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DIVISION OF AGRICULTURAL SCIENCES
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THE POTENTIAL IMPACT OF DIRECT-MARKETING POLICIES ON THE ECONOMIC VIABILITY OF SMALL FRUIT AND VEGETABLE FARMS IN CALIFORNIA

By

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WAITE MEMORIAL BOOK COLLECTION
DEPT. OF AGRIC. AND APPLIED ECONOMICS

CALIFORNIA AGRICULTURAL EXPERIMENT STATION
GIANNINI FOUNDATION OF AGRICULTURAL ECONOMICS

Giannini Foundation Research Report No. 327

December, 1978

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THE POTENTIAL IMPACT OF DIRECT–MARKETING POLICIES ON THE ECONOMIC VIABILITY OF SMALL FRUIT AND VEGETABLE FARMS IN CALIFORNIA

by

E. Phillip LeVeen and Mark R. Gustafson[1]

INTRODUCTION

This paper evaluates the probable consequences of public policies intended to improve the economic welfare and viability of small fruit and vegetable farmers by stimulating the development of alternative marketing arrangements, based on direct farm–to–consumer exchange of fresh produce. By combining the limited available data with a set of reasonable assumptions, deliberately chosen to portray such "direct marketing" policies in their most favorable light, it will be shown that even the most successful direct–marketing program will bring only marginal economic improvement to the majority of existing small farmers and will, therefore, not seriously challenge those forces which continue to drive such small producers out of business. On the other hand, these policies could provide considerable benefit to a relatively few small farmers who could orient their production entirely toward such markets. Moreover, they could provide substantial benefit to consumers who want higher quality and, perhaps, cheaper produce than is available in the traditional retail outlets.

This finding suggests two conclusions. First, direct–marketing policies cannot provide a general panacea for the problems of small farms. Indeed, insofar as such policies divert attention away from the real problem of finding ways of integrating the small farm into the conventional marketing system, they may actually hurt the prospects for small farm viability. Second, the magnitude of the impact of direct–marketing policies is so slight that opposition to the development of direct–marketing policies from established farm interests is unwarranted.

DIRECT MARKETING AND THE SMALL FARM

Interest in the viability of small fruit and vegetable farms stems from the fact that the production of fresh fruit and vegetable crops is relatively less mechanized and more

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labor–intensive than most other forms of agricultural production; therefore, such production is apparently less subject to technical economies of size which account for much of the increasing growth of farm size in other crops. Furthermore, because the value of output per acre in fresh fruit and vegetable crops is much higher than in other crops, the number of acres required to support a family is small (Appendix Tables 3 and 4).[1] This means that the small fruit and vegetable farm should be relatively accessible to the family farmer and should offer a substantial source of economic opportunity to a large number of families in California given the importance of these crops.

However, in spite of such favorable attributes, most of the production in these crops takes place on large farms. Table 1 illustrates this point. Moreover, an analysis of the trends in size and concentration for the 10 years, 1964–1974, shows that virtually all growth in vegetable production was captured by the largest farms (Class 1a). Small–size classes are declining in terms of the numbers of farms and in terms of their share of total output. Similar, but somewhat more moderate, trends are found in fruit production.[2]

The reasons underlying this tendency toward concentration of production on large farms appear less related to technical conditions in farm production than to the effects of markets. During the past 20 years, the marketing of fruits and vegetables has changed.[3] There are fewer and larger buyers, and there has been considerable integration of retailing and wholesaling activities. The new marketing system demands large–volume production of the farmer because of increasing economies of size in the handling, shipping, and distribution of fresh produce. The small producer, who cannot meet the volume demands or who cannot tailor his production to meet the timing or quality requirements of the market, finds he can sell his crops in a limited number of markets in which prices are low and demand is unstable.[4] Table 2 illustrates the fact that small farms have lower sales per acre after adjusting for crop mix and resource quality factors. Some of the reported differences between large– and small–farm sales derive from the likely superior productive efficiency of the large units, but a major portion of the sales differential appears related to market access.[5]

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[1] *Infra*, pp. 24 and 25.

[2] E. Phillip LeVeen, "The Advantages of Large Crop Farms in California," University of California, Department of Agricultural and Resource Economics, Working Paper No. 54 (Berkeley, 1977), pp. 2-7.

[3] The most comprehensive analysis of the marketing sector is contained in National Commission on Food Marketing, *Organization and Competition in Food Retailing*, Technical Study No. 7 (Washington, D. C.: U. S. Government Printing Office, 1966).

[4] For a more detailed analysis of the problems of the small farmer in the conventional marketing system, see Mark R. Gustafson and Curtis Moulton, *The Marketing Situation and Opportunities of Low–Income Growers of Fresh Produce in California*, University of California, Community Development Research Series, Special Publication No. 3237 (Davis, 1977), pp. 6–15.

[5] For a more detailed discussion, see LeVeen, *op. cit.*, pp. 15–18.

TABLE 1

Vegetables[a] and Fruits:[b] Distribution of Crop Sales and Harvested Cropland by Economic Class of Farm, California, 1974

Distribution	Total crop farms	Total crop sales	Total harvested cropland	Economic class of farm: Ia $500,000 and over	Ia $200,000-$499,999	Ia $100,000-$199,999	Ib $40,000-$99,999	II $20,000-$39,999	III $10,000-$19,999	IV $5,000-$9,999	V $2,500-$4,999	Total[c]
		million dollars	acres	percent								
Crop farms												
All farms	36,250			5.2	7.4	9.4	18.8	17.7	17.0	14.2	10.0	100.0
Vegetables	2,047			23.7	20.2	13.1	14.3	10.1	8.2	6.2	4.2	100.0
Fruits	22,286			1.7	3.7	7.0	18.8	19.7	19.9	16.0	13.4	100.0
Crop sales												
All farms		4,721		57.2	17.4	9.8	9.0	3.7	1.8	0.8	0.3	100.0
Vegetables		1,034		79.3	14.0	3.9	1.9	0.6	0.3	0.1	*d*	100.0
Fruits		1,397		28.1	20.4	16.6	18.9	8.9	4.5	1.9	0.7	100.0
Harvested cropland[e]												
All farms			7,376,000		77.6		11.2	5.2	3.0	1.6	1.4	100.0
Vegetables			961,987		96.5		2.1	0.9	0.3	0.1	*d*	100.0
Fruits			1,611,142		54.8		20.7	11.3	6.9	3.7	2.6	100.0

[a]Includes melons.

[b]Includes nuts and berries.

[c]Totals are rounded.

[d]Less than .05 percent.

[e]Refers to cropland on crop farms only.

Source: U. S. Bureau of the Census, *Census of Agriculture, 1974. Volume 1, California, State and County Data*, Part 5, 1977.

