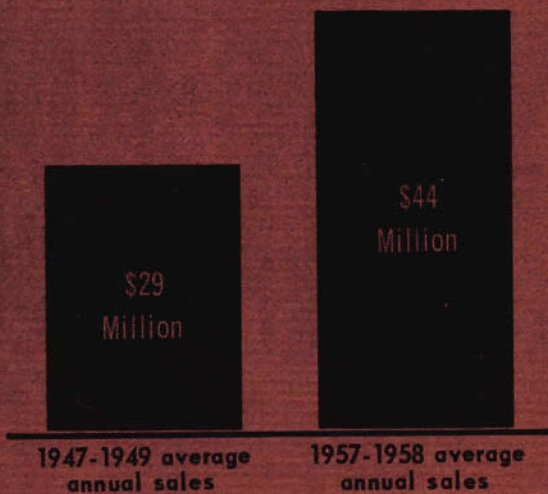


Trends

IN

HAWAII'S DIVERSIFIED AGRICULTURE

PERRY F. PHILIPP
AGRICULTURAL ECONOMIST
HAWAII AGRICULTURAL EXPERIMENT STATION
UNIVERSITY OF HAWAII



TRENDS IN HAWAII'S DIVERSIFIED AGRICULTURE*

PERRY F. PHILIPP
Agricultural Economist
Hawaii Agricultural Experiment Station
University of Hawaii

I am going to give you a bird's-eye view of some recent and expected trends in Hawaii's diversified agriculture, primarily as they relate to the topic of this conference, "The 1970 Honolulu Market for Produce and Livestock." By "diversified agriculture" is meant here the production of all agricultural products other than sugar cane and pineapple. Specifically, I am going to discuss changes between 1947-1949 and 1957-1958 in:

1. Value and physical volume of diversified agricultural products,
2. Prices of diversified agricultural products,
3. Size and number of diversified farms, and
4. Oahu's share in Hawaii's diversified agricultural production.

1. VALUE AND PHYSICAL VOLUME OF AGRICULTURAL PRODUCTS

The value of average annual marketings of diversified agricultural products produced in the islands greatly increased between 1947-1949 and 1957-1958 (Figure 1 and Table 1). Crops increased more than livestock.

* *Talk presented on February 2, 1960, at a conference on "The 1970 Honolulu Market for Produce and Livestock," sponsored by the Trade Committee of the Chamber of Commerce of Honolulu in cooperation with the University of Hawaii Agricultural Extension Service and the Hawaii Farm Bureau Federation.*

FIGURE 1. Annual sales in million dollars of locally produced crops and livestock products in 1947-1949 and 1957-1958.

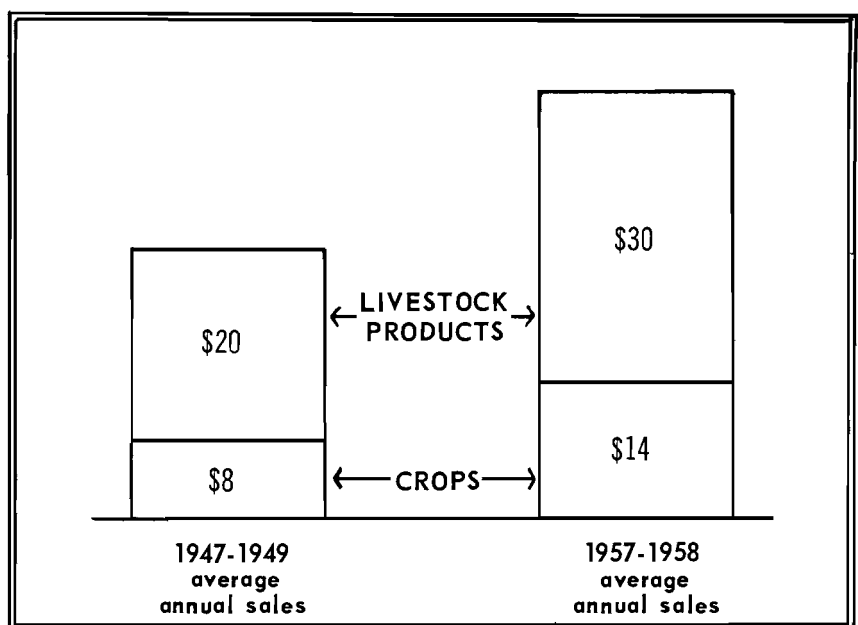


TABLE 1. Changes between 1947-1949 and 1957-1958 in average annual value of marketings of diversified agricultural products produced in Hawaii.

