

# An Economic Study of the Small-Fruit Industry in Oregon



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## SUMMARY

**PRODUCTION.** Berry production in Oregon has increased rapidly since 1919 and now constitutes one of the important branches of Oregon horticulture. The bearing acreage of strawberries, red and black raspberries, loganberries, blackberries and gooseberries in 1929 was estimated at approximately 19,300 acres and the estimated value of harvested production of these crops in the same year was a little more than \$3,800,000.

In comparison with the United States as a whole, the aggregate production of all berries in Oregon or the Pacific Northwest is not large. When the volume canned and cold packed is considered, however, this area occupies a predominant position.

It is significant that while the acreage of all berries in the United States decreased from 310,000 acres in 1899 to 249,000 acres in 1919, the acreage in both Oregon and Washington more than doubled during the same period. Since 1919 the trend of berry acreages, particularly of strawberries and raspberries, has been upward, not only in the Pacific Northwest but also in the country as a whole. This increase, however, has been considerably more rapid in the Pacific Northwest.

Oregon's berry industry is becoming concentrated more and more in the Willamette Valley, and to a lesser extent in the Hood River Valley. In 1899, for example, Willamette Valley counties could claim but 55 percent of all small-fruit acreages in Oregon; whereas by 1929 the share of these counties had risen to 84 percent. During the same period Hood River Valley gradually but consistently increased its acreage, but viewed from the standpoint of state totals its percentage declined. Since 1899 other districts in Oregon either showed a slow increase in acreage or an actual decrease.

Turning to acreage trends by kind in Oregon, we note that from 1919 to 1929 strawberries increased nearly fourfold, raspberries, threefold; from 1919 to 1923 loganberries more than doubled, but declined rapidly from then until 1929; cultivated blackberries remained virtually stationary in acreage during the period 1919-1929, and gooseberries, although increasing considerably after 1919 and reaching a peak in acreage about 1926, have since been subject to a decline of approximately 50 percent.

**CANNING.** Viewing the trend during the past three decades, it appears that the national output of canned berries has not increased as rapidly as the packs of other fruits. For the years 1899, 1904, and 1909, berries averaged 13 percent of the United States canned fruit pack, but the average declined to 9.4 percent for the years 1923, 1925, and 1927. In the Pacific Northwest, however, it is significant that the pack of canned berries not only increased at a faster rate than the national berry pack but its rate of gain was more rapid even than the total canned pack of California fruits or the pack of canned Hawaiian pineapple. The aggregate output of other canned fruits in the Pacific Northwest, however, has increased even more rapidly than berries.

In the national output of canned berries, Oregon and Washington stand preeminent. In fact, these states alone in 1927 packed approximately three-fourths of all small fruits, other than blueberries, canned in the

United States. How rapidly Oregon and Washington have outstripped the other states of the Union is indicated by the fact that whereas in 1909 only 7 percent of the value of all canned berries in the United States, other than blueberries, was credited to these two states, the figure in 1927 had grown to 74 percent. This position of ascendancy is doubtless attributable mainly to: (1) the superior quality of the berries produced in Oregon and Washington and (2) the closer proximity of other states to centers of population where berries command a higher price in the fresh market than can be obtained through the act of processing. It is thus very evident that a definite and continued shift has taken place in the canned-berry industry from other states to the Pacific Northwest. There is nothing that would indicate a change of this trend in the near future.

Turning to the various kinds of canned berries, we find that Oregon packed in 1927 no less than 58 percent of the United States total of strawberries, 17 percent of all raspberries, 77 percent of the loganberries, 21 percent of the blackberries, and 55 percent of the gooseberries. Washington's share of canned strawberries in 1927 was 15 percent, raspberries 32 percent, loganberries 23 percent, blackberries 64 percent, and gooseberries 20 percent.

**COLD PACK.** When it comes to the frozen pack of berries, the ascendancy of Oregon and Washington is even more striking. It is estimated that 85 percent or more of the national frozen pack of strawberries is put up in these states, while the percentage of frozen raspberries, loganberries, and blackberries is believed to be even larger. This new and rapidly growing industry holds great promise of future development. Since freezing retains nearly all of the desirable characteristics found in the fresh fruit, preserve and ice-cream manufacturers and hotels and restaurants are turning to cold-pack berries in rapidly increasing numbers. The direct-consumer trade, now in its incipient stages, is at present deterred from making great advances by unsolved problems connected with the technical side of distribution and merchandising. The rapid expansion of the cold-pack business in berries in the Pacific Northwest offers evidence that these products carry the approval of the trade. A continued growth of the industry is confidently predicted.

**DRYING.** The drying of berries in the Pacific Northwest is comparatively unimportant commercially, only loganberries and black raspberries being to any extent so marketed. Formerly large quantities of loganberries were dried in Oregon, but of late years the output of this product has fallen off greatly and is now of little relative importance. Dried blackcaps, however, have been on the increase.

**FRESH-MARKET SHIPMENTS.** Fresh-market shipments absorb a comparatively small proportion of Oregon's surplus production of small fruits. Such shipments are, nevertheless, important in districts like the Hood River Valley, where a large part of the strawberry crop is shipped fresh each year. Fresh strawberry shipments probably exceed by a considerable amount the combined shipments of all other berries from the state of Oregon. The prospects are not bright for extending present fresh-market outlets into the Middle West or East. Limited quantities of fresh berries are being marketed with success in certain sections of Idaho, Montana, the Dakotas, the Twin Cities and occasionally beyond, but the possibilities for the further extension of these markets appear to be limited.

**PRICES.** A study and comparison of prices paid Oregon growers for the various berries under consideration is enlightening in revealing their competitive position and outlook. Strawberry and raspberry prices have on the whole been well sustained during the past eight or ten years, despite the definite and continued acreage increases that these berries have undergone in Oregon and Washington since 1919. Prices of the other berries have not fared so well, however. The unprofitableness of producing loganberries at prices that ruled from 1921 to 1929 is evidenced by the rapid and continued decline in acreage that took place in Oregon. Blackberry prices have undergone a general downward trend, which began some twelve or thirteen years ago, although Oregon's cultivated blackberry acreage has remained virtually stationary in recent years. Gooseberry prices, on the other hand, registered an upward movement until 1922-23, and then showed a continued decline until 1928-29. The effect of this trend was to stimulate a rapid increase in gooseberry acreage until 1925-26, after which a great decline took place.

Since canned berries as a group are normally higher priced than competing fruits they can scarcely ever hope to supplant, to any considerable degree, cheaper fruits such as canned peaches or Hawaiian pineapple. If berries can maintain themselves against inroads from these other fruits, however, there is always the prospect of such increase in consumption as follows the normal increase in population and rise in standards of living.

**OUTLOOK.** In considering his program of berry acreage expansion or retrenchment, the grower should bear in mind that since the potential production of berries in the Pacific Northwest is far in excess of present market demands, his acreage policy should be guided primarily by a consideration of trends in competing areas and of changes in market demand for the product.

Considered from the long-time point of view, the outlook for strawberries in Oregon appears favorable. The fact that (1) the output of canned strawberries has increased rapidly in this state since 1919, while it has declined in other states, and (2) the volume of frozen strawberries has increased much more rapidly in Oregon and Washington than elsewhere, offers evidence that Oregon possesses certain competitive advantages in the production of strawberries for processing purposes. There is nothing at the present time to indicate a reversal of these trends. The opinion prevails in some quarters, however, that the output of canned strawberries in the future may be somewhat curtailed in favor of the frozen product.

The fact that the long-time market outlook for strawberries appears attractive should not blind growers to the need of pursuing a conservative and cautious policy of expansion in their plantings. In the past, periodic over- and under-production in this and other fruits has occurred, mainly because producers have been influenced primarily by prices received for the current crop. At this writing (October 1930), for example, the attractiveness of prevailing price levels is stimulating many new plantings in both Oregon and Washington, and unless growers exercise due caution during 1931-32 there is danger of a repetition of what has happened in previous years.

While the long-time outlook for red raspberries appears favorable in Oregon, growers should be cautioned not to increase their plantings faster than the trends in canning and cold pack warrant. Many new plantings

have recently been set out in the Gresham and Lebanon districts of this state and in parts of western Washington.

A conservative expansion program for black raspberries, from a long-time standpoint, seems warranted in view of the increased use of dried blackcaps and the upward trend in the Pacific Northwest canned output in the face of improved prices. However, since Michigan and New York—the states of largest canned blackcap output—have maintained their packs at about the same level, there may be a question as to how much of this business will shift to Oregon and Washington in the near future. The fact that the demand for blackcaps is more restricted than for most other berries should be taken into consideration in any future program of expansion.

From all the facts at hand it appears that no considerable expansion of the loganberry acreage is warranted at the present time. In view of the greatly decreased acreage of this crop in recent years, growers may do well to maintain present acreages that are in a good state of production, but those who are contemplating an expansion of this crop should bear in mind that any considerable increase in production will likely result in prices that are unremunerative to the grower.

The appearance, during the summer of 1930, of the red berry mite on blackberry patches in Oregon raises a question as to what effect this might have on the future of blackberry production in this state. The larger average yields obtained by growers in Washington, coupled with the vast amounts of wild Evergreen blackberries found in Oregon, have in the past been important factors of competition confronting Oregon blackberry growers. Should the red berry disease prove serious in the future, however, it may mean the elimination of wild Evergreen blackberries from competition with the cultivated acreage and thus remove one important limitation to the profitable expansion of the cultivated acreage.

Under the circumstances of a greatly reduced acreage of gooseberries in the Pacific Northwest, and a downward trend in the canned gooseberry pack of other states, growers in favored localities of Oregon may be justified in setting out small new plantings of this crop. No extensive program of expansion is warranted, however, since gooseberries as a canned product have never met with great popular favor. A small increase in production is consequently sufficient to take care of the needs of a relatively large population.

# An Economic Study of the Small-Fruit Industry in Oregon

By

GEORGE L. SULERUD and MILTON N. NELSON

## IMPORTANCE OF SMALL FRUITS IN OREGON

The small-fruit industry in Oregon has increased considerably during recent years and now constitutes one of the important branches of Oregon horticulture. Estimates made by the United States Bureau of Agricultural Economics place the 1929 strawberry acreage in the state at 10,500 acres. This, together with an estimated cane-fruit acreage of approximately 9,000 acres, makes a total of between 19,000 and 20,000 acres of small fruits being grown in Oregon. While this acreage constitutes but a small fraction of the acreage of all crops raised in the state, the berries represented in this figure are of real importance to those areas and producers concerned.

Conditions in Oregon and the Pacific Northwest generally are favorable for the production of small fruits from the standpoint of large yields of high quality, and there is no doubt that the potential production of these fruits in this region is greatly in excess of present market demands. Local markets absorb only a relatively small proportion of Oregon's commercial berry production. The greater part of the crop is absorbed by processing plants and the packed product is sold in widely scattered markets throughout the United States and to some extent even in foreign markets. Future expansion, therefore, should be guided primarily by present and prospective market conditions.

Economic success for the berry grower in Oregon depends as much on his ability to adapt himself to shifts in competing producing areas and to changes in market demand as it does on individual farm efficiency. The influence of changing demand and competing areas is reflected in the price of the product. With competing areas expanding production, for example, lower prices tend to follow. Also, with a lessening of consumer demand the natural tendency is for prices to decline.

It was with the objective in mind of assembling, analyzing, and interpreting, in so far as is possible, all the facts available relating to the present economic status and outlook for the small-fruit industry in Oregon, that this study was undertaken.

The incompleteness of data encountered in some phases of the study has made it necessary to couch conclusions and recommendations in terms of less finality than could have been done had the basic statistics been more complete. In the main, however, it is felt that the data are sufficiently adequate to reveal trends of significance to growers of small fruits. The need for further and more intensive studies of such problems as cold-pack distribution, the merchandising of canned berries, factors affecting consumer demand, manufacturing and distribution costs, and the like, is urgent.

In 1929, the total value of small fruits produced in the state was estimated at \$3,801,500. This represented 3.6 percent of the value of all crops, 14.6 percent of the value of all horticultural crops, and 19.7 percent of the value of all fruits and nuts.\*

Figure 1 shows the relative importance of small fruits compared to other horticultural crops in Oregon when viewed from the standpoint of average value over the period 1926-1929. Small fruits make up 16.3 percent of the total; tree fruits and nuts, 57.6 percent; vegetables, 15.6 percent; and miscellaneous crops, 10.5 percent.†

**RELATIVE IMPORTANCE OF HORTICULTURAL CROPS IN OREGON**  
(Basis 1926-1929 Ave Value of \$23,640,000)

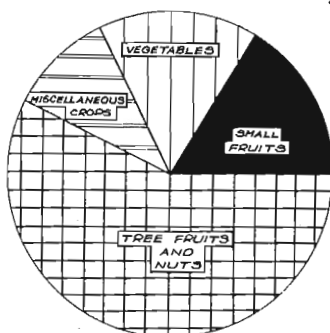


Figure 1. The relative importance of horticultural crops in Oregon. (Basis 1926-1929 value of production.)

Figure 2 shows the comparative importance of each kind of berry to the aggregate value of all small fruits.‡ Strawberries make up nearly half the value of all berries, while loganberries make up approximately one-fifth of the total. Red raspberries and blackberries rank next in order, each involving one-eighth of the aggregate value; while black raspberries and gooseberries make up the remainder, which amounts to less than 7 percent.§

\*Information obtained from the office of the Federal Statistician, Portland. The value of gooseberries, blackberries, and black raspberries had to be estimated separately as these berries were not included in the annual crop report for 1929. The foregoing figure does not include the value of cranberries, which amounted to \$72,500 in 1929.

†These data were computed from annual reports of the Federal Statistician. Vegetables include truck crops and gardens. Miscellaneous crops include nursery stock and mint. The values of gooseberries and black raspberries in 1926-1929 and of blackberries in 1929 were estimated separately. Potatoes are not here considered as a horticultural crop although in some states they are so classified. The 1926-1929 average value of potato production in Oregon was \$4,753,000.

‡The small fruits under consideration in this study include strawberries, raspberries, loganberries, blackberries, and gooseberries. In addition to these Oregon produces small amounts of cranberries and currants, neither of which are of great commercial importance.

§Averaged from annual reports of the Federal Statistician. Separate estimates were made of gooseberries and black raspberries. The percentages of the total are as follows: strawberries 47.1 percent, loganberries 21.3 percent, red raspberries 12.7 percent, blackberries 12.2 percent, black raspberries 5.0 percent, gooseberries 1.7 percent.

## RELATIVE IMPORTANCE OF SMALL FRUITS IN OREGON

(Basis 1925-1929 Ave. Value of \$3,630,000)

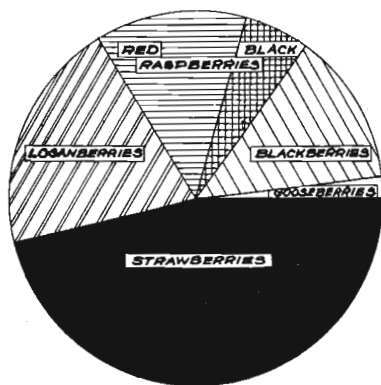


Figure 2. The relative importance of small fruits in Oregon. (Basis 1925-1929 average value of production.)

## GEOGRAPHIC DISTRIBUTION

When compared with the United States as a whole, the production of small fruits in Oregon or the Pacific Northwest does not loom large. In 1929 Oregon had 5.2 percent of the commercial strawberry acreage in the country and Washington had 4.4 percent (see Figure 3). Unfortunately, up-to-date statistics on other small-fruit acreages in the United States will not be available until the 1929 Census figures are published; hence, it is not possible at this writing to compare such acreages in the states of Oregon and Washington with the country at large.

Census figures for 1919 show that Oregon had 2.3 percent of the United States raspberry acreage and Washington 3.6 percent. Since these states increased their raspberry acreage about threefold from 1919 to 1929, it is highly probable that their percentages also have increased. Oregon had seven-tenths of the national loganberry acreage in 1919, and indications are that the percentage remains at least this large at the present time. With regard to cultivated blackberries, Oregon and Washington each had about 3 percent of the total in 1919. Oregon's percentage probably has not changed much since then, while Washington undoubtedly now has a much larger percentage.

**Strawberries.** Strawberries probably now exceed the combined acreages of all other small fruits grown in the United States.\* They are grown to a greater or lesser extent in almost every state of the Union, although

\*Strawberries made up 48 percent of all small-fruit acreages in the United States in 1919. With the rapid increase in strawberries since then, it seems probable that this crop will exceed half of the total at the present time.

the United States Division of Crop and Livestock Estimates includes only twenty-nine states in its annual estimates of commercial strawberry production. The classification of states into Early, Second Early, Intermediate, and Late as shown in Figure 3 is based on the time of season the crop is marketed in those states.\*

**PERCENTAGE DISTRIBUTION OF STRAWBERRY ACREAGE, COMMERCIAL PRODUCING DISTRICTS IN THE UNITED STATES, 1929.**

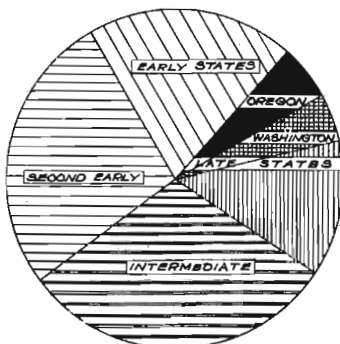


Figure 3. Percentage distribution of strawberry acreage. Commercial producing districts in the United States, 1929.

**Raspberries.** Raspberries rank next to strawberries in importance and probably make up about one-fifth of the national small-fruit acreage.† The geographical distribution of raspberry acreage in the United States is somewhat more limited than that of strawberries, being confined mainly to the northern part of the United States. The hot summers of the South are unfavorable to the production of this fruit, and much of the Great Plains area and parts of the Rocky Mountain states are unadapted to raspberry culture as the winters are too severe and the summers too hot and dry. In 1919 most of the raspberry acreage was located in the Middle Atlantic and North Central states.‡ Since then the raspberry acreage in the Pacific Northwest has increased rapidly and no doubt constitutes at the present time a larger percentage of the total than the 1920 Census would indicate.

\*The information upon which Figure 3 is based was obtained from the Division of Crop and Livestock Estimates, United States Bureau of Agricultural Economics. See also Tables XXVII and XXVIII (Appendix). The Early states include Alabama, Louisiana, Florida, Mississippi, and Texas; the Second Early states include Arkansas, Southern California, Georgia, North and South Carolina, Tennessee, and Virginia; the Intermediate states include Northern California, Delaware, Illinois, Kansas, Kentucky, Maryland, Missouri, and New Jersey; and the Late states include Indiana, Iowa, Michigan, New York, Ohio, Pennsylvania, Wisconsin, Utah, Oregon, and Washington. Oregon had 5.2 percent of the acreage of all commercial producing states in 1929, while Washington had 4.4 percent.

†About 20 percent of the small-fruit acreage in 1919 was raspberries. It is the opinion of the writers that this percentage has not changed materially since then.

‡For 1919 acreages see Table I.

**Loganberries.** Commercial production of loganberries is confined almost entirely to the Pacific Northwest and particularly to the Willamette Valley in Oregon. In the state of Washington no extensive centers have been developed, since the canes suffer considerably from winter injury except in the lower Columbia Valley and in protected places in the Puget Sound region.\* California still grows some loganberries but the production trend has been downward in recent years. The loganberry has been tested in many parts of the Central and Eastern states, but does not seem to thrive well.\* In states where the winter temperature falls to zero Fahrenheit or lower, the canes winter-kill, while in the Southern states the summer climate seems unfavorable.

**Blackberries.** Blackberries are cultivated abundantly in such states as Texas, Missouri, Illinois, Kentucky, and Oklahoma, besides Oregon and Washington in the Pacific Northwest.† The cultivation of this fruit has extended much less rapidly than would have been the case had not the wild blackberries been found in such abundance throughout the country. Dry summers and severe winters are serious handicaps to blackberry culture, hence much of the Rocky Mountain and Northern Great Plains region is unsuited to the cultivation of blackberries.

**Gooseberries.** The gooseberry is a native of cool, moist, northern climates and is grown more extensively in the North Central states than anywhere else. Gooseberries are hardy and withstand very low temperatures. Most varieties can withstand the winters in the northern Great Plains area.‡ On the other hand, they are injured by the long hot summers of the Southern states, except in the higher altitudes, while in many of the Western states limited rainfall restricts their culture materially. Climatic conditions in parts of Western Oregon and Washington are quite favorable for gooseberry production.

**Conclusions.** Considering Oregon alone, or even the Pacific Northwest, in its national setting, it is thus evident that the aggregate small-fruit tonnage produced in this region is not large. When the volume canned and cold-packed is considered, however, the Pacific Northwest is far from insignificant. In fact, as will be disclosed in a subsequent section, this locality occupies a position of dominating importance.

## NATIONAL AND REGIONAL TRENDS IN ACREAGE AND PRODUCTION

As previously stated, up-to-date statistics on small-fruit acreages in the United States, other than those of strawberries, are lacking. Table I presents such figures as are now available from the Federal Census reports. Strawberries alone were included in the 1925 Agricultural Census.

As Table I reveals, it is significant that while the acreage of all small fruits in the United States decreased from 310,000 acres in 1899 to 249,000 acres in 1919, the Pacific states were actually registering an increase from

\*See U. S. Dept. of Agric. Farmers' Bulletin 998, page 5.

†See U. S. Dept. of Agric. Farmers' Bulletin 1399, pages 2-4.

‡See U. S. Dept. of Agric. Farmer's Bulletin 1398, pages 1-2.

TABLE I. SMALL-FRUIT ACREAGES IN THE UNITED STATES, BY GEOGRAPHIC DIVISION, 1899-1924\*

Kind and year	United States	New Eng-land, Middle Atlantic	North Central	South Atlantic, South Central	Mountain and Pacific	Oregon	Washington
	acres	acres	acres	acres	acres	acres	acres
<i>All small fruits</i>							
1899 .....	309,768	76,319	127,424	88,302	17,723	3,470	2,845
1909 .....	272,460	69,020	92,544	83,814	27,082	5,122	5,508
1919 .....	249,084	59,091	92,561	68,975	28,457	8,463	7,434
<i>Strawberries</i>							
1899 .....	151,363	25,927	49,418	68,506	7,512	1,792	1,268
1909 .....	143,045	23,634	40,037	65,450	13,924	2,941	3,283
1919 .....	119,395	17,262	42,405	47,232	12,496	2,812	3,087
1924 .....	193,175	18,962	48,848	107,396	17,969	6,327	5,485
<i>All cane and bush fruit†</i>							
1899 .....	158,405	50,392	78,006	19,796	10,211	1,678	1,577
1909 .....	129,415	45,386	52,507	18,364	13,158	2,181	2,225
1919 .....	129,689	41,829	50,156	21,743	15,961	5,561	4,347
<i>Raspberries and loganberries</i>							
1899 .....	60,916	19,693	32,179	5,646	3,398	479	625
1909 .....	48,668	16,398	22,379	3,409	6,482	1,460	1,210
1919 .....	54,256	16,452	25,622	3,454	8,728	3,931	2,332
<i>Blackberries‡</i>							
1899 .....	50,211	9,492	24,941	12,325	3,453	717	388
1909 .....	49,004	8,208	22,171	14,295	4,330	431	769
1919 .....	46,165	6,316	17,192	17,780	4,877	1,354	1,403
<i>Other berries§</i>							
1899 .....	47,278	21,207	20,886	1,825	3,360	482	564
1909 .....	31,743	20,780	7,957	660	2,346	290	246
1919 .....	29,268	19,061	7,342	509	2,356	366	612

\*Data for the years 1899, 1909, and 1919 obtained from the 12th, 13th, and 14th Census of the United States. Statistics on strawberries in 1924 were obtained from the 1925 United States Census of Agriculture. States included in each Geographic Division as follows:

*New England:* Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut.

*Middle Atlantic:* New York, New Jersey, Pennsylvania.

*East North Central:* Ohio, Indiana, Illinois, Michigan, Wisconsin.

*West North Central:* Minnesota, Iowa, Missouri, North Dakota, Nebraska, Kansas.

*South Atlantic:* Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida.

*East South Central:* Kentucky, Tennessee, Alabama, Mississippi.

*West South Central:* Arkansas, Louisiana, Oklahoma, Texas.

*Mountain:* Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada.

*Pacific:* Washington, Oregon, California.

†Includes raspberries, loganberries, blackberries and "other berries" as listed in Table I.

‡Includes also dewberries, which are grown mostly in North Carolina, New Jersey, Michigan, New York, Georgia, South Carolina, Maryland, Texas, and other southern states.

§Includes gooseberries, currants, cranberries, and all other miscellaneous berries.

12,600 acres in 1899 to 23,800 acres in 1919.¶ Since 1919, the trend of small-fruit acreages, particularly of strawberries and raspberries, has been upward, not only in the Pacific Northwest, but also in the country as a whole. This increase, however, has been considerably more rapid in the Pacific Northwest.¶

¶In Table I the Mountain and Pacific states are grouped together. The Mountain states are unimportant, however, and showed an actual decrease in the acreage of all small fruits from 1899 to 1919. In 1919, the Mountain group had only one-sixth of the acreage in both Mountain and Pacific states.

¶See discussion on strawberries and raspberries on pages following.

TABLE II. PERCENTAGE DISTRIBUTION OF SMALL-FRUIT ACREAGES IN THE UNITED STATES, BY GEOGRAPHIC DIVISION, 1899-1924\*

Kind and year	United States	New England, Middle Atlantic	North Central	South Atlantic, South Central	Mountain and Pacific	Oregon	Washington
	acres	acres	acres	acres	acres	acres	acres
<i>All small fruits</i>							
1899 .....	100	24	41	29	6	1.1	0.9
1909 .....	100	25	34	31	10	1.9	2.0
1919 .....	100	24	37	27.5	11.5	3.4	3.0
<i>Strawberries</i>							
1899 .....	100	17	32	46	5	1.2	0.8
1909 .....	100	16	28	46	10	2.6	2.3
1919 .....	100	15	36	39	10	2.4	2.6
1924 .....	100	10	26	55	9	3.3	2.8
<i>All cane and bush fruits</i>							
1899 .....	100	32	49	12	7	1.1	1.0
1909 .....	100	35	41	14	10	1.7	1.7
1919 .....	100	32	39	17	12	4.3	3.4
<i>Raspberries and loganberries</i>							
1899 .....	100	32	54	9	5	.8	1.0
1909 .....	100	33	46	8	13	3.0	2.5
1919 .....	100	30	47	7	16	7.2	4.3
<i>Blackberries</i>							
1899 .....	100	18	50	25	7	1.4	0.6
1909 .....	100	16	46	29	9	.9	1.6
1919 .....	100	13	37	39	11	2.9	3.0
<i>Other berries</i>							
1899 .....	100	45	44	4	7	1.1	1.2
1909 .....	100	65	25	3	7	.9	0.8
1919 .....	100	65	25	2	8	1.3	2.1

\*Computed from Table I.

## STRAWBERRIES

Since 1899 the strawberry acreage in Oregon and Washington has increased relative to the country as a whole. Strawberries in the United States decreased from 151,000 acres in 1899 to 119,000 acres in 1919, but increased to 193,000 acres in 1924. Oregon and Washington, on the other hand, showed an actual acreage increase during both periods. In 1899, Oregon had 1.2 percent of the national acreage, while in 1924 it had 3.3 percent (see Table II). Indications are that this percentage has continued to increase since 1924. The trend in Washington has been similar to that of Oregon.

Strawberry acreage trends for the entire United States cannot be presented to date for reasons already mentioned. The Division of Crop and Livestock Estimates of the United States Bureau of Agricultural Economics, however, has made annual estimates of strawberry acreage in the commercial producing states since 1918. These estimates embodied in Figure 4 show that while the strawberry acreage in the United States, the Late states, and Oregon and Washington has trended definitely upward since 1918, the acreage in Oregon and Washington has increased at a consider-

ably faster rate than has that of the other late producing states; also faster than the United States as a whole.\* Oregon increased its acreage fourfold from 1918 to 1929; the commercial acreage in the United States was a little more than doubled during the same period.

### COMMERCIAL STRAWBERRY ACREAGE IN THE UNITED STATES, THE LATE PRODUCING STATES, OREGON AND WASHINGTON, 1918 - 1930

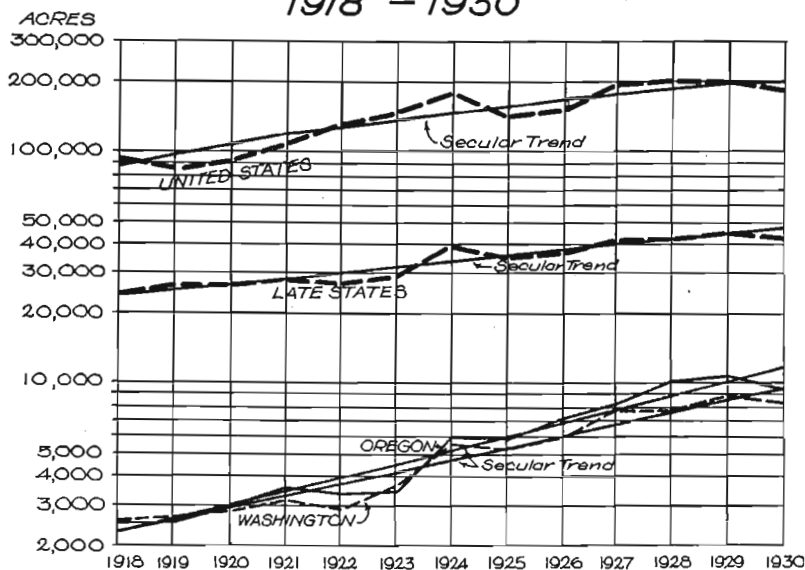


Figure 4. Strawberry acreage in the United States, Late Producing states, Oregon, and Washington, 1918-1930.

A further comparison of Oregon and Washington with other states is given in figures 5 and 6.† The Early states, such as Florida and Louisiana, have increased their acreage relative to the country as a whole; the Second Early states have been decreasing in recent years; the Intermediate states decreased from 1919 to 1924, but recovered again later; and the Late states decreased from 1919 to 1923, relative to other states, but recovered somewhat after that and have about held their own the past six years. The Late states now have nearly one-fourth of the total acreage in commercial producing states.

Estimates for 1929 and 1930 show that Oregon has a little more than 5 percent of the total commercial strawberry acreage in the United States. Since Oregon strawberries do not enter into direct competition with those of the earlier producing states,‡ however, a somewhat better comparison of

\*For states included in each group see Table XXVII, Appendix.

†Based on Appendix Tables XVII and XXVIII.

‡With regard to fresh-market shipments eastward, Oregon strawberries do come into direct competition with shipments from Arkansas and Missouri, as is shown in the discussion of fresh-market shipments on page 62. So far as the canned and cold-packed product is concerned, however, competition is more direct with the Late states.

trends is afforded in Figure 6. Both Oregon and Washington have increased their acreage much faster than the other Late states, as is clearly indicated in Figure 6. Oregon now (1930) has 21 percent and Washington 19 percent of the strawberry acreage in these states.

