



## ABSTRACT

Prices received for grapes by Missouri growers are shown to be influenced principally by production in California and the Ozarks. Grape production in these areas has increased greatly since 1921, resulting in low prices. Future production at approximately present levels is in prospect, and prices will probably be similar to those of recent years, with marked fluctuations in the Missouri production and price. An analysis of cost of production in Missouri indicates that these prices will enable the average grower to about break even, while some will make a small profit and others should consider the advisability of abandoning their vineyards. Figures for individual growers and sections or particular years may be substituted for certain items included, in order to relate the data for the region as a whole to individual conditions. Some possibilities of increasing returns to growers are offered by improving quality, broadening markets, and development of by-products, but these opportunities are not as great as might be anticipated. No relief from low prices in the form of a material reduction in marketing costs appears in prospect.

## ACKNOWLEDGMENT

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# Economic Position of the Grape Industry in Missouri

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"Grape growing on a commercial scale in Missouri had its beginning about 1850. Between 1860 and 1870 it developed into a very important industry, especially about St. Louis, Hermann, and other river towns. In 1870 Missouri produced more wine than any other state except California and for several years Missouri was among the leading grape producing states of the country; but from 1875 production steadily decreased."

"Recently Missouri has experienced a revival of interest in grape growing, especially in the southern part of the state. (See Figure 11.) Thousands of acres of vineyards have been planted during the past two or three years and as a result the State may regain the position of importance it once occupied in the grape growing industry."\*

The opportunities for grape growing in Missouri from a physical production standpoint are outlined in the bulletin from which the preceding quotation is taken. The purpose of the present bulletin is to demonstrate the economic possibilities of grapes in Missouri. Growers are only too well acquainted with the fact that returns from grapes have in recent years been generally unsatisfactory. Grapes are a lifetime enterprise, and entry into the business calls for greater thought than is given many other enterprises. Potential producers who contemplate setting out vineyards are therefore vitally interested in the following question:

(1) *Is the present or prospective future status of the grape industry such that I can expect reasonably satisfactory returns from a vineyard enterprise?*

Growers already in the business are also concerned with the answer to this question, as evidenced by the fact that many producers are contemplating pulling up or neglecting their vineyards. They are even more interested, however, in another question:

(2) *If the outlook for the industry as a whole should prove unpromising, what are the prospects of increasing returns to Missouri producers by improved marketing methods?*

\*Introduction to Missouri Agricultural Experiment Station Bulletin 208, *Grape Growing in Missouri* (now out of print), by H. G. Swartwout. (1926).

This publication is designed to answer these two questions, so far as available information will permit. A similar but more complete and detailed study of the strawberry industry of Missouri was reported in August, 1928, as Station Bulletin 262. In Missouri grapes are generally marketed through the same channels as strawberries, and many of the marketing problems encountered are common to both commodities. Grapes are produced in the same areas of the State as strawberries, and largely by the same growers. For these reasons, and in order to avoid duplication, only those phases of small fruit production and marketing in Missouri which are peculiar to grapes have been treated in this publication. Thus, in order to obtain the full significance of facts presented herein it is necessary that they be considered in connection with the facts and discussion contained in Bulletin 262\*. Some of the statistical measures used may not be clear to the average reader, but this should not prevent an understanding of the remainder of the material and of the conclusions reached.

### FACTORS AFFECTING MISSOURI GRAPE PRICES

The supply and demand factors affecting grape prices are similar to those involved in the case of strawberries, though somewhat more complicated. Their relative complexity is due to differences in methods of utilization and of varieties and production areas.

**Types of Grapes.**—The grapes produced in the United States may be classified in a number of different ways:

- (a) European (*Vinifera*) and American (*Labrusca*);
- (b) Wine, raisin, and table grapes;
- (c) Grapes designed for fresh grape shipment and to be dried as raisins.
- (d) Table grapes and juice stock.

The European (*Vinifera*) grapes were introduced into America by the early settlers, but were found not sufficiently well adapted to climatic and other conditions encountered in the Eastern part of the country. Missouri as well as some other eastern and mid-western states, shortly after the Civil War, had a heavy production of wine grapes including

\*There are relatively few data available on Missouri grape production and prices. The State census records and the reports of the Missouri Cooperative Crop Reporting Service do not contain the same information on grapes as for strawberries and other more important crops. The Bureau of Agricultural Economics does not maintain a field office covering the Ozark grape deal, as it does in some other sections. For these reasons less information was available for analyzing the Missouri grape situation than was used in the strawberry study. On the other hand, a great deal of information on the European (*vinifera*) grape situation is available and has been admirably summarized in Bulletin 429 of the California Agricultural Experiment Station, which publication has in a number of instances been drawn upon for data relevant to the Missouri situation. It is regretted that the results of the national survey now being conducted by the Bureau of Agricultural Economics will not be available in time for inclusion in this publication.

some vinifera and hybrid varieties, but at present the vinifera varieties are practically confined to California, where the climate is admirably adapted to the production of this type of grape.

East of the Rocky Mountains the commercially grown varieties are of native American origin (mostly *Labrusca*), and are usually termed American or Eastern grapes. They represent but a small part of total grape production (See Figures 2 and 10). Some of the more common varieties are the Concord, Niagara, Delaware, and Catawba. In Missouri only two varieties are found, the Concord and the Moore's Early, the latter being an early grape quite similar to the Concord, but less hardy and productive. Hereafter, when the term "American Grapes" is used it means American type or so-called Eastern grapes, grown east of the Rocky Mountains.

**Uses of Grapes.**—The American grapes have a thin slip-skin and a characteristic tangy flavor not possessed by the thick-skinned, sweeter European grapes. They are used mainly as table grapes. There is no way of definitely ascertaining the proportion of American type grapes which are converted into wine. Interviews with dealers in a number of markets elicited some widely differing opinions. Two of the leading dealers of the Twin Cities estimated, respectively, that 5 and 25 per cent of Missouri Concords sold there were used for making wine. Estimates by dealers in other cities varied within this range. In some cities with certain foreign elements of population it is a favorite practice to mix the juice of Concords with that of European wine varieties in the making of home brew. However, it is probable that Michigan grapes are used to a greater extent for this purpose, since Missouri's supply comes on the market before wine making fully begins.

The European grapes grown in California are of three general types:\* (1) Table grapes. The Malaga and Tokay varieties of this type furnish the chief competition to Missouri grapes. Table grapes constitute about 22 per cent of the California acreage. (2) Wine grapes (chiefly Zinfandel and Alicante) are used practically altogether for home wine making. Like other California grapes, they move largely to the big cities of the East and the lake states. About 26 per cent of the California acreage is in wine varieties. (3) Raisin varieties (Muscat and Thompson Seedless) constitute 52 per cent of the California acreage.

Each of these three classes of California grapes are included in the shipments of fresh grapes to market. Practically all of the wine grapes are so utilized, and they made up 40 per cent of California fresh grape shipments in 1926. Table grapes constituted 37 per cent of the shipments from that State, while 23 per cent were of the raisin varieties, for use as

\*See Bulletin 429, California Agricultural Experiment Station, for complete discussion.

fresh stock. The proportion of the raisin grape crop going into shipments of fresh grapes will depend on the relative prices of raisins and fresh grapes, and the large production of raisin grapes is therefore a constant potential source of supply which definitely limits the possibilities of price advance.

Of these shipments it is estimated that all of the wine grape varieties, 16 per cent of the raisin varieties and about 13 per cent of the table varieties were used for home wine making.

From these and other figures Table 1 has been prepared, showing the approximate production areas, species, types, and uses of grapes, expressed in terms of percentages. The reader should study this table carefully, since it constitutes an essential key to an understanding of the economic position of the grape industry.

**Competition Between Types and Areas.**—As a result of this complicated situation it is not an easy matter to determine the probable future supply of grapes so far as the effect on Missouri prices is concerned. The big question centers around the extent to which these different types of grapes and areas of production compete with each other. When grapes were being heavily promoted in Missouri several years ago, a favorite argument was the supposed fact that Missouri grapes come on the market earlier than those from other sections.

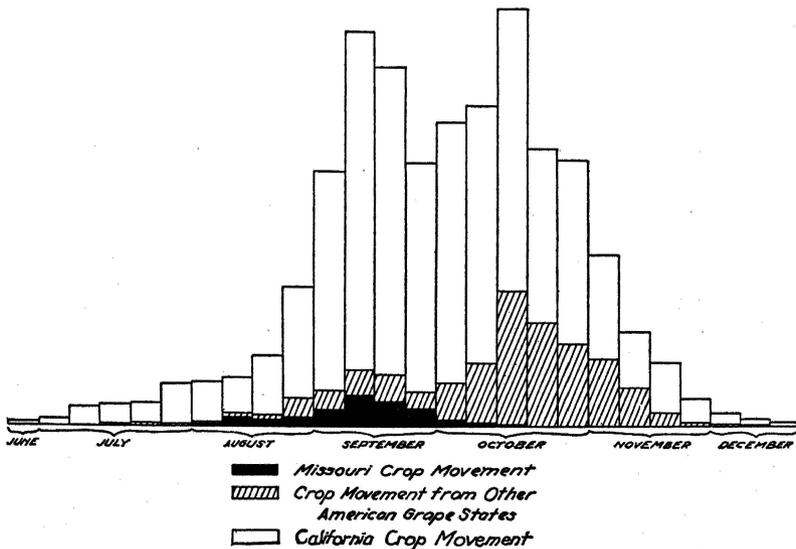


Fig. 2.—Weekly Shipments of Grapes in the United States by Areas, 1926.