	Average annual marketings		1957-1958 average expressed as percentage change from 1947-1949 average
	1947-1949	1957-1958	
	<i>Million dollars</i>		<i>Percent</i>
Diversified crops	8.4	14.3	+70
Livestock products	20.2	30.1	+49
Total	28.6	44.4	+55

SOURCE:

1958 Statistics of Hawaiian Agriculture, Agr. Econ. Rpt. 38, University of Hawaii, June 1959.

Now let us look at changes in physical volume and prices of individual products or groups of products between 1947-1949 and 1957-1958 and speculate on their future.

CROPS (Figure 2 and Table 2)

Macadamia Nuts: The volume of marketings increased by 129 percent. A substantial increase in output can be expected as existing young plantings come into full bearing.

Coffee: Production increased greatly as a result of higher prices. A decline is expected since price trends have been sharply downward during the last 3 years.

Guava and passion fruit for processing: Marketings rose to 4.3 million pounds in 1955 from a low level in 1947-1949, but declined to 3.6 million pounds in 1958. An increase in output of fruit for processing can be expected.

Vegetables and melons: Production increased slightly, but the share of island-produced vegetables and melons in Hawaii's market declined from 55 percent to 50 percent. Not much change is in sight.

Taro: Marketings declined by 27 percent for many reasons, such as decrease in demand, increase in the price of poi, and competition for land. No change in these factors is expected in the near future.

Rice: Marketings declined by 43 percent. Output of this crop decreased because of mainland competition. No growth is foreseen for this crop.

Please note that a big share of most of the crops which showed an actual or expected large increase in marketings was grown for export.

FIGURE 2. Average annual volume of marketings of locally produced diversified crops in 1957-1958, expressed as percentage change from 1947-1949 annual average.

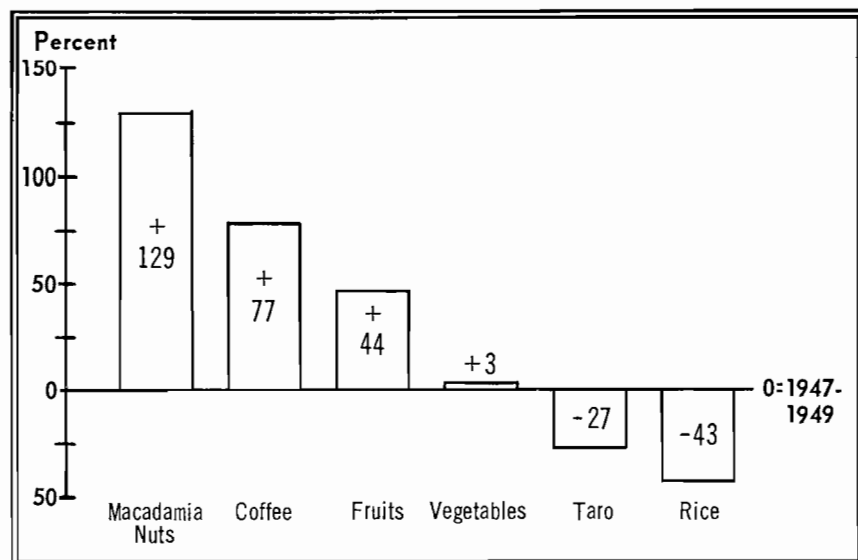


TABLE 2. Changes between 1947-1949 and 1957-1958 in average annual volume of marketings of diversified crops produced in Hawaii.

CROP	Annual marketings of locally produced crops			Market share of locally produced crops	
	1947-1949 average	1957-1958 average	1957-1958 average expressed as % change from 1947-1949 average	1947-1949	1957-1958
	<i>Million pounds</i>		<i>Percent</i>	<i>Percent</i>	
Macadamia nuts	.7	1.6	+129	100	100
Coffee, green	6.6	11.7	+77	*	*
Fresh fruits	16.2	23.3	+44	38	46
Vegetables and melons	47.0	48.5	+3	55	50
Taro	13.6	9.9	-27	100	100
Rice	.7	.4	-43	1.4	.7

* No statistics of coffee imports from the mainland to Hawaii were available.

