Potential Fresh Market Outlets For Oregon Vegetables And Small Fruits

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SUMMARY AND CONCLUSIONS

Objectives of this study were to determine whether Oregon growers could profitably produce and sell increased volumes of vegetables and small fruits in fresh markets, and if so, under what conditions such expansion might occur.

Data from government and private sources on producing and marketing vegetables and small fruits in fresh markets and information from personal interviews with growers, production specialists, marketing men, and produce buyers for stores in Oregon and California were used.

The amount by which expected prices exceeded expected costs of producing and marketing was used as the measure of potential profitable expansion for selected crops.

About 125,000 acres were planted to vegetables, cantaloupe, and watermelon in Oregon in 1962. Of this, 14% was for the fresh market and 86% for processing. Acreage devoted to fresh market production has changed little since 1949, but by 1962, processing acreage had increased 54%. Multnomah County had a larger percentage of its cropland devoted to fresh market vegetables than any other county. On many farms, vegetable acreages were small. Twenty percent of the farms surveyed grew only one vegetable and another 20% produced two vegetables.

Few growers had their produce graded by government graders; many did not grade their produce at all; and few cooled it mechanically before sale. Many different types of containers were used for each crop; for example, eight for sweet corn and six for carrots.

In general growers did not favor sales contracts for fresh market produce. Seventy percent of the 182 growers interviewed were familiar with official information on prices, although several growers said, "I take what price the buyer will give."

Types of market outlets varied among crops, as did prices received in different outlets. Differences in produce and in services performed reduced the significance of price comparisons among outlets.

Annual incomes from all sources, after paying farm business expenses, were less than $3,000 for one-half the growers interviewed.

Cost of production varied much more with yield per acre than with acres of crop harvested.

Portland, Seattle, San Francisco, and Los Angeles were selected as potential markets for two selected vegetables—sweet corn and carrots.

Specific Findings

Under the assumptions used, including one that costs and prices would bear about the same relation to each other for the next few years as they have borne during 1959, 1960, and 1961, some of the findings follow:

Sweet corn

1. Net returns per acre of Oregon sweet corn sold in fresh markets would be $64 in Los Angeles; $106 in San Francisco; $157 in Portland; and $194 in Seattle.
2. Net returns per acre of Oregon sweet corn sold for processing are very small; possibly $15 to $25, even if yields are above average.
3. If a minimum net return to growers of $50 per acre is assumed, and if shipments are spread throughout the Oregon production season, the following increase in carlot unloads could be sold: Portland, 8; Seattle, 32; and San Francisco, 23. This represents about a 20% increase above sweet corn planted in western Oregon for the fresh market in 1961.

Carrots

1. Net returns per acre of Oregon carrots sold in fresh markets from a 10 to 20 acre operation would be $224 in Los Angeles; $274 in San Francisco; $405 in Seattle; and $480 in Portland.
2. Net returns were about $235 per acre for carrots sold for processing.
3. Definite limitations exist as to how much expansion could take place without excessive lowering of prices. Risks are higher in producing for the fresh market than for the processing market.

Oregon and Washington are good markets for California carrots. Fifty carlots were sold in Portland and 135 carlots were shipped through Oregon and into Seattle-Tacoma during the six months of Oregon production in 1962.

Strawberries

Oregon markets are more dependent on California strawberries than seems necessary if improved varieties of fresh market strawberries could be developed and grown in Oregon. Only 27 of the 168 carlots of strawberries unloaded in Portland in 1962 were grown in Oregon. California sold almost twice as many strawberries in the Portland market during Oregon's peak month of June 1962, as did Oregon growers.

Conclusions

The Willamette Valley is a region well adapted to growing small fruits and vegetables. The range of soils is wide, and some of them are very well adapted to production of one or more fruit and vegetable crops. Weather is one of the principal forces affecting profitable fruit and vegetable production in western Oregon during some years. The growing season is relatively long, with a 40-year average of 214 frost free days from April 1 through October 31 in Marion County, located near the center of the Valley. But the

nights are frequently too cool for large-scale, commercial production of such crops as peppers, tomatoes, and some fruit crops. Cool nights delay crop growth, requiring long growing periods. At the same time, low temperatures permit relatively leisurely harvest and unusually fine quality of many vegetable crops. Rain may be another serious problem, especially in the fall and spring. Unlike semi-arid regions where irrigation is the only source of water during the growing season, the Willamette Valley does receive rains in early summer, although July, August, and September generally are dry.

Heterogeneity or dissimilarity and small scale operations generally characterize this Oregon industry. Selection of crops, varieties, grading, packing, and selling practices are largely individual decisions. This heterogeneity, in such small-scale operations, is not conducive to efficient marketing. If production for the fresh market industry is to keep pace with growth in population and with increasing competition from other areas, consideration must be given to changes in production and marketing of small fruits and vegetables.

Large volume buyers desire uniform, quality produce from dependable sources during as long a period of time as possible. They are willing to pay prices necessary to obtain such merchandise. It is less expensive and more satisfactory in the long run for them to obtain their fresh fruits and vegetables under these conditions than it is to buy from numerous scattered sources with different varieties, packages, and qualities. Besides, the large buyer knows he cannot be sure he will obtain what he wants when he wants it if he buys from a large number of small growers. Since competition forces him to have the merchandise in his stores, he *must* buy from dependable sources. If the price is higher, he considers the money well spent—because his stores must have fresh vegetables and fruits or lose sales and customers.

With some exceptions, buying practices of large buyers do not fit well into existing fresh vegetable production in western Oregon. Conversations with growers and the trade indicate that any of the following situations might exist in the next decade:

- Continuation of the present, generally small-scale, heterogeneous type of production in Oregon.
- Displacement of small growers by purchase of their holdings and evolvement of a relatively few large producers, as in California.
- Establishment of an industry committee (growers, wholesalers, and retail buyers) to attempt to remedy some of the major weaknesses in the existing production and marketing structure so as to attract and supply large buyers on a continuing and expanding basis.
- Combinations of any of these situations.

If little change is made, out-of-state, competing areas probably will supply increasing portions of the large-volume retail outlets, and Oregon growers will supply the smaller market outlets, including roadside stands.

Enlargement of production operations is being stimulated by residential and industrial developments on lands adjoining cities and small communities. Small growers are selling their land for home and factory sites and going out of vegetable production. Some new growers on larger units are going into the industry, which can be a very high

risk one, especially for a farmer inexperienced in growing and marketing.

Establishment of an industry committee (growers, wholesalers, and retail buyers) to try to set the groundwork for a successful, large-scale, fresh fruit and vegetable industry in Oregon is confronted with many serious problems and possibly with objections from some parts of the industry. Probably the selection of a small committee representing various parts of the industry to discuss only possible objectives and problems would be a way to start consideration of economic expansion of Oregon's fresh fruit and vegetable industry.