TABLE I.—DISTRIBUTION OF GRAPE PRODUCTION BY AREAS, SPECIES, TYPES, USES, (IN TONS AND PERCENTAGES) 1926†

	Total					Table			Wine	Raisin				
	Total	Fresh			Dried	Fresh			Fresh	Total	Fresh			Dried
		Total	Table	Juice	Total	Total	Table	Juice	Total (all juice)	Total	Total	Table	Juice	Total
	Total	Total	Table	Juice	Total	Total	Table	Juice	Total (all juice)	Total	Total	Table	Juice	Total
Total United States	2,349,000 Tons 100%	1,261,000 53.6%	568,650 24.2%	827,670 35.2%	1,088,000 46.3%	663,960 28.2%	595,170 25.3%	68,790 2.92%	412,080 17.5%	1,272,960 54.1%	185,640 7.9%	65,280 2.77%	120,320 5.12%	1,088,000 46.3%
California (Vinifera)	2,040,000 86.8% of total production	952,680 46.7%	306,000 15%	781,320 38.3%	1,088,320 53.3%	354,960 17.4%	332,520 16.3%	22,440 1.1%	412,080 20.2%	1,272,960 62.4%	185,640 9.1%	65,280 3.2%	161,160 7.9%	1,088,000 53.3%
States east of Rockies (mostly Labrusca)	309,000 13.2% of total production	309,000 100%	262,650 85%*	46,350 15%*		309,000 100%	262,650 85%*	46,350 15%*						
Missouri (Labrusca)	12,880	12,880	12,236 95%*	644 5%*		12,880 100%	12,236 95%*	644 5%*						

\*Arbitrary estimates based on opinions of market operators.

†Data from various sources, based in some cases on shipments.

This partially erroneous conclusion must be based on the assumption that Missouri grapes do not compete directly with California shipments, since, as shown in Figure 2, the California movement reaches the first of two seasonal peaks at the time the Missouri movement is also at its height.

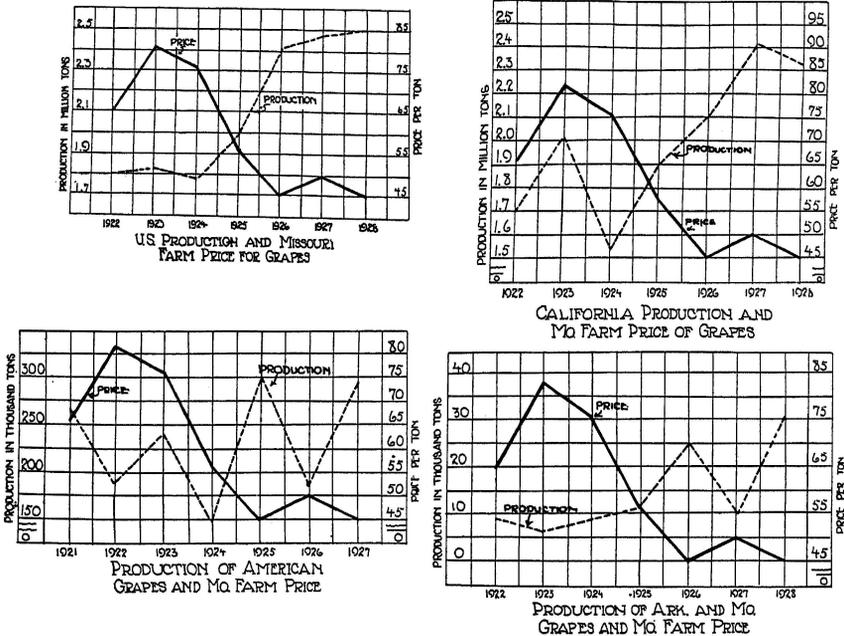


Fig. 3.—Missouri Farm Price of Grapes and Production in the United States and Different Areas, 1922-28.

**Relation Between Missouri Farm Price and Production in Different Areas.**—The relation between the Missouri farm price of grapes and production in the Ozarks, American grape states, California, and the United States as a whole, is shown in Figures 3 and 4.

Both figures show a very close relation between production in the United States as a whole and the Missouri price. The second chart in Figure 3 indicates a less distinct but evident relation between California production and the Missouri price. There seems to be somewhat less relation between the Missouri price and total production of American type grapes than between the Missouri price and Missouri or Ozark production.

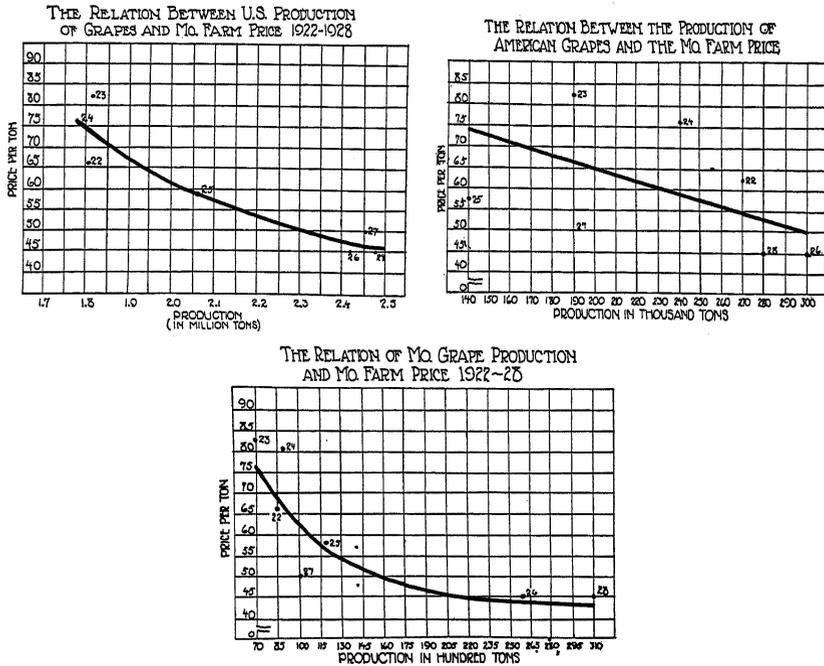


Fig. 4.—Supply Price Curves Showing the Relation Between the Missouri Farm Price for Grapes and Production in Different Areas and the U. S., 1922-28.

TABLE 2.—MULTIPLE CORRELATION BETWEEN MISSOURI FARM PRICE OF GRAPES ( $x_1$ ), MISSOURI AND ARKANSAS PRODUCTION ( $x_2$ ), AMERICAN GRAPE PRODUCTION ( $x_3$ ), AND CALIFORNIA GRAPE PRODUCTION. ( $x_4$ ). 1922-1928

Year	Price Per Ton $x_1$	Production in Tons		
		$x_2$	$x_3$	$x_4$
1922	\$66.00	8550	269,621	1,706,000
1923	82.00	6960	191,229	2,030,000
1924	76.00	8840	237,042	1,535,000
1925	57.00	11700	144,821	1,912,000
1926	45.00	25880	301,532	2,114,000
1927	50.00	10000	189,446	2,406,000
1928	45.00	31000	283,981	2,331,000

Gross Correlations		Partial Correlations		Multiple Correlation	
$r_{12}$	— .7641 ± .106	$r_{1-23}$	— .632 ± .15	$R_{1-234}$	= .834 ± .0789
$r_{13}$	— .3260 ± .22	$r_{1-24}$	— .8309 ± .078	$R^2_{1-234}$	= .695
$r_{14}$	— .6729 ± .13	$r_{1-34}$	— .7451 ± .113		

While the number of years for which data are available is too small for very satisfactory analysis of this kind, a multiple correlation (.834 ± .079) between the Missouri farm price and production in California,

Missouri, and Arkansas, and American grape producing states indicates that production in these areas accounts for 69.5 per cent of the price changes. The relative importance of each factor is partially indicated by the simple correlations shown in Table 2, the coefficients of determination not having been calculated.

**Seasonal Competition.**—The relative importance of the American grape producing states which compete with Missouri is shown in Figure 5. It will be noted in Figure 2 that the greater part of the production of these states comes on the market after Missouri's. The total Ozark shipments account for the greater part of shipments through the middle of September. Kansas, Iowa, Nebraska, and Illinois furnish some competition from American type grapes during the last half of the Missouri season, but California shipments are the principal bar to a clear market. Shipments of table stock from California seem to have two seasonal peaks, the last being the highest. The first of these peaks comes at about the same time that the Missouri peak is reached.

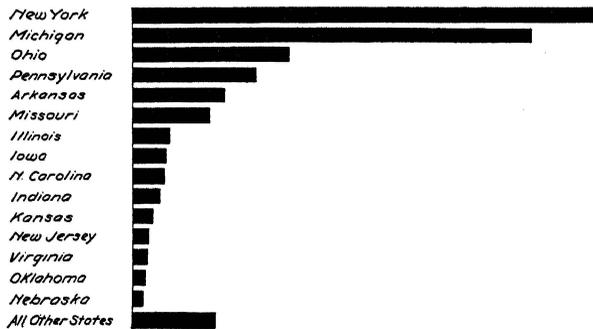


Fig. 5.—Production of American Type Grapes by States, 1928.