SOURCE:

1958 Statistics of Hawaiian Agriculture, Agr. Econ. Rpt. 38, University of Hawaii, June 1959.

LIVESTOCK PRODUCTS (Figure 3 and Table 3)

Chickens: Island production has increased more than threefold and its share in Hawaii's total marketings has gone up from 32 percent to 38 percent. Hawaii's producers hope to hold their market against an aggressive mainland broiler industry.

Eggs: Island production also almost tripled. Island eggs increased their market share from 57 percent to 79 percent. Some additional expansion can be expected.

Milk: Local production increased 63 percent. Present production levels are expected to be at least maintained during the next decade. In the more distant future, local producers may have to face the threat of importation of improved processed products such as powdered whole milk.

Pork: Marketings of island pork increased by 71 percent between 1947-1949 and 1953, but from 1953 to 1958 they declined by 12 percent. The share of island pork in the Hawaiian market increased from 53 percent to 56 percent between 1947-1949 and 1957-1958. Lower priced mainland pork continues to compete strongly with island pork.

Beef: Island beef sales increased by 31 percent; however, the share of island beef in the Hawaiian beef market declined from 70 percent to 58 percent. A major reason for this decline was the increased importation of choice beef which competed with island grass-fed beef. Hawaii is trying to reverse this trend by finishing some of its cattle in newly established feed lots.

Honey and Beeswax: Island marketings are only half of what they were 10 years ago. Beekeeping is now a minor agricultural industry and no change is in sight.

FIGURE 3. Average annual volume of marketings of locally produced livestock products in 1957-1958, expressed as percentage change from 1947-1949 annual average.

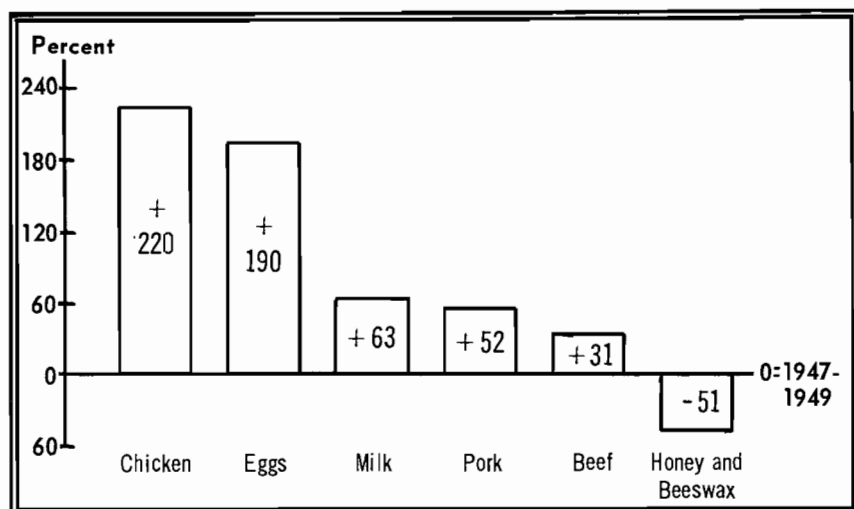


TABLE 3. Changes between 1947-1949 and 1957-1958 in average annual volume of marketings of livestock products produced in Hawaii.

Product	Unit	Annual marketings of locally produced livestock products			Market share of locally produced livestock products	
		1947-1949 average	1957-1958 average	1957-1958 average expressed as % change from 1947-1949 average	1947-1949	1957-1958
Chicken	1,000,000 pounds	1.0	3.2	+220	32	38
Eggs	100,000 cases	1.0	2.9	+190	57	79
Milk	1,000,000 quarts	31.7	51.8	+63	100*	100*
Pork	1,000,000 pounds	5.8	8.8	+52	53	56
Beef	1,000,000 pounds	17.9	23.4	+31	70	58
Honey and beeswax	100,000 pounds	7.6	3.7	-51	**	**

* Fresh milk on the civilian market only.

