

Farm Prices and Production

index numbers of prices received by farmers
and of production indicate relative changes

G. M. Kuznets

In 1949 California farmers' cash receipts from marketings amounted to slightly over two billion dollars.

Approximately 28% of this amount was derived from the sale of field crops, 20% from the sale of fruits and nuts, and 14% from the sale of truck crops or a total of 62% from the sale of all crops; livestock and livestock products accounted for the remaining 38% of cash receipts in 1949.

These figures give an indication of the current relative importance of the categories for which index numbers were calculated separately. Fixed weights based on the average of the period 1935-1939 were used in constructing the various indexes.

The index numbers—of prices received by farmers, of production, of marketings, and of acreage of crops by major groupings of agricultural commodities produced in California—were constructed to

facilitate the study of relative changes in the agriculture of the state during the past 30 or 40 years.

Trends

Production of field crops has practically tripled since the 1910-1914 period.

Prices received by farmers, however, after reaching in 1947 an all-time high—since 1909—declined drastically in 1948 and 1949.

With the sole exception of hay, the prices of the 11 field crops in the index declined in 1948 and still farther in 1949. The rise in the production index since the average of the war years 1942-1946 is accounted for largely by the striking increase in the production of cotton from the 1942-1946 average of 380,000 bales to an estimated 1,300,000 bales in 1949 and to a lesser extent by more moderate increases in production of potatoes, rice,

and sugar beets. The 11 field crops represented in the index accounted in 1949 for 96% of cash receipts from marketings of all field crops produced in California.

Somewhat the same trends are shown by the index numbers for truck crops. Production of truck crops has doubled since the late 1920's and it has risen substantially but not as spectacularly as the production of field crops since 1942-1946. Prices of truck crops were relatively high in 1947 and have declined in 1948 and 1949 to a level somewhat above the 1942-1946 average.

For most fruits and tree nuts produced in California the period 1942-1946 was one of highest prices on record. The major exception to this is provided by citrus—oranges, lemons, and grapefruit—for which the price peak was reached in the late 1920's.

In general, with the single exception of lemons, prices of the 14 fruit and nut crops included in the index—which in 1949 accounted for 91% of cash receipts from sale of all fruits and nuts produced in California—showed substantial declines in 1947, 1948, and 1949 from the war-year average of 1942-1946.

Production of deciduous fruits has been maintained since the war at about the level reached in 1942-1946. Production of tree nuts has increased during the

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Index Numbers of Prices Received and Production of Crops

Crop years	Field crops ^a		Truck crops ^b		Fruits and nuts ^c							
	Prices received	Production	Prices received	Production	All		Deciduous		Citrus		Nuts	
					Prices received	Production	Prices received	Production	Prices received	Production	Prices received	Production
Average of 1935-1939 = 100												
1910-1914	112	57				35		39		34		20
1925-1929	155	67	117	71	184	78	162	85	210	71	181	67
1942-1946	206	115	208	131	273	125	351	114	188	136	231	133
1947	282	142	232	157	188	123	234	120	130	124	196	136
1948	256	156	214	151	211	110	252	113	163	98	202	149
1949 preliminary	220	170	214	151	183	117	202	111	166	112	156	180

^a Includes barley, beans, cotton, cottonseed, flaxseed, hay, hops, potatoes, rice, sugar beets, and wheat.

^b Includes asparagus, cantaloupes, carrots, cauliflower, celery, lettuce, onions, peas, strawberries, and tomatoes.

^c Includes apples, apricots, cherries, figs, grapes, peaches, pears, plums, and prunes; grapefruit, lemons, and oranges; almonds and walnuts.

Index Numbers of Prices Received and Production of Livestock and Livestock Products*

Years	All livestock and products		Meat animals		Dairy products		Poultry and eggs	
	Prices received	Production	Prices received	Production	Prices received	Production	Prices received	Production
Average of 1935-1939 = 100								
1910-1914	90		87		88		104	
1925-1929	132	85	129	81	133	81	135	94
1942-1946	173	129	179	122	169	125	169	147
1947	236	134	273	120	217	137	213	154
1948	266	136	321	119	237	133	228	169
1949 preliminary	236	150	282	126	212	136	202	207

* Includes cattle, calves, sheep, lambs, and hogs; milk (wholesale), milk fat, milk and cream retail; chickens, chicken eggs and turkeys.

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WATER

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rials—generally, coarse sand and gravel strata—and as it slowly flows or percolates through the strata, it dissolves minerals from the rock and soil in varying quantities.

If the minerals dissolved are in the form of calcium and magnesium salts the water is known as hard water, and common soaps do not form suds readily in it. This type of water is usually considered good for irrigation purposes, as only occasionally do the calcium and magnesium salts reach a concentration toxic to plant growth. An example of this type of water would be No. 10 of the table.

Soft water, on the other hand, may come from either of two sources: 1, rain water containing very few minerals; this usually will include runoff waters from melting snows or excessive rains, which have not had sufficient contact with the soil or rocks to dissolve appreciable quantities of minerals—such as river waters No. 1, No. 2, and No. 3; 2, water containing a high percentage of sodium salts, such as well waters No. 8 and No. 9. These salts may reach a concentration toxic to plants, but even at low concentrations they cause a deterioration of the soil structure, and with their continued use the surface soil will seal and prevent the wetting of deeper layers.