There are, of course, many people with a distinct preference for American type grapes, who will buy them regardless of the quantity or price of Vinifera varieties. When American grapes are scarce, as during the first part of the Missouri season, these consumers are forced to pay a relatively high price. This, coupled with the fewer shipments of directly competing California varieties, results in higher prices for Missouri grapes during the first part of the season. This does not mean a great deal to the growers, however, since the quantity shipped at these prices is small, as shown by the first chart in Figure 6. The other charts in this figure throw additional light on the seasonal movements of production and prices. It will be noted that a falling off in Missouri shipments toward the end of the season does not result in a similar gain in price, due to the increasing movement of American type grapes from other areas, and the large California shipments.

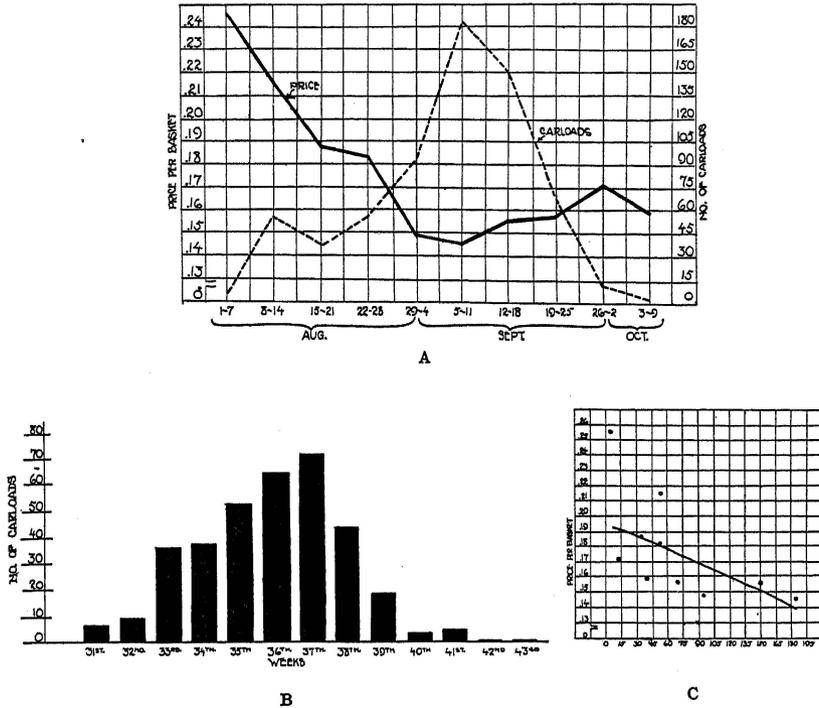


Fig. 6.—(a) Weekly Prices and Carload Shipments of Grapes, Missouri, 1926. (b) Average Seasonal Variation in Shipments, 1925-28 (weeks are numbered to avoid confusion of dates). (c) Supply-price Curve Showing Relation Between Weekly Shipments and Average Weekly Price.

The fact that the arrival of the first Missouri shipments on the market before the heavy movement of American type grapes does not give any great advantage to Missouri producers (as claimed in promotion activities) is partially indicated by Table 3, which shows the average prices received by six leading American grape producing states from 1922 to 1928. The later maturing of the crop of the northern states helps to overcome the disadvantage of heavier shipments because of the tendency to postpone home wine making until the fall months. It will be noted that Arkansas, coming on the market first, has a relatively high average, as do the eastern states which have a lower freight rate and are nearer the principal markets. It must also be remembered that some shipments from the northern states come on the market at the tail end of the season, which gives them an additional advantage similar to that of Arkansas. In all probability price data from the source used is more accurate for any given section for a period of years than between different

sections, yet the figures are sufficiently reliable for a rough comparison of the various areas.

TABLE 3.—FARM PRICE OF GRAPES BY STATES, 1922-28\*

	1928	1927	1926	1925	1924	1923	1922	Average	Per cent of Average for all States
New York	46	61	35	90	74	72	84	66	95.8
Michigan	37	45	35	74	76	92	70	61.2	88.8
Ohio	59	60	40	95	80	90	140	80.5	116.8
Pennsylvania	46	61	34	95	78	76	100	67.1	97.4
Arkansas	57	65	38	60	69	140	120	78.4	113.8
Missouri	45	50	45	57	76	82	66	60.1	87.2
Average	--	--	--	--	--	--	--	68.9	----

The foregoing evidence shows the importance of coming on the market as early as possible. It also indicates the difficulty of talking about the economic possibilities of grapes in the State as a whole. The outlook might be very unfavorable in general, but fairly good for an early maturing variety like Moore's Early (which, however, has other disadvantages) in the very southern part of the State. Of course, the possibility of further development in Arkansas would have to be considered in the latter regard.

**Factors Affecting Price.**—From these data and interviews with numerous market operators, the following conclusions may be drawn:

(1) It is entirely incorrect to exclude California production in considering the economic possibilities of grapes in Missouri, even though the competition is in some respects indirect.

(2) California grape production and prices in effect establish a sort of upper limit beyond which the price of American grapes, including those produced in Missouri, cannot go. But within this limit the Missouri price is affected by production in both competing American type producing states and in the Ozarks, more particularly the latter. Thus, a year of light production in Missouri\* and Arkansas (such as 1927) will result in relatively high prices, which, however, would undoubtedly be considerably higher were it not for the effect of the California production.

(3) In arriving at conclusions regarding probable future supplies affecting prices of Missouri grapes the best single barometer would

\*Table 4 shows some factors affecting Missouri production. These correlations yield results quite different from those obtained by Stover of Cornell, in a correlation of these factors with the purchasing power of grapes.

appear to be the trend of total U. S. production, and next, that of production in the Ozark region.

4.

TABLE 4.—RELATION BETWEEN CARLOAD SHIPMENTS OF GRAPES FROM MISSOURI AND (1) JUNE, JULY, AND AUGUST RAINFALL THE PREVIOUS YEAR, (2) JULY AND AUGUST TEMPERATURE THE PREVIOUS YEAR, (3) DAYS OF LAST KILLING FROST FROM MARCH 1ST.

Simple Correlations		
(1) $r = .491 \pm .1477$	(2) $r = -.259 \pm .1816$	(3) $r = -.255 \pm .182$

(4) That expansion or contraction of acreage in the Ozark region is of importance more from the standpoint of whether or not it is profitable for the individual producers involved than from the standpoint of the effect of such action on price. In other words, the potential producer may reasonably give less consideration to the probable effect of his contemplated entry into production on the general price level for grapes than he would in the case of strawberries, for instance, and more to the problem of whether or not he can hope to make a profit under given price conditions. This is due to the relatively small effect which the actions of individual producers and sections have on the price determining supply of grapes.

### PAST AND PROBABLE FUTURE TRENDS IN THE GRAPE INDUSTRY

Prices received by Missouri grape producers previous to 1922 are not available. However, it may be assumed that the year-to-year changes have roughly corresponded to those for the northern American grape producing states. Figure 7 shows the purchasing power (based on actual prices with the influence of the general price level removed) of grapes

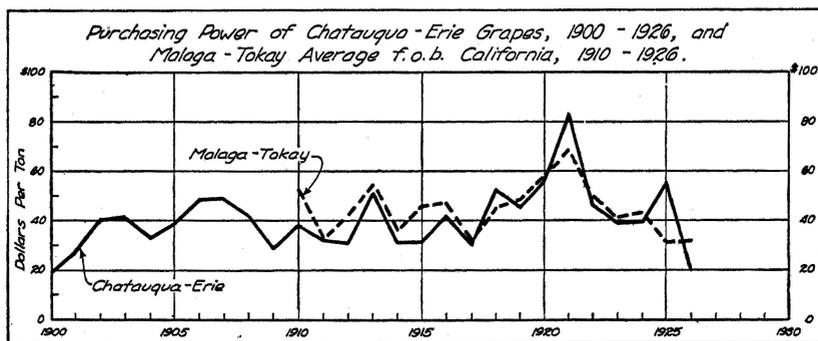


Fig. 7.—Purchasing Power of Chatauqua-Erie Grapes, 1900-1926, and Malaga-Tokay average f. o. b. California, 1910-26. (Courtesy of the California Agricultural Experiment Station—see Bulletin 429 for original sources of data.)

for the Chautauqua-Erie section of New York and Pennsylvania from 1900 to 1926, and of Malaga-Tokay (California table varieties) from 1910.

It will be seen that the purchasing power of grapes experienced a marked rise from 1917 to 1921, the extreme peak reached in the latter year being largely due to an unfavorable season which greatly curtailed grape shipments (Figure 9). The rise in actual prices was even more precipitate. This was followed by an even more rapid decline in price in 1922 and 1923. All types of grapes participated in this general movement. The extremely high prices of the period 1919 to 1921 may be attributed largely to the sudden advent of prohibition, as well as to the bad year previously mentioned and certain aspects of the raisin situation.