TABLE 2

Crop Sales According to Economic Class of Vegetable[a] and Fruit[b] Farms, California, 1974

Crop farm	Economic class of farm					
	Ia	Ib	II	III	IV	V
	$100,000 and over	$40,000-$99,999	$20,000-$39,999	$10,000 $19,999	$5,000-$9,999	$2,500-$4,999
	dollars					
Vegetables						
Sales of all crops per harvested acre[c]	1,141	1,011	782	806	758	583
Sales of vegetables per harvested acre[d]	1,583	1,250	1,290	1,076	929	715
Fruits						
Sales of all crops per harvested acre[c]	1,030	789	680	568	440	244
Sales of fruit and nuts per harvested acre[d]	1,198	934	853	717	614	340

[a]Includes melons.

[b]Includes nuts and berries.

[c]Sales of all crops grown on the farm including crops outside of designated crop category.

[d]Sales of vegetables or fruits only, divided by acreage in vegetables or fruits.

Source: U. S. Bureau of the Census, *Census of Agriculture, 1974. Volume 1, California, State and County Data,* Part 5, 1977, Table 33.

Because the small fruit and vegetable farms' future success apparently depends upon their ability to overcome market barriers, many have advocated direct–market arrangements as important mechanisms by which the small producer can gain entry into the high–priced fresh produce markets without having to contend with the conventional market system.[1] It is argued that direct marketing has the additional advantage that it has no built–in biases favoring the large producer. In fact, some contend that the large producer will have little incentive to compete in these market outlets given their preferred position in the conventional market system and given the additional costs of tailoring their production for two different kinds of markets.[2] Of course, there is nothing to stop the large producer from specializing in production for direct markets; but if he does, he will not have substantially greater market power than the small producer.

This analysis is not concerned with any particular form of direct marketing; there are several possible arrangements which would allow the small farmer to escape the conventional system including farmer to retail outlet, farmer to government institution, farmer to restaurant, farmer to farmers' market, farmer to consumer food buying group, farmer to neighborhood produce peddler, farmer to roadside stand, and consumer to farm "pick your own" and "rent a tree" operations. Each of these options has advantages and disadvantages to the individual farmer,[3] and all allow him to increase the value of his production by receiving a higher price for a larger portion of his crop than would be offered in the conventional system. Moreover, if the farmer has unemployed family labor, he may also increase his income by undertaking some of the marketing functions himself.

PUBLIC POLICIES AND DIRECT–MARKETING SALES

Even though farmers are now free to sell their crops in direct markets, it is likely that public policies could further stimulate the sales through such outlets by changing the incentives affecting the behavior of both farmers and consumers. Farmer incentives could be changed in two ways: (1) deregulation of grading standards[4] to permit the farmer to offer on the fresh market grades which now must go to the lower priced processing

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[1]Refugio Rochin and Ann Hoyt, *Consumer Cooperatives and Direct Marketing Opportunities for Small Farmers in Northern California,* University of California, Community Development Research Series, Special Publication No. 3238 (Davis, 1977), pp. 4–9; also, see Small Farm Viability Project, "Marketing Task Force: Final Report," *The Family Farm in California: Report of the Small Farm Viability Project* (Sacramento, 1977), pp. 1–6.

[2]For example, in *ibid.* it is argued that the development of a "supergrade" for fresh produce would benefit the small and not the large farmer because of the costs of having two kinds of harvest; one for the specialty market and one for the conventional market would be too expensive.

[3]For an analysis of the particular strengths and weaknesses of different kinds of direct–market arrangements, see Gustafson and Moulton, *op. cit.,* pp. 19–43.

[4]There have already been substantial modifications in the regulations affecting the size and quality standards of direct–marketed produce, although there remain some restrictions; see Rochin and Hoyt, *op. cit.,* p. 11.

market or which are left unharvested[1] and (2) deregulation of transportation and packaging requirements to allow farmers to bring produce to market for lower costs which should increase their return in direct markets. The extent to which these changes would increase the farmer's willingness to seek out direct markets and their impact on the prices of produce sold in these markets is unknown.

Public policies, which actively promote direct marketing by subsidizing the development of farmers' markets or by facilitating the exchange of information between farmers and consumers regarding the location, availability, and price of crops for sale will affect consumer willingness to frequent direct markets. Locating farmers' markets near large population centers reduces the amount of time consumers would need to spend in traveling to the market and this, in turn, lowers the effective costs of produce in direct markets. Of course, the private sector will undertake the development of such markets if indeed they are profitable. However, public subsidization lowers the costs of starting such markets and thereby stimulates their development which may otherwise be very slow. Information–exchange policies stimulate consumer interest by reducing the uncertainty associated with searching for fresh produce, and thus these will increase consumer demand for direct–marketed produce.

To measure the potential economic gain for small fruit and vegetable farms, it is first necessary to estimate the additional volume of fresh produce sales through direct–market outlets resulting from such policies. A precise estimate of this added volume is not possible without much more data than are currently available; however, the following discussion suggests that, even with active public intervention, the increase in sales of direct markets is likely to be modest.

The consumer's decision to shop at the direct–market outlet or to drive to a roadside stand, *etc.*, is based on several factors, the two most important of which are price and

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[1]The differences between fresh and processing prices are very large as the following examples illustrate:

	1974 Prices	
	Fresh	Processing
Crops	dollars	
Strawberries (cwt.)	30.70	18.30
Carrots (cwt.)	7.17	1.77
Cauliflower (cwt.)	18.10	8.10
Tomatoes (cwt.)	16.80	2.85
Oranges (box)	5.04	0.89
Grapes (ton)	250.00	122.00
Apricots (ton	468.00	241.00
Apples (ton)	192.00	103.00

Sources: California Crop and Livestock Reporting Service, *Fruit and Nut Statistics, 1973–74* (Sacramento, 1975); also, *idem, Vegetable Statistics, 1973–74* (Sacramento, 1975).

quality of the produce. The present farm–retail price spread of fresh produce is between 65 percent and 70 percent of the retail price, so the elimination of some of the intermediary steps should allow farmers to offer produce at lower prices and still cover any additional marketing costs incurred. However, the fact that the consumer must make an additional shopping trip to purchase produce from the direct market implies that the real cost of produce in these markets may not be as low as it appears. If the consumer must spend much additional time or must incur additional transportation costs (which are implied by trips to the countryside), the advantages of lower priced fruits and vegetables may be sharply reduced and will not be sufficient to encourage the cost–conscious consumer to frequent these markets.