INTRODUCTION

Fresh vegetables and fruits are available the year-round for most consumers. Providing this steady supply is a major accomplishment of the marketing system -- from the grower through various middlemen, such as brokers, wholesalers, and retailers. Buying from different production areas must be planned long before harvest if stores are to have the produce consumers expect day after day. Growers must plan their sales in advance of planting if they are to have a strong, ready market for their produce, especially if buyers have large volume.

Successful production of fruits and vegetables has been an important part of Oregon agriculture for many years, and production is increasing in the state. Although Oregon is favored in many ways with its soil and climate, its neighboring state on the south is the nation's number one producer of fruits and vegetables and provides severe competition to Oregon growers. Western Washington and irrigated areas in central Washington also are large and successful producers of vegetables and small fruits which supply Washington markets and some in Oregon and California. At the same time that Oregon growers of fresh vegetables and small fruits are meeting stronger competition from out-of-state growers, many farmers, particularly in parts of the Willamette Valley, are searching for nongrass crops to produce in order to increase their declining farm incomes.

One objective of this study is to determine whether Oregon growers can profitably expand production and sale of vegetables and small fruits in fresh markets. Another objective is to determine what production and marketing conditions would need to be attained so that Oregon vegetables and small fruits could be sold profitably on a larger scale than at present in fresh markets.

Procedure employed

1. Data on carlot unloads in Portland, Seattle, San Francisco, and Los Angeles were studied to determine volume and seasonality of movement of vegetables and small fruits for fresh markets in the four cities in recent years.
2. Wholesale and retail firms buying and selling fresh vegetables and small fruits in volume in the Portland market were interviewed to learn of their marketing procedures, practices, and problems.
3. Growers and marketing firms in specialized production areas of

California were interviewed to learn about production and marketing practices.

4. Names of all growers of vegetables and small fruits for fresh market were obtained from all known sources in 14 counties in western and southwestern Oregon.[1] This sampling universe consisted of 402 farms, excluding apple, pear, peach, potato, and dry onion farms. However, information about the latter two crops was obtained from producers who grew one or more other vegetable and small fruit crops for fresh markets. Growers of strawberries, blueberries, and tomatoes were included among the 402 farms. A sample of 200 farms was drawn from the 402 farms. During December 1961, and January 1962, 182 usable schedules were obtained from 200 personal interviews. They provided detailed information on production and marketing practices, characteristics of growers, and their income levels.
5. Data on prices growers received for several years and volume of produce sold were obtained from USDA publications for selected crops in the four markets.
6. On the basis of available information, sweet corn and carrots were selected as two crops which appeared to have potentials for market expansion.
7. Conferences were held with a small group of Oregon sweet-corn growers and with a group of carrot growers to determine costs involved in producing these crops.
8. Data on costs of grading, packaging, selling, and transporting corn and carrots were obtained from industry sources in Portland.
9. Elasticity of demand for sweet corn in the San Francisco market was calculated.
10. Finally, costs of producing and marketing (including transportation and brokerage fees) were compared with prices paid in recent years in each of the four markets during various time periods. Numbers of dollars by which selling prices for the two products exceeded total costs were used to measure whether or not profitable expansion of production and sales seemed feasible in each of the four markets.

VEGETABLE PRODUCTION

Volume of Production

Vegetable production in Oregon increased from 86,510 acres with a farm value of $21 million in 1949 to 125,500 acres with a farm value of $31 million in 1962. Area devoted to production of fresh market vegetables fluctuated around 16,000 acres during this period with a low of 13,540 acres in 1955 and a high of 18,150 acres in 1951. Fresh vegetable acreages were much smaller than acreages in processed vegetables. The latter increased 54% from 70,380 in 1949 to 108,180 in 1962 (Table 1).

[1] Counties included in the sampling area are: Benton, Clackamas, Clatsop, Columbia, Douglas, Jackson, Lane, Linn, Multnomah, Marion, Polk, Yamhill, Washington, and Josephine.

Table 1. Farm value and number of acres of principal vegetable crops grown in Oregon for fresh market and for processing, by years, 1949-1962[1]

	Fresh market		Processed	
Year	*Acres*	*Thousands of dollars*	*Acres*	*Thousands of dollars*
1949	16,130	8,166	70,380	12,909
1950	16,230	6,116	72,230	12,782
1951	18,150	10,504	82,920	14,990
1952	17,560	11,714	74,290	14,323
1953	17,640	6,958	75,430	15,718
1954	15,830	7,637	83,830	15,535
1955	13,540	7,081	85,980	16,290
1956	14,480	7,830	95,830	20,615
1957	13,950	7,987	93,050	20,291
1958	15,900	10,612	85,950	18,187
1959	16,280	6,826	88,170	19,514
1960	17,050	7,921	93,920	17,660
1961	17,550	12,865	110,600	22,302
1962	17,320	7,831	108,180	23,504

[1] USDA Statistical Reporting Service; Oregon Crop and Livestock Reporting Service.

Location of Vegetable Production

Production of vegetables for the fresh market was scattered throughout most western Oregon counties except Columbia and the coastal counties. Morrow, Umatilla, and Malheur were the only counties in eastern Oregon with sizeable acreages of fresh market vegetables. Concentration of fresh vegetable production is shown by counties for 1959 in Figure 1. Percentage of crop acres devoted to the production of fresh vegetables was greatest in the counties nearest Portland, the large population center. In Multnomah County from 10 to 12% of available crop acres were devoted to fresh vegetable production. Clackamas County ranked second with from 7.5% to 10% of available crop acres devoted to fresh vegetables.