**PERCENTAGE DISTRIBUTION OF STRAWBERRY  
ACREAGE BY DISTRICT IN THE UNITED STATES,  
1918-1930**

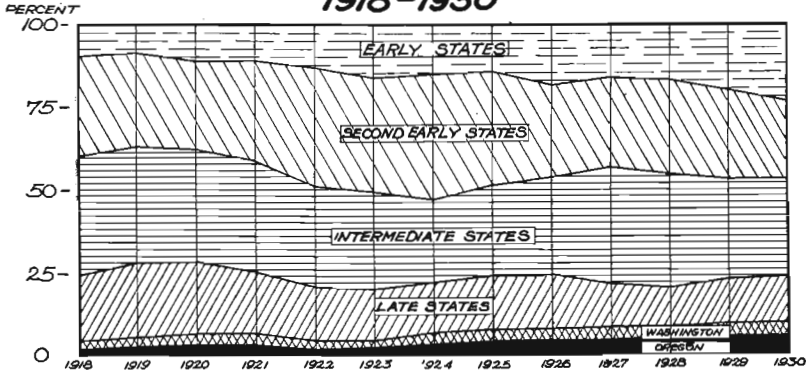


Figure 5. Percentage distribution of strawberry acreage by districts in the United States, 1918-1930.

Strawberry yields per acre have not averaged the same in all districts of the United States, as reference to Table III will show. The 1924-1929 average yield per acre in the Early group of states is considerably below that of the other groups. The Second Early, Intermediate, and Late states, however, have averaged approximately the same. According to these data,

**PERCENTAGE DISTRIBUTION OF STRAWBERRY  
ACREAGE IN LATE PRODUCING STATES  
1918-1930**

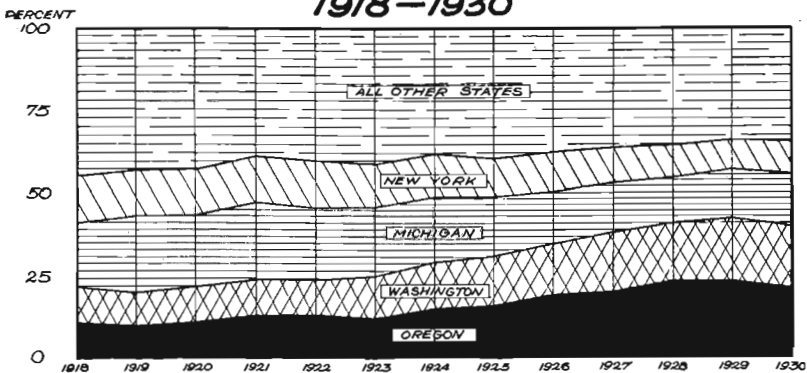


Figure 6. Percentage distribution of strawberry acreage in Late Producing states, 1918-1930.

Oregon strawberry yields average a little higher than those for the United States as a whole, but a trifle lower than the average for the Late states. Washington, on the other hand, averages higher than either the United States or the Late states.

TABLE III. STRAWBERRIES: AVERAGE YIELD PER ACRE BY DISTRICT IN THE UNITED STATES, 1918-1930\*  
(In quarts)

Year	Early	Second Early	Inter-mediate	Late states			United States
				Average of all	Oregon	Washington	
	qt.	qt.	qt.	qt.	qt.	qt.	qt.
Average 1918-1923.....	1,766	1,725	1,742	1,782	1,835	1,951	1,747
1924 .....	1,365	1,804	2,001	1,860	1,600	1,800	1,803
1925 .....	1,302	1,589	1,808	1,473	2,200	1,400	1,580
1926 .....	1,413	1,745	2,080	1,872	1,744	1,860	1,818
1927 .....	1,126	1,881	1,570	2,006	1,700	2,270	1,678
1928 .....	1,550	1,650	1,529	1,762	1,700	2,135	1,616
1929 .....	1,649	1,059	1,673	1,693	1,400	1,730	1,661
1930† .....	1,460	1,491	1,639	1,650	1,400	1,450	1,564
Average 1924-1929 .....	1,401	1,721	1,777	1,778	1,724	1,866	1,693

\*Data obtained from special strawberry reports of Division of Crop and Livestock Estimates, United States Department of Agriculture, Bureau of Agricultural Economics.

†Preliminary.

### OTHER SMALL FRUITS

In most states raspberries, loganberries, blackberries, and gooseberries are of such minor importance that neither State nor Federal crop-reporting services have included them in their annual acreage-estimates. Hence it is virtually impossible to determine what the national and regional trends of these crops have been in recent years. The cane-fruit acreages in the Pacific Northwest have increased considerably since 1919 (see Figure 7 and Table IV). Correspondence received from various state experiment stations throughout the country gives a general indication of regional trends in recent years and will be used in the discussion that follows.

**Raspberries.** While the United States raspberry acreage decreased from 61,000 acres in 1899 to 50,000 acres in 1919, the acreage in both Oregon and Washington showed an increase. In 1899 Oregon had less than 1 percent of the national raspberry acreage, while in 1919 it had  $2\frac{1}{2}$  percent. Similarly, Washington had 1 percent of the acreage in 1899 and  $3\frac{1}{2}$  percent in 1919. Since 1919 these states have increased their acreage about three-fold; hence, it is highly probable that subsequent to that date, the raspberry acreage in Oregon and Washington has increased faster than that of the United States as a whole.‡

The North Central group of states had about half of the United States raspberry acreage in 1919. These states decreased their raspberry acreage from 1899 to 1909, but increased it from 1909 to 1919. It appears that this increase has continued since 1919. Increases in raspberry acreage are

‡This conclusion is supported also by the fact that the canned-raspberry pack of Oregon and Washington combined amounted to about 26 percent of the national output in 1919 and 49 percent in 1927. See page 47. The volume of frozen raspberries also has increased greatly in the Pacific Northwest since 1919. See discussion, pages 54 and 55.

reported in Minnesota, Wisconsin, Michigan, and Indiana; other North Central states report little change.

Nearly one-third of the country's raspberry acreage in 1919 was located in the New England and Middle Atlantic groups of states.\* Raspberries in these states declined in acreage from 1899 to 1909 and remained about stationary during the next decade. Indications seem to point to an increase in the acreage of this crop in the Middle Atlantic states since 1919.

Raspberries are very unimportant in the Southern states. There was a decrease in acreage from 1899 to 1919 and there is nothing that would indicate much change in the situation since 1919.

**Loganberries.** California is the only state outside of Oregon and Washington in which loganberries are produced in commercial quantities. The Federal Census reported 459 acres of loganberries in California in 1919, which was about one-sixth of the Oregon acreage in that year. Since then the production of loganberries in California has decreased to the point where few are being produced at the present time.

**Blackberries.** The cultivated blackberry acreage in the United States decreased from 50,000 acres in 1899 to 46,000 acres in 1919, while in Oregon and Washington the acreage increased. Oregon's percentage of the national total in 1899 was 1.4 percent and in 1919 it was 2.9 percent. Washington increased somewhat faster, from less than 1 percent in 1899 to 3 percent in 1919. Oregon's acreage since 1919 has apparently changed but little, while blackberries in Washington have at least doubled in acreage.

Approximately two-fifths of the blackberry and dewberry acreage in the United States was located in the South Atlantic and South Central states in 1919. These states showed a substantial increase in acreage from 1899 to 1919. There seems to have been a continued increase in blackberry plantings in such states as Texas, Alabama, and Oklahoma during the past few years. In addition there are many wild blackberries harvested each year, both for canning and fresh-market purposes.

More than one-third of the national blackberry acreage in 1919 was located in the North Central states and one-eighth was in the Middle Atlantic and New England groups. The trend in these states was downward from 1899 to 1919. From the information at hand, there is nothing that would indicate a reversal of trend since 1919.

**Gooseberries.** Gooseberries were not enumerated separately in the 1920 Census, being included in the term "other berries." Undoubtedly gooseberries make up a large part of this figure. The national acreage of "other berries" decreased from 14,051 acres in 1899 to 5,085 acres in 1919, a reduction of more than 60 percent from the 1899 acreage.† The acreage in Oregon and Washington decreased slightly over the same period and in 1919 each had a little more than 3 percent of the United States' total. Oregon's gooseberry acreage increased more than threefold from 1919 to 1926, and then declined to about 50 percent in the three years following. In Washington the acreage was about doubled in the same period and was reduced somewhat after that.

\*Mostly in the Middle Atlantic states. Very few raspberries are grown in the New England states.

†In Table I the term "other berries" includes also currants and cranberries in addition to the berries mentioned above.

Reports received from Michigan, Pennsylvania, and Colorado indicate that the acreage in those states has declined in the past few years. The trend of gooseberry acreage in other states since 1919 is not known. In the Pacific Northwest the acreage increased for a time and then declined again. Perhaps the same has been true in these other states. At all events, since the trend in pack of canned gooseberries has been declining in these states, it seems probable that there have been no extensive new plantings in recent years.

### ACREAGE TRENDS IN OREGON AND WASHINGTON

Since Oregon and Washington bear such a close competitive relationship to each other a further comparison of trends in these states is presented in Figure 7 and Table IV. In most cases the acreage trends are very similar. From 1909 to 1919 Washington had a slightly greater strawberry acreage than Oregon, but in recent years the reverse has been true. Both states increased their acreage of strawberries very rapidly from 1919 to 1928 and in 1929 they both decreased.

The Federal Census did not segregate loganberries and raspberries prior to 1919. The greater increase in Oregon from 1899 to 1919 was due to the fact that the acreage of loganberries increased so rapidly during this

TABLE IV. SMALL-FRUIT ACREAGES IN OREGON AND WASHINGTON, 1899-1929\*

State and year	All† small fruits	Strawberries	Cane† and bush berries	All raspberries	Loganberries	Blackberries	Gooseberries
	<i>acres</i>	<i>acres</i>	<i>acres</i>	<i>acres</i>	<i>acres</i>	<i>acres</i>	<i>acres</i>
<i>Oregon</i>							
1899.....	3,470	1,792	1,399	479§	.....	717	203
1909.....	5,122	2,911	2,077	1,460§	.....	431	186
1919.....	8,463	2,812	5,466	1,176	2,755	1,354	181
1924  .....	17,240	6,327	10,763	2,443	6,476	1,331	513
1928  .....	20,274	10,713	9,411	3,445	4,215	1,313	438
1929.....	19,405	10,284	9,001	3,708	3,650	1,308	335
<i>Washington</i>							
1899.....	2,845	1,268	1,224	625§	.....	388	211
1909.....	5,508	3,282	2,093	1,210§	.....	769	114
1919.....	7,434	3,087	3,893	1,786	546	1,403	158
1924.....	15,844	5,485	9,630	5,034	1,456	2,871	269
1928.....	19,727	9,226	9,504	4,816	1,284	3,148	256
1929.....	18,553	9,137	8,561	4,548	877	2,910	226

\*Sources of information: Oregon statistics obtained from same sources as in Table VII. Washington figures for 1899, 1909 and 1919 were obtained from the 12th, 13th and 14th Census of the United States. Strawberry acreage in 1924 from the 1925 U. S. Census of Agriculture. Acreages of other small fruits in 1924 from Sixth Biennial Report, Washington State Department of Agriculture, page 47. The 1928 statistics were taken from the Eighth Biennial Report, Washington State Department of Agriculture, page 41. The 1929 figures were obtained by special correspondence with the Washington State Department of Agriculture.

†Including also currants, cranberries, and huckleberries in addition to the other berries listed.

‡Raspberries, loganberries, blackberries, and gooseberries.

§Includes also loganberries.

||Cane- and bush-fruit acreages for Oregon in 1924 and 1928 were approximated by use of trend lines connecting the two nearest years for which figures are available. The Oregon loganberry acreage attained a peak of 7,041 acres in 1923. Gooseberries reached a peak of 645 acres in 1926. Estimates arrived at in the foregoing manner should be considered only approximate.

period. Loganberries increased still more rapidly in both states for several years after 1919, but in recent years the acreage has declined. In 1929 Oregon had more than four times the loganberry acreage of Washington. Raspberries showed a great increase in Washington from 1919 to 1924, but from 1924 to 1929 the acreage declined slightly. The Oregon acreage, on the other hand, has continued to increase. In 1929 Oregon had a little more than 2,300 acres of red raspberries. (Figures in Table IV include all raspberries.) This compares with 4,550 acres of all raspberries in the state of Washington, most of which no doubt represent red raspberries.\* Black

### SMALL FRUIT ACREAGES IN OREGON AND WASHINGTON 1899-1929

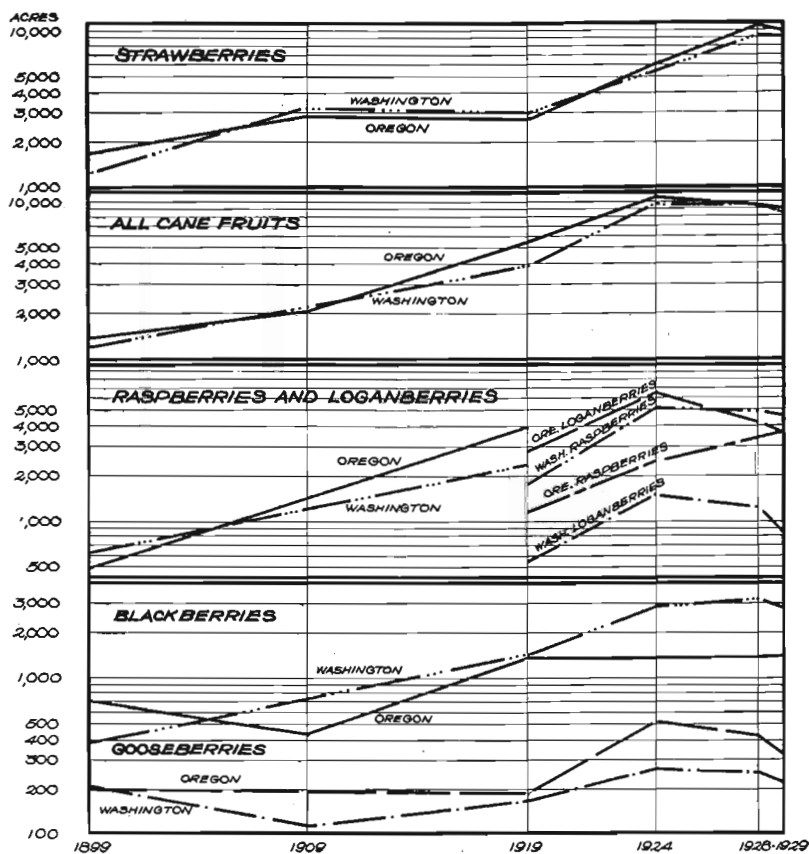


Figure 7. Small-fruit acreages in Oregon and Washington, 1899-1929.

\*Estimates from private sources seem to indicate that between 5 and 6 percent of the total raspberry acreage in Washington in 1929 was represented by blackcaps.

raspberries have been on the increase in both states; but according to private estimates Oregon's commercial acreage in 1929 was about four times as great as Washington's.

Cultivated blackberries in Oregon have not shown a marked upward tendency in the past thirty years. The acreage decreased from 1899 to 1909 and increased considerably from 1909 to 1919, but has remained about stationary since then. The blackberry acreage in Washington, on the other hand, showed a persistent and rapid gain over the whole period. A slight decrease appears to have taken place in 1929. Washington now has more than twice the acreage of Oregon.

The trend in gooseberry acreage in the two states has been very similar except that Oregon has had a larger acreage than Washington. In both cases the acreage was smaller in 1919 than in 1899. From 1919 to 1926 a rapid increase was registered, which was in turn followed by a marked decline.

## THE SITUATION IN OREGON

### GEOGRAPHIC LOCATION

It is obvious from an examination of Figure 8, A and B, that Oregon's small-fruit industry is concentrated in the Willamette River Valley and to a lesser extent in the Hood River Valley.\* Berries are grown on a small commercial scale in several other districts, but the above-mentioned are by far the most important. Strawberries are somewhat more widely scattered than the cane fruits, for the commercial production of the latter is confined very largely to the Willamette Valley area.

The counties leading in strawberry production are Marion, Linn, Clackamas, Washington, Hood River, Multnomah, Yamhill, and Polk (see Figure 9).

Multnomah and Clackamas counties lead in the production of Cuthbert red raspberries, having in the neighborhood of three-fourths of the commercial acreage in Oregon.

Black raspberries, on the other hand, are concentrated largely in the northeastern part of Yamhill county and the southeastern part of Washington county, with lesser acreages in Clackamas, Multnomah, Marion, and Linn counties.

With regard to loganberries, Marion county has more than half the acreage of the state. Yamhill, Polk, Clackamas, Multnomah, Linn, and Washington counties contain most of the remainder.

Marion county leads in cultivated blackberry production, having more than one-third of the state acreage. The other Willamette Valley counties have most of the rest, although a few are found also in the southern and Coast counties. The great abundance of wild Evergreen blackberries throughout Western Oregon has greatly retarded the expansion of cultivated acreage.

\*The acreage distribution as shown in Figure 8, A and B, is based on Table XXX (see Appendix).

Commercial production of gooseberries is confined almost entirely to the Willamette Valley area. Polk, Marion, Washington, and Clackamas counties are the most important.

Berry production in Douglas, Jackson, and Josephine counties is used largely in the fresh-market trade. Early high-priced berries are shipped to such markets as Portland and San Francisco, while the later crop is used locally and to a small extent by canneries.

Most of the cultivated berry production along the Coast is consumed locally. In addition to the large amounts of wild Evergreen blackberries, there is a small volume of other berries absorbed by canneries, but this on the whole is unimportant.

Berries raised in Umatilla, Union, and Deschutes counties, besides supplying the local trade, are shipped fresh to Portland, Spokane, and other neighboring markets. The acreage represented in "all other counties" as given in Table XXX (see Appendix) is grown almost entirely for local consumption, and in most cases such production is not sufficient even for local needs.

### COMPARISON WITH OTHER CROPS

A comparison of small fruits with tree fruits and nuts in Oregon shows that small fruits have increased relative to these other fruits since 1899. As indicated in Table V, berries constituted 3.9 percent of the acreage of all fruits and nuts in 1899, while in 1929 they amounted to 13.0 percent of all fruits and nuts. This percentage increase, it will be observed, was more rapid after 1919 than before.

TABLE V. ACREAGES OF ALL FRUITS AND NUTS IN OREGON, 1899-1929\*

Year	Acreage in Oregon			Percentage of total	
	All fruits and nuts	SMALL FRUITS	Tree fruits and nuts†	SMALL FRUITS	Tree fruits and nuts
	<i>acres</i>	<i>acres</i>	<i>acres</i>	%	%
1899 .....	89,741	3,470	86,271	3.9	96.1
1909 .....	141,689	5,122	136,567	3.6	96.4
1919 .....	149,709	8,463	141,246	5.7	94.3
1924 .....	160,648	17,240	143,408	10.7	89.3
1928 .....	156,169	20,274	135,895	13.0	87.0
1929 .....	148,703	19,405	129,298	13.0	87.0

\*Sources of information: The United States Federal Census data were used for the years 1899, 1909, and 1919. For acreages in 1924, the 1925 U. S. Census of Agriculture was used. Acreages in 1928 and 1929 were obtained from the Oregon annual crop production reports issued by the Division of Crop and Livestock Estimates, United States Bureau of Agricultural Economics, Portland. For berry-acreage figures in 1924, 1928, and 1929, see tables IV and VII. The 1924 and 1928 cane-fruit acreages were estimated by use of trend lines connecting the two nearest years for which figures were available. The small-fruit acreages for 1899, 1909, and 1919 include all berries; the 1924, 1928, and 1929 figures include strawberries, raspberries, loganberries, blackberries, gooseberries, and cranberries. Tree-fruit acreages in census years were approximated by allowing the following number of trees per acre: apples, 60; peaches and apricots, 100; prunes and plums, 100; pears and cherries, 70; grapes, 500; nuts, 25.

†Includes also nursery stock.  
peak in 1928.

Legend - One Dot Represents 10 Acres

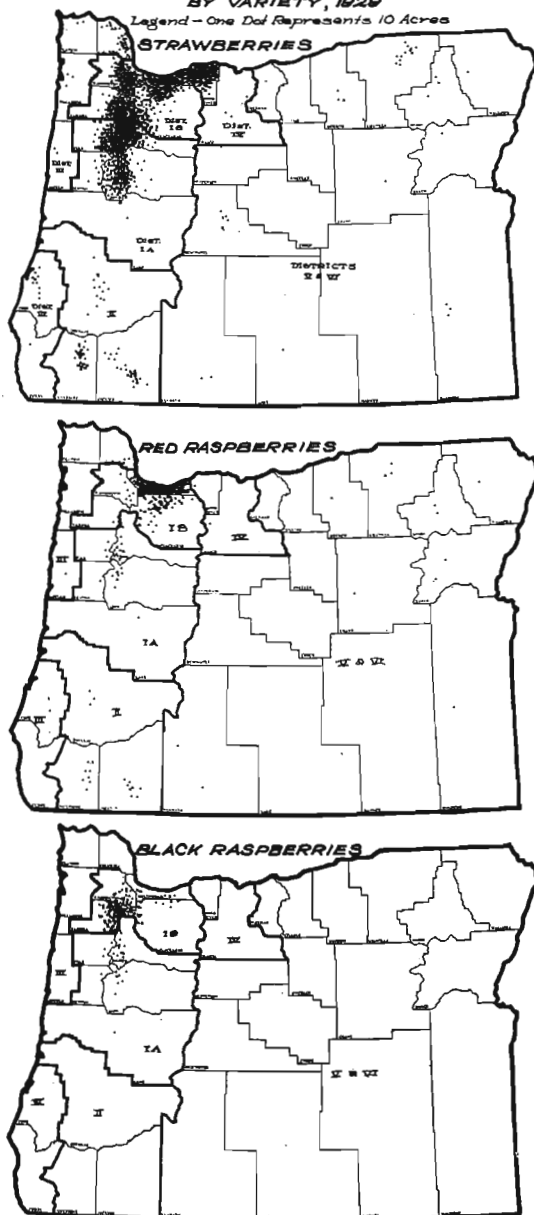


Figure 8, A. Distribution of small-fruit acreages in Oregon, 1929.

Legend—One Dot Represents 10 Acres  
**LOGANBERRIES**

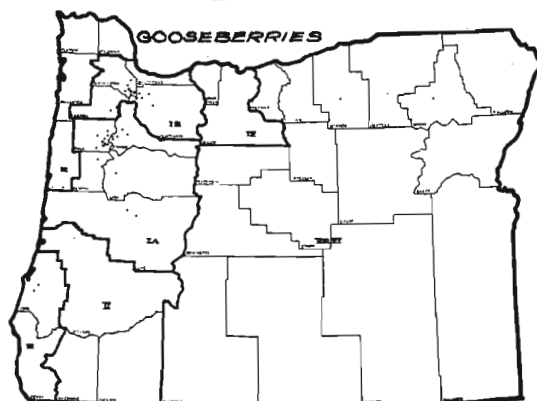
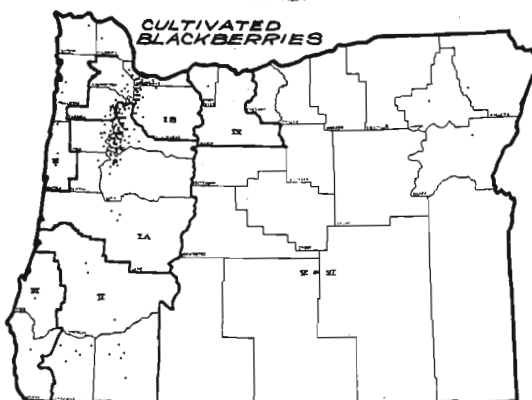
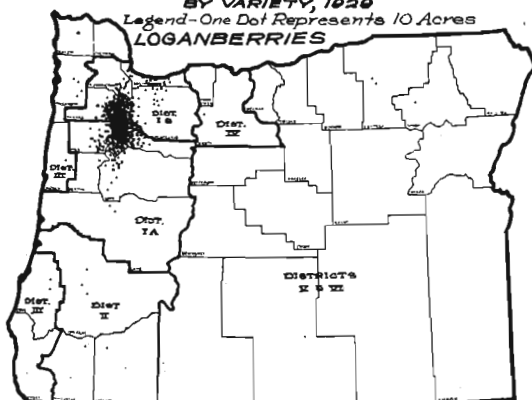


Figure 8, B. Distribution of small-fruit acreages in Oregon, 1929.

## ESTIMATED ACREAGE OF BERRIES BY KIND, IN LEADING COUNTIES, OREGON, 1929

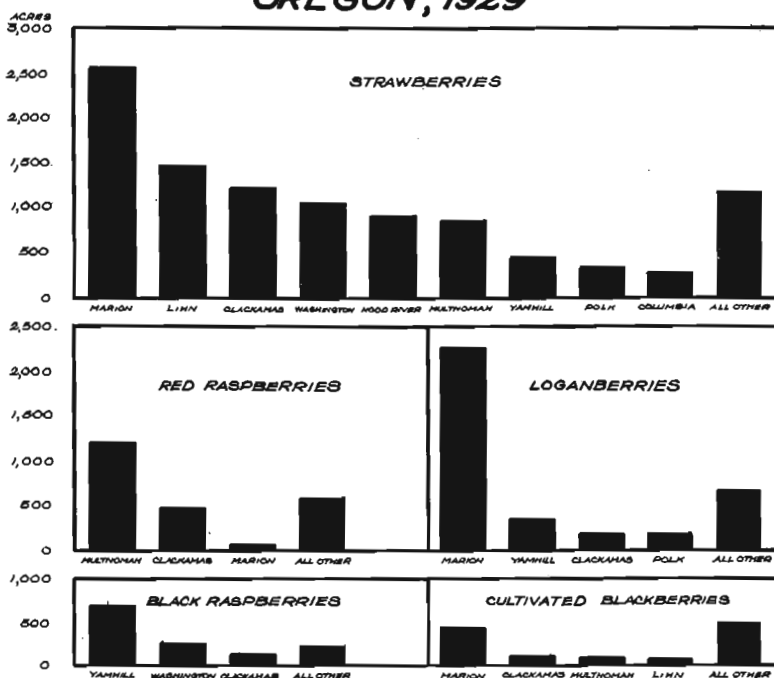


Figure 9. Estimated acreage of berries by kind, leading counties, Oregon, 1929.

### TRENDS IN BEARING AND NON-BEARING ACREAGE

**Bearing acreage.** Figure 10 shows that all of the berries have increased in acreage since 1899, but the rate of change has varied considerably.\* Strawberries underwent no material increase until after 1919, but since then the acreage has increased nearly fourfold. It is estimated that in 1928 the state acreage was approximately 10,700 acres and in 1929, approximately 10,300 acres.† The 1930 bearing acreage of strawberries in Oregon is placed at 9,450 acres by the Division of Crop and Livestock Estimates of

\*The statistics used in the accompanying chart were taken from Table VII. They refer to bearing acreages. Figures for 1929 are estimates arrived at by methods indicated in footnote of Table VII.

†Some discrepancy will be noted between these acreage estimates and those of the Division of Crop and Livestock Estimates of the U. S. Bureau of Agricultural Economics for the same years. The Federal Bureau's acreage estimate for Oregon in 1928 was 10,000 acres; in 1929 it was 10,500 acres. While it is true that certain localities reported continued increases, it is the consensus of opinion among cannery field men and others that in most berry districts there was a decline in 1929 as compared to 1928. From all the information that was obtained in this study, it seems probable that the total acreage of strawberries, both bearing and non-bearing, was greatest in 1927, but that bearing acreage reached its

the United States Bureau of Agricultural Economics (Table XXVII, Appendix), which represents a substantial decline from the year before.

Raspberries and loganberries increased rapidly during the whole period from 1899 to 1923. The Census did not list these crops separately prior to 1919, but a large part of the increase during this period was due to the expansion of loganberries. From 1919 to 1923, loganberries increased

### SMALL FRUIT ACREAGES IN OREGON BY KIND, 1899-1929

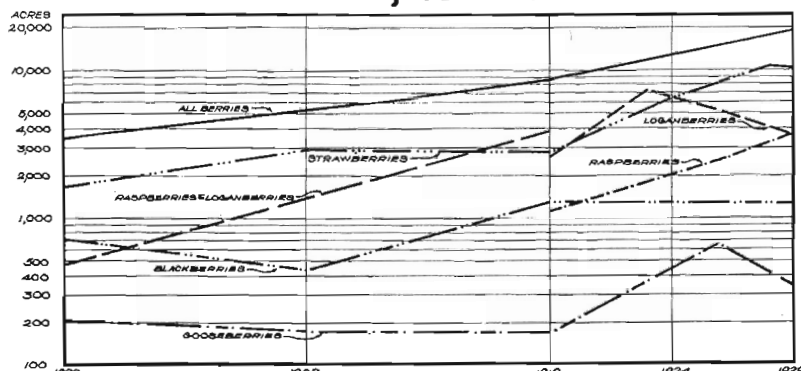


Figure 10. Small-fruit acreages in Oregon, by kind. 1899-1929.

very materially, the acreage having more than doubled; but since 1923 the acreage has trended downward nearly as rapidly as it increased during the previous period. Red and black raspberries, on the other hand, have made large increases since 1919. According to the Oregon crop-production report for 1926, the state acreage of red raspberries in that year was 1,875 acres and of black raspberries 765 acres, making a total of 2,640 acres of all raspberries as compared to the 1919 Census figure of 1,176 acres. This acreage increase continued to 1929, in which year it is estimated that there were 2,341 acres of red raspberries and 1,367 acres of blackcaps.

Considering the state as a whole, blackberries decreased in acreage from 1899 to 1909, increased substantially from 1909 to 1919, and since 1919 have apparently registered little change.

Gooseberries decreased slightly from 1899 to 1919, increased considerably from 1919 to 1926, and then declined rapidly to 1929.

The total acreage of all small fruits in Oregon has trended markedly upward ever since 1899. As indicated in Table V, there was an increase of about 5,000 acres, or 144 percent, from 1899 to 1919 and a further increase of more than 10,900 acres, or 130 percent, from 1919 to 1929.

**Non-bearing acreage.** There is little information available to show the extent of non-bearing as compared to bearing acreages of small fruits in Oregon. It normally requires one year after planting for strawberries to come into full bearing, and two years for the cane fruits. The fact that so-called "baby crops" are frequently harvested before the patches attain full bearing makes it quite difficult at times to draw distinctions. As far as

loganberries, cultivated blackberries, and gooseberries are concerned, however, almost all of the acreage represented by these crops in 1929 was of bearing age, since comparatively few new plantings were set out from 1927 to 1929. A small acreage of loganberries has been set out in parts of the Willamette Valley this year (1930) owing to somewhat more favorable contract offers made to growers.

Information obtained from berry growers and others in the Gresham area indicates an increase of approximately 20 percent in the red-raspberry acreage during 1928-29. Since that district has nearly three-fourths of all red raspberries grown in Oregon it means that a fairly high percentage of the state total is non-bearing. Indications are that many new plantings were set out again this past spring (1930) both in the Gresham and Lebanon (Linn county) districts.

The non-bearing acreage of blackcaps in 1929 is estimated to have been from 7 to 8 percent of the total blackcap acreage in the state. Since 1928 there has been little tendency for growers in the Springbrook area to expand their acreage, but in parts of Linn, Marion, and Clackamas counties a fair increase is reported.