Alkali Soils

When sodium salts in the form of chloride—common salt—and sulfates—glauber salts—accumulate in excessive amounts in the soil they are known as white alkali. Such accumulations may be possible from waters Nos. 13, 14, and 15. Some leaching of the surface soil should be provided, either by rainfall or excess irrigation to remove the excess soluble salts.

The accumulation of sodium carbonate or bicarbonate—soda ash—forms black alkali. Water No. 11 with its high bicarbonate and most of the cations such as sodium, would produce a black alkali if its salts are allowed to accumulate in the surface soil. Small quantities of these salts are much more toxic to plants than the white alkali.

White alkali is easily detected by the accumulation of white or gray salts on the surface of the soil.

The beginning of a black alkali soil is not easily recognized even though the sodium carbonate salts have produced a deteriorated soil structure, with a reduction in rate of water penetration. This condition can be caused by a much lower concentration of salt than usually occurs in the formation of white alkali soil.

The plants listed in the next column are divided into three major groups according to their salt tolerance.

In each of these divisions the more sensitive plants are placed first in each group with increasing salt tolerance progressively down the listing. Plant growth is governed by the concentration and toxicity of the salts dissolved in the soil solution. These salts may have been originally in the soil, or accumulated there from the salts in the irrigation water. The plants listed are provisional and subject to revision, as additional information is obtained. A number of factors may influence the salt tolerance of plants, such as climate, soil type, irrigation practice, and varietal differences and types of salt involved.

Relative tolerance of crop plants to salt constituents in the soil solution arranged in order of increasing tolerance:

Group I. Crops which may be grown on soils of weak salinity: Fruit crops: lemon, orange, apple, plum, peach, apricot, almond, pear, grapefruit. Field and truck crops: green beans, potato, sweet potato, eggplant, artichoke, cabbage, celery, peas, vetch. Forage crops: burnet, ladino clover, red clover, alsike clover, meadow foxtail, white dutch clover.

Group II. Crops which may be grown on soils of medium salinity: Fruit crops: olive, grape, fig, pomegranate. Field and truck crops: wheat, pepper, onion, squash, spinach, carrot, sunflower, lettuce, cantaloupe, rice, oats, rye, barley, sorghum, foxtail, millet, asparagus, tomato, flax, alfalfa. Forage crops: sickle milk vetch, sour clover, cicer milk vetch, tall meadow oat grass, smooth brome, big trefoil, reed canary, meadow fescue, blue grass, orchard grass, tall fescue, alfalfa, herbam clover, sudan grass, dallis grass, strawberry clover, birdsfoot trefoil, sweet clover.

Group III. Crops which may be grown on soils of strong salinity: Fruit crops: date palm. Field and truck crops: cotton, kale, rape, milo, garden beets, sugar beets. Forage crops: western wheat grass, beardless wild rye, Canada wild rye, fescue grass, rhodes grass, bermuda grass, nuttall alkali grass, salt grass, alkali sacaton.

Tolerance to black alkali—sodium carbonate salt—is not considered in the listing as this salt has a high toxic and corrosive action on the plants.

As a measure of tolerance, it is assumed that fair to good yields will be obtained under favorable conditions of climate, soil, and fertilizer.

Plant Tolerance for Boron

For convenience plants are divided into three groups according to their tolerance for boron, in the following listing. The plants that withstand only relatively low concentrations have been designated as sensitive, an intermediate group as semi-tolerant, and a final group as toler-

ant. However, in some cases and under certain conditions, there are no sharp lines of demarcation. Within a group the more sensitive plants have been listed first.

Relative Tolerance of Crop Plants to Boron

Group I (Sensitive)	Group II (Semi-tolerant)	Group III (Tolerant)
Lemon	Lima bean	Tobacco
Grapefruit	Sweet potato	Carrot
Avocado	Bell pepper	Lettuce
Orange	Tomato	Cabbage
Thornless blackberry	Pumpkin	Turnip
Apricot	Zinnia	Onion
Plum	Oat	Broad bean
Prune	Milo	Muskmelon
Peach	Corn	Gladiolus
Cherry	Wheat	Alfalfa
Persimmon	Barley	Sweet clover
Kadota fig	Olive	Garden beets
Grape	Rose	Mangel
Apple	Radish	Sugar beets
Pear	Sweet pea	Artichoke
American elm	Cotton	Palms
Navy bean	Sunflower	Asparagus
English walnut	Field pea	
Black walnut	Potato	
Pecan	Celery	
Cow pea	Vetch	

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PRICES

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same period while the over-all production of citrus has declined materially, largely because of unfavorable weather conditions.

Prices of meat animals, dairy products, and poultry and eggs have increased very materially in the last three years, particularly prices of meat animals—cattle, calves, sheep, lambs, and hogs. The prices in 1948 for these categories were the highest since 1924, the first year for which these indexes were computed.

Production of meat animals in California has increased by about 50% between 1925–1929 and 1942–1946 and has been maintained at about the latter level in the last three years. During the same period, the production of dairy products and particularly poultry and eggs has increased significantly.

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Index numbers for livestock and livestock products were constructed by Dr. I. M. Lee, Assistant Professor of Agricultural Economics, University of California College of Agriculture, Berkeley.

A more complete technical report of this study—Giannini Foundation Mimeographed Report No. 102, February 1950—may be obtained by writing to the Giannini Foundation of Agricultural Economics, University of California, Berkeley 4.