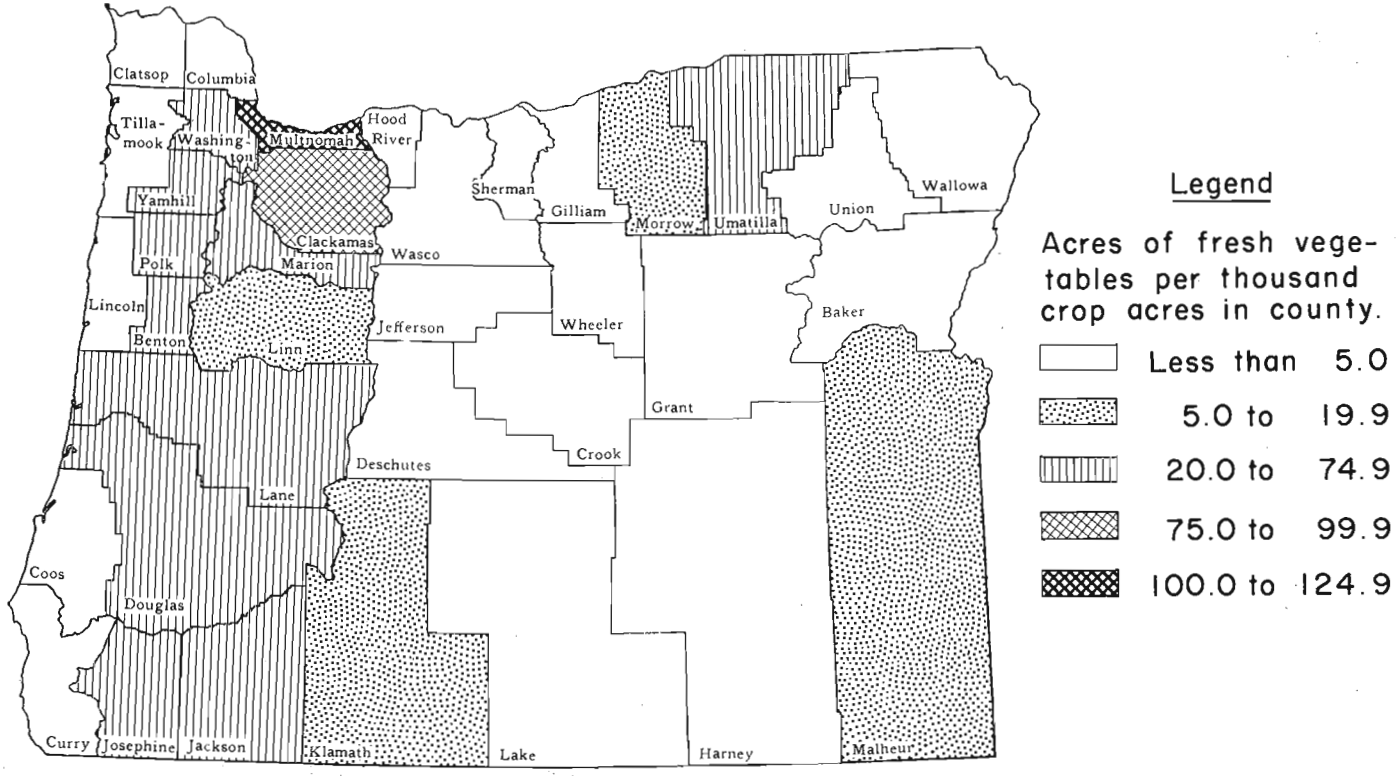
Concentration of processed vegetable production by counties is shown in Appendix Figure 1. Multnomah and Umatilla counties devoted the greatest percentage of available crop acres to processed vegetable production; from 5 to 10% in 1959. Large percentages of the acres in processed vegetables in Umatilla, Union, and Wallowa counties were planted to peas. The Willamette Valley produced a large variety of processed crops, including green beans, sweet corn, and carrots.

The Farm Sample

Two hundred interviews were completed, but three schedules were not used because of insufficient or obviously inaccurate data. Fifteen schedules were discarded because the farmers no longer grew vegetables for the fresh market. This provided 182 usable schedules.

Farms in Multnomah County accounted for approximately 31% of the

Figure 1. Distribution of fresh vegetable production in Oregon by counties—acres of fresh market vegetables per thousand crop acres in county, 1959.*



** Based on unpublished data from the Oregon Crop and Livestock Reporting Service, the USDA Statistical Reporting Service, and the Oregon State University Extension Service.*

total sample. Sixty-two percent of the farms were in the Portland area counties; Multnomah, Clackamas, and Washington. Farms in the two southern Oregon counties, Douglas and Jackson, made up 10.4% of the total number sampled. Farms located in the upper and central Willamette Valley counties accounted for 24% of the total.

Farm Production Practices

Vegetable crops grown

Forty-two different vegetable crops for fresh market were produced in 1961 by the 182 growers (Table 2). Sweet corn, cabbage, squash, asparagus, and cauliflower were the most important fresh market crops in terms of total acres planted. A large portion of the total production of green beans, broccoli, and strawberries, and 44% of the sweet corn were sold to processing firms.

Percentages of total acres planted which were harvested are indicated in Table 2. Carrots and cauliflower had the largest percentages of nonharvested acres among the crops with 150 or more acres. Weather and low prices were the reasons most frequently given for not harvesting crops.

Combination of crop enterprises

The sample farms were grouped by number of crop acres and by crop enterprises to determine relationships between total crop acres in farms and percentages of acres by crop enterprises. Seventy-five percent of the total crop acres were planted to vegetable crops for the fresh market on farms having fewer than 31 crop acres. Farms with from 31 to 100 crop acres had approximately 56% planted to vegetables for the fresh market. On farms with 100 or more crop acres only 19% were planted to vegetables for the fresh market. The percentage of total crop acres planted to processing vegetable crops tended to increase as numbers of crop acres per farm increased.

Small fruits, tree fruits, and nut crops were the most numerous nonvegetable crop enterprises grown on farms having fewer than 31 acres. Forage, grain, hay, and silage crops were the most numerous nonvegetable crop enterprises on farms with 31 or more crop acres.

Crop specialization

Only one vegetable crop was produced on 20% of the farms in the sample, and 40% of the farms produced either one or two fresh vegetables. Two-thirds of the farms (121) produced 4 or fewer vegetable crops; and 60 farms produced 5 or more. Seven farms produced from 10 to 16 vegetables. Blueberries, strawberries, and sweet corn were the crops most frequently grown on farms producing only one vegetable or small fruit crop.

The Growers

Income

Growers were asked to indicate their approximate income from all sources after business expenses were deducted. Each was given a printed card with the broad income groups numbered from 1 to 5 as shown in Table 3. Each

grower was asked to "call-off" his approximate income by number. About 50% of the growers received incomes of less than $3,000 during 1961, and about 75% of them received less than $6,000 for their own labor and for returns on their investment. Information was not obtained on the number of days each grower worked on these crops during the year.