Non-bearing acreage of strawberries probably did not exceed 10 percent of the total in 1929, owing to the fact that declining prices during 1927-28 deterred many farmers from setting out new patches. This is a small percentage considering the fact that it normally requires from 20 to 25 percent of new plantings for replacements alone. A substantial increase in plantings is reported this year (1930), however, with prospects of a still greater increase for the coming season. This prospect is especially true of the Improved Oregon and Marshall varieties.

TABLE VI. BERRY ACREAGE DISTRIBUTION ON FARMS IN THE WILLAMETTE VALLEY, 1929\*

Range in acres	Number of farms reporting†			Percentage of total		
	Straw-berries	Cane fruits	All berries	Straw-berries	Cane fruits	All berries
				%	%	%
Less than 2.0.....	182	213	395	50.0	49.0	49.5
2.0-3.9 .....	90	124	214	25.0	28.6	26.8
4.0-5.9 .....	48	48	96	13.2	11.1	12.0
6.0-7.9 .....	16	18	34	4.3	4.1	4.3
8.0-9.9 .....	6	11	14	1.6	2.5	2.1
10.0-11.9 .....	7	9	16	1.9	2.1	2.0
12.0-13.9 .....	6	5	11	1.6	1.2	1.4
14.0-15.9 .....	3	2	5	0.8	0.5	0.6
16.0 and over .....	6	4	10	1.6	0.9	1.3
TOTAL .....	364	434	798	100.0	100.0	100.0

\*Sample based on lists of growers and their acreages obtained from certain cooperative growers' associations and cannery field men throughout the Valley.

†Reported by kind and variety of berry. These figures do not refer to the total acreage of all berries per farm, but rather to the acreage of each kind and variety per farm.

**Acreage distribution on farms.** A large portion of Oregon's berry crop is produced by farmers who grow only a small acreage. Table VI shows that, in a sample of several hundred Willamette Valley berry farms, about half of all farmers who raise berries reported less than two bearing acres of any one variety in 1929. Approximately one-fourth of the berry farmers reported that they had anywhere between 2.0 to 3.9 acres; one-eighth had from 4.0 to 5.9 acres, and the remaining one-eighth had 6 acres or more of any one kind. It should be borne in mind, of course, that a grower who reported strawberries may also have had one or more other kinds of berries on his place. This is frequently the case. Then too, there will be some variation in acreage distribution from one locality to another.

### DISTRICT AND COUNTY TRENDS IN OREGON

For purposes of convenience in study the state has been divided into geographical districts as outlined in Figure 8, A and B. District I embraces all the Willamette Valley counties and is subdivided into District I (a) which includes Lane, Linn, Benton, Polk, and Marion counties, and District I (b) which includes Yamhill, Washington, Clackamas, and Multnomah counties. District II includes Douglas, Jackson, and Josephine counties to the south; District III, the Pacific Coast and lower Columbia counties; District IV, Hood River and Wasco. Districts V and VI include Umatilla, Union, Deschutes, and all other counties in the state.

**District trends.** The increasing importance of District I (the Willamette Valley counties) in small-fruit production is readily apparent from an examination of Figure 11 and Tables VII and VIII. This is the primary center of commercial berry production in Oregon. In 1899 it had 55 percent of all small-fruit acreages in the state. This percentage increased during each census year following, and by 1929 about 84 percent of the state total was in District I. The total small-fruit acreage during this period increased faster in District I (a), the southern Willamette Valley counties, than in District I (b), the northern counties.

Considering the strawberry acreage alone, the Willamette Valley counties had slightly more than half the state acreage in 1899 and more than three-fourths of the state total in 1929. The southern counties—Marion, Linn, Polk, etc.—increased faster than the counties to the north—Yamhill, Washington, Multnomah, and Clackamas. The Hood River district has declined in relative importance since 1919, although in actual acreage it increased somewhat.

Cane and bush fruit production (raspberries, loganberries, blackberries, and gooseberries) also has increased more rapidly in District I than elsewhere in Oregon. The percentage increased from 58 percent of the state total in 1899 to 90 percent in 1929, thus indicating that the production of these fruits has become even more concentrated than that of strawberries.

It will be noted from Table VII that in District I the actual acreage of all small fruits increased rapidly over the thirty-year period. District II (including Douglas, Jackson, and Josephine counties) has increased its small-fruit acreage slowly throughout, while District III (Coast and Lower Columbia counties) increased its strawberry acreage but in recent years

has slightly decreased its cane-fruit acreage. Columbia county is responsible for the strawberry-acreage increase in this district since 1919. In District IV (Hood River) the strawberry acreage increased gradually but consistently over the whole period. The rest of the state (represented by Districts V and VI) has in general actually decreased its small-fruit acreage

### PERCENTAGE DISTRIBUTION OF SMALL FRUIT ACREAGE BY DISTRICT IN OREGON 1899-1929

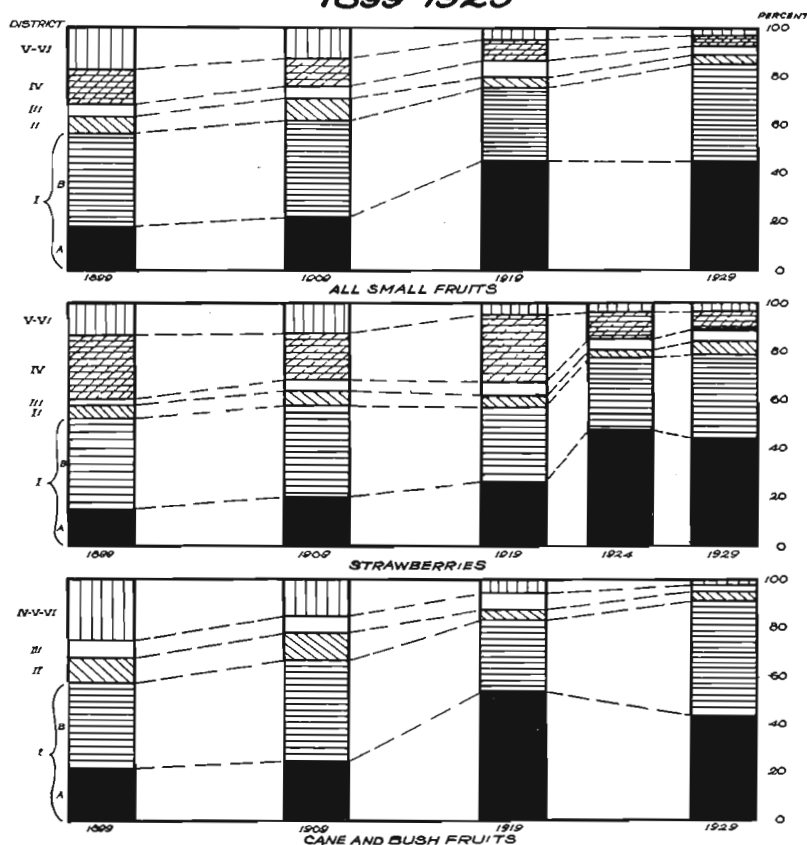


Figure 11. Percentage distribution of small-fruit acreages by districts in Oregon 1899-1929.

since 1899. This is for the most part a deficit-producing area so far as small-fruit production is concerned.

**County trends.** Trends in small-fruit acreages by counties in the Willamette and Hood River valleys since 1899 are shown in Tables IX and X. There was a definite and continuous expansion in most of the counties during this period, with a large part of the increase taking place from 1919 to 1929. An increase in the acreage of all small fruits took place in every

TABLE VII. SMALL-FRUIT ACREAGES BY KIND AND DISTRICT IN OREGON, 1899-1929\*

Variety and year	District I			District II	District III	District IV	Districts V and VI	State total
	(a)	(b)	Total					
<i>All small fruits</i>								
1899 .....	651	1,277	1,928	242	173	498	629	3,470
1909 .....	1,141	2,004	3,145	447	262	610	658	5,122
1919 .....	3,740	2,562	6,302	332	545	856	428	8,463
1929 .....	8,391	7,766	16,157	902	708	963	555	19,285
<i>Strawberries</i>								
1899 .....	287	666	953	82	43	460	254	1,792
1909 .....	597	1,092	1,689	187	116	571	378	2,941
1919 .....	725	861	1,586	102	163	810	151	2,812
1924 .....	3,046	1,820	4,866	166	299	796	200	6,327
1929 .....	4,513	3,525	8,038	555	457	925	309	10,284
<i>Raspberries and loganberries</i>								
1899 .....	104	174	278	30	44	11	116	479
1909 .....	413	656	1,069	156	96	20	119	1,460
<i>Raspberries</i>								
1919 .....	206	777	983	30	39	18	106	1,176
1929 .....	396	2,926	3,322	175	70	15	126	3,708
<i>Loganberries</i>								
1919 .....	1,943	618	2,561	95	80	9	10	2,755
1923 .....	5,117	1,576	6,693	89	190	55	14	7,041
1929 .....	2,661	815	3,476	52	84	9	29	3,650
<i>Blackberries</i>								
1899 .....	142	278	420	102	42	17	136	717
1909 .....	53	155	208	92	19	12	100	431
1919 .....	754	238	992	84	169	14	95	1,354
1929 .....	659	370	1,029	120	79	14	66	1,308
<i>Gooseberries</i>								
1899 .....	57	54	111	15	14	5	58	203
1926 .....	358	230	588	-----	30	-----	27	645
1929 .....	162	130	292	-----	18	-----	25	335

county from 1899 to 1919. Then from 1919 to 1929 a very rapid increase was registered in Marion, Linn, Clackamas, Multnomah, Washington, and Yamhill counties; a moderate increase in Polk and Hood River counties; and an actual decrease in Lane and Benton counties. The greatest *actual* increase took place in Marion county, but the greatest *relative* increase was in Clackamas, Linn, and Washington counties.

A comparison of strawberry-acreage trends as given in Figure 12 indicates that Marion, Linn, Washington, and Clackamas counties have in-

\*Sources of data: For the years 1899, 1909, and 1919, data were computed from the 12th, 13th, and 14th United States Census reports. Strawberry statistics for 1924 were obtained from the 1925 Federal Agricultural Census. Loganberry figures for 1923 were computed by the use of the State Tax Commission Biennial reports, 1921 and 1923; also from Oregon Crop Production reports 1920 to 1923. Estimates for 1929 (and gooseberries 1926) were obtained by special survey in which acreage and trend estimates were obtained from canner field men, county agents, growers and others in each berry district of Oregon. See also footnote to Table XXX (Appendix). Counties included in foregoing districts are as follows: *District I (a)*, Lane, Linn, Benton, Polk, Marion; *District (b)*, Yamhill, Washington, Clackamas, Multnomah; *District II*, Douglas, Jackson, Josephine; *District III*, Curry, Coos, Lincoln, Tillamook, Clatsop, Columbia; *District IV*, Hood River, Wasco; *Districts V, VI*, Umatilla, Union, Deschutes, Sherman, Gilliam, Morrow, Wallowa, Baker, Grant, Crook, Wheeler, Jefferson, Klamath, Lake, Harney, and Malheur.

TABLE VIII. PERCENTAGE DISTRIBUTION OF SMALL-FRUIT ACREAGES IN OREGON BY DISTRICT, 1899-1929\*

Crop and year	District I			District II	District III	District IV	Districts V and VI	State total
	(a)	(b)	Total					
<i>All small fruits</i>	%	%	%	%	%	%	%	%
1899 .....	18	37	55	7	5	15	18	100
1909 .....	22	39	61	9	5	12	13	100
1919 .....	44	30	74	4	7	10	5	100
1929 .....	44	40	84	4	4	5	3	100
<i>Strawberries</i>								
1899 .....	16	37	53	5	2	26	14	100
1909 .....	20	37	57	6	4	20	13	100
1919 .....	26	30	56	4	6	29	5	100
1924 .....	48	29	77	3	5	12	3	100
1929 .....	44	34	78	5	5	9	3	100
<i>Cane and bush fruits</i>								
1899 .....	22	36	58	10	7	3	22	100
1909 .....	25	42	67	12	7	2	12	100
1919 .....	53	30	83	4	7	1	5	100
1929 .....	43	47	90	4	3	....	2	100

\*Computed from Table VII.

### STRAWBERRY ACREAGE IN LEADING COUNTIES, OREGON, 1899-1929

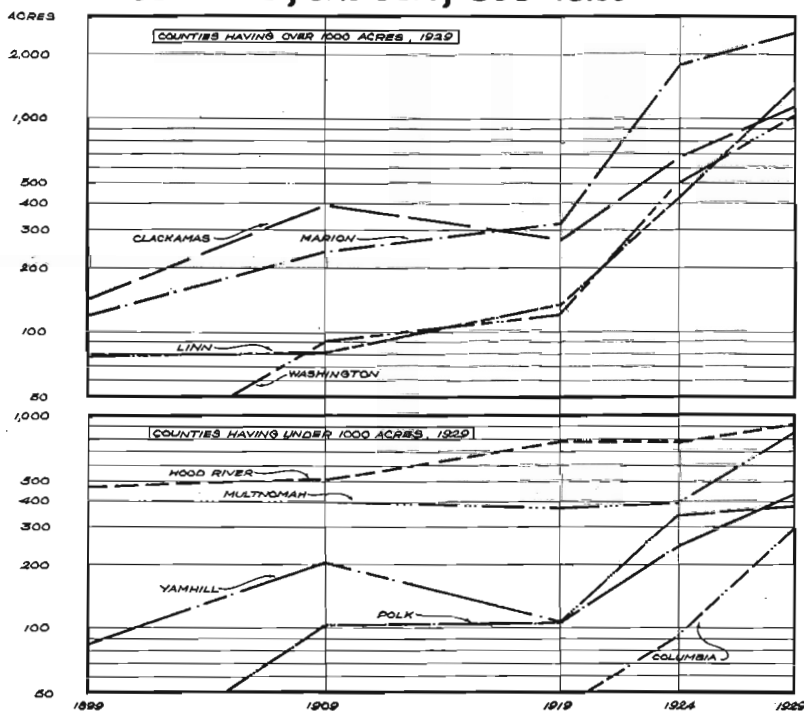


Figure 12. Strawberry acreages in leading counties, Oregon. 1899-1929.

creased their acreage of strawberries more rapidly than have any of the other counties. Linn and Marion counties led in actual acreage increase from 1924 to 1929. Hood River and Multnomah counties led all others from 1899 to 1919, but since the acreage in these counties has increased at a slower rate the above-mentioned counties now exceed them. Yamhill and Polk counties have in general trended upward but are still of lesser importance. Columbia county had a substantial increase from 1924 to 1929.

TABLE IX. SMALL-FRUIT ACREAGES BY KIND, WILLAMETTE VALLEY COUNTIES, 1899-1929\*

(District I a)

Kind and year	Lane	Linn	Benton	Polk	Marion	Total (I a)
<i>All small fruits</i>						
1899 .....	143	162	67	44	235	651
1909 .....	179	119	138	176	529	1,141
1919 .....	589	468	203	320	2,160	3,740
1929 .....	116	1,837	125	768	5,545	8,391
<i>Strawberries</i>						
1899 .....	36	77	36	18	120	287
1909 .....	82	81	91	108	235	597
1919 .....	112	132	50	115	316	725
1924 .....	343	411	123	356	1,813	3,046
1929 .....	25	1,450	88	375	2,575	4,513
<i>Raspberries and loganberries</i>						
1899 .....	29	19	6	7	43	104
1909 .....	57	27	33	39	257	413
<i>Raspberries (all)</i>						
1919 .....	40	86	20	8	52	206
1929 .....	24	135	10	47	180	396
<i>Loganberries</i>						
1919 .....	137	80	65	123	1,538	1,943
1923 .....	384	168	64	269	4,232	5,117
1929 .....	20	150	11	200	2,280	2,661
<i>Blackberries</i>						
1899 .....	54	36	19	7	26	142
1909 .....	19	5	5	10	14	53
1919 .....	283	161	40	40	230	754
1929 .....	30	94	10	60	465	659
<i>Gooseberries</i>						
1899 .....	15	18	3	4	17	57
1926 .....	25	16	10	172	135	358
1929 .....	17	8	6	86	45	162

\*For sources of information see footnote to Table VII.

There was no pronounced shift in the geographical distribution of raspberry production from 1919 to 1929. Multnomah and Clackamas counties showed the greatest actual increase in acreage during this ten-year period. The 1920 Census did not distinguish between red and black raspberries but the large increase represented in Yamhill and Washington counties is due almost entirely to the expansion of black raspberries.

The center of loganberry production has not changed materially since 1919. Marion county had more than half the state total in the years 1919, 1923, and 1929. The acreage in most of the counties increased greatly from 1919 to 1923, and decreased again from 1923 to 1929. In Clackamas county

TABLE X. SMALL-FRUIT ACREAGES BY KIND, WILLAMETTE VALLEY  
COUNTIES AND HOOD RIVER 1899-1929\*  
(District I b and Hood River)

Kind and year	Yam- hill	Wash- ington	Clack- amas	Mult- nomah	Total (I b)	Hood River
<i>All small fruits</i>						
1899 .....	185	62	246	784	1,277	498
1909 .....	515	135	567	787	2,004	520
1919 .....	705	445	449	963	2,562	774
1929 .....	1,551	1,620	2,244	2,351	7,766	917
<i>Strawberries</i>						
1899 .....	86	40	140	400	666	460
1909 .....	206	90	396	400	1,092	512
1919 .....	116	122	260	363	861	760
1924 .....	248	500	675	397	1,820	752
1929 .....	425	1,050	1,210	840	3,525	900
<i>Raspberries and logan- berries</i>						
1899 .....	28	8	20	118	174	11
1909 .....	273	25	98	260	656	4
<i>Raspberries (all)</i>						
1919 .....	262	70	44	401	777	5
1929 .....	711	345	604	1,266	2,926	8
<i>Loganberries</i>						
1919 .....	256	207	84	71	618	3
1923 .....	494	320	540	222	1,576	3
1929 .....	350	115	235	115	815	3
<i>Blackberries</i>						
1899 .....	45	6	37	190	278	17
1909 .....	22	7	40	86	155	4
1919 .....	64	38	52	84	238	6
1929 .....	55	50	145	120	370	6
<i>Gooseberries</i>						
1899 .....	16	4	8	26	54	5
1926 .....	40	100	80	10	230	.....
1929 .....	10	60	50	10	130	.....

\*For sources of information see footnote to Table VII.

there was an increase in the loganberry acreage about 1927 but the 1929 acreage was still well below the 1923 figure.

The acreage of cultivated blackberries increased appreciably in Marion county from 1919 to 1929, and increased slightly in Clackamas, Multnomah, Polk, and Washington counties. A decrease was registered in the other counties and especially in Lane county.

Gooseberry acreage expansion was most rapid in Polk, Marion, Washington, and Clackamas counties. Since 1926 there has been a substantial decrease in these as well as in other Willamette Valley counties.

## VARIETIES AND YIELDS

**Strawberries.** The leading strawberry varieties being grown in Oregon at the present time include the Marshall, Improved Oregon, Ettersburg 121, and Clark Seedling. The Improved Oregon and Marshall varieties are treated together, for there is little or no distinction between them as they

are now grown.\* They represent the soft varieties that are used primarily in the cold-pack trade, since they are too soft and too large for canning purposes. They grow best on a light well-drained soil and seem to do especially well in the rolling foot-hills. Marion, Clackamas, Washington, Linn, and Multnomah counties lead in the acreage of Oregon and Marshall strawberries, as shown in Table XI. A very large part of the acreage in the state of Washington is of the Marshall variety.

Ettersburg 121 is the main canning variety, being a firm, dark-red berry that holds its shape and color in the can. This variety is very selective as to soil conditions and can be grown successfully only on the heavier clay loam soils or the heavy alluvial soils found in parts of the Willamette Valley.† Parts of Columbia county are suited to its growth. Marion and Linn counties contain the bulk of the acreage in Oregon. The acreage of Ettersburgs in the state of Washington is very small.

The production of Clark Seedling strawberries is centered in the Hood River Valley. It is a fruit of medium size, dark red, very firm and solid, and very desirable for long-distance shipping. This variety is also an excellent canning berry. Its chief disadvantage lies in the fact that it is a light yielder (see Table XII).

In addition to these, the Gold Dollar strawberry is grown to some extent in favored localities for the early fresh market since it usually matures from ten days to two weeks earlier than other varieties. There is also a small scattered acreage of Everbearing strawberries. Formerly the Trebla, Wilson, and Magoon varieties were quite important, but these have been replaced very largely by the Oregon, Marshall, and Ettersburg 121.

It is estimated that in 1929 the Willamette Valley counties and Columbia county to the north had approximately 2,350 acres of Ettersburg 121 strawberries, which represented nearly three-tenths of all the strawberries in this area (see Table XI). Of the remaining seven-tenths, Oregon and Marshalls constituted by far the largest amount, probably 85 to 90 percent. Gold Dollar and miscellaneous varieties made up the remainder.

TABLE XI. ESTIMATED BEARING ACREAGE OF STRAWBERRIES, BY VARIETY AND COUNTY, WESTERN OREGON, 1929‡

County	Ettersburg 121	Oregon, Marshalls, and miscellaneous	Total	County	Ettersburg 121	Oregon, Marshalls, and miscellaneous	Total
Benton .....	56	32	88	Yamhill .....	15	410	425
Linn .....	500	950	1,450	Washington .....	75	975	1,050
Marion .....	1,400	1,175	2,575	Multnomah .....	25	815	840
Polk .....	160	215	375	Clackamas .....	50	1,160	1,210
Total of foregoing .....	2,116	2,372	4,488	Total of foregoing .....	165	3,360	3,525
Columbia .....	66	228	294	Total of all .....	2,347	5,960	8,307

‡These figures were arrived at by obtaining estimates from cannery field men, county agents, growers, and others familiar with conditions in their respective localities.

\*Oregon Agricultural Experiment Station Bulletin 245. May 1929. p. 22.

†*Ibid.*, p. 22.

It will be observed from Table XI that Marion and Linn counties produce about 80 percent of all the Ettersburgs raised in Oregon. Counties leading in Oregon and Marshall acreage are Marion, Clackamas, Washington, Linn, and Multnomah.

**Other berries.** Cuthbert is the only variety of red raspberry of importance in Oregon. It is admirably adapted to both the canning and fresh-fruit trade. The rich, well-drained soils in the Gresham district, combined with the cool, moist atmosphere, make that section the leading district in the production of Cuthbert raspberries. Plum Farmer and Munger are the leading varieties of black raspberries. They are grown to some extent in various parts of the Willamette Valley. The soils and topography of the Springbrook-Newberg district are especially well suited to their growth.

Evergreen is the outstanding blackberry variety in Oregon. Besides being cultivated, it grows wild in great abundance throughout Western Oregon. In many places it is even considered a nuisance to pastures. Nevertheless, the wild Evergreen furnishes a very large part of the blackberry tonnage used by Oregon cannerymen. The Himalaya and Lawton varieties are grown to a limited extent. They are not so desirable for canning purposes as the Evergreen. A few attempts are being made to cultivate the wild mountain blackberry. The fruit is of fine flavor but yields do not compare favorably with the other varieties.

Loganberry is the only variety of its class that has established itself in Oregon. Primus and Phenomenal have not been able to compete with it.\*

The Oregon Champion gooseberry is the standard variety grown in this state. It is vigorous, productive, early bearing, and the fruit is of medium size.† Gooseberries are grown in various parts of the Willamette Valley.

**Yields.** Estimates of usual yields per acre of small fruits in Oregon were obtained from cannery field men, county agents, growers, and others acquainted with conditions in their respective localities. A summary of these estimates as given in Table XII indicates that the usual yield per acre of all strawberries in Oregon is approximately 1.70 tons per acre. When individual varieties are considered, Marshalls and Improved Ore-gons yield the highest, averaging about 1.85 tons; Ettersburgs next, 1.55 tons; and Clark Seedlings lowest, 1.25 tons. The average yield of red raspberries in Oregon is about 1.75 tons. Raspberry yields average somewhat higher in the Gresham district than in other sections of the state. Blackcaps average slightly more than 1 ton per acre; loganberries not quite 2 tons; blackberries 3.5 tons; and gooseberries a little more than 2 tons.

Berry yields in 1929 averaged lower than usual in all cases except Clark Seedling strawberries, which yielded much better than average in that year. The 1930 yields of Marshalls, Ettersburgs, and Clark Seedlings are reported to have averaged considerably under the 1929 figure. Loganberries, blackberries, and blackcaps also have yielded somewhat less. The Gresham district reported an average yield of 1.5 tons of Cuthbert raspberries in 1930, which is somewhat lower than the usual yield in that section.

\*See Oregon Experiment Station Circular 48, The Cane Fruit Industry in Oregon, by H. Hartman. p. 6.

†See Colorado Agricultural Extension Service Bulletin 300 A, Small Fruits. p. 58.

TABLE XII. AVERAGE YIELD PER ACRE OF BERRIES IN OREGON BY VARIETY AND KIND, 1919-1929\*

Variety	Usual yield	1929	1919
	<i>tons</i>	<i>tons</i>	<i>qts.</i>
All strawberries .....	1.70	1.25	1,479
Oregon and Marshalls .....	1.85	1.30	.....
Ettersburg 121 .....	1.55	1.00	.....
Clark Seedlings .....	1.25	2.00	.....
Red Raspberries .....	1.75	1.35	1,552
Blackberries .....	3.50	2.55	1,580
Blackcaps .....	1.05	0.80	.....
Loganberries .....	1.85	1.60	3,702
Gooseberries .....	2.15	2.05	2,132

\*Federal Census data for the year 1919. The 1929 and usual yield figures were arrived at by estimates obtained from cannery field men, county agents, growers, and others familiar with conditions in the berry-producing districts of Oregon.

It is believed that the trends in loganberry and gooseberry yields have been downward during the past eight or ten years. Many contend that whereas the state average yield of loganberries was formerly much more than two tons per acre, the average in more recent years has been under two tons. This may be explained largely by the fact that the unfavorable prices prevailing in recent years have discouraged growers from giving their patches the proper care. Yields seem to have held up well on patches properly cared for.

According to statements of growers and others in the Hood River district, the yield of Clark Seedlings trended downward for a number of years, but with the better care given the patches it is thought that yields are again improving. The strawberry root weevil has been a serious pest in that section and has no doubt had an adverse effect on yields.

Reports on strawberry yields issued annually by the Division of Crop and Livestock Estimates of the Federal Bureau of Agricultural Economics seem to indicate a downward trend for Oregon since 1918-1923. According to the Bureau estimates, the 1918-1923 state average yield of all strawberries was 1,835 quarts, while the 1924-1929 average was 1,724 quarts.† Cannery field men and growers in the important berry sections of the Willamette Valley, on the other hand, seem to be of the opinion that strawberry yields have, on the whole, held up quite well.

As far as the other berry varieties are concerned, yields have apparently held up well, taking the state as a whole. Yields have no doubt declined in some sections but have shown improvement in others. Berry acreage expansion on to the newer lands has also tended to maintain yields.

**Comparative yields, Oregon and Washington.** A comparison of usual yield estimates obtained from a number of cannerymen and horticultural inspectors in Washington with similar estimates in Oregon indicate that Washington berry yields run somewhat higher than yields in Oregon. These averages, summarized in Table XIII, show that in the state of Washington soft strawberries yield about three-tenths ton more per acre than in Oregon; red raspberries yield one-half ton more; loganberries, two-thirds ton more; blackberries, two tons more; and gooseberries, five-

†See Table III, p. 18.

sixths ton more per acre. It is probable that the greater availability of moisture in parts of western Washington accounts in large part for this difference.

TABLE XIII. USUAL YIELDS PER ACRE OF BERRIES IN OREGON AND WASHINGTON, BY VARIETY AND KIND

State	Marshall straw- berries	Red rasp- berries	Logan- berries	Black- berries	Goose- berries
	<i>tons</i>	<i>tons</i>	<i>tons</i>	<i>tons</i>	<i>tons</i>
Oregon .....	1.85	1.75	1.85	3.50	2.15
Washington .....	2.15	2.25	2.50	5.50	3.00

## TRENDS IN FRUIT PACK AND FRESH MARKET SHIPMENTS, NATIONAL, REGIONAL, AND STATE

As has already been mentioned, Oregon must rely to a large extent upon canning and cold pack in the disposal of its surplus production of small fruits. National and regional trends in the volume of pack have an important influence on the industry in Oregon. It is essential to know the trends in the important producing areas in order to gain some idea of the extent of competition from those areas.

### TRENDS IN CANNED FRUIT PACK

#### COMPARISON WITH OTHER FRUITS

Canned berries make up a comparatively small proportion of the United States canned pack of all fruits. According to reports of the Federal Census of Manufactures the national berry pack averaged 9.4 percent of the pack of all fruits during the years 1923, 1925, and 1927 (see Table XXXI, Appendix).<sup>\*</sup> When Hawaiian pineapple is included in the United States pack, the average for these years is reduced to 7.1 percent. An idea of the competitive position of berries as compared to other fruits may be obtained from Figure 13, which shows that the packs of both peaches and pineapple are much greater than of berries. The volume of canned peaches has averaged more than four times the national canned berry output, while the Hawaiian pineapple pack has been more than three times as great. The packs of apples and pears have averaged larger, too, while apricots have averaged nearly the same.

It appears from Figure 14 that canned berries in the United States

<sup>\*</sup>The Federal Census of Manufacturers is taken every two years, and since the 1929 figures are not yet available it has not been possible to use them in this average. When Federal Census data are compared with figures of the California Cannery League, there seems to be some indication that the Census has understated the actual volume of peaches and apricots in California. This is also true of Oregon berries when Census figures are compared with statistics of the Northwest Cannery Association. Even though the Census data may tend to understate the actual volume of fruit pack in the United States, however, this should not seriously affect their usefulness in showing trends and in comparing the relative importance of berries with other fruits in the national pack.

# **CANNED PACK OF FRUITS IN THE UNITED STATES AND HAWAII** (Ave of years 1923-1925 & 1927)

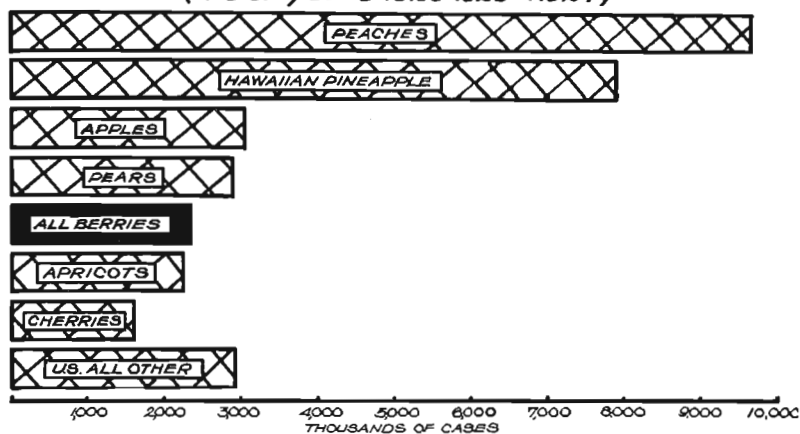


Figure 13. Canned pack of fruits in the United States and Hawaii. Average 1923, 1925, and 1927.