The high prices brought on by these factors did not last long. Producers, heedless of the usual effect on production and future prices of such temporary prosperity, set out grape vines and then more grape vines. At the present time grapes rank second to apples in carload shipments in the United States. Figures on production are not available prior to 1922 but the vast increase which took place, mainly in California,

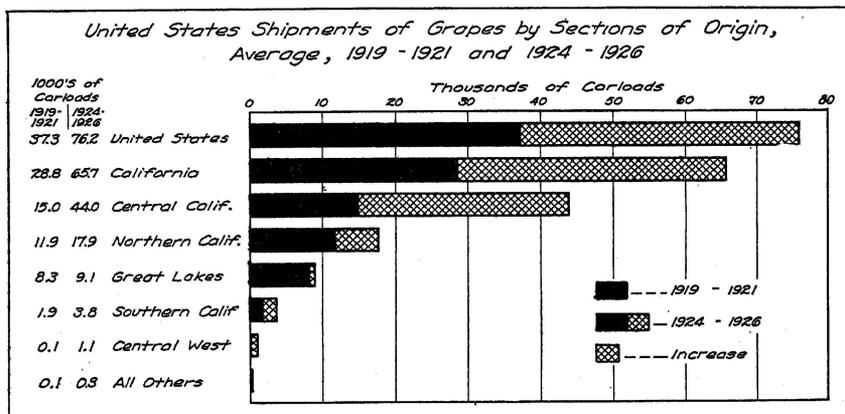


Fig. 8.—United States Shipments of Grapes by Section of Origin, 1919-21 and 1924-26. (Courtesy of the California Agricultural Experiment Station.)

is indicated by Figures 8 and 9. The solid lines in Figure 9 represent the actual percentage changes in shipments, while the dotted line represents the trend (line of least squares).

The tremendous increase in shipments of grapes is by no means wholly accounted for by increased production. The largest part of the total increase, as shown by the charts, has come from California. Both

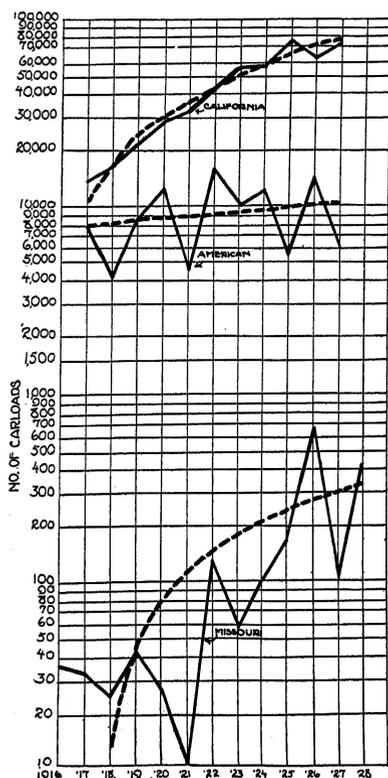


Fig. 9.—Rate of Change of Grape Shipments from Different Areas, 1916-28. (In this chart semi-logarithmic paper has been used, in which the vertical scale is designed to show actual changes, although the figures are expressed as actual shipments; i. e., the higher the line moves, the greater is the number of carloads represented by a given distance covered.) The trend lines were calculated by the line of least squares method.

the percentage and actual changes in the shipments from all American grape states have been relatively small. While the percentage increase in the Ozarks has been very great, the effect on total shipments has been small. The relatively high increase in California shipments, as compared with production, has been due to the diversion into fresh channels of grapes formerly converted into wine or raisins, a result of prohibition and the unfavorable raisin situation since 1921.

Figure 10 shows further the relative growth in production (as contrasted with shipments, shown in the other charts) since 1922. It will be seen that while the increase for the United States as a whole has been steady, production of American grapes has fluctuated violently, and even with the present number of vines production may be relatively low and prices correspondingly higher in any one year. This chart also indicates the relative importance of Missouri as compared with other American grape states and the country as a whole.

It should not be assumed that increases in the production and shipments of grapes have been as out of proportion to changes in demand as the year-to-year figures might indicate. Conditions have been such as to bring about a great increase in the demand for grapes. In addition to the normal increase in population, and the effect of prohibition on the use of grapes for home brew, we have witnessed an increase in the population of large cities, which use a large part of the California European grapes, over twice as fast as that for the country as a whole. The supply, however, has made even greater strides, which has resulted in the low prices.

**Probable Acreage Trend.**—A leveling off in production of grapes may be noted in Figure 10. This is due to the coming in bearing of approximately the maximum full bearing acreage of most classes of grapes which we can expect for some years to come. Production has heretofore been increasing as new vineyards planted during and immediately after the postwar boom period came into bearing. This movement has now been about consummated in California, and there is apparently no marked tendency to increase acreage in the American grape states except Missouri and Arkansas. In the latter states the development has

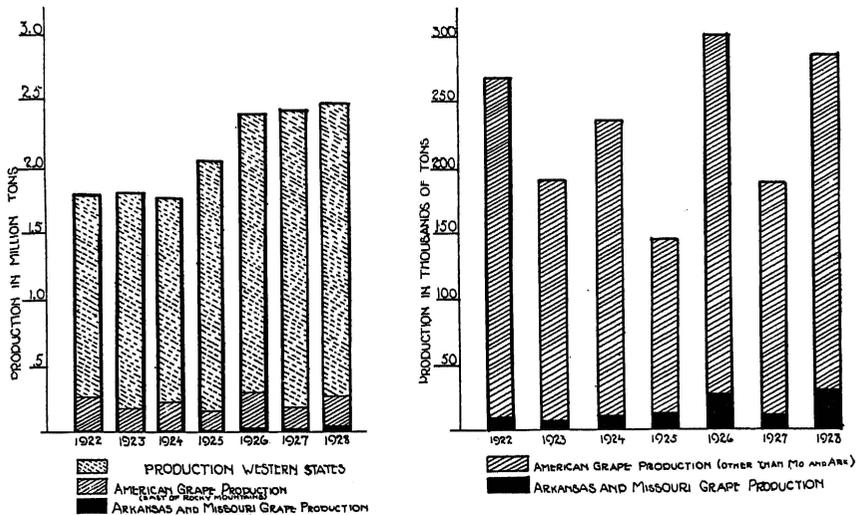


Fig. 10.—Production of Grapes in the U. S., 1922-28, by Areas.

been more recent than elsewhere, and in all probability the bearing acreage will continue to increase somewhat for several years, although Figure 9 indicates that production has already shown a tendency to level off in Missouri. Figure 11, showing the increase in number of grape vines in Missouri by census periods, indicates the growth in recent years in the southwestern part of the State. The increase has been even more marked in Arkansas. A considerable part of this acreage is just now coming into full bearing, and will probably continue so for a year or more. However, it is unlikely that there has been an appreciable increase in new vineyards since 1926, so that a more stable acreage situation can be expected in Missouri from 1930 on. This is much less true of Arkansas.

With a continuance of low prices it is probable that many vineyards in California will be torn up. In 1928 it is variously estimated that from 10,000 to 16,000 carloads of grapes were left to rot in the fields

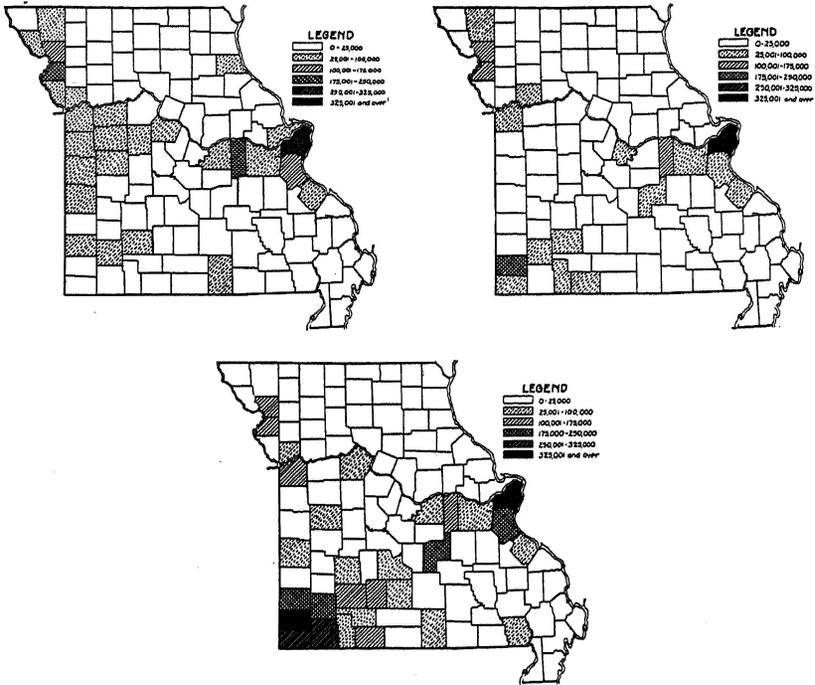


Fig. 11.—Number of Grape Vines in Missouri by Counties, 1909-1919-1924.

in that state. Many of the most unfavorably situated growers there will almost surely be forced to abandon their vines. This will be true to a certain extent in Missouri and other American type grape states, also, but it is not likely that this abandonment will be very great.

Because of these conditions, and the fact that grape vines have an indefinite age, we may expect the acreage of grapes in this country to continue about on the present level for some years to come, with possibly a gradual thinning out as individual producers become discouraged and decide to get out of production.

**Yields and Production.**—Low prices may be expected to affect the amount of care given the vineyards by many growers, and grapes which would be harvested and shipped in case of a shortage will undoubtedly be left unpicked in many cases. There are many other factors which might seriously affect the yield, and thereby temporarily nullify any general forecast of production. Reference to Figure 9 will show that extreme fluctuations in production are more common to the American grape states than to California.