To illustrate this point, if the typical consumer spends 20 percent of his or her weekly food budget on fresh produce and this produce can be purchased at a 25 percent discount in a direct–market outlet, the actual savings in the weekly budget will be only 5 percent which, for most consumers, will amount to very few dollars. These benefits will be further limited if the direct–market outlets do not offer a sufficiently wide variety of produce, and the consumer is required to shop at more than one market to satisfy his or her produce requirements.

These considerations suggest that direct–marketing policies will appeal primarily to those produce consumers who are "quality conscious" rather than "price conscious." By reducing the costs of market access and by allowing farmers to sell a wide array and size of produce, some of the quality–conscious consumers who now shop at supermarkets or other retail outlets may be attracted to farmers' markets or other kinds of direct market. The relative number of quality–conscious consumers who might be attracted by more convenient markets or somewhat lower costs is not known, but several factors suggest it is a comparatively small group.

First, there is already a wide array of opportunities to purchase quality produce in many California cities. Supermarket quality is relatively high,[1] and smaller produce stores specialize in selling high–quality items purchased in local wholesale markets. Unless there is a substantial reduction in produce price in the new direct markets or unless quality in these markets is much higher, it is therefore unlikely that many consumers will find it necessary to give up buying at existing outlets. The advantages of the one–stop shopping trip to the supermarket––a trip which must be made anyway for other commodities––are substantial and constitute a large barrier to a major shift toward farmers' markets. Lastly, it must be noted that almost 25 percent of all food is purchased at restaurants or institutional eating places, so consumers do not directly purchase a fairly large portion of their fresh produce. The large business, such as the fast–food chain, is unlikely to develop direct–market arrangements with small farmers; this further limits the potential expansion of consumption through direct markets.

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[1]Because of elaborate distribution facilities, supermarkets cannot place fruits and vegetables on their shelves which are picked the same day, but the modern cooling techniques employed do allow reasonably fresh produce to be sold. It is interesting to note that direct–marketing policies have been much more enthusiastically received in eastern states, and this may be a result of the fact that produce quality in eastern supermarkets (much of this produce comes from California) may be lower than is typical in California supermarkets because of the additional travel time.

THE IMPACT OF DIRECT–MARKETING POLICIES ON SMALL FARMS

The potential effect of public policy is a matter of considerable speculation. Despite uncertainties concerning current and likely future volume of direct marketings, it has been possible to develop an analytical approach which provides reasonably concise conclusions regarding the impact of direct–marketing policies on small farm welfare.

The National Commission on Food Marketing estimated that about .4 percent ($300 million) of all food sales (nationwide) in 1963 were made through direct–market arrangements.[1] If all of these sales consisted of fresh produce only, then this figure would imply that about 5 percent of all fresh produce was sold to consumers directly in 1963. However, if allowance is made for sales of milk, eggs, and meat, the true proportion of fresh produce direct marketed was more likely between 2 percent and 3 percent of total fresh produce sales nationally in 1963. There is no more recent survey of the nation's direct–marketing activities, and there is no comprehensive estimate of the total sales of direct–marketed produce for California. There is considerable information for some states, however. For example, a U. S. Department of Agriculture survey estimates the gross sales of roadside stands in 17 states, not including California.[2] In the same study, estimates of the number of roadside stands, farmers' markets, and pick–your–own operations are given for California. A comparison of these figures with those of other states leads to an estimate of direct–market sales in California of no more than $10 million, or about 3 percent of total fresh fruit and vegetable sales by farmers. These considerations lead to the conclusion that a defendable estimate of current direct–market sales is approximately 2 percent of total fresh fruit and vegetable sales, and this percentage is taken as the point of departure for the impact analysis.

To assess the impact of public policies on direct markets and small farmers, two projections are made of the probable increase in direct–market sales which would result from deregulation and from the active financial support of new arrangements. The projection of a 100 percent increase in direct–market sales––from 2 percent to 4 percent of total fresh produce sales––is taken as a generous estimate of the probable impact of the shift induced by policy and means that farmers would sell additional produce worth about $7 million in farm value through direct markets. This estimated increase is consistent with some sketchy evidence of the impact of similar policies in other states.[3] However,

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[1]National Commission on Food Marketing, *Food from Farmer to Consumer* (Washington, D. C.: U. S. Government Printing Office, 1966), p. 6.

[2]H. R. Linstrom, *Farmer to Consumer Marketing,* U. S. Economics, Statistics, and Cooperative Services, ESCS 01 (February, 1978), 26p.; see, also, "How Big is the Roadside Market Industry?" *American Vegetable Grower,* Vol. 25, No. 2 (February, 1977).

[3]In Rochin and Hoyt, *op. cit.*, p. 10, it is reported that a Pennsylvania program has stimulated additional consumer sales of over $100 million. These sales are not broken down into component parts; they include milk, eggs, and other nonproduce items as well as fresh fruits and vegetables. If 75 percent of these sales are fresh produce, this program would have stimulated additional produce consumption in direct markets equal to about 4 percent of total fresh produce sales which is somewhat larger than anticipated in California.

even though this estimate is considered generous, especially in light of the above discussion, there is considerable uncertainty over the impact of policy; therefore, a second projection is made to illustrate the possible impact of a much greater shift toward direct markets than can be reasonably expected. The following analysis contains estimates of the impact of a tenfold increase in direct–market sales (from 2 percent to 20 percent of total consumption, with the net farm value increased by $63 million and the retail value increased by $180 million). This second measure is intended to provide a check on the sensitivity of the impact analysis and to indicate the degree to which a major and unexpected shift in consumption patterns could affect the conclusions of the paper.

Given these two projected impacts of public policy, it is now possible to analyze the consequences for the small farm population. To assess this impact, two marketing regions are drawn within which all participating farms and consumers will be contained. The boundaries of these regions are based on the idea that, in order for farmers to take advantage of direct markets, they must have access or be accessible to a major metropolitan market. A two–hour driving time was, therefore, used to select counties in which farmers might participate in direct–marketing programs (Figure 1). The actual boundaries of these regions include some farmers living more than two hours from these markets because county data cannot be disaggregated (if any part of a county is within two hours of the markets, the entire county must be included). This may lead to an overstatement of the number of farmers who could potentially benefit from direct–market programs. The demographic data for these two regions are as follows:

	Northern region	Southern region	Both
	percent of entire state		
Population	34.2	60.3	94.5
Vegetable farms	56.8	30.5	87.3
Fruit farms	60.8	27.8	88.6

Farmers and consumers living outside these regions are assumed not to participate in direct–marketing programs.