# **CANNED PACK OF FRUITS IN THE UNITED STATES AND HAWAII** 1899-1927

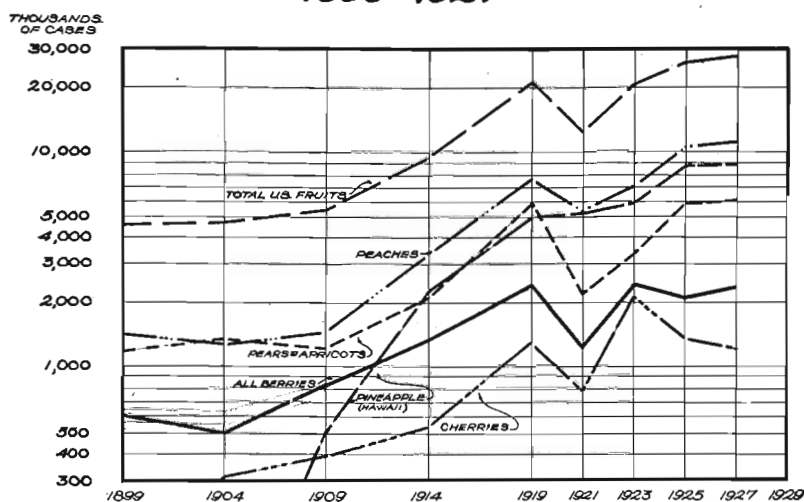


Figure 14. Canned pack of fruits in the United States and Hawaii. 1899-1927.

have not increased in proportion to the pack of other fruits.\* The average for the years 1899, 1904, and 1909 shows that berries constituted 13 percent of the United States canned fruit pack in those years. Berries averaged 11.4 percent of the national pack during the next three census years, 1914, 1919, and 1921, while in the years 1923, 1925, and 1927 they averaged only 9.4 percent.† The difference in rate of growth is especially pronounced when we compare the trend of berries with that of peaches and Hawaiian pineapple. The peach pack in 1927 was nearly 8 times as great as it was in 1909, the Hawaiian pineapple pack was 17 times as great, while the canned berry pack was only about 3 times as great. Apples showed about the same proportionate gain as berries throughout the period, while apricots, pears and cherries showed a greater proportionate gain.

In contrast with the foregoing national trends, Figure 15 and Table XXXII (see Appendix) show that since 1919 the canned berry pack in Oregon and the Pacific Northwest has increased at a somewhat faster rate than the packs of California fruits and Hawaiian pineapple, although at a slower rate than the total pack of all canned fruits in the Pacific Northwest. As will be emphasized presently, the more favorable showing of berries in the Pacific Northwest is attributable to the fact that in the past twelve years the berry pack in Oregon and Washington has increased much more rapidly than the berry packs in other sections of the country.

### **COMPARATIVE CANNED FRUIT PACK— CALIFORNIA, HAWAII, AND PACIFIC NORTHWEST 1919-1929**

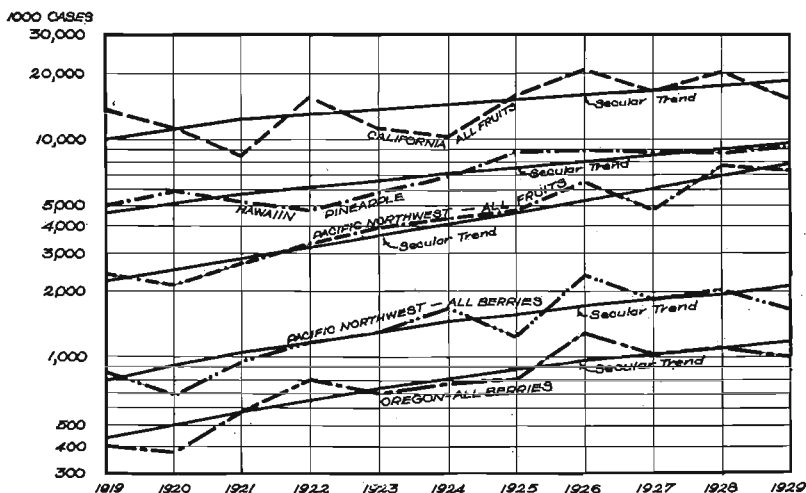


Figure 15. Comparative canned fruit pack, California, Hawaii, Pacific Northwest, and Oregon. 1919-1929.

\*Based on Table XXXI (see Appendix).

†Yearly figures are not available to show these comparisons, but the Census figures when averaged in the foregoing manner should give quite a reliable picture of trends.

Figure 15 also shows that the rate of increase in the pack of canned berries has not been quite as rapid during the past few years as it was from 1919 to 1924. This is undoubtedly due in large measure to the fact that the volume of berries going to cold pack has been increasing very rapidly in the Pacific Northwest.

#### NATIONAL CANNED BERRY PACK BY KIND

**Volume by kind.** Figure 16 shows that blackberries are canned in considerably greater volume than any other berry in the United States.\* The average for the years 1919, 1924, 1925, and 1927 indicates that blackberries have made up about one-third of all berries packed in the United States. Raspberries rank second, averaging nearly one-fourth of the total of all berries. The Census did not list red and black raspberries separately, but statistics from other sources for Oregon, Washington, New York, and Michigan—the leading states in canned raspberries—indicate that red raspberries made up, on the average, about 77 percent and blackcaps about 23 percent, of the total.† These figures, however, should be considered only approximately accurate.

#### UNITED STATES CANNED BERRY PACK, BY KIND (Ave of years 1919-24-25-27)

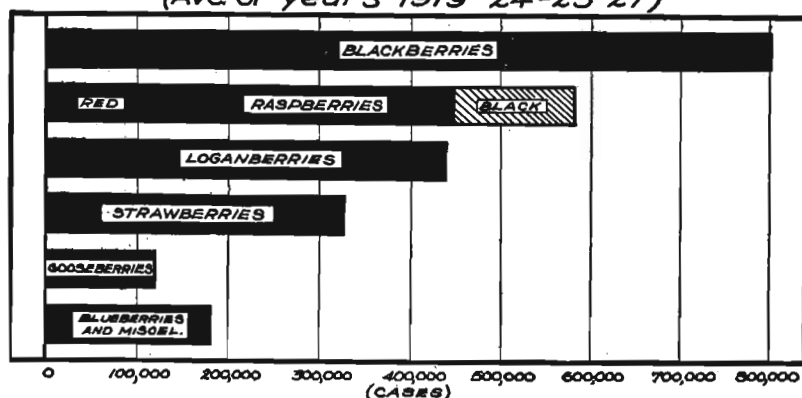


Figure 16. United States canned berry pack, by kind. 1919-1927.

Loganberries rank next in order, averaging slightly less than the pack of red raspberries, and including a little less than one-fifth of the United States total berry pack. Strawberries follow loganberries, the pack being about three-fourths that of loganberries. The volume of canned gooseber-

\*Information based on Table XXXIII (see Appendix).

†Based on the following sources of information: For Oregon and Washington, the annual reports of the Northwest Cannery Association were used; New York statistics, from reports of the Association of New York Cannery, Inc.; Michigan, 1924 figures from National Cannery Association, Special Survey; for years 1928 and 1929, Michigan Canning Report, issued by Michigan State Department of Agriculture. See also Table XXXV (Appendix).

ries, in turn, has averaged only about one-third that of strawberries. Blueberries and miscellaneous berries are shown for comparison with the rest.

**Trends by kind.** A comparison of trends of berries by kind since 1899 indicates that canned loganberries, blackberries, and raspberries have increased more rapidly than canned strawberries and gooseberries. (See Figure 17 and Table XXXIII, Appendix.) From the small pack of 40,000 cases reported by the Census in 1914,\* loganberries increased to 641,000 cases in 1924. The peak of canned loganberries was reached in 1916 when Oregon and Washington packed nearly 900,000 cases of this fruit,† but as will be shown presently the volume has since declined.‡

### UNITED STATES CANNED BERRY PACK BY KIND, — 1899-1927

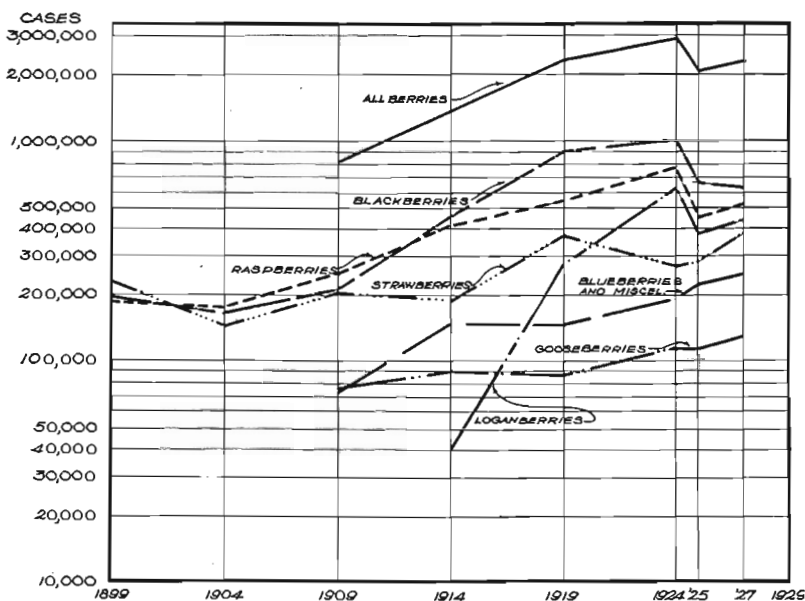


Figure 17. Canned pack of berries in the United States, by kind. 1899-1927.

The packs of blackberries, raspberries, and strawberries averaged approximately the same in volume during the years 1899, 1904, and 1909. Comparing these figures with the 1919-1927 average, it will be noted that the pack of blackberries increased more than fourfold, raspberries nearly threefold, and strawberries twofold. Gooseberries were not reported by

\*Loganberries were not reported prior to 1914. The pack in the earlier years, however, is known to have been very small. California's pack in 1909 was reported to be 3,204 cases, and in 1912 it was 16,965. (See California Fruit News Annual Review 1912 and 1913, p. 17.)

†Northwest Cannery Association gives 895,387 cases packed in the Pacific Northwest in 1926. See Table XXXVI (Appendix).

‡See Figure 19 B and discussion pages 47 and 49.

the Census prior to 1909, but the trend since 1909 has been slowly upward—slower, in fact, than any of the other berries.

The 1929 figures of the Federal Census of Manufactures are not yet available for comparison with the earlier years. Some notion of the changes that have occurred from 1927 to 1929 may be gained, however, by examining the shifts in the leading states where berry-pack statistics are available from other sources. When the packs in the states of Oregon, Washington, New York, Michigan, and Texas (as listed in Table XXXV, Appendix) are totaled, and percentages of the 1929 to the 1927 figures are computed, the following figures are obtained:

Strawberries, 1929 pack.....	87 percent of 1927.
Raspberries (all), 1929 pack.....	110 percent of 1927.
Blackberries, 1929 pack.....	109 percent of 1927.
Gooseberries, 1929 pack.....	41 percent of 1927.
Loganberries, 1929 pack.....	74 percent of 1927.
Total berries, 1929 pack.....	94 percent of 1927.

If these figures are in any way an index of what the national trend has been, it would seem that the United States strawberry pack declined somewhat from 1927 to 1929; that the raspberry and blackberry packs increased; and that the gooseberry and loganberry packs decreased considerably in the two-year period.

#### LEADING STATES IN CANNED BERRY OUTPUT

Oregon and Washington are the most important states in the Union with respect to the annual output of canned berries. Reference to Figure 18 shows that these two states have packed, on the average, about three-fifths of the canned berries in the United States.\* Maine's berry pack is omitted from the figure since the pack in that state consists almost entirely

#### PERCENTAGE DISTRIBUTION OF CANNED BERRY PACK IN THE U.S. BY STATE, 1919-1927

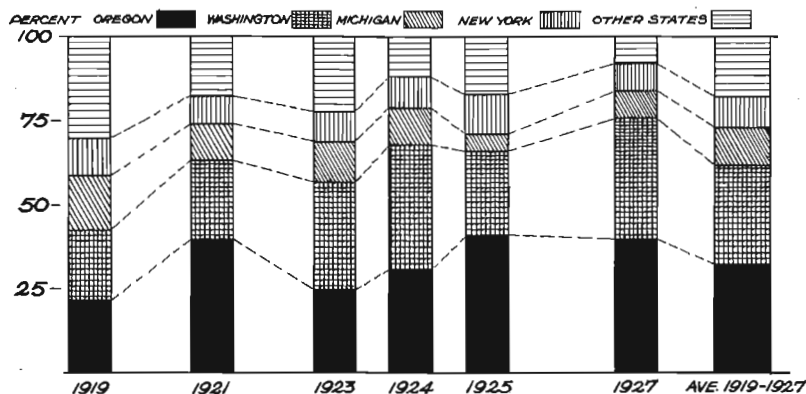


Figure 18. Percentage of canned berry pack by states in United States, 1919-1927.

\*Information taken from Table XXXIV (see Appendix).

of blueberries. Even if Maine's pack were included, however, Oregon and Washington would still be credited with more than half of the United States total.

Something of the expansion of the canned berry industry in Oregon and Washington relative to other states is indicated in Table XIV, which shows the value of the canned berry pack by principal states in the United States since 1909. Oregon and Washington were unimportant in the national berry pack as early as 1909, for in that year only 7 percent of the value of all canned berries in the United States was credited to these two states. This percentage increased very rapidly in succeeding years. By 1914 Oregon and Washington's share was 29 percent of the national total, and in 1919 their share increased to 43 percent. The increase continued to 1927, when 75 percent of the value of canned berries in the United States, exclusive of Maine, was reported in these states.

Michigan increased the value of its berry pack from 1909 to 1919, relative to the United States as a whole, but since then has declined. New York, on the other hand, declined from 36 percent in 1909 to 9 percent in 1927. The greatest decrease, however, took place in the states listed as "all others" in the table. Nearly half of the berry pack in the country was put up in those states in 1909, while in 1927 they are credited with only 8 percent.

TABLE XIV. VALUE OF CANNED BERRY PACK BY PRINCIPAL STATES IN THE UNITED STATES, 1909-1927\*

(Thousands of dollars)

State	1909	1914	1919	1921	1923	1925	1927
Oregon .....	\$ 46	\$ 286	\$3,254	\$1,810	\$2,839	\$3,366	\$3,669
Washington .....	73	543	3,422	1,397	3,033	2,007	2,746
Michigan .....	150	320	2,392	596	1,177	432	825
New York .....	596	717	2,070	495	813	1,036	792
All others .....	784	989	4,643	1,048	1,792	1,264	660
Total of foregoing.....	1,649	2,855	15,781	5,346	9,654	8,105	8,692
Maine .....	105	247	667	437	735	974	1,114
Total all berries .....	1,754	3,102	16,448	5,783	10,389	9,079	9,806
Percentages of total	%	%	%	%	%	%	%
Oregon .....	3	10	21	34	29	41	42
Washington .....	4	19	22	26	31	25	32
Michigan .....	9	11	15	11	12	5	9
New York .....	36	25	13	9	9	13	9
All others .....	48	35	29	20	19	16	8
Total .....	100	100	100	100	100	100	100

\*These data were obtained from the following sources: For the years 1909, 1914, and 1919, Fourteenth Census of the U. S. Manufactures; 1919, Canning and Preserving report. For years 1921, 1923, 1925, from Federal Census of Manufactures Biennial reports, 1921-1927.

#### CANNED BERRIES BY KIND AND STATE

Some notion of the relative importance of leading states in the canned pack of berries by kind may be obtained from Tables XV and XVI and Figure 19, A and B.† The Census of Manufactures did not list strawberries,

†Figure 19, A and B, is based partly on Table XV and partly on Tables XXXV and XXXVI (see Appendix).

gooseberries, or blueberries separately in 1925 and 1927, including them in the term "other berries." An attempt has been made to segregate these by methods explained in the table footnote. The resulting figures are believed

TABLE XV. CANNED BERRY PACK BY KIND AND STATE IN THE UNITED STATES\*  
(Standard Cases 1909-1924; Actual Cases 1925-1927)

Kind and state	1909	1914	1919	1924	1925†	1927†	Average 1919-1927
<i>Strawberries</i>							
Oregon .....	3,490	15,194	21,107	86,607	110,574	228,027	111,579
Washington .....	§	17,564	25,426	37,001	34,218	58,337	38,745
Michigan .....	9,754	23,940	87,892	84,194	17,693	42,717	58,124
New York .....	32,159	39,490	32,089	20,769	14,077	14,346	20,320
Maryland .....	106,724	63,878	75,215	18,218	1,615	8,573	25,905
All others .....	56,279	25,853	132,368	13,545	94,901	40,057	70,218
Total .....	208,406	185,919	374,097	260,334	273,078	392,057	324,891
<i>Raspberries</i>							
Oregon .....	9,658	29,641	37,416	111,288	81,409	92,579	80,673
Washington .....	10,109	89,738	103,986	299,627	85,576	171,889	165,315
Michigan .....	27,384	67,142	131,223	138,632	65,595	96,116	107,892
New York .....	169,486	199,230	213,096	223,112	206,834	152,678	198,930
All others .....	30,427	28,881	65,698	10,432	22,283	15,284	28,424
Total .....	247,064	414,632	551,419	783,091	461,877	528,546	581,234
<i>Blackberries</i>							
Oregon .....	§	§	230,205	222,088	214,898	129,641	199,208
Washington .....	24,052	93,768	225,620	489,837	277,996	399,733	355,797
Michigan .....	6,312	9,624	81,022	42,095	8,714	8,025	34,964
Texas .....	§	6,478	52,490	106,274	96,465	60,756	78,996
All others .....	180,174	342,291	291,320	147,135	61,551	28,178	132,046
Total .....	210,538	452,161	910,657	1,007,429	659,624	626,333	801,011
<i>Gooseberries</i>							
Oregon .....	1,938	3,459	12,324	61,565	45,164	72,008	47,765
Washington .....	§	§	4,479	15,704	22,178	26,853	17,303
Michigan .....	11,766	28,999	33,730	30,440	7,922	19,127	22,805
New York .....	3,866	7,684	1,391	-----	2,495	1,383	1,317
All others .....	58,742	49,451	35,102	9,274	41,077	13,718	24,793
Total .....	76,312	89,593	87,026	116,983	118,836	133,089	113,983
<i>Loganberries</i>							
Oregon .....		§	195,535	407,151	325,674	338,342	316,676
Washington .....		§	64,857	208,197	57,054	102,857	108,241
All others .....		§	13,272	25,918	3,615	-----	10,701
Total .....		39,508	273,664	641,266	386,343	441,199	435,618

\*Sources of data: 1909 figures from 13th Census of U. S., Vol. 10, Manufactures pp. 393-97. For 1914, Census of Manufacturers 1914, Vol. 2, pp. 380-85. For 1919, 14th Census of U. S., Manufactures, Canning and Preserving. 1924 figures from National Canners Association Special Survey; 1925 and 1927 statistics from Federal Census of Manufactures, biennial reports.

†The 1925 and 1927 Census did not segregate strawberries, gooseberries, and blueberries, including them in the term "other berries." An attempt has been made to segregate strawberries and gooseberries from "other berries" as follows: For Oregon and Washington the Northwest Canners Association figures were used to get at the percent of strawberries and gooseberries included in "other berries" and these percents were used in dividing the Census figure. Similarly, the New York figures were obtained by use of the Association of New York Canners statistics as a base. Michigan figures were obtained by averaging packs of adjacent years, 1924 and 1928-1929, to get the approximate percentage of each berry. For "All other states" it is assumed that the percents would be the same as the foregoing states in 1925 and 1927. These figures should be approximately correct, but the possibility of error must be recognized.

§Not reported separately in these years.

||Not reported.

to be approximately correct, but the possibility of error, must, of course, be recognized.\*

The increasing importance of Oregon in the United States canned-strawberry pack is readily apparent from an examination of the accompanying Tables XV and XVI and Figure 19, A and B. Oregon increased its strawberry pack from 2 percent of the United States total in 1909 to 58 percent in 1927. Washington increased in relative importance from 7 percent of the national pack in 1919, to 15 percent in 1927. Unlike Oregon, however, Washington has not increased its actual volume of pack since

### **PACK OF CANNED BERRIES, BY KIND , IN LEADING STATES, 1919-1929**

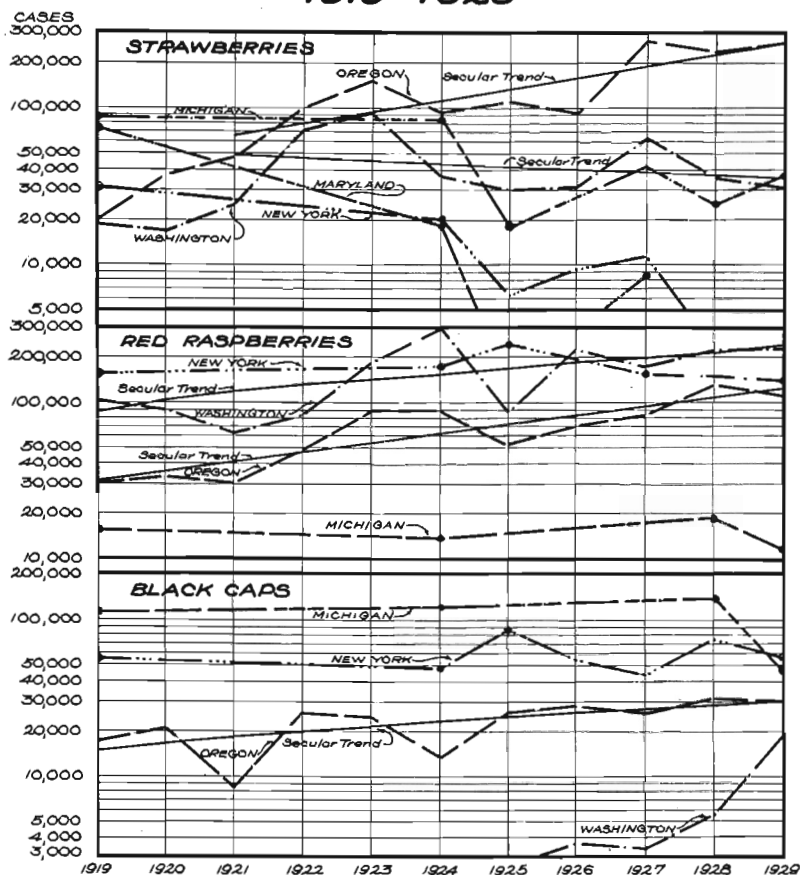


Figure 19 A. Pack of canned berries by kind. See also Figure 19 B on opposite page.

\*It will be observed that the Census figures do not always check with statistics obtained from other sources; in some cases they are larger and in other cases smaller. The Census reports, however, are the only source of information available for many states, and

1922; the tendency, if anything, has been downward. Maryland formerly packed about half the volume of canned strawberries in the United States, but now that state packs a very small percentage of the total. Michigan and New York have likewise declined in relative importance.

As early as 1909 Oregon and Washington each canned approximately 4 percent of the United States pack of raspberries. Oregon's raspberry pack in 1919 amounted to 7 percent of the United States pack, while in 1927 it amounted to 17 percent. Washington had 19 percent of the national pack in 1919 and 32 percent in 1927. (The Federal Census did not list red and

### PACK OF CANNED BERRIES, BY KIND , IN LEADING STATES, 1919-1929

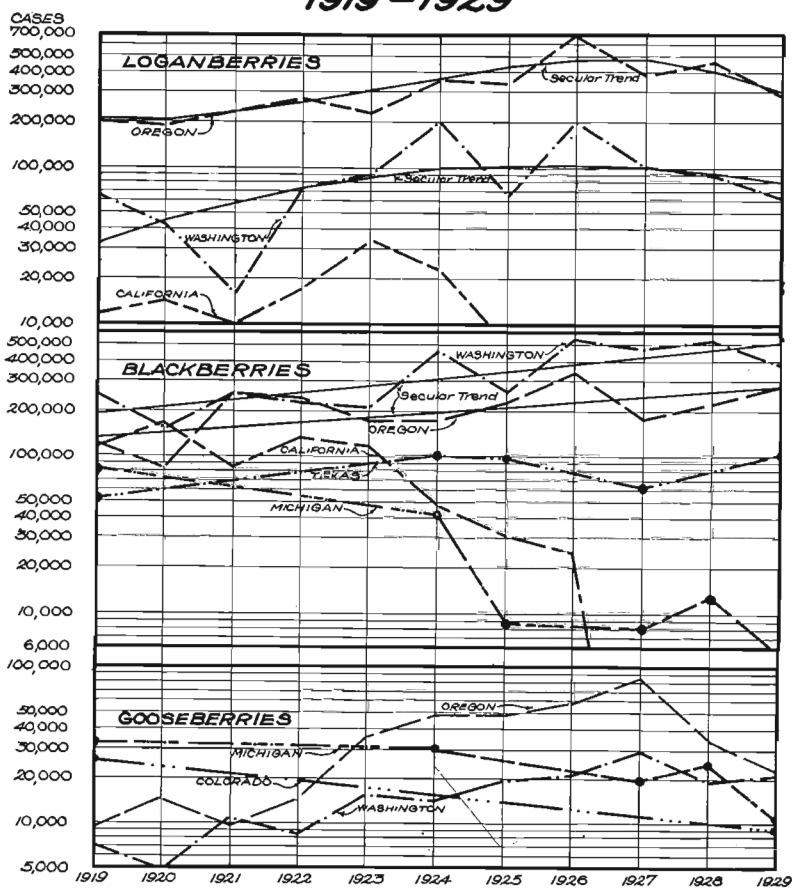


Figure 19 B. Pack of canned berries by kind. See also Figure 19 A on opposite page.

for purposes of showing trends and geographic distribution they should be quite satisfactory.

black raspberries separately.) Figure 19 A shows that red raspberries have trended upward rapidly in Oregon and Washington since 1919; the increase in Oregon has been at a more rapid rate than that of Washington. With regard to blackcaps, however, the Oregon pack has shown a moderate increase, while Washington has increased its pack considerably during the past few years.

TABLE XVI. PERCENTAGE DISTRIBUTION OF CANNED BERRY PACK, BY KIND AND STATE, 1919-1927\*

Kind and state	1909	1914	1919	1924	1925	1927	Average 1919- 1927
<i>Strawberries</i>	%	%	%	%	%	%	%
Oregon .....	2	8	6	33	40	58	34
Washington .....	-----	10	7	14	13	15	12
Michigan .....	5	13	23	33	6	11	18
New York .....	15	21	9	8	5	4	6
Maryland .....	51	34	20	7	1	2	8
All others .....	27	14	35	5	35	10	22
Total .....	100	100	100	100	100	100	100
<i>Raspberries</i>							
Oregon .....	4	7	7	14	18	17	14
Washington .....	4	22	19	38	18	32	28
Michigan .....	11	16	24	17	14	19	19
New York .....	69	48	38	28	45	29	34
All others .....	12	7	12	3	5	3	5
Total .....	100	100	100	100	100	100	100
<i>Blackberries</i>							
Oregon .....	-----	-----	25	22	33	21	25
Washington .....	11	21	28	49	42	64	44
Michigan .....	3	2	9	4	1	1	4
Texas .....	-----	1	6	10	15	10	10
All others .....	86	76	32	15	9	4	17
Total .....	100	100	100	100	100	100	100
<i>Gooseberries</i>							
Oregon .....	3	4	14	53	38	55	42
Washington .....	-----	-----	5	13	19	20	15
Michigan .....	15	32	39	26	7	14	20
New York .....	5	9	2	-----	2	1	1
All others .....	77	55	40	8	34	10	22
Total .....	100	100	100	100	100	100	100
<i>Loganberries</i>							
Oregon .....	-----	-----	71	64	84	77	73
Washington .....	-----	-----	24	32	15	23	25
All others .....	-----	-----	5	4	1	-----	2
Total .....	-----	-----	100	100	100	100	100

\*Data computed from Table XV.

New York formerly put up two-thirds or more of all raspberries canned in the United States, but now it averages only about one-third. Michigan increased its percentage from 11 percent in 1909 to 24 percent in 1919. Nearly one-fifth of the national raspberry pack, including black and red, is now put up in Michigan. The actual volume of both red and black raspberries has apparently remained about constant in New York and Michigan during the past ten years. These states are still the most important in the canned pack of blackcaps,† while Washington ranks first in the amount of canned red raspberries.

†The Michigan Fruit Cannery, Inc., estimates that 130,000 cases of black raspberries are normally packed in that state.

Tables XV and XVI show that Washington is the leading state in the output of canned blackberries, having packed in 1927 approximately 64 percent of the total for the United States. Oregon ranked second with 21 percent and Texas third with 10 percent. The volume of canned blackberries has increased considerably in Oregon, Washington, and Texas since 1909, while in other states the pack has trended sharply downward. These include such states as California, Maryland, New Jersey, North Carolina, and Tennessee. In Washington the pack has increased more rapidly than in either Oregon or Texas.

With regard to loganberries, there are now virtually only two states that pack this fruit—namely, Oregon and Washington. Oregon has averaged nearly three-fourths of this pack and Washington has put up most of the remainder.\* The volume increased rapidly in both states from 1914 until 1926, but a material decrease was registered in the three years following. California packed a considerable amount of loganberries prior to 1919, it being credited with 111,000 cases in 1917.† Since 1923-24, however, very few loganberries have been canned in that state.

Oregon, Washington, and Michigan are the leading states in the volume of canned gooseberries. In 1927 Oregon canned more than half of the national pack of this fruit; Washington packed 20 percent and Michigan 14 percent. The gooseberry pack in Oregon increased from 3,459 cases in 1914 to 12,324 cases in 1919. The most important increase took place from 1919 to 1927, however, with a sharp decline in the two years following. The peak in Washington was also reached in 1927, but the decline in 1928-29 was not as rapid as in Oregon. Michigan and Colorado have apparently trended downward since 1919. The available statistics on gooseberry pack in these states are very meager, but such figures as are available seem to indicate a definite downward trend during the past decade.‡ Michigan packed almost as many gooseberries in 1914 as in 1919, and more than in 1927. Estimates obtained from Michigan cannerymen seem to indicate that the average gooseberry pack in the state does not exceed 25,000 cases.

Maryland's pack of gooseberries is included in the group of "all others" as given in Table XV. In 1909 there were 53,513 cases packed in that state; in 1914 there were 42,763 cases and in 1919 only 9,175 cases. Thus Maryland, formerly ranked first in importance of this pack, later became unimportant.

### TRENDS IN RELATION TO MARKET DEMANDS

As has already been shown, the national output of canned berries has not increased as rapidly as the volume of other canned fruits. The much greater volume of such fruits as peaches and pineapples, coupled with their lower prices, has permitted cannerymen and distributors to carry on a more elaborate and effective campaign of advertising and merchandising these fruits than has been possible with berries. Then, too, it is alleged

\*The Cannerymen's League of California has reported no loganberries packed in that state since 1926.

†Annual Statistical Review, Western Canner and Packer 1929, p. 26. The increase in California occurred from 1910 to 1917.