**Demand.**—The future demand for fresh grapes is less predictable than for many other farm products, because of its relation to prohibition.

If the latter were done away with or nullified it would undoubtedly greatly decrease the demand for fresh grapes, and producers of American grapes would suffer indirectly along with those in California. It is, on the other hand, possible but not likely that home wine-making will decline materially in popularity.

In recent years there has been a tremendous increase in the production of nearly all kinds of fruits and vegetables, frequently resulting in very low prices. Since Missouri grapes come on the market at the time of the peak movement of other fruits and vegetables, this increased production tends to offset any tendency toward an increased demand for table grapes due to a growing population and other factors. Fluctuations in the production of competing fruits and vegetables affect the demand for grapes from year to year. For example in 1927 competition from peaches and other fruits was relatively slight, while in 1928 it was heavy. However, we are unlikely to have short crops of competing fruits in years when the grape crop is normal or heavy.

**Price Outlook.**—In the light of the foregoing circumstances it may be concluded that grape prices for at least several and probably a good many years will continue at a low level, unless extreme measures are taken to reduce acreage or handle the surplus. Because of the extreme fluctuations in yields it is probable that prices of Missouri grapes will vary considerably, but in years when they are above the general trend they will be offset by the smaller number of baskets marketed by growers, and the California crop will almost surely prevent the full realization of the advantages of short crops, which otherwise might result in higher total net returns to growers. In other words, growers may reasonably base their expectations of the future upon the situation which obtained in 1926, 1927, and 1928.

**Booster Propaganda.**—In strong contrast to the actual facts are the following statements from the press and other sources, which are typical of the kind of publicity which has contributed to the expansion of grapes in the Ozarks:

“The present annual production of grapes in the Ozarks is less than 3000 cars. It has been estimated the markets could absorb annually fully 40,000 cars of Ozark grown grapes”.

“For forty days Ozark grown grapes possess an absolute monopoly of the markets of the entire country!”

“Big as the industry already is, . . . . declare it is still in its infancy. They point out that . . . . the Ozark grapes have the market all to themselves for a month . . . . and . . . . ‘grapes will thrive on every hillside in the Ozarks’.”

**What Should Be Done About Acreage?**—The Bureau of Agricultural Economics, in considering grape prospects in its 1929 Agricul-

tural Outlook, says, "An immediate reduction of bearing acreage seems to be the surest method" of obtaining relief. While this may be very good advice for many California producers who are unfavorably situated, it may not apply to Missouri growers. The cost of production as well as the price must be considered in this connection.

### COST OF PRODUCTION AND ITS RELATION TO THE PRICE OUTLOOK

Enterprise cost of production records covering the year 1926 were obtained in six counties from 114 growers. Of these, 102 records were for development and bearing years, 12 for development years only, and 16 for the bearing year only. (See Table 5.)

TABLE 5.—AREAS, NO. OF GROWERS, AND ACREAGE COVERED BY COST OF PRODUCTION RECORDS

County	Towns	Number of Growers	Number of Acres
Barry	Monett	2	7
	Exeter	20	38
	Cassville	1	3.5
	Wheaton	1	2.5
Newton	Neosho	24	79
	Seneca	6	10
Jasper	Webb City	4	5.5
	Sarcoxié	11	13.75
	Joplin	4	10
	Carterville	2	6.25
	Carthage	1	3
	Alba	1	1
McDonald	Noel	8	27
	Anderson	10	21.5
	Rocky Comfort	5	13.5
Lawrence	Mt. Vernon	3	28
	Marionville	6	14.33
	Aurora	4	25
Douglas	Ava	1	1
Total		114	309.83

**Cost of Development.**—There are three years of development costs incurred before a vineyard comes into bearing. These costs must then be prorated (with interest) over the bearing years, the life of a vineyard being indefinite, but assumed for purposes of calculating costs to be twenty-five years. Trellis costs were charged off over a ten-year period.

The average itemized development costs, both total and for each of

the three years, are shown in Table 6 and Figure 12. These costs are based on a total of 82 usable records (without cover or inter-tilled crops), but due to omissions and other causes some items, such as the cost of trellis, are covered by a considerably smaller number of items. Interest on investment in land was charged at five per cent, and on the vineyard investment at eight per cent. Depreciation of equipment

TABLE 6.—COST PER ACRE DEVELOPING GRAPES, BASED ON 82 RECORDS.

	1st Year	2nd Year	3rd Year	Total 3 Years
<b>Labor and Power:</b>				
Preparing land.....	6.46	5.22		11.68
Planting.....	6.60	.50	.29	7.39
Cultivating.....	11.53	7.29	12.41	31.21
Fertilizer.....	.76	1.08	.44	2.28
Hoing.....	4.89	3.85	4.19	12.91
Pruning.....	.68	2.72	4.62	8.02
Spraying.....			7.12	7.12
Stakes.....	.64	2.07		2.71
Trellis.....		6.15	8.73	14.88
Tying.....			5.17	5.17
Harvest Costs.....			11.15	11.15
Misc.....	1.11	2.57		3.68
Total Labor and Power.....	32.67	31.45	54.12	118.24
<b>Materials:</b>				
Fertilizer.....	1.51	1.93	.97	4.41
Stakes.....	.90	2.32		3.22
Trellis.....		16.13	16.89	33.02
Plants.....	20.01	2.24		22.25
Spray Materials.....			2.46	2.46
Containers.....			5.96	5.96
Misc.....		.33	.17	.50
Total Materials.....	22.42	22.95	26.45	71.82
<b>Other Costs:</b>				
Taxes.....	.79	.76	.75	2.30
Equipment.....	3.55	2.70	3.50	9.75
Interest (Land).....	3.57	3.46	3.61	10.64
Interest (Vyd.).....		5.04	10.35	15.39
Total Other Costs.....	7.91	11.96	18.21	38.08
<b>Grand Total.....</b>	<b>63.00</b>	<b>66.36</b>	<b>98.78</b>	<b>228.14</b>
<b>Receipts from Grapes (3rd Year.)..</b>			<b>36.44</b>	<b>36.44</b>
<b>Annual Net Costs.....</b>	<b>63.00</b>	<b>66.36</b>	<b>62.34</b>	<b>191.70</b>
Less cost of trellis and tying.....				53.07
<b>Three-year net cost.....</b>				<b>138.63</b>

was figured at 4.4 cents per horse hour with certain exceptions. Horse labor was charged at 12 cents per hour, man labor at actual cost. The total receipts for the third year (the time at which the vines begin bearing) were subtracted to get the net cost for the year. The other items are self-explanatory. In Table 9 are given the man and horse labor requirements for the various operations, and these may be used to correct

the cost figures for changes in rates per hour from year to year or for individual growers.

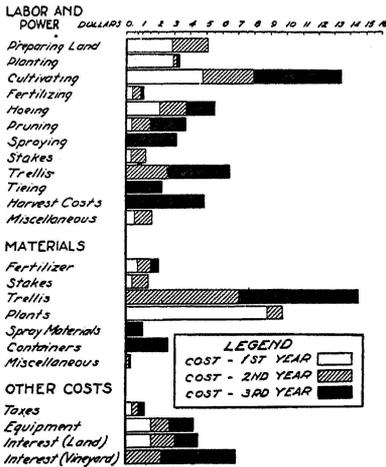


Fig. 12.—Cost Per Acre of Developing Grapes in Southwest Missouri, Based on 82 Records.

**Total Cost of Production Per Acre and Basket.**—The costs for bearing years are somewhat complicated by the matter of cover crops. An insufficient number of records from growers using cover crops was obtained to compare costs under the two methods, and there were so many combinations of cover crops and inter-tilled crops that it was believed best to omit these records from one cost summary. The costs for the forty remaining records, none of which included cover crops, are shown in Table 7 and Figure 13. In Table 8 are given the costs as calculated from 96 records including those vineyards with cover and intertilled crops.

TABLE 7.—COST OF GRAPE PRODUCTION, BASED ON 40 RECORDS, WITHOUT COVER CROPS, 1926

	Cost per Acre	Cost per 4 qt. bsk.
<b>Labor and Power</b>		
Previous to harvest.....	\$42.32	4.27 cent
At harvest.....	44.91	4.53
Total.....	87.23	8.80
<b>Materials</b>		
Fertilizer and Manure.....	.24	.02
Spray Materials.....	5.50	.56
Containers.....	33.58	3.39
Total.....	39.32	3.97
<b>Other Costs</b>		
Gas and oil.....	.58	.06
Taxes.....	.51	.05
Dep. for equipment.....	11.42	1.15
Dep. for trellis.....	7.64	.77
Res. for dep. of vvd.....	11.31	1.14
Total.....	31.46	3.17
Total Cost without Interest.....	158.01	15.94
Interest on investment—land \$77.56 per acre at 5% ..	3.88	.39
Total Costs with Interest.....	161.89	16.33
Return to grower.....	144.38	14.56
Profit or loss		
Loss.....	17.48	1.77

Yield per acre—991.63—4 quart baskets.