In order to determine the number of farms that might be supported by direct–market policies, the amount of land needed to supply 100 percent of each region's fresh produce consumption is first calculated (Table 3, column 6). This calculation is based on the estimated total acreage needed to supply the state's population with fresh produce (Appendix Tables 1 and 2) and the proportion of total population within each region. It is instructive to note that, even if *all* fresh produce was to be purchased from direct markets and local farmers, only 15 percent of the state's vegetable acreage and 6 percent of its fruit acreage would be needed (Table 3; compare column 6 with column 1). The remaining fruit and vegetable acreage would be used to supply the out–of–state demand

FIGURE I. Direct-Market Regions

TABLE 3

Total Acreage and Actual Acreage in Fresh Production and Estimated Additional Acreage Needed to Supply Potential Direct-Market Demand for Vegetables and Fruits Regional and California, 1974

Region[c] and crops	Total acreage	Actual acreage in fresh production for demand of: Total United States	California[d]	Estimated acreage needed to supply potential direct-market demand for fresh fruits and vegetables if sales in direct markets are:[e] 2 percent	20 percent	100 percent
	1	2	3	4	5	6
	acres					
Northern						
Vegetables	469,159	283,022	76,942	833	8,331	42,486
Fruits	656,000	196,977	44,883	498	4,982	25,402
Southern						
Vegetables	229,358	139,265	37,614	1,504	15,054	76,804
Fruits	345,000	103,593	23,605	899	8,997	45,883
California						
Vegetables	773,720	449,243	126,902	2,337	23,385	119,290
Fruits	1,108,780	333,058	75,889	1,397	13,979	71,290
Total	1,882,500	782,301	202,791	3,734	37,364	190,580
	percent					
Northern						
Vegetables	100.0	60.3	16.4	0.2	1.8	9.1
Fruits	100.0	30.1	6.8	0.1	0.9	4.6
Southern						
Vegetables	100.0	60.3	16.4	0.7	6.6	33.5
Fruits	100.0	30.1	6.8	0.2	2.2	11.5
California						
Vegetables	100.0	60.3	16.4	0.3	3.0	15.4
Fruits	100.0	30.1	6.8	0.1	1.2	6.4
Total	100.0	41.6	10.8	0.2	2.0	10.1

[a]Includes melons.

[b]Includes berries and excludes nuts.

[c]Designated in Figure 1, *supra*, p. 10.

[d]Based on the assumption that regional totals are the same proportion of total fresh production as overall average for state.

[e]Regional subtotals for fruit and vegetables are based upon statewide per capita consumption estimates (Appendix Tables 1 and 2, *infra*, pp. 22 and 23) and regional population estimates converted into the relevant acreages. The California totals refer only to the two regions which omit approximately 5 percent of the state's overall population.

Sources:

Col. 1: U. S. Bureau of the Census, *Census of Agriculture, 1974. Volume 1, California, State and County Data*, Part 5, 1977.

Cols. 2 and 3: Appendix Tables 1 and 2, *infra*, pp. 22 and 23.

Cols. 4, 5, and 6: Computed.

for fresh produce (about 30 percent of all acreage) and the demands of processors (about 59 percent of total acreage).

As indicated above, the actual proportion of fresh produce currently direct marketed stands about 2 percent of all fresh produce; this implies that only 0.3 percent of vegetable acreage and 0.1 percent of fruit acreage are devoted to direct marketing (Table 3, column 4). If policies doubled direct–marketing consumption, these percentages would double but would obviously remain very small. Even in the unlikely event that direct–market policies increased direct–market consumption to 20 percent (Table 3, column 5), the total acreage needed to supply these markets would be 3 percent of existing vegetable acreage and 1 percent of existing fruit acreage. The regional implications of direct–marketing policies may also be seen in Table 3. In general, because of a different balance between crop production and population among regions, direct–marketing policies would have a relatively greater impact in the southern region, especially in vegetables (Table 3; compare columns 4 or 5 with column 3).

To determine the number of small farms which might be accommodated by this increased acreage, additional assumptions must be made. First, it is assumed that *all* of any additional acreage goes to "small" farms. This assumption will overstate the true policy impact since larger farms will certainly participate in direct markets. Second, the small farm is defined as any farm producing less than $40,000 in total sales (Census Size, Class II and below). As can be seen from Table 4, this definition encompasses about 71 percent of all fruit farms and 26.2 percent of all vegetable farms.

This definition of the small farm is made because farms in this size range are most likely to have marketing difficulties and therefore would be most benefited by direct–marketing policies and because the operators of many of these farms are relatively poor and would be the appropriate targets for such policies. Table 5 shows the characteristics of small fruit and vegetable farms taken from the 1974 Agricultural Census. While many, if not most, of the fruit farms may be classified as "part time" farms run by operators whose major source of income comes from off–farm employment, there are still almost 27 percent (3,000 fruit farms in all) on which the operator and family report *no* off–farm income of any kind. These families have incomes which average approximately $7,500 or less given the average sales of farms in this size class. An even stronger case can be made that small vegetable farms are the source of considerable poverty. About 57 percent of these 750 farms report no off–farm income; and on these farms, it seems highly likely that family income must range from $5,000 to $7,500.

Using the data of Table 3 and Appendix Tables 3 and 4, the number of farms which might be fully supported by direct markets is now estimated (Table 6). It is assumed that each farm sells $40,000 in total sales, earns roughly $16,000 in farm income, and receives the current average price of fresh fruit ($1,800 per acre) and fresh vegetables ($1,700 per acre). Under these assumptions, a doubling of direct–marketing consumption could support 99 vegetable farms and 64 fruit farms; a tenfold increase in direct–market sales confined to the small farm sector could support 996 vegetable farms and 636 fruit farms. Under these assumptions, the overall impact of such policies would be restricted to between 1.5 percent and 14.8 percent of existing small farms. The regional impact

TABLE 4

Regional and State Total of Small Vegetable and Fruit Farms[a]
Harvested Cropland, and Crop Sales
California, 1974

Region[b] and crop farm	Small farms					
	Number	Percent of all farms	Harvested cropland	Percent of all acres	Crop sales	Percent of all sales
			acres		1,000 dollars	
Northern						
Vegetables[c]	478	26.5	5,533	1.2	5,983	0.9
Fruits[d]	6,113	62.6	134,480	20.5	94,136	15.2
Southern						
Vegetables[c]	236	24.3	2,729	1.2	2,951	0.9
Fruits[d]	3,215	71.5	70,725	20.5	49,508	15.2
California						
Vegetables[c]	743	23.4	8,600	1.2	9,300	0.9
Fruits[d]	10,264	63.4	226,896	20.5	158,827	15.2

[a]Defined as commercial farms ($2,500 or more in sales) producing less than $40,000 in total sales.

[b]Designated in Figure 1, *supra*, p. 10. Regional totals for small farms, acres, and sales are derived by assuming that the proportion of small farms, acres, and sales in each region is the same as the overall state small farm proportions.