‡Colorado cannery operators advise that the large increase in production of gooseberries in Oregon during recent years has been a serious handicap to Colorado growers.

that the development of the canned-berry industry has been retarded in the past by technical difficulties incident to processing, particularly pinholing and gas formation. This has deterred large organizations from entering into an extensive advertising campaign to expand the canned-berry markets, since cannerymen and distributors do not feel that they can guarantee the product for a long enough time. During more recent years, however, research has eliminated many of the troubles from swelled tins and more careful study by canners has resulted in greater uniformity of pack.

**Loganberries.** The pack of canned loganberries, it will be remembered, increased much faster than any of the other berries from 1914 to 1926, but since 1926 the pack has fallen off considerably. With the greatly increased acreage of loganberries planted in Oregon after 1900, growers found the market much overstocked by 1912, since no constructive effort had been made to find markets for this fruit. It was at this time that canners first began to display considerable interest in the fruit, and because loganberries were so low in price and had such a fine appearance, they began securing distribution through many small orders. An advertising and merchandising campaign was started in the following years and by 1918-19 the demand became considerable for loganberries in every form—canned, preserved, dried, juice, etc. Markets were extended both at home and abroad.

In more recent years, however, the domestic demand for loganberries has declined. The characteristic tartness of this fruit does not seem to take very well with the average American consumer. People will eat loganberries for a time, but sooner or later they seem to tire of them. Many contend that this is due to the fact that processors are in the habit of canning loganberries before they are fully mature, which tends to impart a strong acid taste to the fruit. Canners, on the other hand, state that the trade places a great deal of emphasis on appearance, and to allow loganberries to become fully ripe before canning would mean a mushy pack. It is emphasized, too, that since canned loganberries for pie require more sugar than other berries, bakers are slow to use them for this purpose.

During the past several years England has taken a large part of the canned loganberry pack each year (see Table XVIII and discussion page 52). The strong tart flavor seems to appeal to the English consumer much more than to the American. Some dealers, however, report that the trade even in England has also been gradually diminishing. This may be due in part to the prolonged depression of business in that country. The English will not pay a high price for this fruit, and the demand becomes seriously curtailed whenever the price rises above a certain level.

**Blackberries.** One reason for the increased pack of blackberries is the fact that, next to gooseberries, they average lower in price than any other berry.\* Canning costs of blackberries are lower, and the baking trade uses them extensively since they do not require as much sugar as most of the other berries.

**Raspberries.** Canned raspberries, despite the fact that they are high in price,† have also shown a substantial increase in volume during the past twenty years. Distributors and brokers report an increase in the demand

\*See figures 25 and 26 pages 74 and 75.

†See Figure 25 and discussion pages 74 and 75.

for this product. Not many canned raspberries are exported, however. Information is lacking to show how blackcaps have trended in comparison with red raspberries. Canned blackcaps are used largely in pies, but since they are so high in price\* their use for this purpose as compared to blackberries, for example, is quite restricted.

**Strawberries.** The volume of canned strawberries in the United States has not increased as rapidly as that of raspberries or blackberries. Prices of the canned product average higher than any other berry owing to the fact that more fruit and labor are required. The additional fact that many people prefer strawberry preserves to canned strawberries may also help to explain why the canned product has not increased so rapidly. The Oregon Ettersburg 121 strawberry makes an excellent canning berry, but many of the other varieties become bleached in color, soft, and insipid when canned, and become what many people would term "a poor second to strawberry preserves."

**Gooseberries.** The gooseberry is the least popular of the canned berries, and the increase in volume of this pack has been slower than any of the others mentioned. It is said that the demand for gooseberries moves in cycles—people take to them for a time and then tire of them. Complaints have been made that canners have at times packed gooseberries that were wormy or that contained spray residue. Eastern distributors and brokers state that Pacific Northwest berries, with the possible exception of gooseberries, are equal or superior to the product of most other areas. It is claimed in some quarters that Michigan grows a gooseberry that is larger and one that holds up better in the can than the Northwest berry. Since the output of canned gooseberries has shifted more to Oregon and Washington in recent years, however, it would seem that if Michigan does produce such a superior product, the volume of pack produced in that state should assume greater proportions than it has.

**Quality of Pacific Northwest pack.** With few exceptions, distributors and brokers acclaim the Pacific Northwest berry pack as being unequalled or unexcelled in any other area of the United States. They attribute this excellence (1) to the superior quality of the raw product itself; and (2) to the wider experience of cannerymen operating in the Pacific Northwest and the higher-class equipment that they employ in processing the fruit.

#### FOREIGN EXPORTS OF CANNED BERRIES

With the exception of loganberries, canned berry exports from the Pacific Northwest or the United States are very unimportant.† Reference to Table XVII shows that loganberries made up more than 96 percent of the total canned berry exports from the port of Portland during the years 1926-1929. Since the bulk of the United States canned berry exports is made from the Pacific Northwest, the preponderance of loganberries, even in the national figure, is very evident.

When an allowance of 48 pounds gross shipping weight per case is made, the 1926-1929 average annual exports of loganberries from Portland

\*See Figure 25 page 74.

†Exports of all canned berries from the United States amounted to only 3.8 percent of the total canned fruit exported during 1927-1929. See also Table XVII.

TABLE XVII. FOREIGN EXPORTS OF CANNED BERRIES FROM PORT OF PORTLAND, OREGON, AND WASHINGTON CUSTOMS DISTRICTS, AND THE UNITED STATES, 1926-1929\*

(In pounds)†

Item	1926	1927	1928	1929	Average 1926-1929
	lb.	lb.	lb.	lb.	lb.
<i>Port of Portland</i>					
Loganberries .....	11,144,417	4,502,363	8,982,816	8,993,912	8,405,877
Strawberries .....	172,105	180,923	352,579	126,987	208,149
Raspberries .....	52,056	85,824	92,953	43,092	68,481
Gooseberries .....	64,564	12,856			19,355
Total berries .....	11,433,142	4,781,966	9,428,348	9,163,991	8,701,862
<i>Oregon Customs District</i>					
All berries .....	\$	4,805,543	9,337,129	10,350,833	8,164,502‡
<i>Washington Customs District</i>					
All berries .....	\$	513,972	2,645,997	2,221,558	1,793,842‡
<i>United States</i>					
All berries .....	\$	6,901,029	13,089,370	12,684,141	10,891,513‡
All canned fruits .....		247,855,484	305,760,602	307,367,148	286,994,411‡

\*Sources of information: Port of Portland statistics were obtained from the Portland Chamber of Commerce, Maritime Commerce Department. Figures for Oregon and Washington Customs Districts were obtained from compilations of the U. S. Bureau of Foreign and Domestic Commerce, Portland Offices. Statistics for the United States were obtained from the U. S. Department of Commerce, "Commerce Reports," May 20, 1929, p. 479; and Feb. 17, 1930, p. 451.

†The weights given are the gross or actual weights of the shipments.

\$Not available.

‡Average 1927-1929.

would be somewhat in excess of 175,000 cases. This figure is equivalent to approximately two-fifths of the canned loganberry pack put up in the state of Oregon during the same period.||

By far the greatest volume of canned-berry exports from Oregon and Washington goes to the United Kingdom (Table XVIII). A few scattered shipments are made to other European countries, Canada, South America, and the Orient, but even when considered in the aggregate they are of very minor importance.

It is unfortunate that there are no adequate national statistics to show the extent and growth of this important method of berry processing. The pack of preserves, jams, and jellies in Oregon increased from an average of 31,600 cases in 1919-1924 to an average of 47,400 cases in 1925-1929, representing an increase of 50 percent. (See Table XXXVI, Appendix.) Washington, on the other hand, showed only a small increase over the period.

During this time, the pack of canned berries in the Pacific Northwest underwent a much larger relative increase than that of preserves, jams, and jellies. Such a direct comparison is hardly warranted, however, since in recent years an increasing proportion of preserves and jams is being manufactured from frozen berries shipped to various markets throughout the United States, as will be shown presently.

Those who are acquainted with the situation are of the opinion that although the volume of preserve products manufactured in the United

||Canned berry exports from the Washington Customs District are not segregated by kind.

States is large, the output of these products has not increased nearly as rapidly as the volume of canned fruits. It is held that the lack of legal standards of purity for preserves, jams, etc., has been a serious handicap to the expansion of the industry. Federal Government food officials have found it difficult to prevent products that are deficient in fruit from being offered for sale to the public as pure preserves. The growth of the preserving industry in the future is no doubt contingent in large measure upon securing the confidence of the public in the purity and integrity of the product.

TABLE XVIII. FOREIGN EXPORTS OF CANNED BERRIES FROM OREGON AND WASHINGTON CUSTOMS DISTRICTS, BY COUNTRIES OF DESTINATION, 1927-1929\*

(In pounds)

Country	Oregon			Oregon and Washington		
	1927	1928	1929	1927	1928	1929
	<i>lb.</i>	<i>lb.</i>	<i>lb.</i>	<i>lb.</i>	<i>lb.</i>	<i>lb.</i>
United Kingdom .....	4,768,796	9,175,132	10,189,502	5,145,072	11,722,469	12,128,993
Irish Free State .....	14,430	101,557	17,860	22,530	114,457	21,070
Other European Countries .....	11,615	24,363	34,333	13,938	32,124	59,909
Canada .....						201,654
South America .....	6,352		86,822	6,352		110,556
Orient and Australia .....	4,350	35,225	22,316	17,052	49,931	48,505
Others (Africa and Asia Minor) .....		852		90	2,172	1,704
Total .....	4,805,543	9,337,129	10,350,833	5,319,515	11,984,126	12,572,391

\*Data obtained from compilations of U. S. Bureau of Foreign and Domestic Commerce, Portland offices.

### PRESERVES, JAMS, AND JELLIES

The greater part of the fruit used in the manufacture of preserves, jams, and jellies is made up of berries. Strawberries probably involve more than half the total preserves and jams, while the other berries include a large part of the remainder.†

### JUICE

The loganberry is the only small fruit that has been used in commercial quantities for beverage purposes. Loganberry juice began to make its appearance before the World War and was extensively advertised during 1917-18. It was estimated that in 1920 about 585 tons, or 10 percent of Oregon's commercial loganberry crop, was used in the manufacture of juice.‡ The advertising campaign was soon discontinued, however, and the demand for the product fell off similarly to that for dried loganberries. During the past few years only a very small tonnage of loganberries has been manufactured into juice.

†Estimates made by dealers, preservers, and others in the trade.

‡Oregon Crop Production, 1920, issued by the Portland branch of the U. S. Department of Agriculture Bureau of Crop Estimates. February 1921.

### TRENDS IN VOLUME OF COLD PACK

**Pacific Northwest.** The Pacific Northwest packs far more frozen berries than any other district in the United States. It is estimated that 85 percent or more of the national frozen strawberry pack is put up in the states of Oregon and Washington, while the packs of frozen raspberries and loganberries appear to be limited almost wholly to these states.\* The cold-pack method of preserving berries has developed into an industry of major proportions in the Pacific Northwest, whereas in the eastern states it has mainly afforded a means of disposing of the surplus crop during years of abundant supply.† In Utah the freezing of strawberries is becoming more important each year, but that state still ranks much below either Oregon or Washington in the volume of this pack.

According to statements of those in the trade, the frozen-pack method of preserving berries was started in the Pacific Northwest as early as 1911, but the development so far as volume of pack is concerned was quite slow until 1919-1920. Since then, however, the growth has been rapid, although there are no adequate statistics to show the rate of growth prior to 1925. Estimates from private sources seem to indicate that the strawberry pack in 1919 amounted to only a few thousand barrels, with a more or less rapid increase from then onward. Loganberries apparently were cold-packed in appreciable quantities in 1919 and 1920. The Oregon Crop Production report for 1920 states that about 20 percent of the loganberry crop in that year was barreled.‡ Such pack would approximate 6,000 barrels. Blackberries and raspberries were also frozen to some extent, but just how much was disposed of in this manner it is impossible to say.

The Northwest Cannerymen Association has made annual estimates of the volume of cold pack in the Pacific Northwest beginning with 1926. These statistics, together with estimates of the 1925 pack obtained from other sources, are summarized in Figure 20 and Table XIX. The general trend of total pack has been definitely upward, but year-to-year fluctuations are pronounced. It is estimated that the frozen pack of berries in 1925 amounted to slightly less than 50,000 barrels (or barrel equivalents), while in 1926 it exceeded 83,000 barrels. The year of largest volume was in 1928, when 138,000 barrels of berries were packed. In 1929 it dropped to 96,000 barrels, which is somewhat larger than the five-year average of 88,000 barrels. The 1930 pack, particularly of strawberries, is considerably under the 1929 figure.

On the average, strawberries involve nearly two-thirds of the total volume of frozen berries in the Pacific Northwest (see Table XIX). Red raspberries average one-fourth of the total, while the remaining one-ninth of the pack is made up of blackberries, loganberries, and black raspberries, named in the order of importance. Gooseberries are very insignificant

\*Based on information obtained by correspondence with agricultural experiment stations, cannerymen, brokers, canners' associations, etc., throughout the United States.

†Excepting the state of Maine where large quantities of blueberries are frozen each year.

‡See Oregon Crop Production, 1920, issued by the U. S. Department of Agriculture Bureau of Crop Estimates, Portland, Oregon (dated February 1921).

compared to other berries, as is indicated in Table XIX. Year-to-year fluctuations in relative volume have been great, but the period under observation is too short to ascertain definitely what changes, if any, have taken place in the relative importance of the various kinds of frozen berries.

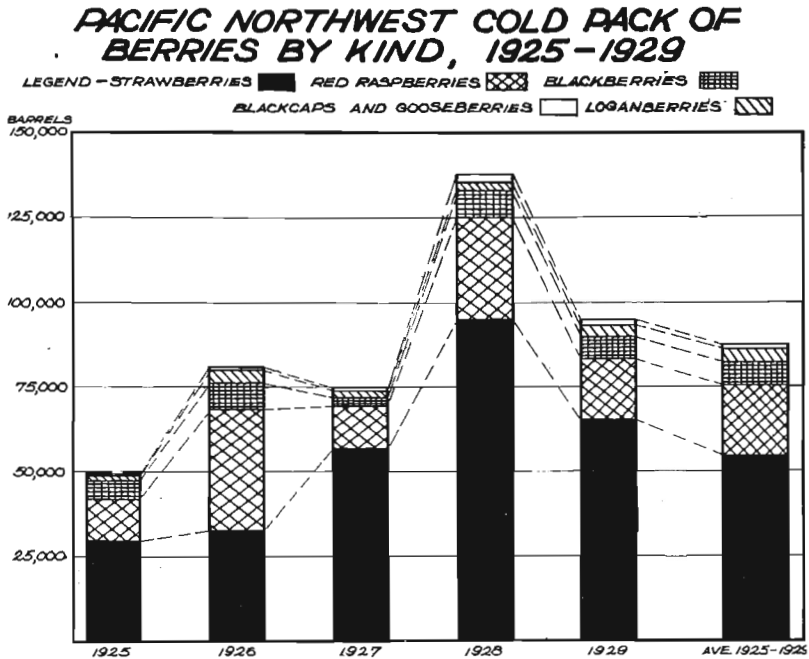


Figure 20. Pacific Northwest cold pack of fruits by kind. 1925-1929.

**Pack in Oregon and Washington.** The Northwest Cannerymen Association figures on volume of cold pack in the Pacific Northwest have not been segregated by state, hence it is difficult to show how Oregon and Washington compare in the expansion of the frozen-pack industry. Estimates were obtained from a number of cannerymen and dealers as to what they considered to be the normal or average contribution from each state. The results of these estimates are presented in Figure 21 and Table XX, using the five-year average, 1925-1929, to make the comparisons. According to these estimates Oregon has barreled a little more than half the Pacific Northwest frozen pack of strawberries; seven-tenths of the loganberries; three-fourths of the black raspberries; two-thirds of the gooseberries; and somewhat more than one-fifth each of red raspberries and blackberries. Thus in the aggregate volume of all berries, Oregon's share of the total has been about 44 percent and Washington's share, 56 percent.

TABLE XIX. PACIFIC NORTHWEST COLD PACK OF BERRIES BY KIND, 1925-1929\*

Kind	1925	1926	1927	1928	1929	Average 1925- 1929
<i>50-gallon barrel equivalents</i>	<i>barrels</i>	<i>barrels</i>	<i>barrels</i>	<i>barrels</i>	<i>barrels</i>	<i>barrels</i>
Strawberries .....	30,000	33,164	57,447	94,656	65,469	56,147
Red raspberries .....	12,121	36,168	12,233	30,071	17,927	21,704
Blackberries .....	5,333	8,774	2,754	8,656	7,265	6,556
Loganberries .....	1,867	4,688	2,343	2,534	3,792	3,045
Blackcaps .....	267	617	20	1,847	1,261	802
Gooseberries .....	.....	20	82	243	23	74
Total berries .....	49,588	83,431	74,879	138,007	95,737	88,328
All others .....	†	1,169	966	1,776	2,183	1,524
Total all fruits .....	.....	84,600	75,845	139,783	97,920	89,852
<i>Fresh fruit equivalents†</i>	<i>lb.</i>	<i>lb.</i>	<i>lb.</i>	<i>lb.</i>	<i>lb.</i>	<i>lb.</i>
Strawberries .....	9,000,000	9,949,200	17,234,100	31,236,480	20,622,735	17,608,503
Red raspberries .....	4,000,000	11,935,440	4,036,890	9,923,430	5,915,910	7,162,334
Blackberries .....	2,000,000	3,290,250	1,005,210	2,856,480	2,724,375	2,375,263
Loganberries .....	700,000	1,758,000	878,625	836,200	1,251,360	1,084,837
Blackcaps .....	100,000	203,610	7,500	609,510	460,265	276,177
Gooseberries .....	.....	7,600	27,060	80,190	7,590	24,488
Total berries .....	15,800,000	27,144,100	23,189,385	45,542,290	30,982,235	28,531,602
<i>Percentages‡</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>
Strawberries .....	60	40	77	69	68	64
Red raspberries .....	24	43	16	22	19	25
Blackberries .....	11	10	4	6	8	7
Loganberries .....	4	6	3	2	4	3
Blackcaps .....	1	1	§	1	1	1
Gooseberries .....	.....	§	§	§	§	§
Total berries .....	100	100	100	100	100	100

\*Data for years 1926 to 1929 were computed from annual reports of the Northwest Cannery Association. All sizes of containers were converted to 50-gallon barrel equivalents. Figures for 1925 were arrived at by using estimates of men in the trade, individual cannery reports, etc., and comparing these with fruit production estimates, canned pack of berries, cold storage holdings and the like. The 1925 cold pack as a whole was known to be considerably less than the 1926 pack; somewhat in proportion to the fruit cannery pack. The estimates given above should be approximately correct, although no great accuracy can be claimed for them.

†Not estimated.

‡In converting to fresh-fruit basis the following figures were used: Fruit packed with no sugar, 380 pounds per barrel or 7.6 pounds per gallon; fruit packed in the ratio of two parts berries to one part sugar, 300 pounds per barrel or 9.0 pounds per gallon; for ratios of 3:1 and 4:1 an allowance of 330 pounds of fruit per barrel was made.

§Less than 1 percent.

||Computed from basis of 50-gallon barrel equivalents.

The cold-pack industry has trended sharply upward in Oregon during recent years. Estimates made of Oregon's volume of cold pack in 1923, published by the office of the State Statistician (expressed in barrels of 400 pounds net)|| were as follows: strawberries, 4,832; red raspberries, 1,477; blackcaps, 71; loganberries, 1,316; blackberries, 437; and cherries, 10,200. Comparing these figures with the averages in Table XX, the upward trend in berry pack is obvious. The 1925-1929 average pack of strawberries was more than six times the 1923 figure; for red raspberries and blackberries it was more than three times the 1923 figure. Blackcaps in-

||See Oregon Crop Production, 1923 (dated March, 1924), issued by the U. S. Department of Agriculture Bureau of Agricultural Economics, Portland, Oregon.

### ESTIMATED VOLUME OF COLD PACK IN OREGON AND WASHINGTON 1925-1929 AVERAGE

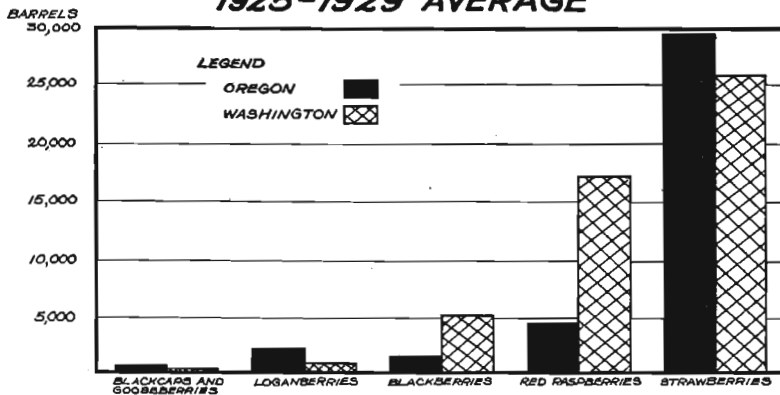


Figure 21. Estimated volume of cold pack in Oregon and Washington. 1925-1929 average.

TABLE XX. ESTIMATED VOLUME OF COLD PACK IN OREGON AND WASHINGTON, 1925-1929 AVERAGE\*

Kind	Pacific Northwest	Oregon	Washington	Percentages of total	
				Oregon	Wash'gton
	bbl.	bbl.	bbl.	%	%
Strawberries .....	56,147	29,758	26,389	53	47
Red raspberries .....	21,704	4,558	17,146	21	79
Blackberries .....	6,556	1,508	5,048	23	77
Loganberries .....	3,045	2,132	913	70	30
Blackcaps .....	802	602	200	75	25
Gooseberries .....	74	50	24	67	33
Total berries .....	88,328	38,608	49,720	44	56

\*The figures on Pacific Northwest pack were obtained from Table XIX. The percentages used were arrived at from estimates of dealers and cannerymen.

creased many times, but even yet the volume is small compared to the other berries. Loganberries show an increase from 1923 to 1925-1929, but as mentioned earlier, the frozen pack of this fruit is believed to have been larger in 1919-20 than it is at the present time.

**Extent of cold pack in other areas.** Information obtained by correspondence with experiment stations, cannerymen, and others throughout the country indicates that the volume of cold pack in the East and Middle West is very small. Such states as Delaware, Maryland, Virginia, New Jersey, and Michigan pack small quantities of strawberries each year, while in the Southern states almost no strawberries are cold-packed. In California it is estimated that only a small percent of the crop is cold-packed, while in Utah about half the crop is processed in this manner.†

†As reported by the Agricultural Experiment Stations in those states.

Outside of the Pacific Northwest, Utah probably has a larger volume than any other area. Indications are that the Utah pack is increasing, although the volume is still far below that of either Oregon or Washington. According to reports of the Division of Crop and Livestock Estimates of the United States Bureau of Agricultural Economics, Utah's strawberry acreage, consisting mainly of the Marshall variety, increased from 950 acres in 1924 to 1,300 acres in 1929. The 1929 figure is equivalent to about one-eighth the strawberry acreage reported for Oregon in that year. It is estimated that about one half of the Utah crop goes into fresh-market channels while the other half is used for cold-pack purposes.

As has already been mentioned, there are very few raspberries cold-packed outside of Oregon and Washington. The same is true of loganberries, since the production of this fruit is confined almost entirely to the Pacific Northwest. From the information available it appears that blackberries are not cold-packed in any appreciable quantities in other parts of the country.

It has been the practice in recent years to freeze considerable quantities of berries and sour cherries in the crates in centers such as New York and Chicago. These fruits are later utilized in the bakery and restaurant trade.

The cold-pack method of preserving fruits other than those mentioned above, has been confined mainly to cherries and blueberries. Large quantities of blueberries are frozen in Maine and some frozen blueberries are also imported from Canada. The heaviest pack of frozen barreled cherries comes from Wisconsin, Michigan, and New York. As far as other fruits are concerned they are as yet unimportant in the cold-pack trade, since there are still certain technological problems to be overcome before they can be preserved in a satisfactory manner by freezing.

**Quality of Pacific Northwest frozen berries.** Reports received from brokers and ice-cream and preserve manufacturers indicate that the Northwest product is as a rule equal or superior to the product of other areas. Special mention of the excellencies of the Pacific Northwest pack is made by a number of Middle West and Eastern concerns.

For preserve manufacturing, the Marshall strawberry, while having a fine flavor, does not seem to be quite as desirable as some of the other varieties of strawberries that are now being grown in the East.\* The reason given is that the Marshall strawberry tends to grow larger than the desirable preserving size; also, it does not hold its shape well when cooked with sugar for preserves. Some preservers mix Marshall strawberries with firmer berries from the South, claiming that a superior product results from such a mixture.

The Cuthbert raspberry from the Pacific Northwest is reported by some to be the finest packed in the entire country. Favorable comment is also made of frozen Evergreen and Himalaya blackberries, which compare favorably with varieties grown in the East. The close proximity to such cities as New York and Philadelphia means that packers have to pay too high a price to growers in competition with fresh-market offers to put the blackberries into barrels, hence much of the cold-pack business goes to the Pacific Northwest.

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\*Technical Adviser, National Preservers Association, Washington, D. C.

**Uses and market demands.** With the rapid increase in the volume of frozen berries packed in the Pacific Northwest during recent years it is to be expected that the market uses and demands have been growing too. Oregon and Washington afford the largest source of berries used by preserve manufacturers in the United States.\* Ice-cream manufacturers, hotels, and restaurants are using cold-packed berries in increasing quantities for ice-creams, desserts, and the soda-fountain trade, since freezing retains almost all of the desirable characteristics found in the fresh fruit such as color, flavor, texture, and aroma. Then there is also the direct-consumer trade that has recently been started in many sections of the country and which holds promise of continued growth in the future.

Preserve manufacturers find that the use of cold-packed berries has distinct advantages. Freezing preserves the color, flavor, and texture of the fruit so that at any time during the year these frozen berries may be made into preserves which have all the characteristics and fine flavors of a preserve made from fresh fruit. It is found to be impractical for any large preserve manufacturer to attempt to use fresh strawberries in making up his year's supply of preserves. He could not possibly handle the required volume of fruit during the fresh-fruit season, and even if this were possible the strawberry preserves, unless kept in cold storage, would rapidly lose their color and flavor.

Brokers and preserve manufacturers report that strawberries make by far the most popular preserve product. The demand for this product is large throughout the entire country. Raspberries probably rank next to the strawberry. Blackberry and loganberry preserves do not claim nearly so important a place as strawberry preserves. The berry fruits taken as a whole represent a much larger preserve production than the other fruits.

Manufacturers of ice-cream indicate a preference for cold-packed strawberries over canned or preserved berries because they have a more natural flavor and hold their color better.

**Small-container market possibilities.** Of late, a lively interest has developed in the possibilities of the one-pound frozen carton as a means of expanding market outlets for Pacific Northwest berries. In 1928 there were reported no less than 434,000 one-pound cartons of frozen strawberries packed in Oregon and Washington, as against none in 1927.† In 1929 the figure stood at 1,115,000 and in addition there were 553,000 pounds of strawberries frozen for the first time that year in one-pound cans. There were also 84,000 one-pound cartons of raspberries and 25,000 one-pound cartons of loganberries packed in 1929.

It is the consensus of opinion among those in the trade, that the limiting factor in the expansion of the small-carton business is the problem of merchandising and distribution. If quality is to remain unimpaired it is of course essential that the product be maintained in a frozen condition until it is ready for ultimate use.

This in turn requires that refrigeration facilities be adequate from the point of production to the point of final disposition. The lack of such facilities has heretofore limited the sale of frozen berries in small cartons

\*Statement of the Technical Adviser, National Preservers Association, Washington, D. C.

†From annual reports of the Northwest Cannery Association.

to the larger cities. With the rapid spread and adoption of mechanical refrigeration devices suited to small retail stores and even to the home of the consumer himself, it is perhaps only a question of time before retailers in virtually every small city or town will be in a position to handle this perishable commodity and offer it for sale.

Little is known regarding the reception given the product by consumers in those centers where it has already been introduced. The small-carton business is still in its experimental stage. The rapidity with which the volume of pack has expanded, however, seems to augur well for its future, provided, of course, that the product can be distributed and sold in a satisfactory state of preservation. In accomplishing this objective, however, not only must the technical problems of production and distribution be solved, but those who sell the product must themselves understand its limitations and help educate consumers to understand and appreciate the conditions surrounding its successful use.

Some distributors in consuming markets repackage the frozen berries from large containers. This method has not proved altogether satisfactory. The complaint is widespread that in repacking the fruit becomes disfigured, the change in temperature involved tends to break down the berry tissues, and the exposure of the fruit to the air leads to discoloration. The conviction is growing that if the small-carton business is to be successfully exploited, it must be done by packing the product directly into the small cartons in the first instance, at the point of production. The fact that repacking adds to the expense, additional labor and the use of two sets of containers being involved, and is also responsible for losses due to waste of the fruit itself, lends weight to this conviction.

Since the small-carton business is still in an experimental stage, it is doubtless well to pursue a cautious policy of conservative development calculated to keep pace with the solution of the problems of distribution and merchandising now confronting the industry.

### DRIED SMALL FRUITS

Loganberries and black raspberries are the only small fruits that are dried in any commercial quantities in the Pacific Northwest. Statistics to show trends in volume of these fruits evaporated in Oregon are for the most part either lacking or incomplete.

According to statements of those in the trade, the 1913 and 1914 crops of loganberries in the Willamette Valley were largely evaporated, since there was no outlet for the fresh fruit. At the outset, Eastern distributors were disinclined to handle the product, but the product nevertheless gained a fairly wide distribution through numerous small orders. In the following years the situation was completely reversed, the demand for dried loganberries in 1919 far exceeding the available supply.

From the Oregon crop production reports for 1920, 1921, and 1923, estimates of volume of loganberries evaporated in Oregon are presented in Table XXI. According to these figures, more than one-third of the 1923 commercial crop of loganberries in Oregon was evaporated. The volume evaporated since then, however, has dropped off materially. Estimates obtained from private sources indicate that, on the average, between 5 and 6

percent of the commercial crop was dried from 1925 to 1929. Evidently the demand for this particular product has fallen off considerably in recent years.

Dried blackcap production in Oregon apparently has been on the increase since 1925. One marketing organization handling a large part of Oregon's output reports that its volume of dried blackcaps increased more than threefold from 1925-26 to 1928-29. Oregon's dried output in 1930, however, has been considerably under that of 1929, one primary reason for this being that the berries did not dry out nearly so well.

One of the main uses to which dried blackcaps are put is in the making of pies. The dried blackcap business has suffered somewhat from the exceptionally high prices that prevailed a few years ago when the use of this product for pie-baking purposes was severely curtailed. Dried blackcaps are also being used to an increasing extent as a basis for fruit-juice coloring. This tendency is explained perhaps by a more insistent consumer demand for genuine fruit products.