Table 2. Number of growers, total acres planted, percentage of total acres harvested, average yield per acre, percent of production marketed fresh, percent of production processed, for vegetable crops produced by 182 western Oregon growers, 1961

Crop	Growers	Acreage		Average yield per acre[1]	Utilization	
		Planted	Harvested		Fresh market	Processed
	Number	*Number*	*%*	*1,000 pounds*	*%*	*%*
Asparagus	3	330.0	99	2.6	75	25
Green beans	33	565.7	100	13.8	3	97
Shell beans	2	2.5	100	2.4	100	....
Blueberries	16	37.4	75	2.7	48	52
Broccoli	14	543.5	97	7.8	16	84
Brussels sprouts	1	15.0	100	6.0	100	....
Cabbage	53	517.1	73	14.9	88	12
Cantaloupe	15	133.1	74	5.9	100	....
Carrots	23	198.5	66	14.1	72	28
Celery	2	30.3	83	35.4	100	....
Corn	54	1035.5	88	6.8	56	44
Cucumbers	28	62.5	73	15.3	79	21
Garlic	7	7.8	100	24.7	100	....
Melons	12	41.3	45	10.0	100	....
Dry onions	11	79.5	99	17.6	100	....
Parsnips	17	96.0	61	14.6	100	....
Peas	4	7.5	87	3.4	100	....
Peppers	17	28.1	90	14.9	99	1
Potatoes	37	1040.7	92	14.3	[2]	[2]
Pumpkins	6	24.0	40	23.5	100	....
Rutabagas	14	100.0	69[3]	23.3	94	6
Spinach	7	18.5	64	7.2	100	....
Danish squash	17	75.8	92	12.5	100	....
Other squash	41	217.5	98	11.9	84	16
Strawberries	47	560.9	76	5.9	19	81
Tomatoes	40	88.2	72	19.9	92	8
Turnips	21	191.3	51[3]	11.8	100	....
Rhubarb	12	67.5	77	18.3	50	50
Blackeyed peas	3	2.1	52	.4	100	....
Eggplant	5	2.3	96	10.7	100	....

Continued on next page.

[1] Based on acres harvested.

[2] Not computed because of a large quantity in storage.

[3] Some still in fields at time of interview.

[4] Remainder lost after harvest.

Table 2. Number of growers, total acres planted, percentage of total acres harvested, average yield per acre, percent of production marketed fresh, percent of production processed, for vegetable crops produced by 182 western Oregon growers, 1961 (Continued)

Crop	Growers	Acreage		Average yield per acre[1]	Utilization	
		Planted	Harvested		Fresh market	Processed
	Number	*Number*	*%*	*1,000 pounds* 5-dozen-bunch crates	*%*	*%*
Beets	11	59.2	84	14.5	45	55
Dill	5	7.2	86	74.5	100	....
Endive	4	3.3	73	70.8	100	....
Green onions	20	63.2	95	337.5	100	....
Parsley	7	4.0	100	245.8	100	....
Radishes	20	152.5	88	301.9	100	....
Salad greens	8	38.8	59	68.6	100	....
Leeks	1	.8	100	150.0	100	....
Leaf lettuce	6	9.1	76	120.3	76[1]	....
				2-dozen-head crates		
Cauliflower	29	243.5	66	148.8	87	13
Head lettuce	26	175.1	83	292.8	100	....
Romaine	8	18.3	73	318.1	100	....

Table 3. Number and percentage distributions of 182 western Oregon fresh vegetable growers by income groups, 1961[1]

Income group	Vegetable growers	
	Number	Percent
1. Less than $3,000	92	50
2. $3,000-$5,999	49	27
3. $6,000-$9,999	20	12
4. $10,000-$14,999	7	4
5. $15,000 and over	10	5
Don't know or refused to answer	4	2
TOTAL	182	100

[1] Income was defined as gross income from all sources (farm and off-farm), less business expenses.

Age of growers

The ages of the growers followed a bi-modal distribution. A large percentage (35) of the growers were from 40 to 49 years of age. Thirty-one percent were 60 years of age or older. Only 13% were under 40 years of age, and 21% of the growers were from 50 to 59 years of age.

VEGETABLE MARKETING

Information on marketing practices and market outlets for fresh vegetables was obtained for the following reasons: (1) To learn the adequacy of marketing practices presently used by Oregon growers; (2) to evaluate which of the many market outlets was most profitable; and (3) to provide bases for evaluating the potential for increasing fresh market sales through improved marketing practices and more use of available market outlets.

Marketing Practices

Grading

One-third of the growers did not use any standardized grading system. Most growers who did grade their produce used their own sets of standards for establishing grades (Table 4). Very few producers had their crops graded and inspected by federal inspectors. Large variations occurred in the standards used in their "own" or producer grades, with a few meeting requirements for federal grades. Some growers sorted only on the basis of damaged produce. Others, using their own grading system, sorted on the basis of quality and size of produce.

The growers in the survey were asked for their opinions of the importance of grading their produce. About 50% of them believed that grading was *very* important in obtaining top prices. Twenty-eight percent thought it was of some importance; 7% believed that grading was not important at all; and 9% did not know.

Cooling

Relatively few growers cooled their produce mechanically before selling it. Six out of 54 growers of sweet corn and 12 out of 40 growers of radishes and green onions cooled their produce mechanically. Four percent of the lettuce growers cooled their products. Three of the seven producers of spinach cooled it. A common practice was to allow produce to stand in the cool of the night.

Packaging

Six different types of pack were employed in marketing carrots. They varied from used boxes or lugs to new cartons containing 48 one-pound-cello bags. Sweet corn was packed in eight different types of containers. For the 42 different crops, 154 different types of pack were used.

The percentage of growers packing in new cartons rather than in used containers varied by crops, but used containers were widely utilized (Table 5). None of the 26 growers of lettuce packed all of his lettuce in new containers. Sixty percent of the growers of carrots, and 68% of the growers of sweet corn packed entirely in used containers. The grower's own private brands were displayed on some of the vegetables packed by only 19 growers. A large part of the produce packed under brand names was packed for a particular market outlet under the marketing firm's brand name. Relatively few of the growers prepackaged any of their produce.

Table 4. Number and percentage distributions of 182 western Oregon fresh produce growers by type of grades used, and by principal crops, 1961

Crop	Grade									
	Own		Federal		State		No official grade		Total	
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
Green beans	13	39	..	..	..	..	20	61	33	100
Cantaloupe	7	46	1	6	..	..	7	47	15	100
Carrots	12	52	..	..	..	..	11	48	23	100
Cabbage and cauliflower	65	80	2	3	..	..	14	17	81	100
Corn	31	57	3	6	..	..	20	37	54	100
Cucumbers	18	64	2	7	..	..	8	29	28	100
Lettuce	24	86	..	..	..	..	5	14	29	100
Green onions and radishes	37	93	..	..	..	..	3	7	40	100
Peppers	12	71	1	6	..	..	4	23	17	100
Parsnips	13	76	..	..	..	..	4	24	17	100
Squash	43	74	3	5	..	..	12	21	58	100
Strawberries and blueberries	20	32	..	..	1	1	42	67	63	100
Tomatoes	17	42	2	5	..	..	21	53	40	100
Turnips	16	76	1	5	..	..	4	19	21	100
Minor crops	91	64	2	1	1	1	48	34	142	100
TOTAL	419	63	17	3	2	0	221	34	661	100

Table 5. Number and percentage distributions of 182 western Oregon fresh vegetable growers by use of new and used containers by principal crops, 1961