[c]Includes melons. The state figures are taken directly from the 1974 Census of Agriculture. There are no comparable small farm statistics for the counties, so the regional statistics are estimated by making the following assumptions. The proportion of total regional cropland and sales allocated to the small farm sector is based on the state averages. The number of small farms in each region is estimated by assuming that the average size of these farms is the same as the average small farm size for the state.

[d]Includes berries and excludes nuts. The fruit farm figures are derived in a similar way as those for vegetable farms except an additional adjustment is made to disaggregate fruit farms from the totals provided in the Census which refer to fruit and nut farms. The elimination of nut farms is accomplished by using estimated nut acreage and value for 1974 from the California Crop and Livestock Reporting Service and by assuming fruit and nut farms are of the same size. The distribution between large and small fruit farms (acreage and sales) is assumed the same as for fruit and nut farms.

Sources:

For vegetables, see U. S. Bureau of the Census, *Agricultural Census, 1974. Volume 1, California, State and County Data*, Part 5, Chapter I, Tables 32 and 33; Chapter II, Tables 28, 29, and 30; and Chapter III, Table 11, 1977.

For fruits, see California Crop and Livestock Reporting Service, *Fruit and Nut Statistics, 1973-74* (Sacramento, 1975).

TABLE 5

Economic and Demographic Characteristics of Small Vegetable and Fruit Farms[a]
California, 1974

Characteristics	Vegetables[b]	Fruits[c]
	percent	
Farm operator		
Living on own farm	54.0	60.0
Reporting farming as principal occupation	76.7	52.0
Working more than 200 days off farm	19.1	36.8
Families reporting off-farm income	42.9	73.4
Full owners of farm	52.2	88.2
	dollars	
Sales, size, and income of average small farm[d]		
Total sales per farm	16,503	14,540
Net farm income	4,390	1,454
Net nonfarm income	6,621	11,680
Total income per farm	11,011	13,134
Total harvested cropland (acres)	21.2	25.7
Total harvested cropland in vegetables and fruits only (acres)	13.0	20.5

[a]Defined as commercial farms ($2,500 or more in sales) producing less than $40,000 in total sales.

[b]Includes melons.

[c]Includes nuts and berries.

[d]Sales and size statistics differ slightly from those implied by Table 4, *supra*, p. 13, because the farms described as fruit and vegetable farms in the Census also sell other crops, and not all small farms selling fruit and vegetables are included in the two Census categories (they may be classified, for example, as cash grain farms) used in this table.

Source: U. S. Bureau of the Census, *Census of Agriculture, 1974. Volume 1, California, State and County Data*, Part 5, Chapter I, Table 33, 1977.

TABLE 6

Number of Small Vegetable and Fruit Farms[a] Supported by Potential Direct-Marketing Policies, California, 1974

Region[b] and crop farm	Small farms supported if direct-market consumption increases:			
	Double from 2 percent to 4 percent		Tenfold from 2 percent to 20 percent	
	number	percent of existing small farms	number	percent of existing small farms
Northern				
Vegetables[c]	38	7.3	355	74.3
Fruits[d]	23	0.4	226	3.7
Southern				
Vegetables[c]	72	27.1	641	271.6
Fruits[d]	41	1.3	410	12.7
California	(174)	(1.5)	(1,632)	(14.8)
Vegetables[c]	110	13.3	996	134.1
Fruits[d]	64	0.6	636	6.2

[a]Defined as commercial farms producing $40,000 in total sales; 22 acres of fruits @ $1,800 per acre yield and 23 acres of vegetables @ $1,737 per acre yield.

[b]Designated in Figure 1, *supra*, p. 10.

[c]Includes melons.

[d]Includes berries.

Source: Computed.

of these policies would be more pronounced, especially in the southern region which has relatively fewer farms. For example, if direct–market consumption of vegetables increased to 7 percent of total consumption in the southern region, all the existing small vegetable farms could be supported by direct–market sales. If 20 percent of the consumption of vegetables occurred through direct markets in the southern region, 405 new vegetable farms could be supported.

A second estimate of the potential impact of direct marketing is shown in Table 7. It shows the additional sales and net income which would be available to small farms under increased direct–market consumption. In estimating these impacts, it is assumed that all of the benefits from increased direct marketing are available to existing small farms only and that these benefits are evenly distributed over the entire population of small farms in each region; that is, each small farm is assumed to sell the same portion of its crops in the direct markets as every other small farm and the rest of its crops in the conventional markets.

To obtain the impact of direct marketing on total small farm sales, it is assumed that each small farm receives the same price for fresh produce as is typical in the conventional markets (Appendix Tables 3 and 4).[1] By selling a larger proportion of his crops at the nondiscounted fresh market prices in direct markets, the small producer increases his sales by avoiding having to sell in low–priced processing markets (Table 2).[2] Thus, the typical small fruit farm is assumed to increase sales by $1,100 per acre, and the typical small vegetable farm is assumed to increase sales per acre by $655 on that portion sold in the direct market in comparison to the fruit and vegetable sales levels shown in Table 2. This method of calculating the benefits certainly overstates the impact of direct–marketing programs because it assumes that small farms currently have lower sales per acre solely because they lack access to fresh markets. However, there are indications that small farms also have lower sales per acre than larger farms because they have inferior resources and because they lack skilled management.[3] Direct–marketing policies will not change management or resources; therefore, it is unlikely that small farms will produce such high sales per acre even in a direct–market arrangement.

Table 7 also contains estimates of the impact of higher sales on net small farm income. Not all of the increased revenue derived from selling at higher prices will be available to the farmer as net income; some portion of the increased revenue must be used to pay for higher production costs associated with growing and harvesting fruits and vegetables for the fresh market. For example, under 1974 production costs (as revealed in the Agricultural Census data) small fruit farms received only 9 percent of the sales dollar in income (to be applied to family labor and capital), and small vegetable farms received about 26.6 percent of the sales dollar as income. It seems likely that the direct–market

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[1] *Infra*, pp. 24 and 25.

[2] Footnote 1, *supra*, p. 4.

[3] LeVeen, *op. cit.*, pp. 7–10.

