfrida, Mc-Neal and Double Adobe)	14,500

\*These electrical districts keep no record of acreage. Hence, this figure is an estimate only.

TABLE 5.—PRINCIPAL ARIZONA CROPS IN 1947—ACREAGE BY COUNTIES AND PRODUCTION FOR THE STATE

Crops	State totals <sup>a</sup>	Apache	Cochise	Cocconino	Graham	Greenlee	Maricopa	Navajo	Pima	Pinal	Yavapai	Yuma
Alfalfa: acres	210,000	4,300	2,000	700	5,500	1,000	133,000	2,200	3,000	23,000	4,000	30,000
Tons cut for hay	514,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cotton: acres	225,000 <sup>b</sup>	.....	2,150	.....	15,600	1,550	59,350	.....	15,250	128,800	.....	1,400
Bales of cotton	220,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Feed grains	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Barley: acres	104,000	700	300	200	2,300	100	79,000	300	1,900	12,600	900	5,100
Tons of grain	92,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Corn: acres	32,000	8,600	900	3,200	700	500	1,000	11,700	1,300	600	1,300	100
Tons of grain	10,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grain sorghums: acs.	59,000	200	1,500	200	400	300	44,500	300	2,000	8,000	300	1,000
Tons of grain	60,000 <sup>c</sup>	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wheat: acres	28,000	1,000	700	1,100	700	200	13,900	2,100	1,000	2,900	800	1,400
Tons of grain	17,600	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dry edible beans: acres	14,000	800	1,900	7,800	.....	.....	100	900	600	300	1,100	.....
Tons harvested	3,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Truck crops: acres <sup>d,e</sup>	100,000	.....	700	.....	500	.....	60,000	.....	1,500	3,000	.....	30,000
Cars shipped	47,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Flax: acres	20,000	.....	.....	.....	.....	.....	2,500	.....	.....	500	.....	17,000
Tons harvested	15,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grapefruit: acres	11,200	.....	.....	.....	.....	.....	10,000	.....	.....	.....	.....	1,200
Tons sold <sup>f,g</sup>	100,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oranges: acres <sup>d</sup>	8,300	.....	.....	.....	.....	.....	8,000	.....	.....	.....	.....	320
Tons harvested	37,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Acres irrigated <sup>e,f</sup>	825,000	13,000	23,000	3,000	35,000	6,000	415,000	8,000	30,000	200,000	11,000	82,000

Source.—The Federal Crop and Livestock Reporting Service, Phoenix, except as otherwise noted.

<sup>a</sup>State totals include estimates for Gila, Mohave, and Santa Cruz counties.

<sup>b</sup>Includes American-Egyptian cotton, 250 acres in Graham County and 50 acres in Maricopa County, with a production of approximately 150 bales.

<sup>c</sup>Does not include grain in 7,000 acres of silage and forage.

<sup>d</sup>Year ended August 31, 1947.

<sup>e</sup>Estimates of Department of Agricultural Economics, University of Arizona.

<sup>f</sup>Figures represent both irrigated crops and irrigated pasture. A acreage double cropped is counted but once. In addition, it is estimated that dry-land crops were harvested from approximately 65,000 acres.

<sup>g</sup>Does not include 22,000 tons left on trees and 9,000 tons "dumped."