TABLE 8.—COST OF PRODUCTION OF GRAPES, BASED ON 102 RECORDS WITH AND WITHOUT COVER CROPS, 1926

	Cost per Acre	Cost per 4 qt. bsk.
<b>Labor and Power</b>		
Previous to harvest.....	\$43.53	4.394 cents
At harvest.....	46.80	4.724
Total.....	90.33	9.12
<b>Materials</b>		
Fertilizers and Manure.....	.52	.05
Spray Materials.....	6.19	.62
Containers.....	34.77	3.51
Total.....	41.48	4.18
<b>Other Costs (Seed, gas and oil, hired machine work) ...</b>	.95	.10
Taxes.....	1.02	.10
Dep. & rep. of equipment.....	12.10	1.22
Dep. & rep. of trellis.....	7.64	.77
Res. for depletion of vvd.....	11.31	1.14
Total.....	33.02	3.33
Total Cost without interest.....	164.83	16.639
Int. on investment at 5%.....	3.88	.391
Total Cost with Interest.....	168.71	17.03
Returns to farmer 990.6 bsk. at 14c.....	137.68	14.00

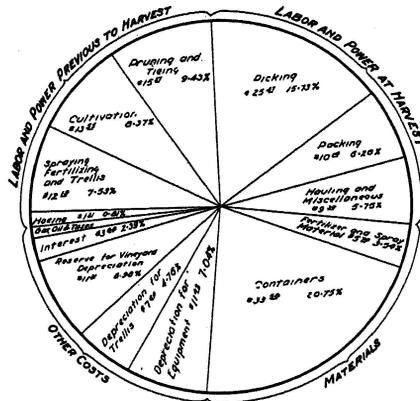


Fig. 13.—Costs of Grape Production Based on 40 Records Without Cover Crops, 1926. Total Cost per Acre, \$161.89.

**Yields, Costs and Prices.**—It is possible, by substituting different values for the rate per hour for man labor, yield per acre, and harvesting costs and price per basket, to arrive at cost and profit figures representing approximately the situation for any particular grower, locality, or year. For example, in 1926 the 40 growers without cover crops had a cost per basket of 16.33 cents, and received 14.56 per basket, leaving a net loss of 1.77 cents. In 1927 the yield was lower and prices received

were higher, and the net profit can be easily calculated by substituting the correct figures. The same applies to any year. Including all of the 96 growers the cost per basket in 1926 was greater, and the loss larger (3 cents per basket). For some purposes the average figures are most valuable, but the individual grower is concerned mainly with his own costs, which can be roughly calculated in the manner described.

**Individual Costs.**—The cost of individual growers varied rather widely, as shown in Figure 14. Differences in yields are, of course,

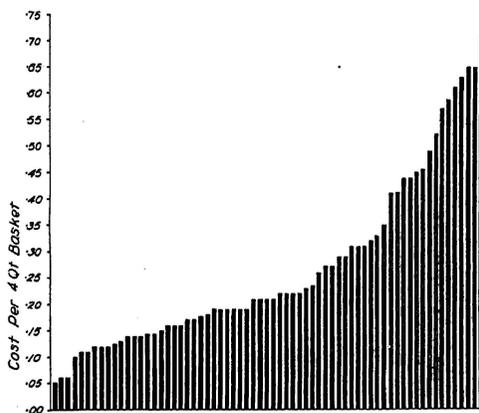


Fig. 14.—Variations in Costs of Production of Individual Growers. (Includes those within two standard deviations.)

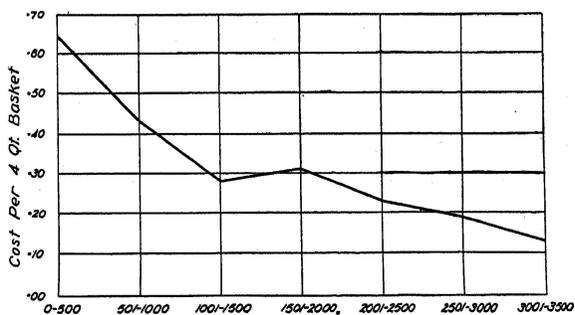


Fig. 15.—Relation Between Yield Per Acre and Cost of Production.

the most important cause of differences in individual costs per basket. The influence of yield on cost is shown in Figure 15. This difference in yield may be due to natural conditions such as soil or topography, or to differences in the intensity or efficiency of cultivation. Insofar as

the differences in yield are due to that latter factor, Figure 15 indicates that costs could be reduced by more intensive cultivation.

**Relation Between the Grape Outlook and Costs.**—Sufficient facts have now been adduced to furnish an answer to the first of the two questions propounded at the beginning of this publication. It has been demonstrated that the future outlook of the grape industry, including that in Missouri, is rather pessimistic, and that we may expect prices varying greatly from year to year, but in general corresponding to those received in the past few years. Growers with an average cost of production can be expected to about break even, while in some cases obtaining an outlet for otherwise unemployed family labor. Growers whose unfavorable situation or poor methods cause their costs to be appreciably higher than average might advantageously consider the abandonment of their vineyards. There are many other growers with costs lower than average who will continue to make a profit in the business. *Under almost no circumstances do the facts justify speculative planting by non-farmers using hired labor, rented land and equipment.* It is up to the individual farmer to apply the principles and corrected figures which represent his own particular conditions in answering this vital question for himself.

TABLE 9.—LABOR REQUIREMENTS PER ACRE IN GRAPE PRODUCTION

	Development Years						Bearing Year	
	1st Year		2nd Year		3rd Year		Man Hrs.	Horse Hrs.
	Man Hrs.	Horse Hrs.	Man Hrs.	Horse Hrs.	Man Hrs.	Horse Hrs.		
Preparing Land	13.08	26.83	13.	19.66				
Planting	25.16	4.66	2.27		1.45			
Cultivating	25.66	44.75	17.81	28.08	34.05	46.66	33.22	51.91
Fertilizing	1.62	1.54	2.54	4.33	1.1	1.83	1.46	.75
Hoeing	20.37		17.50		20.95		10.91	
Pruning	2.83		12.36		23.10			
Spraying					22.45	21.91	35.91	31.08
Stakes	2.45		8.41	1.83				
Trellis			23.77	7.66	38.90	7.91	.127	.25
Tieing					25.35			
Harvest Costs					52.45	5.5		
Miscellaneous	3.83		10.32	2.5				
Pruning and Tieing							65.3	7.5
Picking							115.77	
Packing							46.09	
Hauling							33.68	7.41
<b>Total</b>	<b>95.00</b>	<b>77.78</b>	<b>107.98</b>	<b>64.06</b>	<b>219.80</b>	<b>83.81</b>	<b>344.09</b>	<b>99.66</b>

**POSSIBILITIES OF INCREASING RETURNS BY IMPROVED MARKETING METHODS**

Growers dissatisfied with the prices received for grapes are frequently inclined to blame their local associations or selling agency, or the supposedly unreasonable margins taken by brokers and other middlemen. Obviously, however, the selling organizations are not responsible for the over-production of grapes, and even the best of marketing methods can do no more than minimize the unsatisfactory conditions. Likewise, marketing association officials who assign the trouble to the unsatisfactory pack put up by growers are only criticizing themselves, since quality is only what the association makes it.

**Marketing Costs.**—The belief that “retail prices are high enough, if it were not for the enormous margins of the brokers and other dealers” is based on a lack of knowledge of market conditions. So would present

prices received by producers be satisfactory if it cost nothing to produce grapes. The discussion of marketing costs for strawberries in Bulletin 262 applies in practically the same way to grapes, and will not be repeated in this publication. Figure 16 shows the approximate division of the price paid for grapes by the consumer, based on personal observation and checking on the Minneapolis market. These costs or margins vary greatly from year to year and for individual markets, dealers and transactions; consequently any average means little.

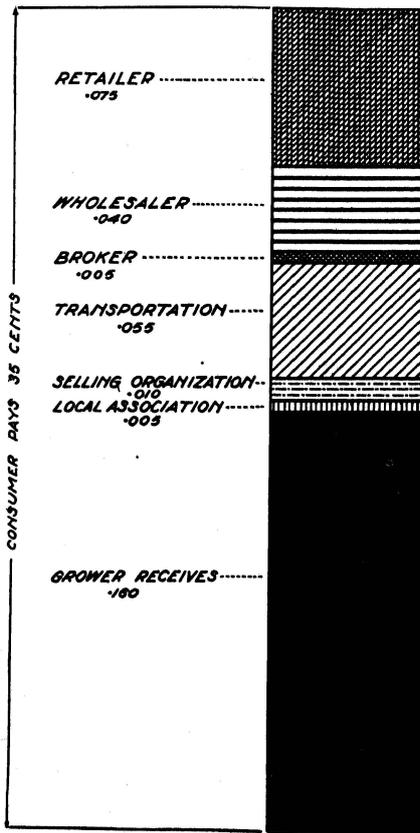


Fig. 16.—Estimated Division of the Price Paid for Grapes by the Consumer.

When the wholesale price is low (as in 1926) retailers claim they are able to make a larger margin per basket than in years of light production and higher prices (as 1927), when more sales resistance from consumers is encountered. Just the opposite is said to be true of wholesale

dealers, who maintain that glutted, uncertain markets cause them to reduce margins in attempting to effect a quick turnover. Brokerage charges vary from \$15 to \$25 per car. The local selling costs vary somewhat, and of course freight charges cannot be reduced to a significant average.

It has been repeatedly proved that there is little chance of materially reducing marketing costs as a whole. This applies in general to grapes, but margins may be cut in the case of some individual carloads by more efficient selling by growers' organizations. The impracticability of greatly reducing marketing costs must be apparent to anyone who examines Figure 16 and considers what the elimination of any of the agencies involved would mean.