TABLE 7

Estimated Economic Impact of Direct Marketing on Existing Small Vegetable and Fruit Farms[a]
California, 1974

Region[b] and crop farm	Economic impacts resulting if direct-marketing consumption increases: Double from 2 percent to 4 percent	Tenfold from 2 percent to 20 percent
Northern and southern		
Vegetable farms[c]		
1. Total farms	714	714
2. Increase in crop sales (1,000 dollars)[d]	1,531	5,412[e]
3. Increase in sales per farm (dollars)	2,148	7,579
4. Increase in net income (1,000 dollars)[f]	951	3,982
5. Increase in net income per farm (dollars)	1,332	5,576
6. Increase in net income (percent of total net income)	30.3	127.0
Fruit farms[g]		
7. Total farms	9,328	9,328
8. Increase in crop sales (1,000 dollars)[d]	1,536	15,377
9. Increase in sales per farm (dollars)	165	1,649
10. Increase in net income (1,000 dollars)[f]	929	9,303
11. Increase in net income per farm (dollars)	100	997
12. Increase in net income (percent of total net income)	6.9	68.5
California		
Vegetable and fruit farms		
13. Increase in total crop sales (1,000 dollars)[d]	3,067	20,789
14. Increase in total net income (1,000 dollars)[f]	1,880	13,285
15. Increase in total net income per farm (dollars)	170	1,207
16. Increase in total net income of all small fruit and vegetable farms (percent of total net income)	10.3	73.1

[a]Defined as commercial farms ($2,500 or more in sales) producing less than $40,000 in total sales.

[b]Designated in Figure 1, *supra*, p. 10.

[c]Includes melons.

[d]Calculated on the basis of $655 per acre of additional sales on vegetable farms and $1,100 per acre on fruit farms. Estimates are based on the difference between average farm value of fresh fruits and vegetables and reported sales for small farms. These sums are multiplied by the increased acreage attributed to direct marketing (Table 3, *supra*, p. 11).

[e]Estimate is incomplete because there is a demand for more vegetable production than can be met by existing farmers.

[f]The net income received per dollar of direct-market sales is estimated to be 40 percent of the gross sales dollar. To obtain the portion of the incremental revenue (i.e., rows 2 and 8) retained by the farmer, account is taken of the percent retained within the conventional market system (26.6 percent for vegetable farms and 9.0 percent for fruit farms), and the share of the incremental revenue is calculated to bring the percent retained on the entire direct-market sales dollar to 40 percent. Thus, vegetable farms retain 62.1 percent of the incremental revenue from direct marketing, and fruit farms retain 60.5 percent of the incremental revenue.

[g]Includes berries.

Sources:

Rows 1 and 7:	Table 4, *supra*, p. 13.
Rows 2 and 8:	Calculated according to footnote *f*; data from Tables 2 and 4, *supra*, pp. 4 and 13, respectively, and Appendix Tables 3 and 4, *infra*, pp. 24 and 25, respectively.
Rows 3 and 9:	Computed by dividing row 2 by row 1 and dividing row 8 by row 7.
Rows 4 and 10:	Calculated according to procedure in footnote *d* based on data from rows 2 and 8 and data from Table 5, *supra*, p. 14.
Rows 5 and 11:	Calculated by dividing row 4 by row 1 and dividing row 10 by row 7.
Rows 6 and 12:	Calculated by dividing row 5 by net farm income from vegetable farms in Table 5, *supra*, p. 14, and dividing row 11 by net fruit farm income in Table 5, *supra*, p. 14.
Rows 13 and 14:	Summation of row 2 plus row 8 and row 4 plus row 10.
Row 15:	Calculated by dividing row 14 by total small farms in Table 4, *supra*, p. 13.
Row 16:	Calculated by dividing row 14 by total net farm income calculated by multiplying total small farms (Table 4, *supra*, p. 13) by average net farm income (Table 5, *supra*, p. 14).

sales will yield much higher incomes (per dollar of sales), but there are no data available to suggest how much larger the farmer's share will be in comparison to his share in the traditional marketing system. For the purpose of this analysis, therefore, an extremely favorable assumption is made that the small farmer retains 40 percent of the gross direct–market sales dollar as net income. This assumption almost certainly overstates the true net income created by direct marketing because even the largest farms with the greatest market access and the lowest production costs do not retain much more than 25 percent of the sales dollar in the traditional markets.[1]

As can be seen in Table 7, the impact of policies which doubled direct–market consumption would be to increase the net incomes of the 714 small vegetable farms in the two regions by about $1,332 per farm and the net incomes of the 9,328 small fruit farms in the two regions by about $100 per farm. Overall, these increases amount to about $170 per small fruit and vegetable farm in the state. If direct–market consumption were to increase tenfold, the benefits would become much more pronounced, with the statewide average jumping to $1,207 per small farm and much larger increases for small vegetable farms.

It might be argued that these estimates understate the full benefits of direct marketing to the farmer because they are based on the prices of fresh fruit and vegetables in the conventional markets. By eliminating the middleman operations, the farmer can actually sell his crops for higher prices than farmers receive in these conventional markets and thus receive additional benefits. This argument may be partly true, but it must be remembered that the farmer who markets his crops must incur additional expenses which are not incurred by farmers in the conventional markets. Thus, if the farmer is to cover his additional marketing costs, he must be more highly rewarded for his crops than his competitors who use the conventional markets. It is possible that the farmer and his family have underemployed labor and that the additional marketing functions can be undertaken by family members who would earn a higher return on their labor than would be otherwise possible. In this sense, direct marketing could increase family income by more than is estimated in Table 7. However, because of the very generous assumptions made regarding the small farmer's share of the direct–marketing dollar and the concentration of all benefits in the hands of small farmers only, it is likely that the estimates in Table 7 overstate the possible impact of direct–marketing policies on small fruit and vegetable farmers.

Direct–Marketing Policies in Perspective

Whether one views the impact of direct–marketing policies as important or unimportant or substantial or insignificant depends upon one's perspective. By confining the preceding analysis to the impact of policies on the existing small fruit and vegetable farm population, the significance of the policies has been magnified. For instance, it has been shown that small vegetable farm income could be increased 30 percent by doubling direct–market consumption and that 110 small vegetable farms could be fully supported

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[1] *Ibid.*

with annual incomes of $16,000 by such increases in direct–marketing consumption. Yet, even from this perspective, the overall impact of such policies on the entire small farm population is seen to be small, largely because there are thousands of small fruit farms that cannot be incorporated in any substantial way into the growing direct–market demand.

If the perspective is shifted to that of the entire population of fruit and vegetable farms, the impact of direct–marketing policies is seen to be even less significant. For example, small vegetable farms currently sell about $10 million in processed and fresh vegetables which is about 1 percent of the total vegetable sales of California farms (Table 1). Under direct marketing, the sales of small vegetable farms could rise by $1.5 million, thereby increasing the share of small vegetable farms to 1.2 percent of total vegetable sales. Even if 20 percent of all vegetables were purchased through direct markets and sold by small farms, the share of this sector would rise to only 2.5 percent of total vegetable sales. Similarly, small fruit farms have about 15.9 percent of total sales; with direct marketing, these farms would increase their share to 16 percent (at the extreme, 17 percent) of total fruit sales.