** No statistics of honey imports from the mainland to Hawaii were available.

SOURCE:

1958 Statistics of Hawaiian Agriculture, Agr. Econ. Rpt. 38, University of Hawaii, June 1959.

2. PRICES OF DIVERSIFIED AGRICULTURAL PRODUCTS

Prices of diversified agricultural products in Hawaii depend mainly on mainland prices plus transportation costs, and demand and supply of island and mainland agricultural products in Hawaii.

Many prefer island products for various reasons, such as greater freshness, or specific product characteristics, such as soft non-refrigerated pork. These preferences have been declining in strength for reasons such as changes in eating habits and in the racial composition of the population and improvement in the condition of imported mainland products. A further decline of the margin between prices of mainland and island products may be expected.

If we take the average 1947-1949 prices as 100, the average prices of four crops or crop groups were higher in 1957-1958 and those of two crops were lower. (Figure 4 and Table 4.) Of the six major livestock products, the price of only one, honey, was slightly above that of 1947-1949 and the prices of five products were lower (Table 4 and Figure 5.)

These changes in prices do not adequately show the changes in purchasing power of the money received from the sale of agricultural products. To show that, prices were adjusted by the changes in the average level of prices paid by U. S. farmers between 1947-1949 and 1957-1958. (Table 4 and Figures 4 and 5.) All products except coffee had a lower purchasing power in 1957-1958 than they had 10 years earlier, and the declining price of coffee during the last 3 years also greatly worries coffee farmers.

TABLE 4. Changes between 1947-1949 and 1957-1958 in average annual prices and purchasing power of locally produced agricultural products.

10

Product	1957-1958 average prices expressed as % change from 1947-1949 average prices	1957-1958 average purchasing power expressed as % change from 1947-1949 average purchasing power*
	Percent	Percent
Crops		
Coffee, parchment	+29**	+8**
Vegetables and melons	+14	-2
Macadamia nuts	+09	-6
Taro	+104	-10
Fruits	-10	-22
Rice	-25	-36
Livestock		
Honey	+1	-13
Milk	0	-13
Beef	-1	-14
Hogs	-23	-34
Chickens	-35	-44
Eggs	-36	-44

* In the calculation of purchasing power, prices were adjusted by the average 1957-1958 index number for prices paid by U. S. farmers (115.5 percent of 1947-1949).

** For coffee, the average January 12, 1960 price instead of the 1957-1958 price and the 1959 index number for prices paid by U. S. farmers (119 percent of 1947-1949) were used.

SOURCE:

1958 Statistics of Hawaiian Agriculture, Agr. Econ. Rpt. 38, University of Hawaii, June 1959.

Federal-State Market Report, Vol. XXIV, No. 3, University of Hawaii, June 1959.

Coffee Marketings and Farm Value, Hawaii Cooperative Crop and Livestock Reporting Service, University of Hawaii, October 27, 1959.

FIGURE 4. 1957-1958 prices and purchasing power of diversified crops, expressed as percentage change from 1947-1949 prices and purchasing power.