TABLE XXI. LOGANBERRIES: COMMERCIAL PRODUCTION AND VOLUME EVAPORATED IN OREGON 1920-1923\*

Year	Commercial production	Amount evaporated	Percentage of commercial crop evaporated
	<i>lb.</i>	<i>lb.</i>	%
1920 .....	11,689,000	1,168,900	10
1921 .....	10,607,500	1,780,000	17
1923 .....	10,700,000	4,000,000	37

\*Taken from Oregon Crop Production reports for years 1920, 1921, and 1923, office of the U. S. Department of Agriculture Bureau of Agricultural Economics.

### FRESH-MARKET SHIPMENTS

Fresh-market shipments absorb a comparatively small proportion of Oregon's surplus production of small fruits. As has already been shown, the greater part of the crop is marketed through processing plants. Fresh-market shipments are nevertheless important in such districts as the Hood River Valley, where a large part of the crop is shipped fresh each year. Oregon also supplies the bulk of the strawberries used in Washington (state) for about the first two weeks of the Oregon season.

Owing to a lack of statistical information it is not possible to show in any concrete fashion the relative importance of the several kinds of berries in the fresh-market trade. The only available statistics on fresh berry shipments from Oregon are the data on annual car-lot shipments of strawberries published by the Federal Bureau of Agricultural Economics. It is the opinion of those in the trade that the fresh shipments of strawberries would probably be considerably greater than the combined shipments of all other berries from Oregon.

From the standpoint of the United States total car-lot shipments of strawberries, Oregon and Washington do not rank high. Figure 22 and Tables XXXVII and XXXVIII (see Appendix) indicate that the combined car-lot shipments from these states now make up about 1 percent of the

national total, whereas from 1920 to 1923 they averaged nearly 2 percent. Generally speaking, shipments from the Late strawberry-producing states (Michigan, New York, Wisconsin, Oregon, Washington, etc.) have been decreasing in importance compared to other areas since 1920, while the Early states (such as Florida, Louisiana, and Texas) have been rapidly increasing in importance. Car-lot shipments from the Late states have decreased both relatively and in actual amount since 1920, and now constitute but 3 percent of the entire volume in the United States.

### **STRAWBERRIES: PERCENTAGE DISTRIBUTION OF CARLOT SHIPMENTS BY DISTRICT IN THE UNITED STATES, 1920-1929**

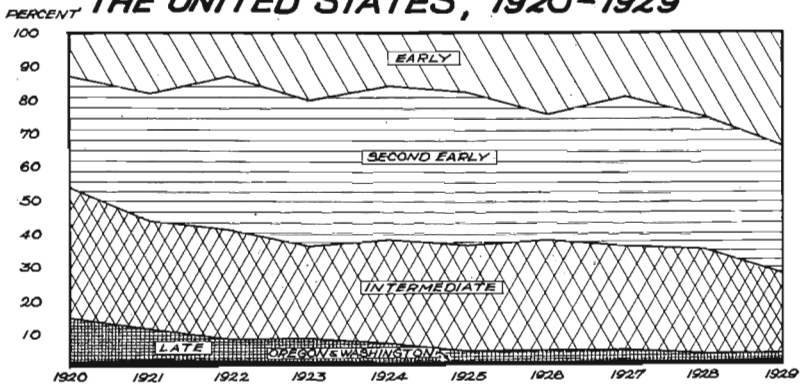


Figure 22. Strawberries: percentage distribution of car-lot shipments by district in the United States, 1920-1929.

Arkansas and Missouri supply large quantities of strawberries to the Middle West states at a time of the season when Oregon starts shipping its crop.\* Table XXII indicates that the car-lot movement from these states has increased greatly since 1920. The 1920-1924 average shipment of strawberries from these states was 2,275 car-loads, while the 1925-1929 average amounted to 3,713 car-loads. The increasing competition from Arkansas and Missouri for the fresh-strawberry market in the Middle West is thus quite evident.

Car-lot shipments of strawberries from Oregon are made primarily from the Hood River and Willamette River Valley areas. Table XXIII shows that Hood River ships, on the average, about two-thirds and the Willamette Valley the remaining one-third of Oregon's total shipments. These shipments are widely scattered throughout the Northwest—the Dakotas, Montana, Idaho, and Washington.

\*In 1928, for example, the car-lot unloads of strawberries at several mid-western markets originating in Arkansas and Missouri were as follows: Duluth 43; St. Paul 124; Minneapolis 190; Des Moines 106; Sioux City, Iowa, 67; Milwaukee 175; Chicago 299. Louisiana is also a heavy shipper to these markets, but strawberries from that state are marketed earlier. (See U. S. Department of Agriculture Statistical Bulletin No. 30, May 1930.)

TABLE XXII. STRAWBERRIES; CAR-LOT SHIPMENTS FROM ARKANSAS AND MISSOURI, 1920-1929\*

Year	Arkansas†	Missouri‡	Total	Year	Arkansas†	Missouri‡	Total
1920 .....	650	245	895	1925.....	993	1,497	2,490
1921 .....	1,087	451	1,538	1926.....	1,375	1,435	2,810
1922 .....	2,165	1,963	4,128	1927.....	2,049	1,986	4,035
1923 .....	1,342	872	2,214	1928.....	2,046	2,637	4,683
1924 .....	1,613	990	2,603	1929.....	2,488	2,062	4,550
Average 1920-1924	1,371	904	2,275	Average 1925-1929	1,790	1,923	3,713

\*Sources of Information: For years 1920-1924, from U. S. Department of Agriculture Yearbook 1926, page 918. For years 1925-1929, from Market News Service on Fruits and Vegetables, mimeographed release entitled "Marketing Louisiana Strawberries, Summary of 1929 Season," January 1930.

†Approximate average shipping season, April 20 to June 10.

‡Approximate average shipping season, May 15 to June 15.

TABLE XXIII. CAR-LOT SHIPMENTS OF STRAWBERRIES FROM DISTRICTS IN OREGON, 1920-1929§

District	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	Average 1925-1929
Hood River .....	92	116	130	88	30	43	25	51	81	74	55
Other   .....	11	0	11	27	9	14	14	59	17	29	27
Total .....	103	116	141	115	39	57	39	110	98	103	82

§Sources of data: U. S. Department of Agriculture Statistical Bulletin No. 8, page 64.

U. S. Department of Agriculture Statistical Bulletin No. 19, page 55.

U. S. Department of Agriculture Statistical Bulletin No. 27, page 61.

Also from annual statements of the Division of Fruit and Vegetables, U. S. Bureau of Agricultural Economics on Northwest Car-lot Shipments of fruits and vegetables.

||Includes Portland, Salem, Woodburn, Sherwood, etc.

The foregoing figures do not include shipments made by freight and express in less than full car lots. Hood River strawberries are shipped primarily in car lots, while in the other districts it is believed that the shipments by truck and l.c.l.¶ freight and express would exceed the amount shipped in car-load quantities.

### LIMITING FACTORS IN FRESH-MARKET SHIPMENTS

In considering the prospects and possibilities of expanding Oregon's fresh-berry markets, there are two important factors that must be taken into account—namely, competition from other areas and quality of the fruit upon arrival at the markets.

**Strawberries.** According to information received from service brokers, the Clark Seedling strawberry of the Hood River Valley district, when harvested under favorable weather conditions and properly refrigerated, will successfully carry to markets in the East. The natural markets for Hood River strawberries, however, are usually limited to Montana, the Dakotas, and parts of Western Canada. At the time the Hood River berries are moving there is usually a heavy movement out of Missouri. Strawberries from that state are packed in quarts and often move by freight even as far as Minneapolis and the Dakotas. While the quality does not compare with the product of Hood River Valley, the price is so cheap,

¶l.c.l., less than car-lot.

comparatively, that an enormous quantity goes into consumption. This somewhat defines the territory in which the Hood River berry can be marketed, but on the other hand, there may be seasons when the Hood River crop is early and the Missouri crop late, which might temporarily change the situation.

Of the strawberries grown in the Willamette Valley, the soft varieties do not carry well for any long distance and cannot ordinarily be successfully marketed even in sections of Montana.\* There are always exceptions to this, however, which must be taken into consideration, and occasionally a car may be delivered safely as far east as the Twin Cities.

**Raspberries.** Red raspberries may be successfully shipped as far east as New York City, but in order to accomplish this they must be harvested under good weather conditions, precooled, and properly refrigerated. Oregon no longer ships any appreciable quantity of fresh raspberries eastward; however, considerable quantities are shipped from Washington to the Middle West and East each year. In this connection it is of interest to quote the president of a well-known cooperative fruit growers association in western Washington, who says: "The successful shipping of either raspberries or blackberries is dependent upon several factors which must be combined in a given locality. The individual grower must be trained through many years of painstaking production to produce berries of the right quality. There must be a very considerable concentration of acreage about the shipping point so that car-loads may be assembled quickly and in good order. There must be proper shipping and precooling facilities available and, last, there must be the very best of transportation, as berries in car-loads are all express movement.†

It is also very essential that the marketing agency and the shipper keep in close touch with each other as a certain percentage of the crop should go to the processor to relieve the pressure of the fresh-fruit market and so maintain reasonable prices. Brokers report that the problem of marketing Pacific Northwest red raspberries is becoming greater every year as there are local crops in such states as Minnesota, Illinois, and Michigan which seem to be offering increased competition each year. Theoretically one would expect a constantly growing fresh market for raspberries, but associations in western Washington report that the volume shipped to the fresh market has been fairly constant for the past six or seven years.

**Other berries.** Evergreen blackberries are shipped in small volume from the Pacific Northwest to markets as far east as the Twin Cities and Chicago and in some instances even beyond. The prevailing impression in the trade is that blackberries mature so late in the season that there is difficulty in disposing of any considerable tonnage on the fresh market.

Loganberries have been tried for fresh market and in some sections there is a demand, but usually not in large quantities. Experience has shown that 30 or 40 crates added to a car of other berries can as a rule be marketed at good prices if the market is not overstocked with other berries

\*Report of a service broker who handles large quantities of fruit in the Northwest each year.

†Quotation taken from letter received from Mr. L. M. Hatch, President, The Puyallup and Sumner Fruit Growers Assoc., Puyallup, Wash., dated March 12, 1930.

at the same time. If 100 crates or more of loganberries arrive simultaneously, in the same market, however, the returns are apt to be very disappointing. It is the consensus of opinion among dealers and shippers that the market for loganberries in their fresh state is very limited. If allowed to ripen before shipping, the appearance and condition of loganberries is generally unsatisfactory, and if shipped when immature so as to withstand shipment they are so sour and unpalatable that the purchaser does not try the fruit a second time. As in the case of everything else, there will always be a few people who want them.

One must conclude, then, that the prospects for extending the present market outlets for Oregon fresh berries in the Middle West or East do not appear very encouraging. Chiefly responsible as limiting factors are (1) the perishability of the berries themselves, (2) the ever-increasing competition from other areas more accessible to consuming markets.

### COMPARATIVE UTILIZATION OF BERRY TONNAGE, PACIFIC NORTHWEST AND OREGON

Owing to a lack of adequate statistics it is difficult to show in any satisfactory manner the trends in volume of fresh fruit used in canning, cold pack, fresh-market shipments, etc., over a period of years.

**Pacific Northwest.** Figure 23 indicates something of the relative importance and trends of canning and cold pack in the Pacific Northwest since 1925.\* The volume of strawberries going into cold pack has averaged more than twice the amount canned. Red raspberries appear to have been about equally divided, while the volume of the other small fruits—loganberries, blackberries, blackcaps, and gooseberries—used in canning exceeds many times the quantity used in cold pack.

The figures in Table XXXIX (see Appendix) indicate that the cold pack of strawberries has increased much faster than the canned pack. As early as 1920 the volume of strawberries used in cold pack was probably less than the amount used in canning. By 1925, however, the volume frozen was nearly twice the volume canned and in 1928 more than three times the amount canned.

The amount of red raspberries frozen has fluctuated somewhat more during the past five years than the canned product, but the average has been about the same. Blackcaps as a frozen product increased during 1928-29, but the amount canned is still considerably greater than that cold-packed. As for loganberries, there has been little change in the quantity frozen since 1925, but it is believed that the pack during 1919-20 was considerably larger than at the present time. Blackberries are not frozen in large quantities although the tonnage is greater than that of loganberries. There seems to have been little upward tendency in volume since 1925-26. The volume of gooseberries cold-packed is very small.

**Oregon.** It is difficult to compare trends in cold pack with canned pack for Oregon over a period of years, as data on the frozen pack prior to

\*Information based on Table XXXIX (see Appendix).

1925 are scanty. The Oregon crop production report for 1923, however, contains figures on the volume of berries frozen in Oregon in that year which run as follows:\* strawberries, 967 tons; red raspberries, 296 tons; blackcaps, 14 tons; loganberries, 263 tons; and blackberries, 88 tons. The Oregon-canned pack absorbed in the same year about 3 times as many strawberries, 4 times as many red raspberries, 12 times as many loganberries, and 30 times as many blackberries. Almost no blackcaps were frozen in 1923.

**ESTIMATED VOLUME OF FRESH BERRIES  
USED IN CANNING AND COLD PACK,  
PACIFIC NORTHWEST, 1925-'29 AVE.**

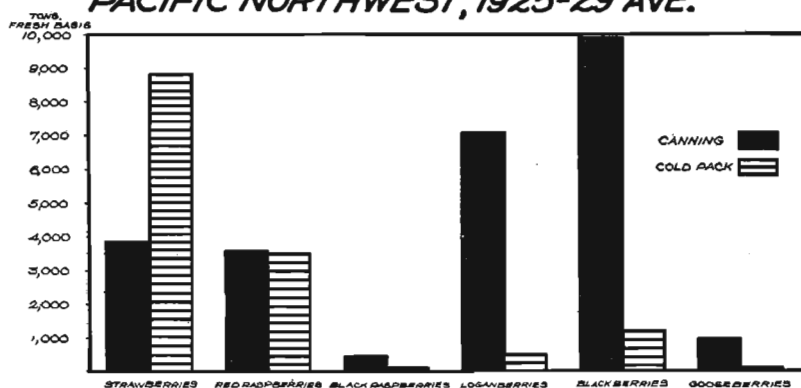


Figure 23. Estimated value of fresh berries used in canning and cold pack, Pacific Northwest 1925-1929 average.

In contrast to the foregoing, Table XXIV indicates that the 1925-1929 average canned pack absorbed about two-thirds as many strawberries as the frozen pack;  $1\frac{1}{2}$  times as many red raspberries; 3 times as many blackcaps; 15 times as many loganberries; and 13 times as many blackberries. From the information at hand it is evident, therefore, that the frozen pack of strawberries in Oregon has been increasing much faster during recent years than the canned pack; that the cold pack of raspberries and blackberries has been increasing somewhat faster; and that the cold pack of loganberries has been falling behind the canned product in relative volume.†

Based on 1925-1929 figures, about two-fifths of the Oregon strawberry crop, on the average, is diverted into cold pack and one-fourth into canning and preserving. It is estimated that about 850 tons, or 7 percent of the crop, is shipped fresh, the remainder being consumed locally.‡

\*See Oregon Crop Production, 1923 (dated March 1924), issued by the U. S. Dept. of Agric. Bureau of Agricultural Economics, Portland, Oregon.

†It is estimated that 20 percent of the 1920 commercial crop, or about 14 percent of the total crop was barreled. This compares with 5 percent during 1925-1929. See Oregon Crop Production 1920 (dated February 1921), U. S. Dept. of Agric. Bureau of Agricultural Economics, Portland, Oregon.

‡The column headed "Apparent Local Consumption" is the remainder after deducting all the other items from harvested production. It should represent approximately the amount of fruit used for home consumption, local trade, and truck and l.c.l. shipments to neighboring markets, although the possibility of error in these figures must be recognized.

The canned pack absorbs a little less than one-half the red raspberry crop, the frozen pack about one-fourth, while the remaining one-fourth is apparently consumed fresh. A large portion of the blackcap production in Oregon is dried, the average of the past few years having exceeded the amount canned. Drying of blackcaps has been on the increase since 1925, although it is reported that a much smaller percentage of the 1930 crop was dried than in 1928 or 1929.

Loganberries, blackberries, and gooseberries are absorbed primarily in canning. Some years ago loganberries were dried in large quantities. During 1913-14 the bulk of the crop was dried, since other market outlets for loganberries were limited. In 1920 and 1921 about 10 percent of the crop was dried, according to the Oregon crop reports for those years. There has been a material decline in the volume dried during the past few years. Loganberry juice has undergone a similar trend. About 10 percent of the commercial crop was converted into juice in 1920, while the amount used for this purpose at the present time is unimportant.

TABLE XXIV. ESTIMATED PRODUCTION AND UTILIZATION OF SMALL FRUITS IN OREGON, 1925-1929 AVERAGE  
(Tons—Fresh Basis)

Item	Harvested production	Canning and preserving	Cold pack	Drying	Fresh shipment	Apparent local consumption
	I	II	III	IV	V	VI
<i>Berries</i>	<i>tons</i>	<i>tons</i>	<i>tons</i>	<i>tons</i>	<i>tons</i>	<i>tons</i>
Strawberries .....	11,440	3,120	4,666	.....	849	2,805
Red raspberries .....	2,740	1,256	752	.....	130	602
Blackcaps .....	1,000	330	104	375	25	166
Loganberries .....	7,740	5,696	380	385	50	1,229
Blackberries .....	4,800	3,632	273	.....	100	795
Gooseberries .....	850	672	8	.....	55	115
<i>Percentage utilization</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>
Strawberries .....	100	27	41	....	7	25
Red raspberries .....	100	46	27	....	5	22
Blackcaps .....	100	33	10	38	2	17
Loganberries .....	100	73	5	5	1	16
Blackberries .....	100	76	6	....	2	16
Gooseberries .....	100	79	1	....	6	14

I. Production data on strawberries, red raspberries, loganberries, and blackberries were averaged from the annual Oregon Crop Production reports issued by the Division of Crop and Livestock Estimates of the U. S. Bureau of Agricultural Economics. Blackcap production obtained by multiplying 1925-1929 average acreage by yield of 1 ton per acre. Gooseberry production obtained by multiplying 1925-29 average acreage by yield of 1½ tons per acre.

II. Computed from the 1925-1929 average pack of canned and preserved fruits in Oregon as issued by the Northwest Cannery Association. Fresh-fruit requirements per case of No. 10 cans: strawberries 34 pounds; red raspberries 31 pounds; loganberries 31 pounds; blackcaps 26 pounds; blackberries 30 pounds; gooseberries 27 pounds. Since berries are packed mostly in No. 2 and No. 10 sizes the following average approximations were used: strawberries 28 pounds; red raspberries 26 pounds; blackcaps 24 pounds; loganberries 26 pounds; blackberries 29 pounds; gooseberries 26 pounds. Preserves, jellies, jams, etc., estimated to include 60 percent strawberries, 12.5 percent loganberries, 12.5 percent raspberries, and 15 percent miscellaneous other fruits and berries.

III. Oregon's share of the Pacific Northwest pack estimated to be: strawberries 53 percent; red raspberries 21 percent; blackberries 23 percent; loganberries 70 percent; blackcaps 75 percent; gooseberries 67 percent. See Table XX.

IV. Estimated from individual cannery reports.

V. Strawberries computed from car-lot shipments (average of 800 crates per car) and estimated local shipments. Estimates of other berries obtained from private sources.

VI. Balance after deducting items in columns II, III, IV and V from items in column I.

## PRICES OF OREGON BERRIES AND COMPARISONS WITH OTHER FRUITS

In analyzing the economic status of any industry a study of prices received for the product is naturally of paramount importance. It is essential to know not only what the price of the commodity itself has been, but also to know how such prices compare with prices of competing products and with prices in general. An attempt will be made in the following pages to show such comparisons.

### PRICES PAID GROWERS FOR BERRIES USED IN PROCESSING

In Figure 24, A and B, and Tables XXV and XXVI are shown the trends in actual and adjusted prices paid Oregon growers for berries used in processing from 1910 to 1929. Since these prices extend over a period of years it becomes necessary to consider also changes in the general price

### **ACTUAL AND ADJUSTED PRICES PAID OREGON GROWERS FOR BERRIES USED IN PROCESSING, 1910-1929**

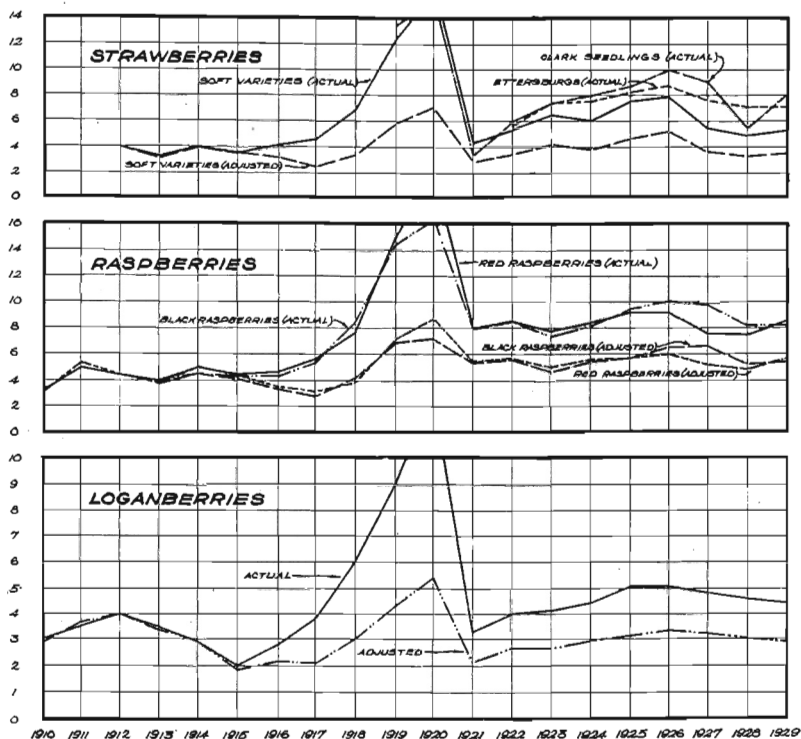


Figure 24, A. Actual and adjusted prices paid Oregon growers for berries used in processing. 1910-1929. See also Figure 24 B on opposite page.

level along with the price movements themselves. For purposes of removing the effects of changes in the general level of prices the All-Commodity Wholesale Price Index\* of the United States Bureau of Labor Statistics is used in the discussion which follows.

**Strawberries.** Viewed from the standpoint of actual prices paid growers, Oregon soft strawberries showed a definite upward trend over the period 1912 to 1929. When such prices are adjusted for changes in the general price level, however, this upward tendency has been slight, as reference to Figure 24 A will show. Price data on Ettersburg 121 and Clark Seedling strawberries are not available for the entire period, but from 1921 to 1929 it appears that the prices of these varieties increased somewhat relative to soft strawberries.†

Figure 24 A shows that strawberry prices have moved somewhat in cycles. A downward tendency of adjusted prices is observed from 1912 to 1917, followed by a great increase during the next three years and a pre-

**ACTUAL AND ADJUSTED PRICES PAID  
OREGON GROWERS FOR BERRIES  
USED IN PROCESSING, 1910-'29**

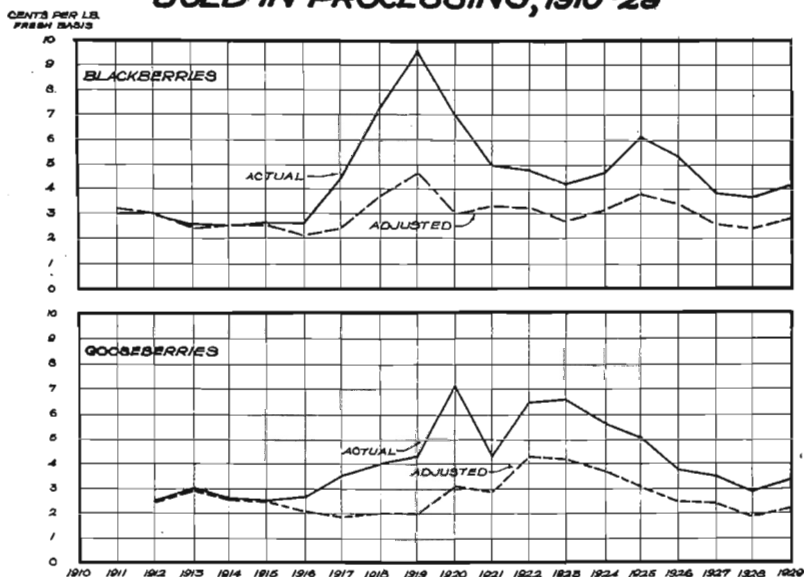


Figure 24, B. Actual and adjusted prices paid Oregon growers for berries used in processing. 1910-1929. See also Figure 24 A on opposite page.

\*Since there is no index available to represent adequately the prices paid by Oregon berry growers for commodities they must purchase, it is not possible in the present discussion to express price changes in terms of grower purchasing power. The use of the foregoing Federal index results in a price that would have prevailed, as nearly as can be calculated had the value of money remained stationary, rather than measuring specifically changes in the per-unit worth to the grower of the commodity under consideration.

†The price margin ordinarily existing between Ettersburg and Marshall strawberries seems to have largely disappeared in 1930.

cipitous drop in 1921. An upward movement is again in evidence beginning with 1922 and attaining a peak in 1926. Prices again dropped after that, reaching a low point in 1928 and recovering somewhat in 1929. The cycle appears once more to be on the upward swing with prices this year (1930) showing material improvement over the two previous years.\*

These periodic movements in prices are no doubt brought about to a considerable extent by alternating periods of over- and under-production. By referring again to Table XXVII (see Appendix), it will be observed that there was a great increase in the strawberry acreage during 1927-28, both in Oregon and in the United States as a whole. With the reduced bearing acreage in 1929-30, prices have again shown improvement. Of course, yield per acre also has an important influence in determining the amount of production, but year-to-year fluctuations in yield are largely out of control while the amount of acreage is determined by the producers themselves.

As has already been shown, the strawberry acreage in Oregon has trended definitely upward since 1918. This in itself seems to indicate that prices have on the whole been maintained at fairly satisfactory levels.†

TABLE XXV. ACTUAL AVERAGE PRICES PAID PRODUCERS IN OREGON FOR BERRIES USED IN PROCESSING, 1910-1929‡  
(Cents per pound)

Year	Strawberries			Red raspberries	Black raspberries	Loganberries	Blackberries	Gooseberries
	Soft varieties	Ettersburg	Clark seedlings					
1910	....	....	....	3.3¢	....	3.0¢	....	....
1911	....	....	....	5.0	....	3.5	3.0¢	....
1912	4.0¢	....	....	4.5	....	4.0	3.0	2.5¢
1913	3.3	....	....	4.0	4.0¢	3.5	2.5	3.0
1914	4.0	....	....	5.0	4.5	2.9	2.5	2.7
1915	3.7	....	....	4.5	4.3	2.0	2.6	2.5
1916	4.1	....	....	4.7	4.3	2.8	2.7	2.7
1917	4.6	....	....	5.7	5.3	3.8	4.4	3.5
1918	6.9	....	....	7.7	8.3	6.0	7.3	4.0
1919	12.4	....	13.5¢	15.0	14.5	9.0	9.6	4.3
1920	16.2	....	15.3	20.0	16.3	12.5	7.0	7.1
1921	4.3	....	3.3	8.0	8.0	3.3	5.0	4.3
1922	5.3	5.7¢	6.0	8.5	8.5	4.0	4.8	6.5
1923	6.4	7.4	7.3	7.8	7.4	4.1	4.2	6.6
1924	6.0	7.5	8.0	8.3	8.1	4.4	4.7	5.7
1925	7.5	8.2	8.7	9.2	9.4	5.1	6.1	5.1
1926	7.9	8.7	10.0	9.2	10.0	5.1	5.3	3.8
1927	5.5	7.6	9.0	7.7	9.9	4.8	3.8	3.6
1928	4.9	7.0	5.5	7.5	8.1	4.6	3.6	2.9
1929	5.2	7.0	8.0	8.4	8.1	4.4	4.1	3.3
Average 1922-1929..	6.1	7.4	7.8	8.3	8.7	4.6	4.6	4.7
Average 1925-1929..	6.2	7.7	8.2	8.4	9.1	4.8	4.6	3.7

‡These data are intended to represent average prices paid growers by bargaining associations, cannerymen, and barrelers for fruit used in processing. A fair sample of prices paid by representative cannerymen (private and cooperative) and bargaining associations was obtained from 1920 onward. Previous to that time, however, there were only two to three price series available with which to construct averages.

§Represents Improved Oregon and Marshall varieties, unhulled basis. Mixed varieties for the earlier years.

\*Contract prices to growers for the 1930 crop of Marshalls and Oregons were approximately 7¢ per pound and cash prices averaged about 8¢. Ettersburgs averaged approximately the same as Marshalls.

†This has reference to the period 1918-1929 as a whole, and not to individual years. Prices in 1921 and 1928, for example, are known to have been very unsatisfactory.

Table XXV shows that the 1922-1929 average prices paid growers for soft strawberries was 6.1¢ per pound, as compared with an average cost of 5.87¢ per pound revealed by studies that were made of strawberry production costs in the Willamette Valley during 1925 and 1926.\* Production from other states is being diverted largely into fresh-market channels, while the canning and cold-pack business has shifted more and more to the Pacific Northwest. This shift, together with the increasing use of frozen strawberries, no doubt has had much to do with maintaining satisfactory prices to Oregon growers.

TABLE XXVI. ADJUSTED AVERAGE PRICES PAID PRODUCERS IN OREGON FOR BERRIES USED IN PROCESSING, 1910-1929†  
(Cents per pound)

Year	All-commodity index‡	Strawberries			Red raspberries	Black raspberries	Loganberries	Blackberries	Gooseberries
		Soft varieties	Ettersburgs	Clark Seedlings					
1910 .....	103	....	....	....	3.2¢	....	2.9¢	....	....
1911 .....	95	....	....	....	5.3	....	3.7	3.2¢	....
1912 .....	101	4.0¢	....	....	4.5	....	4.0	3.0	2.5¢
1913 .....	102	3.2	....	....	3.9	3.9¢	3.4	2.4	2.9
1914 .....	100	4.0	....	....	5.0	4.5	2.9	2.5	2.7
1915 .....	103	3.6	....	....	4.4	4.2	1.9	2.5	2.5
1916 .....	129	3.2	....	....	3.6	3.3	2.2	2.1	2.1
1917 .....	180	2.5	....	....	3.2	2.9	2.1	2.4	1.9
1918 .....	198	3.4	....	....	3.9	4.2	3.0	3.7	2.0
1919 .....	210	5.9	....	6.4¢	7.1	6.9	4.3	4.6	2.0
1920 .....	230	7.0	....	6.7	8.7	7.1	5.4	3.0	3.1
1921 .....	150	2.9	....	2.2	5.3	5.3	2.2	3.3	2.9
1922 .....	152	3.5	3.7¢	3.9	5.6	5.6	2.6	3.2	4.3
1923 .....	156	4.1	4.7	4.7	5.0	4.7	2.6	2.7	4.2
1924 .....	152	3.9	4.9	5.3	5.5	5.3	2.9	3.1	3.8
1925 .....	162	4.6	5.1	5.4	5.7	5.8	3.1	3.8	3.1
1926 .....	154	5.1	5.6	6.5	6.0	6.5	3.3	3.4	2.5
1927 .....	149	3.7	5.1	6.0	5.2	6.6	3.2	2.6	2.4
1928 .....	153	3.2	4.6	3.6	4.9	5.2	3.0	2.4	1.9
1929 .....	151	3.4	4.6	5.3	5.6	5.4	2.9	2.7	2.2
Average 1925-1929	154	4.0	5.0	5.4	5.5	5.9	3.1	3.0	2.4

†Computed by dividing the average prices paid producers as given in Table XXV for each year by the all-commodity wholesale price index for the corresponding year.