In short, direct–marketing policies will have an almost imperceptible impact on the overall distribution of sales and net income between large and small farms. This suggests that large farmers have little to fear from direct–marketing policies, and it also suggests that those who want the small farm to remain a viable and vital institution had better concentrate on policies designed to create greater small farm access to the conventional marketing systems as well as on other nonmarket aspects of small farm viability if they expect to reverse the current trends toward greater concentration in both fruit and vegetable production.

CONCLUSION

An assessment of the potential impact of direct marketing on the viability of the small fruit and vegetable farm in California must contend with the reality that the amount of land needed to produce fresh fruits and vegetables for California consumption is a very small percentage of all land in these crops and that the amount of this land needed to supply even the most successful of direct–marketing programs is even smaller––less than 1 percent of all land in fruit and vegetable production. This places a very large constraint on the potential effectiveness of direct–marketing policies to reverse the forces which are driving the small farm out of existence. Realistically, it is unlikely that such policies can increase the total sales of small producers by more than $3 million or their incomes by more than $1.5 million. While this income could be of considerable benefit to a relatively few fortunate small producers, assuming they can successfully compete for direct–market sales with larger farms, it represents an almost unmeasurable impact on the overall distribution of income between large and small producers. In short, direct–marketing policies can be no general panacea for the vast majority of small fruit and vegetable farms let alone the even larger number of small farmers who produce other kinds of crops which are not amenable to direct marketing.

The economic viability of the small fruit and vegetable farm is very likely linked to market access, but direct marketing does not provide access to a large enough number

of farmers to change the present circumstances. If there is to be a general reversal of the continuing trend toward greater economic concentration in fruit and vegetable production, much more attention must be paid to the conventional marketing system and to making it possible for the small producer to function within this sytem. Although the possible methods whereby this objective might be achieved are beyond the scope of this study, the promotion of small farm marketing cooperatives would appear to be one important method of helping these farmers gain a better foothold. Another possible form of public support of the small farm might lie in changing the provisions of marketing orders and market regulations which may be biased against the small producer.[1]

These conclusions are not intended to dismiss the importance of direct–marketing policies. Such policies still deserve attention for, while they can have only limited impact on the welfare of most small farmers, they may still make an important contribution to consumer welfare which has not been investigated in this analysis. Moreover, this paper has shown that direct–marketing policies could be of considerable importance to vegetable farmers, especially those in the southern part of the state. If the costs of public programs are lower than the improvement in small farm welfare, as they likely are in the case of deregulation or of the support of a "hot line" to improve communication between consumers and farmers, then at least some direct–marketing policies may be justified solely in terms of small farmer welfare.

Any discussion of the "costs" of direct–marketing policies should also take into account the private costs on the larger producers, shippers, wholesalers, and retailers who depend on the viability of the conventional marketing system. Indeed, as indicated above, there could be some redistribution of sales and income from large to small farmers as a result of direct–marketing policies. However, as shown above, the redistribution of sales and income is exceedingly small. Taken together, small fruit and vegetable farmers will increase their share of total sales from about 8.8 percent to about 8.9 percent and, therefore, the larger producers will experience a reduction in their share of total sales from 91.2 percent to 91.1 percent.[2] The effect on income is even less pronounced. Therefore, direct–marketing policies offer little threat to the hegemony of the larger producer and should not impair his welfare.

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[1]John A. Jamison, "Marketing Orders, Cartels, and Cling Peaches: A Long–Run View," *Food Research Institute Studies,* Vol. VI, No. 2 (1961), pp. 117–142.

[2]The analysis of direct–marketing policies presented here has assumed that additional direct–market sales arising from these policies come at the expense of traditional markets. However, it could also be argued that direct–market sales will *increase* the total amount of fresh produce sold rather than redistribute sales from one marketplace to another since some consumers will be able to obtain items which were not available at all in the traditional markets. In this case the overall impact of direct–marketing policies on the traditional markets and market system will be even less than indicated here.

APPENDIX TABLES

APPENDIX TABLE 1

California Fresh Fruit Production for Total and California Consumption, 1974

Crop	Total consumption			California consumption			
	Output, fresh market	Acreage, fresh market	Farm value	Per capita	Total	Total acreage	Total farm value
	1	2	3	4	5	6	7
	1,000 tons	acres	million dollars	pounds	1,000 tons	acres	million dollars
Apples	52.0	5,117	10.0	15.7	45.5[a]	4,477	8.8
Apricots	6.2	1,925	2.9	0.3	3.0	931	1.3
Avocados	53.5	20,740	44.4	2.0	22.0	8,524	18.2
Cherries (sweet)	20.3	8,605	15.8	0.5	4.8	2,035	3.6
Grapefruit	63.7	6,681	8.5	9.9	109.1[a]	6,681	8.5
Grapes	432.4	55,869	108.1	8.2	90.5	11,693	23.2
Nectarines	113.2	10,890	25.9	2.3	25.6	2,462	6.2
Oranges	1,121.0	141,404	148.7	17.7	195.1	24,604	25.9
Other citrus	384.1	35,124	85.6	2.8	30.8	2,817	6.9
Peaches (all)	104.0	7,383	17.6	4.1	32.0[a]	2,272	5.7
Pears (all)	53.0	6,257	10.4	2.5	15.7[a]	1,853	3.1
Plums	140.0	23,000	39.1	1.8	19.6	3,187	5.8
Strawberries	138.8	5,700	85.2	3.0	33.0	1,355	20.2
Fruit (miscellaneous)	11.5	4,363	2.3	0.7	7.9	2,998	1.6
Total	2,693.7	333,058	604.5	71.5	634.6	75,889	139.0

[a]The total California consumption of these fruits exceeds the California production for the local markets. Out-of-state imports not shown in these statistics are thus important in these crops.

Sources:

Cols. 1, 2, 3, 5, 6, and 7: California Crop and Livestock Reporting Service, *Fruit and Nut Statistics, 1973-74* (Sacramento, 1975).

Col. 4: Figures for avocados, grapefruit, oranges, other citrus, and strawberries are estimated by adjusting the national per capita consumption for California (U. S. Economic Research Service, *Food Consumption Prices Expenditures*, Agricultural Economics Report No. 138, Supplement, 1974, p. 15) using regional consumption deviations [P. S. George and G. A. King, *Consumer Demand for Food Commodities in the United States With Projections for 1980*, University of California, Giannini Foundation Monograph No. 26 (Berkeley, 1971), p. 140].

Estimated figures for apples, peaches, and pears are based on national per capital consumption.