Crop	Containers							
	New		Used		Some new and used		Total	
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
Cabbage	13	31	17	40	12	29	42	100
Cantaloupe	1	9	8	73	2	18	11	100
Carrots	2	20	6	60	2	20	10	100
Cauliflower	3	13	14	61	6	26	23	100
Corn	2	5	28	68	11	27	41	100
Cucumbers	1	5	14	74	4	21	19	100
Lettuce	....	....	21	84	4	16	25	100
Green onions	1	5	18	95	....	....	19	100
Parsnips	11	84	1	8	1	8	13	100
Radishes	1	6	17	94	....	....	18	100
Squash	....	....	27	77	8	23	35	100
Tomatoes	3	12	15	63	6	25	24	100
Turnips	9	64	3	22	2	14	14	100
Strawberries	10	53	3	16	6	31	19	100
Blueberries	1	20	2	40	2	40	5	100
Minor crops	12	12	73	74	14	14	99	100
TOTAL	70	17	267	64	80	19	417	100

Attitudes of Growers Toward Contracts

A contract had at one time been used by only 3 of the 182 growers producing vegetables for the fresh market. None of the growers interviewed produced vegetables under a contractual agreement during 1961, and only one indicated that an earlier agreement had been satisfactory to him.

A large portion of the other growers did not think it was to their advantage to grow produce for the fresh market under contract. Younger growers were more favorable toward contracts to "stabilize prices" and "make the marketing job easier" than were older growers.

Source of Price Information

Official information on prices was used by 70% of the growers. Thirty-three percent listed wholesale buyers as their primary source of price information. Only 2.8% of the growers interviewed listed the daily Federal Market News Report as their primary source of price information. Percentages of growers using other sources of market price information were: newspaper 9, neighbor 4, crop report bulletin 4, and processor 4. Many of the growers gave the general impression that they placed little emphasis on price information. Several growers who indicated wholesale buyers as their primary source of information on prices said, "I take what the buyer will give."

Market Outlets

Oregon growers marketed their fresh vegetables through six major types of outlets during 1961. Wholesale distributors were the most important outlets in terms of volume. They purchased about 80% of the total of the 17 largest volume crops marketed. Sales in the Farmers' Wholesale Market in Portland amounted to 5% of the total volume of sales. Buyers in the Portland market estimated that in 1951 from 10 to 15% of fresh market sales were made in the Portland Farmers' Wholesale Market. Roadside stands and direct sales to retail stores each accounted for about 3% of the sales. Vegetables sold from the farm on a "U-pick" basis amounted to slightly more than 1% of sales. Miscellaneous sales made up the balance.

Market outlets might appear to have been generally acceptable to growers since few of them changed from one type of outlet to another after 1959. One hundred sixty-two of the growers interviewed indicated that they had not made any changes in their market outlets during 1959, 1960, and 1961. Sixteen growers reported that they had added new outlets to those used in 1959. Reasons most frequently mentioned for adding or dropping outlets were: (1) changes in buyers for wholesale firms, and (2) discontinuance of production of the crop marketed through the outlet.

Quantities Marketed and Prices Received by Outlets

Growers reported prices received for their fresh vegetable crops from the various markets and some of this information is presented in the tables which follow. Caution should be used, however, if price comparisons are attempted among market outlets. In many instances the vegetables were not identical in the different outlets. Differences in quality, size, pack, time period, service performed, and volume handled prevent meaningful comparisons of these prices.

Sweet corn

Wholesale distributors purchased 43,210 crates of 5 dozen ears of sweet corn which made up 68.1% of the sweet corn sold in 1961 in the fresh market by the 182 vegetable growers in the sample (Table 6). Roadside stands were the second largest volume outlet accounting for 4,945 crates. Sales through brokers accounted for a large portion of the sweet corn sold through miscellaneous outlets. Twenty-five carlots of Oregon-grown sweet corn were shipped to the Seattle, Los Angeles, and San Francisco markets during 1961. Most of these sales were made through brokers.

Prices for sweet corn sold through all outlets averaged $1.76 per 5-dozen-ear crate during 1961. Highest average prices ($1.90 per crate) were received from sales at roadside stands. Lowest average prices were from "U-pick" sales. High and low prices received from each outlet are also indicated in Table 6.

Carrots

During 1961 carrots in the amount of 12,363 units of 100 pounds each were sold through the various outlets (Table 7). Wholesale distributors purchased about 90% of the carrots. Sales in the Farmers' Market and to retail stores accounted for 581 and 500 units, respectively. Prices received from these two outlets were much higher than prices received from wholesale distributors.

Strawberries

About one-half of the 230 tons of strawberries sold on the fresh market by growers in this study were sold directly to wholesale distributors.

Table 6. Number of growers reporting, quantities and percentages of sweet corn sold, and prices received by types of market outlets, 1961

	U-pick	Roadside stand	Retail store	Wholesale distributors	Farmers' wholesale mkt.	Misc. outlets	Total
Number of growers reporting	3	14	9	16	5	12	68
Quantity marketed (crates)[1]	521	4,945	2,973	43,210	3,375	8,440	63,464
Percent of quantity	.8	7.8	4.7	68.1	5.3	13.3	100
Average weighted price/crate							
Mean	$1.35	$1.90	$1.54	$1.77	$1.54	$1.78	$1.76
High	.....	2.17	1.69	2.30	.....	2.25	2.25
Low	.....	1.44	1.33	1.65	.....	1.68	1.63

[1] Five-dozen-ear crates.

Table 7. Number of growers reporting, quantities and percentages of carrots sold, and prices received by types of market outlets, 1961

	U-pick	Road-side stand	Retail store	Whole-sale distribu-tors	Farmers' whole-sale mkt.	Misc. outlets	Total
Number of growers reporting	.....	1	1	10	3	1	16
Quantity marketed (100-lb. units)	.....	60	500	11,345	581	150	12,363
Percent of quantity	.....	.4	4.0	89.8	4.6	1.2	100
Average weighted price/lb.							
Mean	.....	$.035	$.050	$.027	$.049	$.017	$.029
High	.....	.....	.....	.038	.....	.....	.....
Low	.....	.....	.....	.020	.....	.....	.....

Twenty percent went through the Farmers' Wholesale Market (Table 8).

Prices for strawberries ranged from an average of 12 cents per pound when sold to "U-pick" customers to an average of about 21 cents received from wholesale distributors and miscellaneous outlets.

Tomatoes

Roadside stands and "U-pick" were the largest volume outlets for the 11,826 one-hundred-pound units of tomatoes sold fresh by growers in the study (Table 9). Growers reported that many of the tomatoes sold on a "U-pick" basis and from roadside stands were used for home processing. A large part of the tomatoes sold through "miscellaneous outlets" was purchased by truckers and peddlers.

Average price was $.046 per pound. Highest prices were received for the small volume sold to retail stores, and the low price outlets were wholesale distributors and "U-pick."