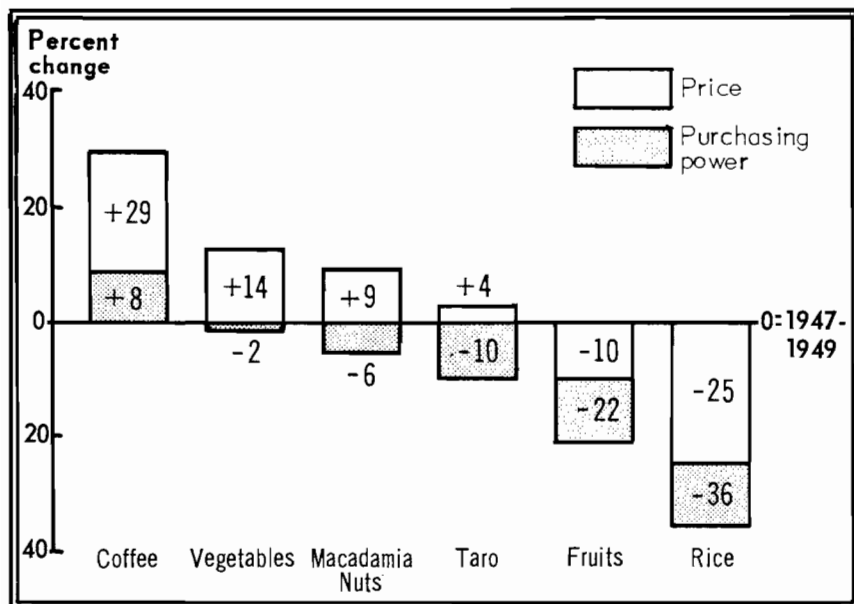
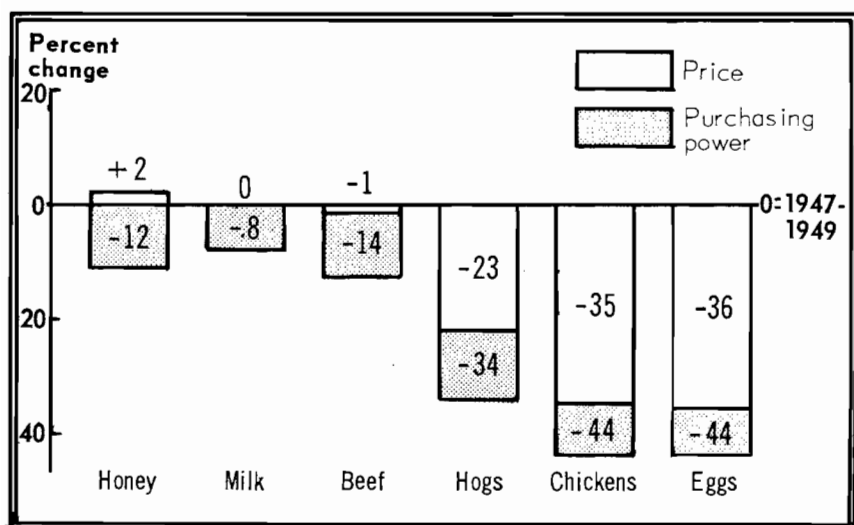


FIGURE 5. 1957-1958 prices and purchasing power of livestock products, expressed as percentage change from 1947-1949 prices and purchasing power.



3. SIZE AND NUMBER OF DIVERSIFIED FARMS

In several agricultural industries in Hawaii, full-time farmers have increased and are continuing to increase the size of their farms. Among the reasons for increases in farm size are the following:

1. Decline in purchasing power of farm products;
2. Increase in farm costs (the index of prices paid by U. S. farmers with 1947-1949 = 100 was 119 in 1959);
3. Lower cost of production per unit with large scale methods and equipment and with automation;
4. Lower cost of bulk buying;
5. Marketing advantages of larger farms.

The increase in size of farms is resulting in a decline in the number of farms. The number of farmers with less than 1,500 layers decreased by two-thirds, and that with more than 3,000 layers increased 4-1/2 times. The total number of egg producers declined by more than 50 percent during the decade.

The best example for these trends is the change in the size and number of egg producers (Table 5 and Figure 6). The concentration in this industry is even greater than these statistics indicate. One egg producer now has 60,000 layers out of a total of less than 600,000 layers in the Islands. Trends are similar for swine raisers.

These trends are nationwide. In the United States as a whole, investment per farm worker in current dollar values rose from \$9,600 in 1950 to \$18,400 in 1958. Even at a constant 1947-1949 value of the dollar the investment per farm worker increased by 42 percent from 1950 to 1958.

In my opinion, the increase in the size of farms does not mean, however, the disappearance of the family-operated farm in Hawaii in those agricultural industries in which it is now important.

TABLE 5. Changes in size and number of poultry and hog farms between 1949 and 1958.