Estimated figures for apricots, cherries, grapes, nectarines, plums, and miscellaneous fruit are based on amount of fruit shipped to fresh markets within California; see, also, California Crop and Livestock Reporting Service, *op. cit.*

APPENDIX TABLE 2

California Fresh Vegetable Production for Total and California Consumption, 1974

Crop	Total consumption			California consumption			
	Output, fresh market	Acreage, fresh market	Farm value	Per capita	Total	Total acreage	Total farm value
	1	2	3	4	5	6	7
	1,000 tons	acres	million dollars	pounds	1,000 tons	acres	million dollars
Artichokes	35.0	10,800	12.2	1.0	10.0	3,124	3.5
Asparagus	30.0	22,000	21.0	1.0	10.1	7,425	7.1
Beans (snap)	13.8	3,100	5.3	1.0	10.1	2,283	3.9
Broccoli	76.1	18,793	26.0	1.0	10.2	2,500	3.5
Cabbage	110.0	9,900	9.1	4.5	45.9	4,100	3.8
Carrots	391.8	23,350	56.2	10.2	112.2	6,155	14.8
Cauliflower	57.7	22,000	20.8	1.0	10.3	3,864	3.7
Celery	539.2	18,600	60.1	7.3	73.6	2,550	8.2
Corn	46.1	12,200	8.6	7.5	46.1	12,200	8.6
Cucumbers	38.5	3,000	7.4	3.3	33.3	2,607	6.4
Lettuce (head)	1,822.2	150,700	248.0	30.1	331.1	25,205	41.5
Melons (all)	510.9	56,400	88.2	23.0	253.0	25,707	40.2
Onions	519.5	31,800	40.4	13.0	130.0	8,057	10.2
Peas	2.3	1,200	0.8	0.1	1.6	528	0.4
Peppers	96.2	9,900	20.4	3.5	35.4	3,650	7.5
Spinach	13.9	1,900	3.4	0.4	4.1	555	1.0
Tomatoes	346.6	28,700	118.6	11.0	121.3	9,222	38.1
Vegetables (miscellaneous)	373.0	34,800	90.4	7.6	74.7	7,170	18.1
Total	5,022.8	449,243	836.9	126.5	1,315.9	126,902	220.5

Sources:

Cols. 1, 2, 3, 5, 6, and 7: California Crop and Livestock Reporting Service, *Vegetable Statistics, 1973-74* (Sacramento, 1975).

Col. 4: Figures for artichokes, asparagus, beans, broccoli, cabbage, carrots, cauliflower, lettuce, melons, onions, and peppers are estimated by adjusting the national per capita consumption for California (U. S. Economic Research Service, *Food Consumption Prices Expenditures,* Agricultural Economics Report No. 138, Supplement, 1974, p. 15) using regional consumption deviations [P. S. George and G. A. King, *Consumer Demand for Food Commodities in the United States With Projections for 1980,* University of California, Giannini Foundation Monograph No. 26 (Berkeley, 1971), p. 140].

Estimated figures for celery, corn, cucumbers, peas, spinach, tomatoes, and miscellaneous vegetables are based on national per capita consumption.

APPENDIX TABLE 3

Value of Fresh Vegetables, Acreage Needed to Produce $40,000 in Total Sales, and Additional $40,000 Farms Potentially Supported by Direct-Marketing Policies Under Projections of Increased Demand, California, 1974

Crop	Value of fresh vegetables	Acreage to produce $40,000 in total sales	Additional $40,000 farms potentially supported by direct markets if consumption increases:	
			Double from 2 percent to 4 percent	Tenfold from 2 percent to 20 percent
	1	2	3	4
	dollars per acre	acres	number	
Artichokes	1,129	35.4	2	16
Asparagus	954	41.9	4	32
Beans (snap)	1,709	23.4	2	18
Broccoli	1,384	28.9	2	16
Cabbage	919	43.5	2	17
Carrots	2,412	16.6	7	67
Cauliflower	945	43.3	2	16
Celery	3,231	12.4	4	37
Corn	705	56.7	4	39
Cucumber	2,467	16.2	3	29
Lettuce (head)	1,645	24.3	21	187
Melons (all)	1,560	25.6	20	180
Onions	1,270	31.5	5	46
Peas	666	60.0	0	2
Peppers	2,060	19.4	4	34
Spinach	1,789	22.5	0	5
Tomatoes	4,132	9.7	19	171
Vegetables (miscellaneous)	2,598	15.4	9	84
Total	1,737	23.0	110	996

Sources:

Col. 1: Based on statewide average yields and fresh market prices; see California Crop and Livestock Reporting Service, *Vegetable Statistics, 1973-74* (Sacramento, 1975).

Col. 2: Computed; obtained by dividing $40,000 by the average value per acre of the crop reported in column 1.

Cols. 3 and 4: Computed; estimated demand for each crop (above existing demand in fresh markets assumed to be 2 percent of total sales). Number of farms is found by dividing total additional acreage by the number of acres needed to produce $40,000 as shown in column 2.

APPENDIX TABLE 4

Value of Fresh Fruits, Acreage Needed to Produce $40,000 in Total Sales, and Additional $40,000 Farms Potentially Supported by Direct-Marketing Policies Under Projections of Increased Demand, California, 1974

Crop	Value of fresh fruits	Acreage to produce $40,000 in total sales	Additional $40,000 farms potentially supported by direct markets if consumption increases:	
			Double from 2 percent to 4 percent	Tenfold from 2 percent to 20 percent
	1	2	3	4
	dollars per acre	acres	number	
Apples	1,966	20.3	4	40
Apricots	1,396	28.7	0	6
Avocados	2,135	18.7	9	82
Cherries (sweet)	1,769	22.6	2	16
Grapefruit	1,272	31.5	4	38
Grapes	1,984	20.2	12	104
Nectarines	2,516	15.9	3	28
Oranges	1,053	38.0	13	116
Other citrus	2,449	16.3	3	31
Peaches (all)	2,508	15.9	3	26
Pears (all)	1,673	24.0	2	14
Plums	1,820	22.0	3	27
Strawberries	12,000	3.3	8	76
Fruit (miscellaneous)	533	75.0	1	8
Total	1,832	21.8	67	612

Sources:

Col. 1: Based on statewide average yields and fresh market prices; see California Crop and Livestock Reporting Service, *Fruit and Nut Statistics, 1973-74* (Sacramento, 1975).

Col. 2: Computed; obtained by dividing $40,000 by the average value per acre of the crop reported in column 1.

Cols. 3 and 4: Computed; estimated demand for each crop (above existing demand in fresh markets assumed to be 2 percent of total sales). Number of farms is found by dividing total additional acreage by the number of acres needed to produce $40,000 as shown in column 2.

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