Other fresh vegetables

Information similar to that presented for sweet corn, carrots, strawberries, and tomatoes is presented in the *Statistical Supplement* which may

Table 8. Number of growers reporting, quantities and percentages of strawberries sold, and prices received by types of market outlets, 1961

	U-pick	Road-side stand	Retail store	Whole-sale distribu-tors	Farmers' whole-sale mkt.	Misc. outlets	Total
Number of growers reporting	5	4	4	8	2	4	27
Quantities marketed (100-lb. units)	304	172	252	2,380	900	623	4,631
Percent of quantity	6.6	3.7	5.4	51.4	19.4	13.5	100
Average weighted price/lb.							
Mean	$.121	$.190	$.164	$.209	$.181	$.214	$.195
High	.....	.....	.178	.....	.....	.233	.219
Low	.....	.....	.119	.....	.....	.196	.176

be obtained from the authors upon request. Other crops included are parsnips, cabbage, green onions, peppers, radishes, lettuce, turnips, Danish squash, cauliflower, rutabagas, and blueberries.

Table 9. Number of growers reporting, quantities and percentages of tomatoes sold, and prices received by types of market outlets, 1961

	U-pick	Road-side stand	Retail store	Whole-sale distribu-tors	Farmers' whole-sale mkt.	Misc. outlets	Total
Number of growers reporting	7	10	9	4	1	17	48
Quantity marketed (100-lb. units)	2,462	2,905	474	1,036	250	4,699	11,826
Percent of quantity	20.8	24.6	4.0	8.8	2.1	39.7	100
Average weighted price/lb.							
Mean	$.020	$.040	$.058	$.0171	$.030	$.036	$.046
High	.....	.....	.092	.0225	.....	.....	.....
Low	.....	.....	.046	.0125	.....	.....	.....

PRELIMINARY ANALYSIS OF OREGON'S COMPETITIVE POSITION

All Vegetables and Small Fruits

In the United States nearly all commercial farm and industrial producers would like to know whether or not they can expand their markets profitably; and if so, how much and how and where. Nonagricultural industries spend millions of dollars each year to try to obtain answers to these questions. There are no easy answers. In agriculture, problems of determining these answers are made more difficult by the ease with which certain foods can be substituted for each other. Very few foods *have* to be eaten—there are numerous substitutes if consumers want to change. Severe competition exists among production areas to sell in favorable markets. New or improved varieties and changes in technology and transportation are continuously altering the competitive position of commodities, growing areas, and individual farmers.

This particular study involves determination of some vegetable and small fruit crops which Oregon farmers possibly could produce and sell profitably in fresh markets in larger volume than at present. To make such determinations with a high degree of accuracy would require many more data than are available anywhere. For example, cost of production and farm price data for all farm products which can be produced successfully on each farm should be available. Possibly the best alternative for some farmers would not be any fruit or vegetable, but might be

a dairy herd or a beef or broiler enterprise.

The most feasible approach to the problem appears to be to select for detailed study a few vegetables which are (1) produced successfully in western Oregon, and (2) sold in large markets where price and quantity data are available.

Market Selection

Profitable expansion of Oregon's commercial, fresh vegetable industry must depend on volume outlets. Small cities and towns usually consume a great deal of produce raised in their immediate area, or they obtain fresh vegetables from a nearby large city market where produce has been shipped from more distant production areas. Oregon has but one relatively large metropolitan area, and so Portland is assumed to be a promising potential market.

California growers are the principal competitors of Oregon fresh vegetable growers, and they annually ship many carloads of produce through Oregon to Seattle-Tacoma—Washington's only large metropolitan area. The Seattle market appears to be a potential outlet for more Oregon produce.

Some Oregon-grown produce is sold in California, especially San Francisco and Los Angeles, either because of production advantage during certain weeks of the year or because of favorable transportation available from truckers seeking return loads to California. Each of these metropolitan areas is heavily populated. They should be able to absorb larger volumes of Oregon produce than either Portland or Seattle without "breaking the market." The four fresh markets named above will be examined as potential outlets for larger volumes of Oregon-grown vegetables and small fruits.

Crop Selection

The large number of small fruits and vegetables produced commercially in western Oregon makes the cost of studying the potentials of all of them prohibitive. For this study only two different crops were selected. Each appeared on a preliminary basis to permit profitable, increased production. Information immediately available for this selection was of four types. One was data on unloads of fresh fruits and vegetables in western cities.[2] Another was data on prices for fresh market vegetables and fruits from various USDA publications.[3] Still another source was production and marketing information obtained from vegetable growers in Oregon and California; from vegetable production and marketing specialists at Oregon State University; and from wholesalers, brokers, and buyers of fresh vegetables for retail stores in Oregon and California markets. The fourth source was the farm survey referred to earlier. It should be recognized that the two crops selected did not necessarily possess the greatest potential for expansion among all the crops, but only

[2] *Fresh Fruit and Vegetable Unloads in Western Cities*, USDA, AMS-428, February 1962.

[3] *Fresh Market Vegetable Prices*, USDA, Statistical Bulletin No. 318, June 1962.

that on a preliminary basis they did appear to have some expansion opportunities.

Data on peppers

Peppers are employed as an example to show how data and observations were used in selecting the crops to study. Unloads of peppers in the Portland and Seattle markets are indicated in Table 10. Peppers from Oregon were unloaded in Portland during only three months, August, September, and October; 25 carlots in both 1960 and 1961, but only 10 carlots in 1962. During these three months of 1962 Oregon supplied 10 of the 28 carlots. Ten carlots came in from California and eight from Washington. During these three years, Oregon growers supplied a total of 59 carlots of peppers, and California and Washington supplied 36 carlots during August, September, and October. This is an average of 12 carlots per year, and must be considered small volume.

Moreover, opportunities in other markets did not appear promising. No Oregon peppers were sold in San Francisco or Los Angeles. In Seattle during this three-month period of 1962, 4 carlots from Oregon and 28 from California were unloaded. During these three months of 1961, 18 carlots from Oregon were unloaded in Seattle, and in 1960 there were only 11 carlots. Replacing the 38 carlots of California peppers sold in Portland (10) and in Seattle (28) with Oregon peppers during August, September, and October 1962, probably would be difficult. Price is an important factor. The largest volume of Oregon peppers usually comes in September. This is also the month of lowest prices during the entire year in the western states. For instance, California farmers received the following dollar prices per hundredweight of peppers for fresh market in 1961: April, $23.00; May, $15.10; June, $14.80; July, $8.70; August, $7.40; *September, $4.35;* October, $6.50; November, $11.00; and December, $7.90; with a season average of $8.50.

California produces peppers throughout the year and ships them to Seattle during eight or nine months in contrast with the two or three months of Oregon shipments. California growers might find it a profitable policy to maintain their Seattle outlets during the low price months, even if they make little or no profit, rather than relinquish their markets to competing Oregon growers for a month or two. Moreover, Seattle buyers would have to consider dependability of supply and quality of product.