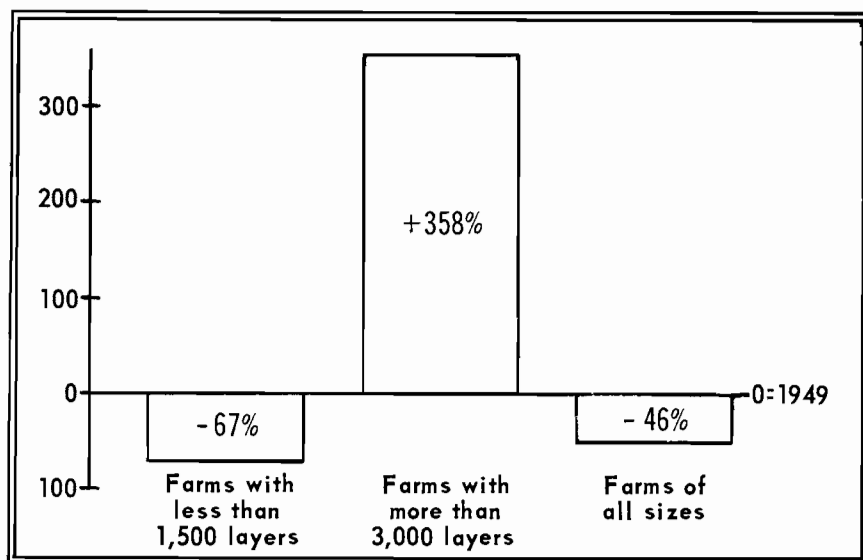
Type of farm	1949	1958	1958 expressed as % change from 1949
	Number	Number	Percent
Poultry farms:			
Less than 1,500 layers	391	131	-67
More than 3,000 layers	12	55	+358
All sizes	424	227	-46
Swine farms:			
Less than 100 swine	350	160	-54
More than 500 swine	3	19	+533
All sizes	481	307	-36

SOURCE:

1958 *Statistics of Hawaiian Agriculture*, Agr. Econ. Rpt. 38, University of Hawaii, June 1959.

1948 *Statistics of Diversified Agriculture in Hawaii*, Agr. Ext. Cir. 263, University of Hawaii, March 1949.

FIGURE 6. Number of poultry farms in 1958, expressed as percentage change from 1949 number.



4. OAHU'S SHARE IN HAWAII'S DIVERSIFIED AGRICULTURAL PRODUCTION

Today, Oahu produces a larger share of diversified agricultural products than it did 10 years ago (Table 6). This statement, however, is not true for all diversified agricultural commodities. Oahu produces now a larger share of vegetables, but less fruit and taro (Figure 7). It has increased its share of the production of all major livestock products (Figure 8).

The acreage of major diversified crops on Oahu has been declining during the past decade, with the unimportant exception of macadamia nuts (Table 7). Oahu's acreage as a percentage of the state acreage has declined for all crops except vegetables and melons (Figure 9). In other words, Oahu's share of the state acreage for high-value crops (\$3,000 gross income per acre for vegetables and melons) has increased and its share of low-value crops (gross income per acre of \$570 for taro, \$475 for bananas, and \$980 for papayas) has declined.

EFFICIENCY OF PRODUCTION

In 1958, Oahu farmers produced 35 percent greater tonnage on 25 percent fewer crop acres than they did in 1948. These trends are typical of the rapid increase in technical efficiency of Hawaii's diversified agriculture during the past decade.

TABLE 6. Oahu's share in Hawaii's total production of major diversified agricultural products in 1948 and 1958.

Agricultural Product	Unit	State production		Oahu production		Outer island production		Oahu production as % of state production	
		1948	1958	1948	1958	1948	1958	1948	1958
Crops:								Percent	
Bananas	1,000,000 pounds	9.5	7.0	8.4	5.8	1.1	1.2	88	83
Vegetables and melons	1,000,000 pounds	48.5	50.6	15.4	20.5	33.1	30.1	32	41
Papayas	1,000,000 pounds	7.1	15.4	6.4	4.8	.7	10.6	90	31
Taro	1,000,000 pounds	14.2	9.6	6.4	2.1	7.8	7.5	45	22
Macadamia nuts	1,000,000 pounds	.75	1.8	.03	.1	.72	1.7	4	6
Livestock products:									
Milk	1,000,000 quarts	31.3	52.8	24.4	46.2	6.9	6.6	78	88
Pork (liveweight)	1,000,000 pounds	8.0	11.5	5.8	9.2	2.2	2.3	72	80
Poultry meat	1,000,000 pounds	1.3	4.9	.8	3.6	.5	1.3	62	73
Eggs	100,000 cases	1.1	3.1	.6	1.9	.5	1.2	55	61
Beef	1,000,000 pounds	16.9	22.0	.3	3.4	16.6	18.6	2	15
Honey	10,000 pounds	65.2	35.2	8.4	4.1	56.8	31.1	13	12

SOURCE:

1958 *Statistics of Hawaiian Agriculture*, Agr. Econ. Rpt. 38, University of Hawaii, June 1959.