‡U. S. Bureau of Labor Statistics all-commodity wholesale price index converted to 1910-1914 base of 100 percent. Taken from the U. S. Bureau of Agricultural Economics, The Agricultural Situation, Feb. 1, 1930.

**Raspberries.** Red and black raspberry prices have shown a marked upward tendency since 1910-1914. Not only have actual prices ruled higher, but to a lesser extent the adjusted prices also have been maintained at higher levels, as reference to Figure 24 A will indicate. It will be noted that the fluctuations characteristic of strawberry prices have, in general, held true of raspberries too. The price fluctuations of red and black raspberries have been quite uniform. Blackcaps averaged somewhat lower in price than red raspberries from 1914 until 1924, but the situation became reversed in the years following. In 1929 red raspberry prices again averaged higher than blackcaps, and from information at hand, it appears that the same is true of 1930 prices.§

\*See Footnote, page 78.

§The 1930 prices of both red and black raspberries have averaged approximately the same as in 1929.

Blackcaps are characterized by some as having an irregular demand. The dried product is used extensively for fruit coloring and in the making of pies. Prices rose to very high levels in 1926-27 and then the market fell off suddenly. It is claimed that prices were so high that pie makers ceased buying blackcaps and as a consequence prices dropped. This is not a desirable situation, as a trade that has been lost is hard to recover. The increased use of blackcaps for fruit coloring has arisen from the fact that the public is becoming more insistent on having genuine fruit products rather than the imitation.

Distributors and brokers report that the demand for canned red raspberries has held up well in recent years. This is in line with the price trend since 1921, which has remained at very much the same level for ten years. Oregon and Washington have packed an increasing proportion of the national raspberry pack, which would indicate that a larger part of the production in eastern and mid-western states is now being sold in the fresh market.

The fact that raspberry prices have been well sustained during the past eight or ten years despite the upward trend of acreage in Oregon and the Pacific Northwest offers indication of a satisfactory condition of the industry in this region.

**Loganberries.** Figure 24 A shows that although the actual prices of loganberries have been maintained at higher levels than they were prior to 1918, such has not been the case when these prices are adjusted for changes in the general price level. Loganberries as a canned and dried product were introduced to the consuming public about 1912, but many people had never heard of them and for a time supplies were greatly in excess of market demands. Prices dropped and reached very low figures in 1914-15. The situation completely reversed itself in the following years, however, and by 1920 prices ranged from 12¢ to 14¢ per pound. Like most other fruits, loganberry prices fell to very low levels in 1921. Prices recovered slowly for several years following, but declined again from 1927 to 1929. The 1930 prices, on the other hand, have averaged somewhat higher than in the years just preceding,\* owing to a much smaller crop.

It will be remembered that because of the great optimism evoked by the high prices prevailing during 1918-1920 the loganberry acreage in Oregon was greatly extended from 1919 to about 1923. The unprofitableness of producing loganberries at prices ruling in the following years is evidenced by the rapid decline in acreage that took place. It is generally claimed that a return of 5¢ per pound to growers is needed to maintain any considerable acreage, whereas the average for the years 1922 to 1929 was approximately 4.6¢ (see Table XXV).

Cannerymen and jobbers report that the domestic market for canned loganberries has been gradually diminishing in recent years and that the English market will not pay a high price for the product. This, together with the great falling-off in demand for dried loganberries, largely explains the unsatisfactory price situation that has existed.

\*Prices for the 1930 crop were from 5 to 5½ cents per pound in comparison with an average of 4.4 cents for the 1929 crop.

**Blackberries.** Blackberry prices (both actual and adjusted) have undergone a general downward trend since 1918-1919. Prices were at low levels during 1913-1916, but increased rapidly in the three years following. A decline was then registered until 1923, with a recovery in the next two years and a continued decline through 1928. A slight increase took place in 1929 and a still further increase is reported for 1930.\*

The canned pack of blackberries in the United States exceeds in volume the pack of any other berry. Demand for this fruit has been well maintained. It seems probable that the great abundance and use of wild blackberries has had a depressing influence on price. In Oregon, a very large proportion of the canned blackberry pack is made up of wild Evergreens. Many sections in Western Oregon report an almost unlimited acreage of the wild berries that could be harvested if prices warranted. Experience has shown that when blackberries are about 4¢ per pound at the cannery, a fair supply of wild blackberries will be forthcoming, and that at 5¢ per pound a very large supply may be expected.†

Cultivated blackberries in Oregon have changed but little in acreage. There have been decreases in some sections and gradual increases in others. Prices of the past few years have not been high enough to encourage new plantings. Most growers state that a 4¢ berry does not allow a sufficient remuneration for the time and money invested in the enterprise.

**Gooseberries.** There apparently has been little change in the long-time trend of adjusted gooseberry prices in Oregon. A long cyclical movement characterizes the series, however—an upward movement beginning with the war years and attaining a peak in 1922-23, this in turn being followed by a downward trend until 1928-29. Prices paid growers in 1930 have been more favorable again, indicating the possible upturn of a new cycle.‡

The demand for gooseberries appears to run in cycles, rising for a time and then falling off again at recurring intervals. It is freely alleged that fruit of poor quality has at times been canned and put on the market. It is believed that this practice has, to some degree, injured the gooseberry trade. The gooseberry acreage in Oregon attained a peak about 1925-26, three years after the peak in prices. With the continued decline in prices that followed, a great reduction in acreage has taken place since 1926.

## COMPARATIVE OPENING PRICES OF CANNED FRUITS

It is of interest to compare canned berry prices with those of other fruits and to observe the influence that canning costs have upon such prices. By turning to Figure 25 the 1925-1929 average opening prices of

\*From 4½ to 5¢ per pound is reported for 1930. The more favorable price was due largely to the curtailed production of cultivated blackberries resulting from winter injury and the appearance of the red berry mite.

†In this connection should be mentioned the appearance during the summer of 1930 of the red berry mite on blackberry patches in Oregon, causing serious damage in certain localities. This pest is known to attack both the cultivated and wild forms, and should it prove serious in the future the supply of wild Evergreens may become greatly curtailed. See also discussion page 82.

‡Prices in 1930 averaged about 5¢ per pound in Oregon.

important Oregon and California fruits may be noted and compared.\* It is seen that canned strawberries top the list, while red raspberries rank second, and blackcaps third. Royal Ann cherries come next, then canned Bartlett pears, followed by loganberries, Hawaiian pineapple, apricots, blackberries, and gooseberries in the order named. At the bottom of the list in the order of their sequence come peaches, prunes, and apples. The influence that costs of canning exercise on opening prices may be seen from a comparison of the latter with the average direct costs of the various canned fruits (Figure 26).† The direct costs shown include the average

### AVERAGE OPENING PRICE OF OREGON AND CALIFORNIA CANNED FRUITS 1925-29 AVE.

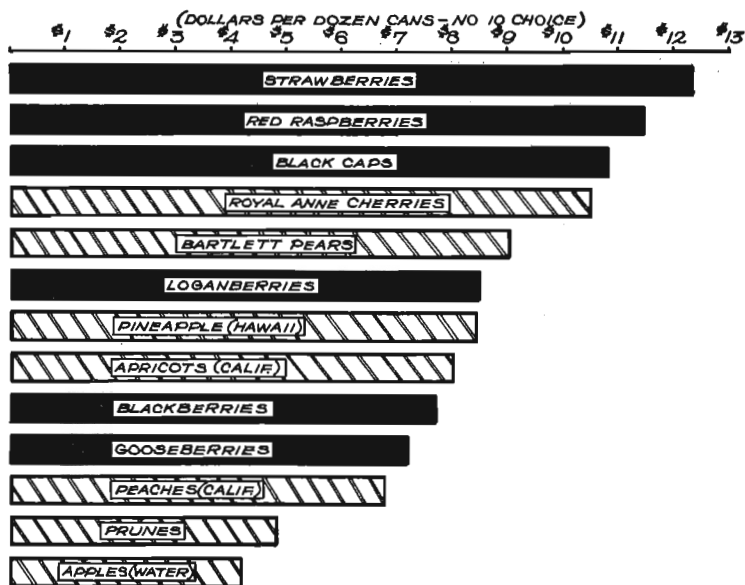


Figure 25. Average opening price of Oregon and California canned fruits. 1925-1929 average.

cost of fruit, direct labor, sugar, labels, cases, and cans. Other cost items such as indirect labor, fuel, administration and selling expense are not included; hence the remainder of the opening price here shown should not be interpreted as the canners' margin of profit.

\*Each year cannerymen issue what are termed "Opening Price Lists" on canned goods, which are used as a basis of sales in disposing of the pack. These opening prices may or may not correspond to actual selling prices, but when taken over a period of years they should quite accurately represent the relative sales price of each kind of canned fruit. For Oregon quotations see Table XL (Appendix). Data on Hawaiian pineapple and California fruits were obtained from the Western Canner and Packer, Statistical Review 1927, p. 35; and Statistical Review, 1930, p. 50.

†Information based on Table XLI (Appendix).

One ton of Ettersburg 121 strawberries, for example, costs the canner nearly five times as much as a ton of prunes (Figure 27),\* four times as much as cling peaches, and nearly three times as much as a ton of canning Bartlett pears. Even gooseberries, which average lower in value than any of the other berries, rank above canning apricots and are, ton for ton, about twice the price of canning peaches.

### **DIRECT COSTS AND OPENING PRICE OF OREGON CANNED FRUITS 1925-1929 AVE.**

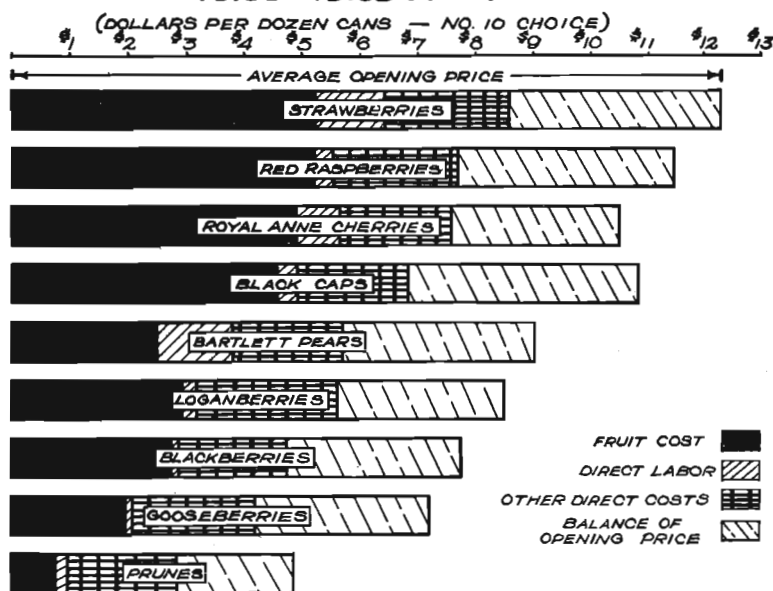


Figure 26. Direct costs and opening price of Oregon canned fruits. 1925-1929 average.

Black raspberries averaged the highest of all the berries in value per ton during 1925-1929, being followed by red raspberries. Normally the position of these two berries is reversed, but the excessively high price at which blackcaps rose during 1925-1927 is largely responsible for the higher average shown in the chart. The other berries in order of rank are as follows: Ettersburg strawberries, Marshall strawberries, loganberries, blackberries, and gooseberries. The price margin ordinarily obtaining between Ettersburg and Marshall strawberries seems to have largely disappeared in 1930.

\*Sources of information: For Oregon fruits, same as in Table XXV. California cling peach and apricot prices obtained from California Experiment Station Bulletin 423 and Extension Service Circular 1. Recent prices were obtained by special correspondence with the California Experiment Station.

## **PRICES PAID PRODUCERS IN OREGON FOR FRESH FRUITS USED IN PROCESSING, 1925-1929 AVERAGE**

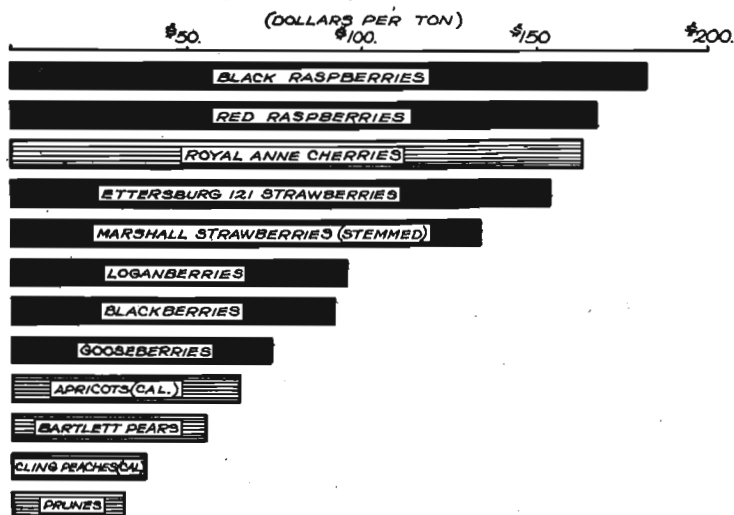


Figure 27. Prices paid producers in Oregon for fresh fruits used in processing. 1925-1929 average.

By examining total direct costs for each of the canned fruits it becomes evident that the chief explanation and justification for the wide differences in opening prices found to prevail are the wide differences in the costs themselves. The opening price of strawberries, for example, is higher than that of any other canned fruit, but the direct costs are also higher. In this case the factors that explain the situation are the high cost of the fruit itself, the relatively large number of pounds of strawberries required per dozen cans, and the heavy direct labor cost involved in the canning process. In virtually every other instance the prevailing opening price as represented in Figure 27 can similarly be explained by a simple analysis of the items of cost involved.

Because canned berries as a group are normally higher priced than the other canned fruits—notably peaches and Hawaiian pineapple, their chief competitors—the limitations placed upon the market outlets of canned berries by this competitive disadvantage must be recognized.\*

\*To what extent retail prices of canned berries are in line with the opening price quotations is not known. In a recent study of the Oregon canned fresh prune, conducted by the Oregon Agricultural Experiment Station, it was found that, although canned fresh prunes enjoy the lowest price in the wholesale trade, that has not generally been found to be true in Oregon retail stores. Retailers stated that their sales of canned prunes are so few and the turnover so slow that in order to protect themselves against loss they are obliged to charge a higher price than wholesale quotations would warrant. It is possible that a similar situation exists with certain of the berries where the volume handled is very small compared to peaches, pineapple, or pears, for example. Then also, there is the factor of losses arising from swelling and pinholing that is said to be more prevalent in the case of berries than with other fruits. It is claimed, however, that research of the past few years has eliminated most of these troubles.

Hawaiian pineapple affords a striking example of the power of advertising and commodity control. Despite the fact that canned Hawaiian pineapple prices when adjusted for changes in the general price level, have trended upward since 1917-18,\* the sales during this period have increased greatly. This product now actually ranks next in volume to peaches.

Berry growers should feel encouraged by the showing berries have made in the face of the low prices and tremendous production of one of their chief competitors, peaches. The acreage now in bearing and yet to come into bearing gives little promise of immediate relief from the depressing influence exercised on the canned fruit industry by this commodity. The tendency of consumers, particularly in a period of depression such as we are now facing, is to turn to the cheaper fruits. The canned-berry industry can scarcely hope to escape from this competition unscathed, particularly because canned berries as a class must necessarily command higher prices than such products as peaches and prunes whose cost of production is normally lower.

## CONCLUSIONS ON THE SITUATION AND OUTLOOK FOR BERRIES IN OREGON

Distance from consuming markets and the fact that competing areas are looking more and more to the fresh-fruit markets to find an outlet for their berries operates to discourage the Pacific Northwest from disposing of its surplus berries through those channels, and points to the canning and cold-pack business as the logical and most profitable means of market disposal.† The very large extent to which this business has become concentrated in the Pacific Northwest in recent years suggests that this region enjoys a competitive advantage over other states in so far as the processed product is concerned.

Being dependent chiefly on market disposal in canned, cold-packed, or dried form, and having in mind the acreages needed to meet this demand at prices that will prove remunerative, growers should base their plans for acreage expansion or retrenchment mainly on the market prospects of each berry in its processed form. The outlook will of course vary with each berry, except that all berries will be directly subject to the competition of other processed fruits.

When viewed from the standpoint of prospective future trends in prices, studies made by the California Agricultural Experiment Station indicate that the prospects are not only for continued low peach and prune prices during the coming years, but also for lower prices of canning pears and apricots due to a probable increased production of these fruits.‡

\*Based on opening price quotations of canned Hawaiian pineapple as issued by R. E. Cotter Co., San Francisco.

†And to drying in the case of black raspberries.

‡See the following publications: California Agricultural Extension Service Circular 1, Peaches, April 1926, p. 23; California Agricultural Experiment Station Bulletin 462, Prune Supply and Price Situation, p. 48; California Experiment Station Bulletin 452, Economic Aspects of the Pear Industry, p. 37; California Experiment Station Bulletin 423, Apricots, pp. 24-28.

If berries can maintain themselves against inroads from these other fruits there is always the prospect of such increase in consumption as follows the normal increase in population and rise in standards of living. Since berries as a group are normally higher priced than competing fruits they can scarcely hope to supplant, to any considerable degree, cheaper fruits such as canned peaches or Hawaiian pineapple, even though resort were made to a program of concerted advertising. Some entertain the conviction that a conservative, well-handled advertising campaign limited to carefully selected markets would prove effective, and no doubt it would, even if the net result were merely to prevent the cheaper and more heavily advertised fruits from making inroads upon berry consumption, but to obtain a fund adequate for national advertising comparable with that of peaches or pineapple would be out of the question. The small volume of berries produced and sold would not permit such expenditure.

As far as the policy of the individual berry grower is concerned, his effort should be directed toward anticipating trends in market demand for the different berries and adjusting his production program accordingly.

**Strawberries.** The market has continued to absorb over a period of years the steadily increasing quantities of strawberries produced in the Pacific Northwest at price levels that have been in excess of average costs.\* This fact demonstrates the favor with which the trade has accepted this product and augurs well for the future. This applies both to the canning berry Ettersburg 121, and to those best adapted to cold packing, the soft varieties.

Of the two forms of market disposal the prospects for further development appear brighter for the cold-pack type of berry. The national canned-strawberry consumption has not increased as rapidly as that of the frozen product nor as rapidly as that of some of the other berries. The demand for frozen strawberries by preservers, ice-cream manufacturers, and the like, has increased enormously within a relatively short space of time, and the direct-consumer trade gives promise of similar development once the technical difficulties characteristic of a new industry are brought under control. Strawberries will undoubtedly be the most popular of the berries for use in the small-container business.

The promising market outlook† for Oregon strawberries would seem to justify a program of continued acreage expansion in the future, particularly of the soft varieties of strawberries. The rate of expansion should be based on the capacity of processing plants to absorb the fruit, and plantings should be better timed than has been the case in the past.

\*Studies made by the Horticulture department of the Oregon Agricultural Experiment Station relative to costs of producing strawberries in the Willamette Valley indicate an average production cost of 5.87¢ per pound (average of hulled and unhulled berries) for the standard varieties in the years 1925 and 1926. (See Oregon Agric. Exp. Sta. Bul. 245, pp. 13-18.) This cost includes both cash and non-cash items, allowing 5 percent interest on the grower's investment. Reference to Table XXV page 70 shows that the 1922-1929 average price paid producers in Oregon for soft strawberries (Improved Orecons and Marshalls primarily) was 6.1¢ per pound (unhulled basis). For this same eight-year period, the average price paid for Ettersburg 121 strawberries was 7.4¢ per pound.

†The opinion prevails in some sections that eastern competition in the cold-pack business will become more keen in the future than it has been in the past. Heretofore the development in the Middle West and East has been slow, owing mainly to the fact that prices ruling in the fresh market have averaged higher than could be obtained through processing.

The long-time trend of prices has been favorable but prices have nevertheless been subject to wide fluctuations. Growers should seek to curb their desire to overplant in seasons when prices have been exceptionally attractive. At this writing, for example, there is evidence that the sharp rise in prices that is occurring in 1930 is stimulating many new plantings in both Oregon and Washington. Unless growers act with caution during the next year or two, therefore, there is danger of a repetition of what has happened in previous years. In seeking to time his program of expansion properly, the intelligent grower will endeavor to anticipate what the prices are likely to be two or three years hence rather than to govern his acreage by prices ruling at planting time.

**Red raspberries.** Like strawberries, red raspberry prices have held up well over a period of years, despite a very substantial increase in the Pacific Northwest acreage. With this berry, also, there has been since 1919 a large increase in the volume canned and cold-packed in the area comprising Oregon and Washington. It is scarcely probable that the frozen pack of red raspberries will gain on the canned pack to the extent that it has in the case of strawberries, nor is it likely that the demand for cold-pack raspberries will approach, much less outstrip, that for strawberries. The greater popularity of the latter for preserve making and ice-cream manufacturing will doubtless continue, and the higher price that raspberries must command will operate in favor of strawberries when it comes to sales in small cartons direct to consumers. There is nothing, however, to indicate that Oregon and Washington will not continue to supply a very large proportion of the national raspberry\* pack and the outlook for a conservative expansion of acreage appears favorable.† But here again growers should be warned not to increase their plantings too rapidly. This year (1930) there have been many new plantings reported in the Gresham and Lebanon districts of Oregon and in parts of western Washington.

**Black raspberries.** As is true of strawberries and red raspberries, blackcap prices have been maintained at satisfactory levels, despite a rapid increase of acreage in Oregon and Washington—notably the former, where the bulk of the production is concentrated. Canned and dried blackcaps loom far more important in the market than blackcaps in the frozen form, although the trend in the latter has been upward. During the past ten years, the volume canned has remained about stationary in the chief competing states, Michigan and New York, but has been rapidly increasing in volume in the Pacific Northwest. The production of the dried product has also been trending upward, particularly since 1925, except that in this case the increase has been confined to Oregon, Washington being unimportant in this volume of pack. When viewed from the long-time standpoint, the increased use of dried blackcaps, particularly in fruit coloring and pie baking, and the upward trend in the Pacific Northwest canned output may justify a conservative program of expansion. There is no justification for

\*These states already pack almost all of the frozen raspberries put up in the United States.

†There is always a question, of course, as to what effect the development of new varieties will have upon competition from other areas. A new variety of red raspberry named the "Chief" has recently been developed at the Minnesota Fruit Breeding Farm. It is claimed that this variety bears earlier in the season, is winter hardy, and is resistant to mosaic and other diseases (see National Farm Journal, Sept. 1930, p. 37).

a rapid, immediate expansion of acreage, however, and any such movement could easily prove disastrous to prices, particularly since the normal demand for blackcaps is more restricted than is the case with most other berries.

**Loganberries.** The commercial production of loganberries is confined almost exclusively to Washington and Oregon. In contrast to strawberries and raspberries the loganberry price situation has for the most part been unfavorable since 1921 and the unsatisfactory returns realized by growers has reflected itself in a definite downward trend in acreage since 1923. Well-informed producers and cannerymen assert that a price of 5¢ per pound is required to maintain any considerable acreage of this crop. The 1922-1929 average price paid Oregon growers, however, was 4.6¢ per pound.\*

Only a relatively small percentage of the total crop of loganberries is absorbed in the dried or cold-pack form, or as juice. Canning absorbs nearly three-fourths of Oregon's total production. Since 1926, when Oregon and Washington's canned pack attained its peak, there has been an appreciable decline in volume of pack. The consensus of opinion is that the demand situation is responsible for this decline. This recession in demand has been taking place both at home and abroad. The English markets have in the past absorbed canned loganberries in large quantities, but of late this trade has been gradually diminishing. It now appears that unless the price is so low abroad as to net the grower a return that he regards as unsatisfactory this commodity cannot be disposed of in the quantities formerly exported. Perhaps the severe depression that has so long existed in England is largely to blame.

There is much speculation as to the reasons for the decline in domestic consumption. The explanation most commonly accepted rests with the nature of the commodity itself. The average American, it is asserted, quickly tires of the tart flavor characteristic of the loganberry. Those who champion the fruit insist that the loganberry is a most delectable product if allowed to mature properly before canning. The tartness of the fruit is unduly accentuated, they maintain, by the practice that prevails of canning the berry before it has reached a perfect stage of ripeness. Cannerymen reply that in order to get the rich red color demanded by the trade and at the same time prevent the product from developing a mushy condition and falling down in the can, the present procedure is unavoidable. It is not the purpose here to do more than call attention to this puzzling problem of a technical nature. Well-posted observers assert that the advertising value of loganberries as a preventive of goitre has not been adequately recognized. Few people know, for instance, that of a long list of foods chosen from various parts of the country for chemical analysis, loganberries were found to rank the highest in point of iodine content.†

All things considered it would seem that no considerable expansion of the loganberry acreage in the next few years is warranted. In view of the greatly decreased production of recent years growers may do well, how-

\*Prices paid growers for the 1930 crop were from 5¢ to 5½¢ per pound. Severe winter injury and a greatly reduced acreage resulted in a much smaller production than in previous years.

†See Jan. 3, 1925, issue of Saturday Evening Post, "Please Pass the Iodine," by Woods Hutchinson, M.D.

ever, to maintain present acreages that are in a good state of production, but those who are contemplating an expansion of this crop should bear in mind that any considerable increase in production will likely result in prices that are unremunerative to the grower.

**Blackberries.** The general trend of blackberry prices has been downward in Oregon since 1918-19. The cultivated blackberry acreage for the state as a whole has not changed materially in the past ten years. During the same period, however, Washington has more than doubled its acreage.\* This difference in trend may be explained on the basis of the lower comparative production costs enjoyed by Washington growers. Cost studies conducted by the Washington State Agricultural Experiment Station disclose that the average cost of cultivated blackberry production in western Washington has been 4.23¢ per pound under conditions of an average yield of 6 tons to the acre.† In Oregon, well-posted growers maintain that a return of 4½¢ to 5¢ per pound is required to cover costs. The yields in Oregon average considerably below those prevailing in Washington.‡ Evidently, then, Washington enjoys a competitive advantage over Oregon that has been reflected in a considerable expansion of acreage as against a stationary acreage in Oregon.

The other important drawback to the growth of Oregon's cultivated blackberry acreage has been the great abundance of wild Evergreen blackberries found in many parts of Oregon. Cannery process these in large quantities and draw virtually no distinction between the wild and cultivated varieties in prices paid. Estimates gathered from private sources indicate that in the five-year period from 1925-1929, more than three-fifths of the canned-blackberry pack in Oregon was made up of wild Evergreen blackberries. In Washington, on the other hand, similar estimates indicate that the wild form of utilization has averaged scarcely one-fourth of the total pack.

The output of canned blackberries has increased rapidly both in Oregon and Washington. Texas is the only other state in the Union where the canned pack has increased, but its pack remains considerably lower than that of either Oregon or Washington.§ California, Michigan, and other states that were formerly important have fallen off greatly in the pack of canned blackberries.

Comparatively few blackberries are cold-packed, the volume thus packed averaging less than one-third that of red raspberries and one-eighth that of strawberries.||

Aside from gooseberries, blackberries are the cheapest of all the small fruits and hence appeal to the pie baker. This increasing trade is no doubt chiefly responsible for the long-time upward trend in the national pack. The rapid concentration of much of the national pack in the Pacific Northwest and the steady upward trend in the total pack itself are favorable factors in a consideration of plans for acreage expansion. But so far as

\*See Table IV, p. 20. The acreage attained a peak in 1928 and declined slightly in 1929.

†Washington Agricultural Experiment Station Bulletin 204, *An Economic Study of Berry Farming in Western Washington*, pp. 47-52. This figure includes both cash and non-cash items and allows 6 percent interest on the investment.

‡See Table XIII page 38.

§See Figure 19 B page 47 and Table XXXV, (Appendix).

||See Figure 20 and Table XIX, pp. 55 and 56.

growers in Oregon are concerned these favorable factors have been more than neutralized by (1) the low-cost advantages enjoyed by growers in Washington which permit them to expand acreage profitably at price levels that are unattractive to Oregon growers, (2) the presence of vast quantities of wild berries accessible to canners if they will but offer a price sufficiently high to induce pickers to harvest them, such price not being high enough to yield a remunerative return on the cultivated acreage.\*

The appearance during the summer of 1930 of the red berry mite (commonly called the red berry disease) on blackberry patches in Oregon raises a question as to what effect this might have on the future of blackberry production in this state. The pest has been known to attack both cultivated and wild forms. It caused serious damage to cultivated patches in the Willamette Valley during 1930. It is believed that this disease can be checked by spraying, but since no cultural attention is usually given to wild Evergreens the future supply from that source may become seriously curtailed, which event would mean the elimination of wild Evergreen blackberries from competition with the cultivated acreage.

On the other hand, should the wild berries continue to be as productive as they have been in the past, there is no reason to suppose that cannerymen will not continue to draw upon them for a large part of their supply in the future just as they have done in the past.† Under such circumstances the prospects for profitably extending the present acreage of cultivated blackberries in Oregon do not appear promising.

**Gooseberries.** The rapid increase and subsequent decline in Oregon's gooseberry acreage has been largely a result of price movement. Gooseberries attained a peak of 6½¢ per pound during 1922-23, which stimulated considerable new plantings in the following two or three years. Prices declined yearly after that and in 1928 reached a low level of less than 3¢ per pound.

Oregon's pack of canned gooseberries has averaged larger than that of any other state in recent years. Canned gooseberries in Oregon and Washington reached a peak in 1927 and have since then shown a sharp decline. It appears that other states like Michigan and Colorado have decreased their canned output since 1919. The long-time trend in national canned gooseberry pack has been slowly upward—slower than that of any of the other berries.

Lack of demand has been the primary reason for the price decline of recent years. People apparently take to gooseberries for a time and then grow tired of them again.

Gooseberry prices this year (1930) show substantial improvement over the several years just previous. Acreages have been greatly reduced and it is possible that an upswing of a new cycle has started. Under such circumstances growers in favored localities of Oregon may be justified in setting out small new plantings of this crop; however, no extensive pro-

\*Whenever blackberries approach a price of 4½¢ to 5¢ per pound, as they have this year (1930), large amounts of wild Evergreens are harvested.

†There is, of course, the possibility that improved varieties of blackberries may be introduced. Work is being undertaken at the present time to perfect a cross between the Oregon Evergreen and the Himalaya blackberry to obtain a hybrid which will keep the size, yield, and texture of the Evergreen combined with the flavor of the Himalaya. How successful such an attempt will be is at present impossible to predict.

gram of expansion is warranted. Growers should bear in mind that gooseberries are easily overdone. The demand for this product is very limited and a small increase in production is sufficient to take care of the needs of a relatively large population.