Unlike pepper growing areas in California, Florida, Texas, and Mexico, much of Oregon has nights that are too cool to mature high quality peppers more than two, or possibly three, months a year. Actually high quality peppers will mature in Oregon later than good quality tomatoes, so the growing season is very short in terms of competition with warmer areas to the south.

Seventeen of the 182 growers produced peppers on 28 acres in 1961. Ninety percent of this crop was harvested. Two-thirds of their crop was sold to wholesale distributors for an average price of $4.00 per hundredweight, and one-third was sold in the Portland Farmers' Market for an average price of $3.90 per hundredweight. These prices were consistent with the low September price in California.

Because of these various production, price, and marketing factors, and the relatively small volume handled in

Table 10A. Carlot unloads of peppers in Portland, Oregon, by origins and months, July through October, 1960, 1961, and 1962

State of origin	Months												Totals 12 months		
	July			August			September			October					
	1960	1961	1962	1960	1961	1962	1960	1961	1962	1960	1961	1962	1960	1961	1962
	Number of carlots														
California	8	11	5	3	2	5	1	....	2	1	3	3	21	25	25
Washington	....	....	....	3	4	4	1	....	3	....	....	1	4	4	8
Other	....	....	....	....	....	....	....	....	....	....	....	....	43	36	38
Oregon	....	....	....	2	6	1	10	12	5	12	7	4	25	25	10
Total	8	11	5	8	12	10	12	12	10	13	10	8	93	90	81

Table 10B. Carlot unloads of peppers in Seattle, Washington, by origins and months, July through October, 1960, 1961, and 1962

State of origin	Months												Totals 12 months		
	July			August			September			October					
	1960	1961	1962	1960	1961	1962	1960	1961	1962	1960	1961	1962	1960	1961	1962
	Number of carlots														
California	18	14	16	9	5	7	11	4	6	5	12	15	72	62	69
Washington	....	....	....	5	8	7	5	7	8	1	....	1	11	15	16
Other	....	....	....	....	....	....	....	....	....	....	....	....	59	67	67
Oregon	....	....	....	....	2	....	3	11	2	7	5	2	11[1]	18	4
Total	18	14	16	14	15	14	19	22	16	13	17	18	153	162	156

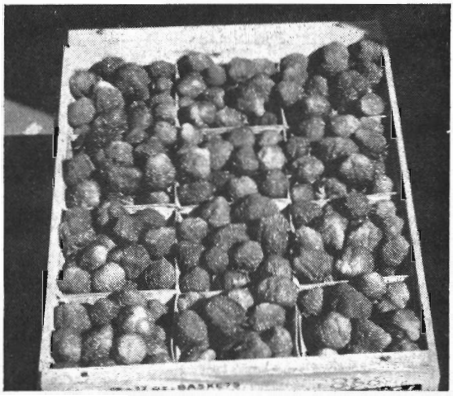
[1] One carlot in November 1960.

these markets, peppers were not believed to be one of the crops with the greatest potential for profitable expansion in western Oregon. Unload data for 12 other crops are presented in the *Statistical Supplement.*

About 30 vegetables and small fruits commonly produced for the fresh market in Oregon were carefully considered in the manner described for peppers.[4] From this group, sweet corn and carrots were selected as crops appearing on a preliminary basis to have favorable potential for market expansion.

Strawberries considered

Strawberries were considered very carefully, because it is believed that a fresh market strawberry variety adapted to growing conditions in Oregon could make and hold a strong place in west coast markets. Much attention by growers and industry has been directed to strawberries for processing and relatively little to varieties for the fresh market. The result is that large volumes of strawberries come into Portland from California during April, May, June, and July. Oregon produces few of its own fresh market strawberries except for the one month of June.[5] At present, no fresh market strawberry variety is produced in Oregon in sufficient volume over several months to occupy an important place, even in the Portland market.



Large volumes of strawberries come into Oregon even during June, its month of peak production.

SWEET CORN

Sweet corn was chosen as one of the vegetables because preliminary study, such as for peppers, indicated likelihood of profitable expansion of sales in one or more of the large western markets. Per capita consumption of fresh sweet corn might not decline if the fresh farm quality of the product were maintained.[6] The crop is adaptable to a wide range of soil types, so it can be produced in many areas of western Oregon. Also, sweet corn appears to have slight risk of crop failure in this area. Successful shipment of high quality produce to California and Washington markets has been demonstrated by several Oregon growers. Western Oregon sweet corn is in season from early or mid-August to mid-October or later, depending on the first killing frost. These conditions, together with favorable market prospects, led to the selection of sweet corn.

[4] Dry onions, potatoes, pears, and apples were not considered.

[5] Unload data in the *Statistical Supplement.*

[6] Between 1940-42 and 1958-60, U.S. per capita consumption of fresh sweet corn increased about 35%, while consumption of fresh artichokes, cauliflower, broccoli, Brussels sprouts, lima beans, snap beans, beets, spinach, and green peas decreased from 10 to 85%. (*Statistical Supplement.*)

Average wholesale prices received for corn for a number of years in each of the four markets were calculated. From the expected prices in each market, costs were subtracted of (1) producing, (2) harvesting, (3) packing, (4) transporting, and (5) paying brokerage fees. The remainder, if any, indicated the expected average profit margin to be obtained in each market.

Unloads

The Portland market was supplied with corn from Oregon, Washington, California, and Idaho in August (Table 11). In August 1960, Oregon-grown corn made up about one-fifth of corn unloads in Portland. In August 1961, the share was about one-half; while in 1962 it was about one-fourth. Little out-of-state sweet corn was sold in Portland in September, October, and November. Sales in Portland declined markedly in October when Oregon in some years has been able to put quality corn on the market.

In Seattle most of the corn was Washington-grown, but a few carlots from Oregon were sold in September and October. California corn moved into the Seattle market in small volume in each of the four months considered. If price-cost relationships were favorable, it appears that opportunity exists to sell Oregon corn in the Seattle-Tacoma market.

Los Angeles and San Francisco obtained about 90% of their corn from California growers. But some Oregon corn sold in San Francisco in August, September, and October and in Los

Table 11. Carlot unloads of sweet corn in Portland, Oregon, by states of origin and by months for 1960, 1961, and 1962[1]

Month		State of origin					
		California	Idaho	Washington	Other	Oregon	Totals
		Number of carlots					
August	1960	8	7	48	....	14	77
August	1961	1	4	37	....	38	80
August	1962	3	1	53	....	18	75
September	1960	4	....	5	....	42	51
September	1961	....	....	....	....	30	30
September	1962	....	....	2	....	31	33
October	1960	....	....	1	....	23	24
October	1961	....	....	....	....	15	15
October	1962	....	....	....	....	16	16
November	1960	....	....	....	....	4	4
November	1961	2	....	....	....	3	5
November	1962	1	....	....	....	4	5
Total, 4 months,	1960	12	7	54	0	83	156
Total, 4 months,	1961	3	4	37	0	86	130
Total, 4 months,	1962	4	1	55	0	69	129
Total, 12 months,	1962	101	1	79	13	70	264

[1] A carlot consists of 750 5-dozen-ear crates of corn.