**Marketing Improvement Limited by California Production.**—There appear to be considerably fewer possibilities of increasing returns to grape growers through improved local marketing methods than is the case with strawberries. The principal reason for this is the over-shadowing importance of the California deal. If the marketing organizations of that state can arrange to hold off the market a sufficient quantity of the lower grade grapes, prices for all grapes should be materially improved. Something may be done along this line in the near future. This does not mean that Missouri by itself can do nothing to improve conditions. Some possibilities are offered by : (1) improving quality, (2) broadening markets, and (3) development of by-products.

**Improving Quality.**—There appears to be a smaller range in price on any one day and market for grapes than for strawberries. This is probably due both to the less perishable nature of grapes, which makes them carry more uniformly, and a smaller degree of difference in quality when loaded. However, as shown in Table 10, the daily range in wholesale price is material. To the extent that this can be attributed to differences in quality the improvement of quality offers a means of raising prices.

TABLE 10.—RANGE IN PRICES OF GRAPES ON THREE MARKETS, 1928

Market	Average Price in Cents per Basket	Average Range in Cents per Basket	Average Devi- ation of Range in Cents per Basket	Per cent which Av. Range is of Av. Price
Chicago	23.05	2.42	1.18	10.49
Kansas City	27.41	5.70	3.00	20.79
Pittsburgh	26.76½	2.21	1.87	8.25

Quality and condition are especially important when shipments are heavy, and increasing. On a falling market, with grapes bought at a constantly decreasing shipping point price, the records show an increased call for government inspectors, an indication of the desire of dealers to avoid accepting their purchases without allowances.

Ozark grapes compare favorably in quality with those from other American grape producing sections, in the opinion of wholesale and retail dealers interviewed. The most important defects in the Missouri pack, as given by them, are slack pack and "straggly" bunches. They do not complain much about green or unripe or crushed berries. Spray residue is sometimes encountered. An inspector in one market said "On one day we had five cars in with straggly bunches."

An analysis of the prices received by local associations shipping through the Ozark Fruit Growers Association shows a marked difference between locals, as shown in Figure 17. It is impossible to say how much

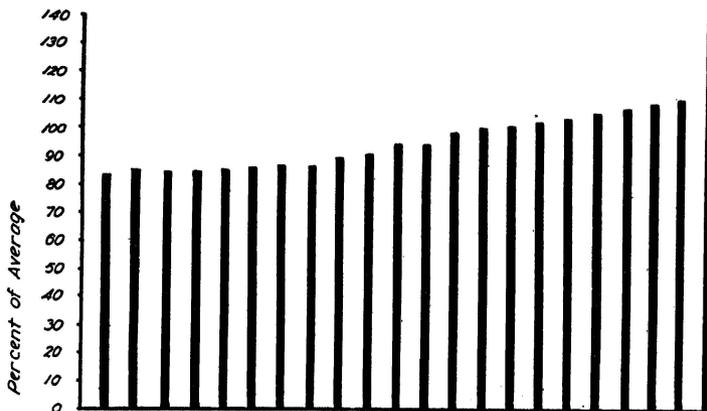


Fig. 17.—The Relation Expressed in Percentage of Average Prices of Individual Associations to the Average of all Locals, 1926.

of this difference is due to differences in quality, and how much to time of coming on the market and other factors. The figures may give some indication, however, of the possibilities of increasing returns to growers in any one locality by improved grading, and are at least significant in pointing to the fact that the general price outlook may mean one thing under particular local circumstances, and quite another thing to another community. It would be possible to account for much of the price difference if several cars from one association were rejected or allowance made for quality.

In Missouri grapes are mostly shed packed because transient pickers working on a piece basis cannot be depended upon to put up a good pack in the field. They will leave trash, green berries, etc., in the pack in order to make speed. Some persons recommend field pack, but it is best only when the help is experienced and conscientious. With the shed pack system there is no excuse for poor pack, and the only thing necessary for the local association to insure quality is to tighten up inspection. While the association inspector cannot look at every basket, he does

know when growers are "getting by" with anything. At one loading point it was found that the association inspector did not know how many pounds should be in each basket—a poor basis for providing against slack pack! If baskets are too heavy they are likely to contain mashed berries, and if too light they are not properly filled, a chief fault noted on the markets. The growers' name and address is usually stamped on each basket, so that kicks from the market can be traced back to the source of the trouble. However, this does not seem to be done to any extent.

Federal-State shipping point inspection would undoubtedly help to solve many of these grading problems. The discussion of this form of inspection contained in Bulletin 262 will apply largely to grapes. It is claimed that 80 per cent of the Pennsylvania crop is now officially inspected, and in New York grading (but not official inspection) is compulsory. The Ozarks have been slow to take up shipping point inspection, with little reason, and this point should be given serious consideration by all locals.

It is a common practice to ship two grades in one car. This should not be done except under unusual circumstances. Since grapes do not necessarily have to be loaded within the 24 hour limit it is probably a better practice to hold the car a little longer and load only number one grapes. Perhaps 5 to 10 per cent of a crop of normal quality will not grade number one (on a local grade basis), which makes it difficult to load out cars of number two. When this is possible the second quality stuff might be put in jumbo baskets to sell for home wine making, boardinghouses, etc., and when not it had usually better be sold locally or processed. Such practices will in the end bring higher net returns to Missouri growers, but in order to realize the full benefit it will be necessary to make the procedure as uniform as possible for all associations.

Detailed instructions on grading and loading grapes are contained in U. S. D. A. Farmers Bulletin 1558. The State Marketing Department will furnish full information on shipping point inspection.

**Broadening Markets.**—In years of short crops, such as 1927, the greater part of Missouri grapes go to a few cities, principally Minneapolis, Denver, and Chicago. At other times the market is wider, as shown by Figure 18, but Missouri shipments are still largely confined to the middle west. The contrast between total unloads and unloads of Missouri grapes is evident by comparing the first two charts in Figure 18. Statistics on unloads do not show the distribution in smaller cities, which is partially indicated by the lower chart in Figure 18. It will be noted that a large proportion of shipments are originally billed to Kansas City and St. Louis, from where they are diverted to other points, including many smaller cities not appearing on any of the maps.

It has been suggested that the Ozarks would be less affected by the

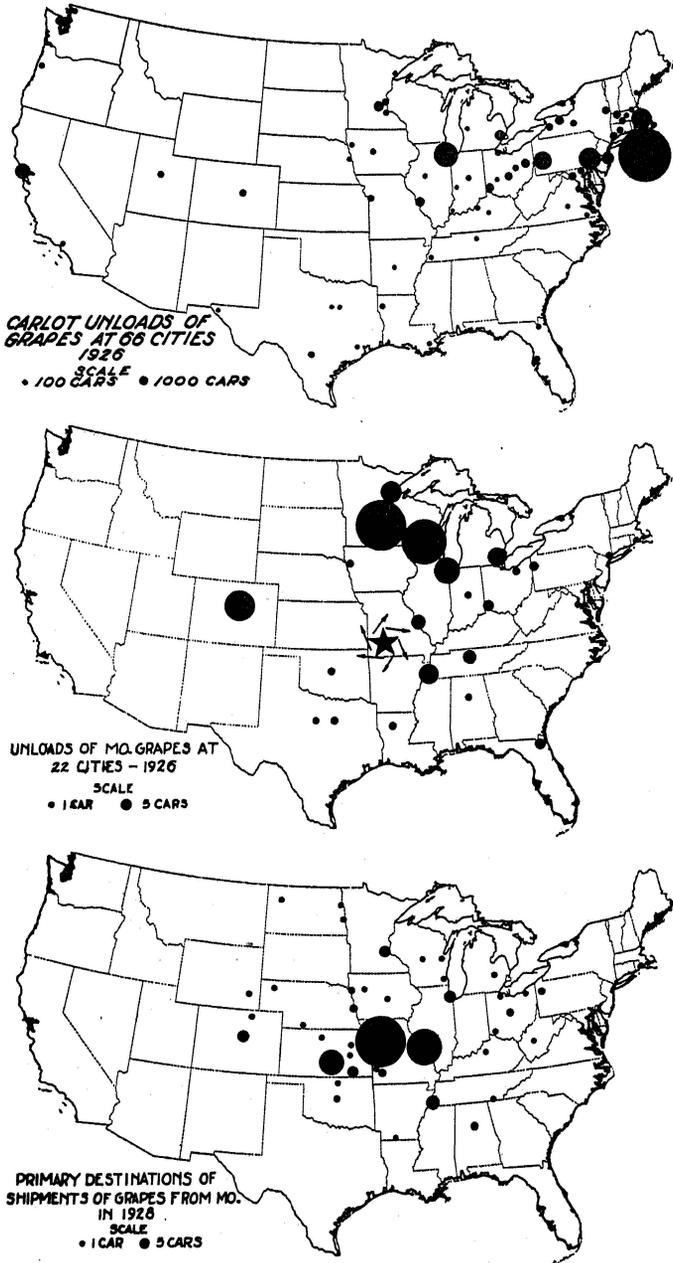


Fig. 18.—Distribution of Missouri and other Grapes in 1926, and Primary Destinations of Missouri Grapes in 1928.

general grape outlook if distribution could be broadened to include more of the smaller cities and large towns. There appears to be some truth in this. Table 11 shows the receipts of grapes at 29 cities during August and September. It will be noted that the Ozarks are not represented to any extent in many of these markets. It might appear, therefore, that returns to growers could be increased by obtaining wider distribution. This probably could be accomplished by more effective sales methods and greater use of selling brokers, although the latter is frowned upon by growers.