1948 *Statistics of Diversified Agriculture in Hawaii*, Agr. Ext. Cir. 263, University of Hawaii, March 1949.

FIGURE 7. Oahu's share of diversified crops marketed in Hawaii in 1948 and 1958.

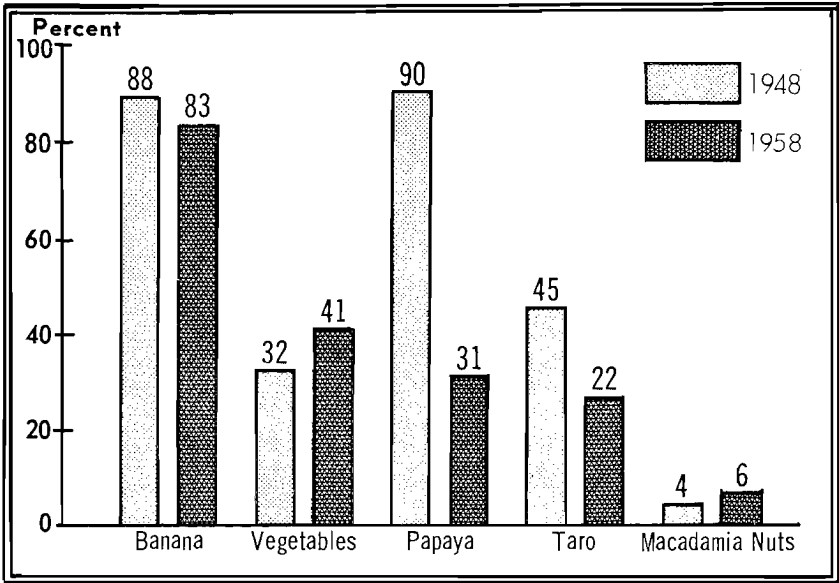


FIGURE 8. Oahu's share of livestock products marketed in Hawaii in 1948 and 1958.

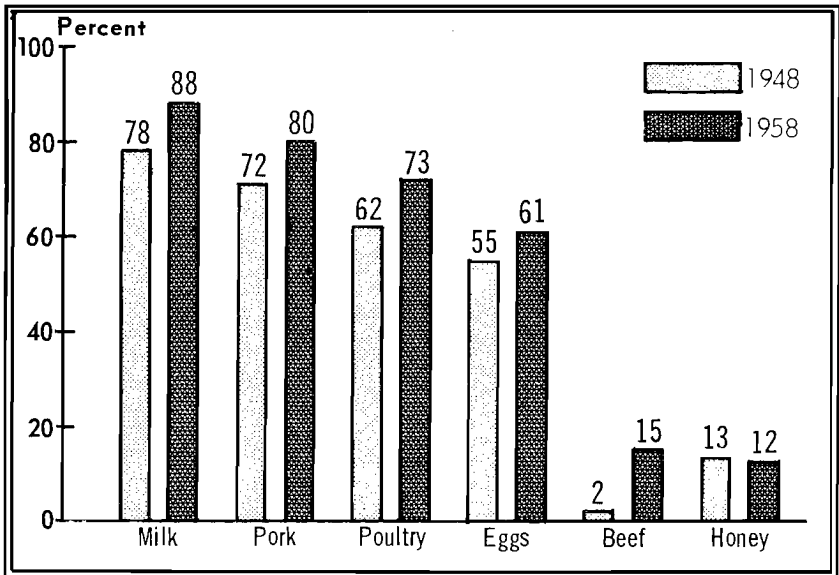


TABLE 7. Oahu's share of acreage of certain diversified agricultural crops in Hawaii in 1948 and 1959.*

Crop	State acreage		Oahu acreage		Outer island acreage		Oahu's acreage as % of state acreage	
	1948	1959	1948	1959	1948	1959	1948	1959
	Acres		Acres		Acres		Percent	
Bananas	1,015	1,022	874	810	141	212	86	79
Vegetables and melons	5,176	3,735	1,936	1,459	3,240	2,276	37	39
Taro	1,015	578	462	160	553	418	46	28
Papayas	547	832	485	221	62	611	89	27
Macadamia nuts	1,088	3,280	123	136	965	3,144	11	4