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## Appendix of Tables

TABLE XXVII. STRAWBERRY ACREAGE IN THE UNITED STATES BY DISTRICTS. COMMERCIAL PRODUCING STATES 1918-1930\*

Year	Early†	Second Early†	Inter-mediate†	Late states†			United States
				Total	Oregon	Wash-ington	
	<i>acres</i>	<i>acres</i>	<i>acres</i>	<i>acres</i>	<i>acres</i>	<i>acres</i>	<i>acres</i>
1918 .....	8,780	27,990	33,080	24,100	2,560	2,610	93,950
1919 .....	7,090	23,960	30,360	25,500	2,590	2,660	86,910
1920 .....	10,250	25,000	31,520	26,620	2,970	2,900	93,410
1921 .....	12,160	33,400	35,650	28,380	3,560	3,160	109,590
1922 .....	17,600	47,980	40,100	27,120	3,440	2,960	132,800
1923 .....	23,690	52,030	43,370	29,270	3,500	3,770	148,360
1924 .....	25,510	67,060	44,550	39,350	6,020	5,620	176,470
1925 .....	20,160	49,030	39,400	36,150	5,930	5,430	144,740
1926 .....	26,740	42,070	44,980	38,250	7,320	6,090	152,040
1927 .....	31,100	51,550	66,170	42,430	8,400	7,670	191,250
1928 .....	34,850	58,850	70,300	44,840	10,000	8,900	208,840
1929 .....	41,960	54,400	61,040	46,220	10,500	8,900	203,620
1930 .....	42,900	42,900	47,330	45,190	9,450	8,500	178,320
1931† .....	41,090	32,310	42,820	45,830	9,930	8,920	162,050
Average 1918-1923..	13,262	35,063	35,680	26,832	3,103	3,010	110,837
Average 1924-1929..	30,053	53,827	54,406	41,207	8,028	7,102	179,493

\*Data obtained from mimeographed reports of the Division of Crop and Livestock Estimates, U. S. Dept. of Agric. Bureau of Agricultural Economics. Includes only those states where strawberries are produced commercially.

†States included in each district as follows: *Early*: Alabama, Florida, Louisiana, Mississippi, and Texas. *Second Early*: Arkansas, California (S. Dist.), Georgia, North Carolina, South Carolina, Tennessee, and Virginia. *Intermediate*: California (Other), Delaware, Illinois, Kansas, Kentucky, Maryland, Missouri, New Jersey. *Late states*: Indiana, Iowa, Michigan, New York, Ohio, Oregon, Pennsylvania, Utah, Washington, Wisconsin.

†Intended bearing acreage 1931 (Preliminary).

TABLE XXVIII. PERCENTAGE DISTRIBUTION OF STRAWBERRY ACREAGE BY DISTRICTS IN THE UNITED STATES, 1918-1930\*

Year	Early	Second Early	Inter-mediate	Late states			United States
				Total	Oregon	Wash-ington	
	%	%	%	%	%	%	%
1918 .....	9	30	35	26	2.7	2.8	100
1919 .....	8	28	35	29	3.0	3.1	100
1920 .....	11	27	34	28	3.2	3.1	100
1921 .....	11	30	33	26	3.3	2.9	100
1922 .....	13	36	30	21	2.6	2.2	100
1923 .....	16	35	29	20	2.4	2.5	100
1924 .....	15	38	25	22	3.4	3.2	100
1925 .....	14	34	27	25	4.1	3.8	100
1926 .....	18	28	29	25	4.8	4.0	100
1927 .....	16	27	35	22	4.4	4.0	100
1928 .....	17	28	34	21	4.8	4.3	100
1929 .....	20	27	30	23	5.2	4.4	100
1930 .....	24	24	27	25	5.3	4.8	100
1931† .....	25.5	20	26.5	28	6.1	5.5	100
Average 1918-1923 .....	12	32	32	24	2.8	2.7	100
Average 1924-1929 .....	17	30	30	23	4.5	4.0	100

\*Computed from Table XXVII.

†Preliminary.

TABLE XXIX. PERCENTAGE DISTRIBUTION OF STRAWBERRY ACREAGE IN THE LATE PRODUCING STATES, 1918-1930\*

Year	Oregon	Washington	Michigan	New York	All others	Total Late states
	%	%	%	%	%	%
1918 .....	11	11	19	14	45	100
1919 .....	10	10	23	14	43	100
1920 .....	11	11	22	14	42	100
1921 .....	13	11	23	14	39	100
1922 .....	13	11	22	14	40	100
1923 .....	12	13	21	13	41	100
1924 .....	15	14	20	13	38	100
1925 .....	16	15	18	12	39	100
1926 .....	19	16	16	12	37	100
1927 .....	20	18	15	11	36	100
1928 .....	22	20	14	10	34	100
1929 .....	23	19	15	9	34	100
1930 .....	21	19	16	10	34	100
1931† .....	22	19	16	10	33	100
Average 1925-1929 .....	20	18	15	11	36	100

\*Computed from special strawberry reports of Division of Crop and Live Stock Estimates, U. S. Dept. of Agric. Bureau of Agricultural Economics.

†Preliminary.

TABLE XXX. ESTIMATED BEARING ACREAGE OF SMALL FRUITS IN OREGON BY KIND AND COUNTY, 1929\*

District and county	Strawberries	Raspberries		Loganberries	Blackberries	Gooseberries
		Red	Black			
<i>District I A</i>						
Lane .....	25	12	12	20	30	17
Linn .....	1,450	70	65	150	94	8
Benton .....	88	5	5	11	10	6
Polk .....	375	30	17	200	60	86
Marion .....	2,575	95	85	2,280	465	45
Total .....	4,513	212	184	2,661	659	162
<i>District I B</i>						
Yamhill .....	425	11	700	350	55	10
Washington .....	1,050	70	275	115	50	60
Clackamas .....	1,210	450	154	235	145	50
Multnomah .....	840	1,214	52	115	120	10
Total .....	3,525	1,745	1,181	815	370	130
Total District I .....	8,038	1,957	1,365	3,476	1,029	292
<i>District II</i>						
Douglas .....	125	30	.....	30	25	.....
Jackson .....	230	75	.....	12	45	.....
Josephine .....	200	70	.....	10	50	.....
Total .....	555	175	.....	52	120	.....
<i>District III</i>						
Curry .....	9	2	.....	2	5	.....
Coos .....	99	20	.....	20	10	15
Lincoln .....	15	12	.....	14	30	.....
Tillamook .....	25	.....	.....	35	24	.....
Clatsop .....	15	4	.....	10	5	3
Columbia .....	294	30	2	3	5	.....
Total .....	457	68	2	84	79	18
<i>District IV</i>						
Hood River .....	900	8	.....	3	6	.....
Wasco .....	25	7	.....	6	8	.....
Total .....	925	15	.....	9	14	.....
<i>Districts V and VI</i>						
Umatilla .....	120	32	.....	15	28	.....
Union .....	30	20	.....	8	12	12
Deschutes .....	50	3	.....	.....	.....	.....
All others† .....	109	71	.....	6	26	13
Total .....	309	126	.....	29	66	25
State total .....	10,284	2,341	1,367	3,650	1,308	335

\*These estimates are based on information obtained by personal interviews and correspondence with cannery field men, county agents, leading growers, and others acquainted with conditions in their respective localities. Use was made also of certain cannery reports and of data obtained from the office of the State Statistician. Federal Census statistics for 1920 and 1925 were used in a number of outlying counties where no other information was available, and where essentially no change in the situation is reported to have taken place since then. As it has not been possible to conduct a detailed survey of small-fruit acreages in Oregon the figures arrived at by the foregoing methods should be considered only approximate.

†Includes Sherman, Gilliam, Morrow, Wallowa, Baker, Grant, Crook, Wheeler, Jefferson, Klamath, Harney, Lake, and Malheur counties.

TABLE XXXI. CANNED PACK OF FRUITS IN THE UNITED STATES AND HAWAII, BY KIND, 1899-1927\*  
(Standard Cases 1899-1923; Actual Cases 1925-1927)

Year	All berries	Peaches	Apricots	Pears	Cherries	Apples	All other fruit	Total U.S. fruits	Hawaiian† pineapple
	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>
1899 .....	600,419	1,449,356	531,648	672,485	114,367	645,762	453,780	4,467,817	.....
1904 .....	489,637	1,304,867	539,815	789,120	319,350	490,341	695,111	4,628,241	25,500
1909 .....	815,851	1,467,213	630,185	637,782	390,351	1,205,742	354,280	5,501,404	510,000
1914 .....	1,333,449	3,407,906	1,051,816	1,062,762	543,213	1,514,939	535,097	9,449,182	2,262,806
1919 .....	2,347,213	7,706,855	3,939,768	2,021,610	1,362,832	2,447,927	1,606,188	21,432,393	5,071,976
1921 .....	1,257,379	5,417,213	1,056,857	1,165,204	779,602	2,239,428	600,331	12,516,014	5,262,503
1923 .....	2,447,494	7,039,334	1,561,658	1,817,924	2,123,541	2,726,498	2,612,508	20,328,957	5,895,747
1925 .....	2,119,559	10,526,286	2,087,961	3,879,917	1,486,631	3,467,176	2,425,250	25,992,780	8,728,580
1927 .....	2,374,588	11,305,057	3,099,357	2,953,502	1,229,386	2,939,031	3,663,400	27,564,321	8,879,252
Average 1899-1909 ....	635,302	1,407,145	567,216	699,796	274,689	780,615	501,057	4,865,820	.....
Average 1914-1921 ....	1,646,014	5,510,658	2,016,147	1,416,525	895,216	2,067,431	913,872	14,465,863	4,199,095
Average 1923-1927 ....	2,313,880	9,623,559	2,249,659	2,883,781	1,613,186	3,044,235	2,900,386	24,628,686	7,834,526
<i>Percentages of total</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>
Average 1899-1909..	13.0	28.9	11.7	14.5	5.6	16.0	10.3	100.00	.....
Average 1914-1921..	11.4	38.1	13.9	9.8	6.2	14.3	6.3	100.00	.....
Average 1923-1927..	9.4	39.0	9.1	11.7	6.6	12.4	11.8	100.00	.....

\*Sources of information as follows: 12th Census of United States, 1900, Vol. 9, Manufacturers, pt. 3, pp. 474-78; Census of Manufactures, 1905. Special reports of Census Office, Manufactures, pt. 3, pp. 410-12; 13th Census of United States, 1910, Vol. 10, Manufactures, pp. 391-397; Census of Manufactures, 1914, Special Reports of Census, Vol. 2, pp. 379-381; 14th Census of United States, 1920, Manufactures, Section on Canning and Preserving. For years 1921, 1923, 1925 and 1927 data obtained from Federal Census of Manufactures, Biennial Reports.

†Data obtained from Association of Hawaiian Pineapple Cannery, University of Hawaii, Honolulu, Hawaii.

TABLE XXXII. CANNED FRUIT PACK, CALIFORNIA, HAWAII, PACIFIC NORTHWEST, AND OREGON, 1919-1929\*

Year	California, all fruits	Hawaiian pineapple	Pacific Northwest, all fruits	Oregon, all fruits	All berries†	
					Pacific Northwest	Oregon
	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>
1919 .....	13,696,403	5,071,976	2,518,064	1,233,736	851,754	403,627
1920 .....	11,382,863	5,986,982	2,111,085	1,018,624	690,279	383,517
1921 .....	8,511,851	5,262,503	2,677,773	1,304,437	957,867	581,354
1922 .....	15,477,865	4,770,239	3,320,539	1,793,854	1,171,568	800,295
1923 .....	11,351,536	5,895,747	3,909,191	1,733,361	1,312,280	707,825
1924 .....	10,362,992	6,825,904	4,268,941	1,824,455	1,779,849	778,439
1925 .....	15,631,852	8,728,580	4,691,867	2,077,120	1,280,362	808,749
1926 .....	20,974,700	8,939,590	6,503,262	3,201,403	2,304,611	1,287,328
1927 .....	16,775,235	8,879,252	4,882,342	2,508,245	1,855,475	1,015,749
1928 .....	20,223,024	8,663,056	7,650,529	3,706,625	2,001,294	1,108,209
1929 .....	15,585,734	9,210,240	7,435,937	3,634,837	1,731,359	1,002,070

\*Sources of information: California canned pack statistics obtained from Western Canner and Packer Statistical Review 1929, p. 26, and 1930, p. 45. Hawaiian pineapple pack data from Association of Hawaiian Pineapple Canners, University of Hawaii, Honolulu, Hawaii. Pacific Northwest and Oregon statistics from annual reports of the Northwest Canners Association.

†Includes strawberries, raspberries (red and black), loganberries, blackberries, and gooseberries.

TABLE XXXIII. CANNED PACK OF BERRIES IN THE UNITED STATES, BY KIND, 1899-1927\*

Year	Black-berries	Rasp-berries	Straw-berries	Goose-berries	Logan-berries	Blueber-ries and miscel-laneous	All berries
	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>
1899† .....	192,033	177,977	230,409	†	†	†	600,419
1904 .....	164,429	177,227	141,527	†	†	†	483,183‡
1909 .....	210,538	247,064	208,406	76,312	†	73,531	815,851
1914 .....	452,161	414,632	185,919	89,593	39,508	151,636	1,333,449
1919 .....	910,657	551,419	374,097	87,026	273,664	150,350	2,347,213
1924 .....	1,007,429	783,091	260,334	116,983	641,303	187,835	2,996,975
1925 .....	659,624	461,877	273,078	118,836	386,343	219,801	2,119,559
1927 .....	626,333	528,546	392,057	133,089	441,199	253,364	2,374,588
Average 1919-1927	801,011	581,234	324,891	113,983	435,627	202,837	2,459,583
Percent-ages of total	%	%	%	%	%	%	%
1909 ....	26.3	30.2	25.5	9.3	.....	8.7	100.0
1914 ....	33.9	31.0	13.9	6.7	3.0	11.5	100.0
1919 ....	38.8	23.5	15.9	3.7	11.7	6.4	100.0
1924 ....	33.5	26.1	8.7	3.9	21.3	6.5	100.0
1925 ....	31.1	21.8	12.8	5.6	18.2	10.5	100.0
1927 ....	26.4	22.3	16.5	5.6	18.5	10.7	100.0
Average 1919-1927	32.6	23.6	13.2	4.6	17.7	8.3	100.0

\*Sources of information as follows: 12th Census of United States, 1900, Vol. 9, Manufactures, pt. 3, pp. 474-78; Census of Manufactures 1905. Special Reports of Census Office, Manufactures, pt. 3, pp. 410-12; 13th Census of United States, 1910, Volume 10, Manufactures, pp. 391-397; Census of Manufactures, 1914, Special Reports of Census, Volume 2, pp. 379-381; 14th Census of United States, 1920, Manufactures, section on Canning and Preserving. For years 1921, 1923, 1925 and 1927, data obtained from Federal Census of Manufactures, Biennial Reports. For 1924, data obtained from National Canners' Association as printed in the California Fruit News, January 31, 1925, page 7.

Cases adjusted to standard size (14 cans No. 2) 1899, 1909, 1914, 1919 and 1924; actual size 1925 and 1927; size not designated in 1904.

†The figures for 1899 were originally expressed in pounds and in a later Census volume the conversion from pounds to cases was made by dividing by 48.

‡Not included in Census reports for these years.

§When expressed in standard cases the Census lists this total as 489,637 in a later Census volume.

TABLE XXXIV. CANNED PACK OF ALL BERRIES IN THE UNITED STATES  
BY STATES 1919-1927\*

In cases†

State	1919	1921	1923	1924	1925	1927	Average 1919-1927
	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>
Oregon .....	496,587	476,205	566,709	888,699	777,719	860,597	677,753
Washington .....	469,567	278,150	745,639	1,049,206	487,788	767,077	632,905
Michigan .....	359,605	136,366	282,716	309,164	100,716	167,898	226,077
New York .....	246,576	89,419	171,911	243,881	224,653	169,962	191,067
Other states .....	674,469	209,960	536,281	334,385	323,558	167,664	374,386
Total of foregoing .....	2,246,804	1,190,100	2,303,256	2,825,335	1,914,434	2,133,198	2,102,188
Maine‡ .....	100,409	67,279	144,238	171,640	205,125	241,390	155,014
Total, all berries .....	2,347,213	1,257,379	2,447,494	2,996,975	2,119,559	2,374,588	2,257,202
<i>Percentages</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>
Oregon .....	22	40	25	31	41	40	32
Washington .....	21	23	32	37	25	36	30
Michigan .....	16	11	12	11	5	8	11
New York .....	11	8	8	9	12	8	9
Other states ....	30	18	23	12	17	8	18
Total of foregoing .....	100	100	100	100	100	100	100
Maine percentage to all berries....	4	5	6	6	10	10	7

\*Sources of data: For the years 1919, 1921, 1923, 1925, and 1927, data were obtained from the Federal Census of Manufactures, Biennial reports. For 1924, data obtained from National Cannery Association as printed in the California Fruit News, January 31, 1925, p. 7.

†Standard cases for years 1919, 1921, 1923, and 1924; actual cases 1925 and 1927.

‡Almost all of Maine's berry pack consists of blueberries.

TABLE XXXV. CANNED PACK OF BERRIES BY KIND AND STATES  
1924-1929\*

Kind and State	1924	1925	1926	1927	1928	1929
<i>Strawberries</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>
Oregon .....	91,103	114,636	92,760	270,314	233,811	264,948
Washington .....	37,081	30,149	30,841	64,330	35,864	31,376
New York .....	19,856	6,469	9,568	11,702	3,035	1,497
Michigan .....	84,194	-----	-----	-----	25,167	38,417
Maryland .....	18,218	1,615	-----	8,573	-----	-----
<i>Red raspberries</i>						
Oregon .....	89,612	53,599	70,075	83,236	132,081	116,522
Washington .....	289,577	89,689	225,542	168,202	221,400	208,068
New York .....	176,124	235,700	197,531	156,254	150,004	145,221
Michigan .....	14,058	-----	-----	-----	19,000	12,636
<i>Blackcaps</i>						
Oregon .....	12,010	25,650	27,801	26,073	31,723	30,159
Washington .....	1,160	2,554	3,770	3,471	5,554	18,831
New York .....	49,901	88,393	54,939	43,511	76,156	56,874
Michigan .....	124,574	-----	-----	-----	148,600	46,700
<i>Blackberries</i>						
Oregon .....	170,677	221,661	343,582	175,864	222,137	274,332
Washington .....	451,475	265,169	535,995	468,834	520,564	388,311
New York .....	1,204	1,143	2,017	0	39	0
Michigan .....	42,095	8,714	-----	8,025	13,143	4,381
Texas .....	106,274	96,465	-----	60,756	-----	108,000
California .....	48,103	31,131	24,366	0	0	0
<i>Gooseberries</i>						
Oregon .....	48,964	47,933	58,352	84,503	34,600	22,621
Washington .....	14,100	19,406	20,506	29,653	19,263	21,359
New York .....	1,997	1,148	1,855	1,095	1,433	590
Michigan .....	30,440	-----	-----	-----	23,905	10,667
Colorado .....	-----	-----	-----	-----	-----	9,000

\*Sources of information as follows: Oregon and Washington figures on actual case pack were obtained from annual reports of the Northwest Cannery Association. New York statistics from reports of the Association of New York Cannerymen, Inc. (Standard cases). Michigan: 1924 figures from National Cannery Association, special survey; the 1925 and 1927 actual case figures from Federal Census of Manufactures; the 1928 and 1929 figures computed from Michigan Canning Report, for 1928-1929, Michigan State Department of Agriculture—converted from tonnage to standard case basis. Maryland: National Cannery Association 1924; Federal Census of Manufactures 1925 and 1927 listed as "other berries." Texas: National Cannery Association 1924; Federal Census of Manufactures, 1925 and 1927; and "Facts in the Food Markets" Feb. 8, 1930; American Institute of Food Distribution, Inc., for 1929 figures. California: Western Cannery and Packer, Statistical Review, March 20, 1930, p. 144. Colorado: Estimate of pack in 1929 obtained from Colorado Cannerymen. The blank spaces indicate no report available.

TABLE XXXVI. CANNED FRUIT PACK IN OREGON AND PACIFIC NORTHWEST 1919-1929\*

Item	Average 1919-1924	1925.	1926	1927	1928	1929	Average 1925-1929
<i>Oregon</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>
Strawberries ..	76,208	114,636	92,760	270,314	233,811	264,948	195,294
Red raspberries ..	53,608	53,599	70,075	83,236	132,081	116,522	91,103
Blackcaps .....	18,082	25,650	27,801	26,073	31,723	30,159	28,281
Loganberries ..	264,605	345,270	694,758	375,759	453,857	293,488	432,626
Blackberries ..	174,621	221,661	343,582	175,864	222,137	274,332	247,515
Gooseberries ..	22,052	47,933	58,352	84,503	34,600	22,621	49,602
Total berries ..	609,176	808,749	1,287,328	1,015,749	1,108,209	1,002,070	1,044,421
Jams, jellies and preserves	31,647	25,636	32,448	73,530	59,495	45,931	47,408
Other fruits ....	843,921	1,242,375	1,881,627	1,418,966	2,538,921	2,586,836	1,933,745
Total all fruits	1,484,744	2,076,760	3,201,403	2,508,245	3,706,625	3,634,837	3,025,574
<i>Pacific Northwest</i>							
Strawberries ..	122,000	145,014	123,601	334,644	269,791	296,324	233,875
Red raspberries ..	189,485	143,288	295,617	251,438	353,481	324,590	273,683
Blackcaps .....	19,174	28,204	31,571	29,544	37,277	48,990	35,317
Loganberries ..	331,093	409,687	895,387	480,995	544,181	354,552	536,960
Blackberries ..	432,963	486,830	879,577	644,698	742,701	662,643	683,290
Gooseberries ..	32,457	67,339	78,858	114,156	53,863	44,260	71,695
Total berries ..	1,127,172	1,280,362	2,304,611	1,855,475	2,001,294	1,731,359	1,834,820
Jams, jellies and preserves	58,512	59,549	85,571	97,736	73,870	68,832	77,112
Other fruits ....	1,948,487	3,351,956	4,113,030	2,929,131	5,575,365	5,635,746	4,321,055
Total all fruits	3,134,171	4,691,867	6,503,262	4,882,342	7,650,529	7,435,937	6,232,987

\*Data obtained from annual reports of the Northwest Cannery Association.

TABLE XXXVII. STRAWBERRIES: CAR-LOT SHIPMENTS BY DISTRICT IN THE UNITED STATES, 1920-1929\*

Year	Early	Second Early	Inter- mediate	Late			United States total
				Total	Oregon	Wash- ington	
	<i>car-loads</i>	<i>car-loads</i>	<i>car-loads</i>	<i>car-loads</i>	<i>car-loads</i>	<i>car-loads</i>	<i>car-loads</i>
1920 .....	965	2,433	2,796	1,005	103	22	7,199
1921 .....	2,000	4,108	3,617	1,140	116	140	10,865
1922 .....	2,456	8,622	6,170	1,513	141	188	18,761
1923 .....	3,606	7,768	5,077	1,350	115	177	17,801
1924 .....	3,037	8,741	5,865	1,323	39	39	18,966
1925 .....	2,240	5,687	3,880	439	57	42	12,246
1926 .....	3,223	5,139	4,637	610	39	17	13,609
1927 .....	3,367	7,992	5,844	688	110	93	17,891
1928 .....	4,653	7,589	5,973	501	99	106	18,716
1929 .....	6,309	7,171	4,734	507	103	61	18,721
Average 1925-1929	3,958	6,716	5,014	549	81	64	16,237

\*Sources of data: For years 1920-1924, from U. S. Dept. of Agric. Yearbook, 1928, p. 485. For years 1925-1929, from Marketing Louisiana Strawberries 1929 Season, U. S. Dept. of Agric. Market News Service.

For states included in each district designated above see Table XXVII.

TABLE XXXVIII. STRAWBERRIES: PERCENTAGE DISTRIBUTION OF CAR-LOT SHIPMENTS BY DISTRICT IN THE UNITED STATES, 1920-1929\*

Year	Early	Second Early	Inter-mediate	Late		United States total
				Total	Oregon and Washington	
	%	%	%	%	%	%
1920 .....	13	34	39	14	1.7	100
1921 .....	18	38	33	11	2.4	100
1922 .....	13	46	33	8	1.8	100
1923 .....	20	44	28	8	1.6	100
1924 .....	16	46	31	7	.4	100
1925 .....	18	46	32	4	.8	100
1926 .....	24	38	34	4	.4	100
1927 .....	19	45	32	4	1.1	100
1928 .....	25	40	32	3	1.2	100
1929 .....	34	38	25	3	.9	100
Average 1925-1929...	25	41	31	3	.9	100

\*Computed from Table XXXVII.

TABLE XXXIX. ESTIMATED VOLUME OF FRESH BERRIES USED IN CANNING, COLD PACK, AND CAR-LOT SHIPMENT, PACIFIC NORTHWEST, 1919-1929\*

(Tons—fresh basis)

Kind and Use	Average 1919-1924	1925	1926	1927	1928	1929	Average 1925-1929
<i>Strawberries</i>	<i>tons</i>	<i>tons</i>	<i>tons</i>	<i>tons</i>	<i>tons</i>	<i>tons</i>	<i>tons</i>
Canning .....	2,182	2,512	2,424	5,476	4,375	4,707	3,899
Cold pack .....	.....	4,500	4,975	8,617	15,618	10,311	8,804
Car-lot shipment .....	1,428	712	418	1,555	1,512	1,181	1,076
<i>Red raspberries</i>							
Canning .....	2,550	1,952	3,971	3,417	4,707	4,322	3,674
Cold pack .....	.....	2,000	5,968	2,018	4,962	2,958	3,581
<i>Blackcaps</i>							
Canning .....	248	355	404	383	469	608	444
Cold pack .....	.....	50	102	4	305	230	138
<i>Loganberries</i>							
Canning .....	4,399	5,415	11,768	6,401	7,183	4,711	7,096
Cold pack .....	.....	350	879	439	418	626	542
<i>Blackberries</i>							
Canning .....	6,318	7,100	12,814	9,416	10,821	9,656	9,961
Cold pack .....	.....	1,000	1,645	503	1,428	1,362	1,187
<i>Gooseberries</i>							
Canning .....	441	894	1,053	1,516	724	597	957
Cold pack .....	.....	.....	4	14	40	4	12

\*Sources of information: Data on canning and cold pack were computed from annual reports of the Northwest Cannery Association. The volume used in canning was computed on the same basis as indicated in Table XXIV. Computations of cold pack as follows: no sugar, 380 pounds fruit per barrel; two parts berries to one part sugar, 300 pounds fruit per barrel; three parts berries to one part sugar, 330 pounds fruit per barrel. Volume of strawberries shipped in car-lots was arrived at by allowing an average of 800 crates per car-load (18 pounds net per crate). Car-lot shipments data obtained from the Division of Crop and Livestock Estimates of the U. S. Bureau of Agricultural Economics. These figures do not include l.c.l. or truck shipments.

TABLE XL. AVERAGE OPENING PRICES OF KIND CANNED BERRIES,  
1914-1929\*  
(Dollars per Dozen No. 10 Choice)

Year	Straw-berries	Red rasp-berries	Black rasp-berries	Logan-berries	Black-berries	Goose-berries
1914 .....	\$ 6.55	\$ 6.35	\$ 5.85	\$ 6.20	\$ 4.35	\$ 5.60
1915 .....	7.25	6.95	6.30	6.35	4.75	6.30
1916 .....	7.25	6.75	6.55	6.15	5.13	5.50
1917 .....	8.25	8.25	8.00	6.25	6.25	6.25
1918 .....	11.25	11.25	10.75	9.50	9.50	8.75
1919 .....	19.00	19.00	19.00	15.50	13.50	10.50
1920 .....	33.50	28.50	28.50	20.00	17.50	14.50
1921 .....	11.00	12.00	12.00	10.50	10.00	9.50
1922 .....	12.00	12.00	11.50	9.25	9.50	10.75
1923 .....	12.00	12.00	10.70	9.00	8.13	10.75
1924 .....	12.25	12.25	10.90	9.00	8.50	10.50
1925 .....	12.70	12.25	11.00	9.00	8.70	8.00
1926 .....	12.90	12.40	11.15	8.95	8.58	7.60
1927 .....	12.25	10.95	11.50	9.10	7.50	6.90
1928 .....	12.40	10.50	10.40	7.35	6.92	7.00
1929 .....	11.25	11.00	10.25	7.90	7.12	6.50
Average 1925-1929	\$12.30	\$11.42	\$10.86	\$ 8.46	\$ 7.76	\$ 7.20

\*Sources of information: Western Canner and Packer, Statistical Review 1927, p. 37, for years 1923-1926. Opening price lists were obtained from several representative canneries in Oregon for the years 1914-1929. These price lists were averaged to obtain the above figures. In some of the earlier years only one or two lists were available, but most of the years are based on several reports.

TABLE XLI. AVERAGE FRESH-FRUIT REQUIREMENTS AND DIRECT COSTS OF CANNED FRUITS, OREGON AND CALIFORNIA, 1925-1929 AVERAGE (Per Dozen No. 10 Choice)

State and Kind	Fresh fruit requirements I	Cost of fruit per pound II	Total cost of fruit III	Direct labor IV	Other direct costs V	Total direct costs VI	Opening price 1925-1929 average VII
<i>Oregon</i>	<i>lb.</i>						
Strawberries .....	68	7.7¢	\$5.24	\$1.19	\$2.15	\$8.58	\$12.30
Red raspberries ....	62	8.4	5.21	.30	2.15	7.66	11.42
Black raspberries..	51	9.1	4.64	.28	1.89	6.81	10.86
Loganberries .....	62	4.8	2.98	.25	2.43	5.66	8.46
Blackberries .....	60.5	4.6	2.78	.12	1.89	4.79	7.76
Gooseberries .....	54	3.7	2.00	.11	2.15	4.26	7.20
Royal Anne cherries .....	60.5	8.2	4.96	.74	1.89	7.59	10.50
Bartlett pears .....	93	2.8	2.56	1.34	1.89	5.79	9.07
Prunes .....	56.5	1.6	.90	.20	1.89	2.99	4.87
Apples, 10 water....	140	.5	.73	.97	1.43	3.13	4.21
<i>California</i>							
Apricots .....	71	3.3	2.31	.....	.....	.....	8.06
Peaches .....	90	1.9	1.67	.....	.....	.....	6.82

Sources of data as follows:

- I. Requirements for Oregon fruits are based on data obtained from a representative cannery covering a period of several years. California apricot and peach requirements were obtained from California Packing Corporation, San Francisco.
- II. Represents 1925-1929 average prices paid growers. Oregon figures from same source as in Table XXV. California figures obtained by special correspondence with the California Experiment Station.
- III. Items in column I multiplied by corresponding items in II.
- IV. Obtained from the records of a private cannery representing the direct labor costs for the year 1924.
- V. Includes sugar at 6¢ per lb.; labels at \$8.35 per 1,000; cases at 15¢ each; cans \$82.67 per 1000. Other manufacturing expense not included.
- VI. Total of items in columns III, IV and V.
- VII. Data on Oregon fruits from same sources as in Table XL. California quotations were obtained from the Western Canner and Packer, Statistical Review 1927, p. 35; and Statistical Review 1930, p. 50.