TABLE 11.—AUGUST AND SEPTEMBER UNLOADS OF GRAPES FROM CALIFORNIA, THE OZARKS, AND OTHER SECTIONS AT 29 MARKETS, 1926.\*

Names of Cities	California	Missouri and Arkansas	Other States
Atlanta.....	42	0	0
Birmingham.....	33	1	0
Chicago.....	1144	80	151
Cincinnati.....	113	23	14
Cleveland.....	352	3	1
Columbus.....	88	3	11
Dallas.....	56	7	0
Denver.....	111	75	47
Des Moines.....	33	0	0
Detroit.....	501	30	17
Duluth.....	57	44	5
Fort Worth.....	32	5	0
Houston.....	64	0	0
Indianapolis.....	46	1	5
Kansas City.....	64	0	0
Louisville.....	60	0	1
Memphis.....	33	18	2
Milwaukee.....	341	108	29
Minneapolis.....	101	121	18
Nashville.....	19	16	0
New York.....	4638	1	52
Omaha.....	76	0	0
Peoria.....	20	0	0
Pittsburgh.....	573	4	14
St. Louis.....	216	5	3
St. Paul.....	79	52	12
San Antonio.....	64	0	0
Sioux City.....	24	3	20
Youngstown.....	175	0	1

\*Data from Division of Fruits and Vegetables, U. S. D. A.

It is easily possible, however, to confuse the relation between a wide distribution and increased returns. The former might actually have the effect of lowering returns. It may be presumed, when 121 cars go to Minneapolis and none to Des Moines, that the former city was willing to pay more for grapes, and hence got them. The only point is that the selling organizations should be sure that they could not have obtained more by working more intensively those markets now receiving but few shipments from Missouri. This cannot be statistically demonstrated, and can only be determined by trial and error in the business of selling.

There is no doubt that the smaller cities and towns are supplied with Ozark grapes to a much greater extent than is shown by the above statistics. Various dealers in the Twin Cities, for example, estimate that 25 to 75 per cent of grapes unloaded there are shipped to outlying cities and towns by truck or less-than-carload freight or express. The extreme variations in their estimates show how difficult it is to arrive by observation at satisfactory conclusions regarding market conditions, and how unreliable are "years of experience" as a guide to selling policies. The larger the crop and the lower the price, the greater is the proportion of receipts shipped out in this way. This is because a larger proportion of the grapes bought in the smaller markets are used for preserving, and because the additional handling costs added to a relatively high shipping point price make the cost to outlying consumers prohibitive. However, just the opposite may be true of towns large enough to handle carlots, since if the price is low enough for canning they will get in a whole car and will then receive none less-than-carload. Grapes stand less-than-carload shipment better than strawberries, and hence a greater proportion of the receipts at the large markets are handled in this way.

**Development of By-Products.**—Dissatisfaction with fresh grape prices has caused a number of growers to become interested in the possibilities of processing grapes. Several individuals have tried the manufacture of grape juice, but since the methods of sale and other circumstances are not representative, the results of these experiments are not very enlightening.

No juice plants are located in Southwest Missouri, the nearest one being at Springdale, Arkansas. At points where juice plants are operating the price paid seems to compare favorably with that received for basket grapes when the cost of packing and containers are taken into consideration. The companies operating these plants have an established trade and reputation, and we are not justified in assuming that new plants adding to the supply of juice on the market would be able to offer equally attractive prices.

Many suggestions for processing grapes into different products have been made, but, as reported by the California Station\*: "Unfortunately . . . . these prospects of a large and expanding market for grape products have never materialized. Effective technical methods of processing . . . . have been devised. Up to the present time, however, the little effort that has been devoted to creating a demand for such products has not resulted in a market demand for any of them sufficiently profitable to dispose of an appreciable quantity of California grapes."

The report cited shows that only a small fraction of one per cent of California's grape crop has been canned, and "these statistics show no

\*See pp. 73-77, California Experiment Station Bulletins 429 and 392.

evident trend toward the utilization of an increased tonnage of grapes for canning". There has apparently been a marked decline in the production of grape juice and syrup in California. The report states that "only a fraction of the eastern grape crop is utilized for this purpose", and "the present volume of sales of eastern grape juice has been built up over a period of about twenty years at considerable cost for advertising and for establishing effective distribution." It was found impracticable to obtain any worthwhile estimate of the proportion of eastern grapes used for juice, and the amount varies greatly from year to year. The California report says, "Available data from the chief juice-pressing section, the Chautauqua-Erie grape belt of New York, indicate that the trend of the output of unfermented grape juice in the East has been declining during the last ten years". Of course, especially low prices for fresh grapes in the east in any one year may greatly stimulate production and consumption of grape juice.

The chief obstacle to the increased consumption of grape juice, either as such or as a soft drink made with grape syrup and carbonated water at soda fountains, appears to be the competition from synthetic soft drinks, which can be produced at a much lower cost. People seem to be interested only in a cool drink at low cost, and not in the constituent elements of the product. Concentrated grape syrup under these circumstances cannot compete with the cheaply made and widely advertised "cooling and refreshing" synthetic flavors. Grape juice itself is too expensive for general use as a summer drink by any but the more well-to-do classes.

The potential juice outlet is particularly important in connection with grapes which will not grade number one. It is difficult for growers to see that they might be better off destroying their off-quality grapes in order to raise the price received for the 90 per cent number one grapes. If a juice market were available to care for the number two and cull grapes this problem would be much less difficult for both growers and marketing organizations.

It is believed that the possibilities of these outlets are worth investigation by the marketing agencies concerned; since it is estimated by individual growers who have tried juice making (but not checked by the authors) that 85 cents per gallon for unconcentrated juice is equivalent to about 22 cents per basket, and on this basis there would be considerable leeway for selling expense above the going price for fresh grapes in years of heavy production.

## SUMMARY

The acreage of grapes in the Ozark section of Missouri has greatly increased in recent years, and producers in many communities are interested in the economic possibilities of this enterprise.

The factors affecting prices received for Missouri grapes are complicated, due to differences in methods of utilization and in varieties and production areas. The Missouri farm price is affected by total United States production, including California, as well as production in the Ozarks. The general level of Missouri grape prices is influenced most by California shipments, while year to year fluctuations are largely the result of variations in Ozark production.

Prices are relatively high at the beginning of the season, when Missouri shipments are light, but do not rise proportionately as production falls off at the end of the season, due to competition from other American type grape producing sections. Because of this it is difficult to generalize regarding the outlook for the State as a whole.

Grape production has increased greatly since 1921, as a result of the high prices immediately following the World War. Fresh grape shipments have increased even more because of the unsatisfactory raisin market. Production is now relatively stable, and may be expected to continue for some time at approximately present levels, due to the long life of vineyards and the improbability of further extended plantings. Production of all kinds of fruits and vegetables has greatly increased in recent years, and may be expected to furnish heavy competition to grape growers in normal years. Production in Eastern grape states, including Missouri, fluctuates violently from year to year, and prices may be expected to vary in the same way. Taking into account decreased yields in years of higher prices, it is unlikely that returns from grapes will change materially for some time, and conditions in 1926, 1927, and 1928 may be taken as indicative of the probable future outlook.

The average total cost of producing grapes in Southwest Missouri in 1926 was 16.33 cents per basket. The growers included received 14.56 cents per basket, leaving a net loss of 1.77 cents per basket. The cost of production and profit or loss may be calculated for any individual grower or particular year by substituting the correct figures covering price, yield, and certain cost items.

These figures, in connection with the outlook as outlined, indicate that the average grower can expect to about break even, at the same time providing an outlet for surplus family labor, while the unfavorably situated or inefficient grower will lose money, and many others with a low cost of production will continue to make a profit. Under almost no

circumstances do the facts justify speculative plantings by non-farmers using hired labor, rented land and equipment.

The possibilities of increasing returns to growers by improved marketing are not as great as in the case of strawberries, because of the limitations imposed by the California crop. Producers in the latter state may favorably influence prices by keeping lower grade grapes off the market, although this is problematical. Possibilities of obtaining better prices in Missouri are offered by: (1) improving quality, (2) broadening markets, and (3) development of by-products.

Missouri grapes compare favorably in quality with those from other American type grape sections, the principal criticisms being slack pack and "straggly" bunches. Shipping point inspection is being rapidly adopted by competing states, and should receive more consideration in Missouri. Quality is particularly important on a falling market because it aids in avoiding rejections and allowances.

An analysis of unloads of grapes from competing sections in various markets indicates the possibility of broadening markets, but this would not necessarily result in higher returns to growers. The smaller cities and towns are supplied to a considerable extent by less-than-carload shipments and motor truck shipments from the larger markets.

Development of by-products has been urged as a possible method of overcoming unfavorable market conditions. But the opportunities for such development appear to be limited, although much more could be done along this line than at present. The results obtained by individual growers cannot be accepted as indicative of the possibilities of joint action by all marketing associations.

It has been suggested that retail prices of grapes are high enough, and that the trouble lies in unreasonable marketing costs. While this is undoubtedly true of some individual carloads, an analysis of marketing costs indicates no possibility of any material reduction.

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