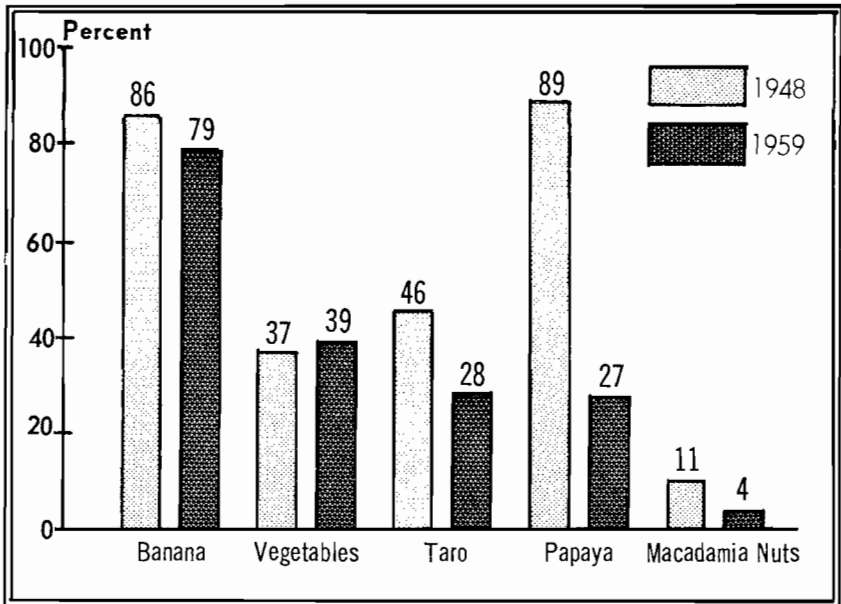
* All data in the 1959 columns are as of December 26, 1959, except for vegetables and melons which are for calendar year 1958.

SOURCE:

Hawaii Agricultural Production and Outlook, Hawaii Cooperative Crop and Livestock Reporting Service, University of Hawaii, January 1960.

1958 Statistics of Hawaii Agriculture, Agr. Econ. Rpt. 38, University of Hawaii, June 1959.

FIGURE 9. Oahu's share of acreage of diversified crops in Hawaii in 1948 and 1959.



RELOCATION OF HAWAII'S DIVERSIFIED AGRICULTURE

What about the relocation of Oahu's diversified agriculture to the outside islands? We should realize that the area needed to keep the "high-value-per-acre agriculture" on Oahu is not large: Let us take one crop and one livestock industry as examples:

Oahu had 1,460 crop acres of vegetables and melons in 1958. "Crop acres" means that 1,460 acres of vegetable and melon plantings were harvested in 1958. However, since often several crops are planted and harvested from 1 acre per year, the actual acreage used for vegetables and melons on Oahu was less than 1,460 acres.

In 1956, Oahu dairies used 260 acres of buildings and corrals and another 360 acres of cultivated land from which grass was cut, a total of 620 acres. In addition, some dairies used 1,800 acres of pasture for milking

cows, and another 4,800 acres for dry cows and for raising replacements. Most of this pasture could be eliminated (1) by using sugar cane and pineapple by-products for roughage, such as pineapple stover or silage and strip sugar cane, and (2) by raising roughage and replacements on the outside islands. Similarly the areas needed for poultry, hogs, pen feeding of cattle, flowers, nurseries, etc., are not really large. "Low-value-per-acre" agriculture can be expected to move gradually to the outside islands.

The question of relocation of "high-value-per-acre" diversified agriculture is not one of availability of land and water on Oahu--both are there. It is rather a matter of decision by the people of the state, whether this type of agriculture does the state more good on Oahu or on the outside islands.

Oahu's farmers have believed, so far, that they would do better on Oahu than on the outside islands; otherwise, according to the principle of comparative advantage, they would not be on Oahu. It will require such changes as better and cheaper transportation and availability of ample, low-priced and good land and water to make it more attractive for them to move to the outside islands.

SUMMARY

In summary, then, Hawaii's diversified agriculture has grown a lot during the last decade. We can expect it to continue growing; however, there are some soft spots. Full-time farms will get bigger, but there will be less farmers.

By 1970 there will still be many diversified farmers on Oahu unless they are forced off the island or unless conditions become much more attractive to them on the outside islands.