Table 12. Average August, September, and October wholesale price received per 5-dozen-ear crates of sweet corn by years, quality, and markets

Market	Quality	1958	1959	1960	1961
		Dollars per 5-dozen-ear crates			
Portland	First	.....	3.01	2.57	2.04
	Second	.....	2.35	2.18	.....
Seattle	Precooled	.....	3.43	2.90	2.67
	Noncooled	.....	2.98	2.62	2.30
San Francisco		1.92	2.97	2.62	2.55
Los Angeles		2.07	2.58	2.53	2.23

Angeles in September (*Statistical Supplement*). The total volume sold in these two markets is so large that a few cars from Oregon would have little effect on total supply in either market, particularly in Los Angeles.

Prices received

Average prices for July, August, September, October, and November and for the entire 12 months were determined from Federal Market News Service daily price quotations in the four markets for several years (*Statistical Supplement*). The average price for the three-month period (August, September, and October) was determined for several years for each market (Table 12).

In comparing prices received for corn with costs of producing and marketing it, average prices and costs are assumed to be about the same in the next few years as they have been in the last few years. Consideration was given to reduction in wholesale prices if larger volumes of corn were marketed. Data for the San Francisco market were adequate to permit determination of elasticity of demand for sweet corn there. It was calculated to be –.507. Hence a 10% increase in quantity of corn in San Francisco can be expected to cause a 20% decrease in price for the average of several seasons.[7]

For instance, if unloads in San Francisco were increased from an average of 429 carlots to 472 (10% increase), average price would be expected to decline 20%, from $2.45 to $1.96 per crate. Prices probably would decline much more, however, if the additional 43 carlots were all shipped within one month. So if additional corn is shipped into San Francisco, shipments should be spread over the marketing season or made during periods of light receipts. If Oregon shipments to San Francisco had been doubled in 1961, expected prices would have averaged $2.48 per crate—$.07 lower than they were. If the 11 additional carlots had arrived during September, expected average price would have been $2.32 per crate, or $.27 lower than it was.

Cost data

Data on costs of producing, harvesting, and packing were obtained by group interviews with growers. The objective of the group interviews was to determine standard, accepted production and marketing practices used by western Oregon growers of sweet corn for fresh market.

[7] Unpublished thesis, *Potential Expansion of Fresh Market Sales as an Outlet for Oregon-grown Vegetables,* by William David Gorman, Department of Agricultural Economics, Oregon State University, June 1962, pp. 109-113.

Group interviews provided the following types of information:

1. Size of farm and number of acres planted to fresh market sweet corn by each grower in the group.
2. Operations performed, number of times performed, size and type of machinery used, hours of labor required, and quantities and costs of materials used.
3. Average yields, by grade of produce.
4. Risk of losing crop in the early growing stages necessitating replanting.
5. Market outlets used, prices received, harvesting dates, and percent of crop normally harvested.

A standard land charge of $35 per acre was used for estimating land cost, based on land valued at from $500 to $550 per acre.

Standard wage rates used were $1.10 per hour for labor connected with machinery operation and $1.00 per hour for hand labor.

Transportation rates from western Oregon to Seattle, San Francisco, and Los Angeles were obtained from trade sources. Most fresh produce shipments originating in Oregon are carried by itinerant truckers. Very little fresh produce moves out of the region by common carriers. Therefore, published rates of common carriers are not typical of rates under which fresh produce actually moves. Itinerant carrier rates fluctuate, depending upon the supply of carriers and the demand for them. But the rate usually ranges from 30 to 40% below common carrier rates.

Producing operations. Estimated costs of producing fresh market sweet corn for 26 to 60 acre operations are presented in Table 13.[8] Machinery-use rates for this size corn enterprise were based on a 51 to 80 acre vegetable farm, on the assumption that all the cropland was not planted to sweet corn.

Three irrigations were used for computing costs in Table 13. Normal operations for seedbed preparation were disk and harrow three times, plow, fertilize, and sterilize the soil. The soil sterilant was normally applied at the rate of 1 pound per acre prior to planting. Some producers substituted a leveling operation for one disking and harrowing. Typical fertilizer application per acre was broadcasting 90 pounds of nitrogen and 80 pounds of phosphorus prior to planting; or side dressing after planting. Some fertilizer, generally nitrogen, was applied with irrigation water. Seed usually was planted with a 2-row planter at the rate of 10 pounds per acre. Some growers used a spray for root worm control, but this depended upon particular conditions on each farm. Three cultivations and three irrigations were the only operations performed during the growing season. Typical water application was three inches for each irrigation.

Harvesting and packing operations. Fresh market sweet corn was hand-picked, loaded on a truck, and hauled to the packing shed. It was then placed in cold-water tanks (hydroprecooled) for 20 to 30 minutes before sorting and packing. Most large growers graded their sweet corn on the basis of Number 1 and Number 2. Small ears and ears with tip damage were usually graded Number 2.

The packing operation was done by hand. The most common type of pack was a 5-dozen-ear crate, although at least 8 different types of pack were

[8] Similar data for 15 to 25 acre corn operations, and for 61 to 100 acre corn operations are presented in the *Statistical Supplement*.

used by Oregon producers in 1961. Producers shipping to local markets generally packed in used boxes or crates costing from $.15 to $.20. All shipments to San Francisco and Los Angeles were in new crates costing from $.40 to $.43. Therefore, grower costs, excluding transportation, were from $.20 to $.25 a crate lower when sold to local retail outlets, or in the Portland wholesale market, than when shipped to out-of-state markets.

Some of the larger growers had cold storage holding facilities on their farms. Sweet corn deteriorates in quality very rapidly unless it is first precooled and then held in cold storage.

Based on survey results, from 10 to 15% of the sweet corn planted was not harvested. The chief cause given for this loss was too low a market price or no market. Small volume operators, selling basically to roadside stands and retail stores, had higher losses from

Table 13. Estimated cost of producing, harvesting, and packing sweet corn for the fresh market; 26 to 60 acre operation in western Oregon, 1961[1]

Operation	Labor and equipment cost/acre	Materials kind and cost/acre		Production cost/acre
Disk and harrow 3X	$3.89			$ 3.89
Plow 1X	2.19			2.19
Fertilize 1X	1.39	90 lb. N; 80 lb. P_2O_5	$21.50	22.89
Spray weeds 1X	1.00	1 lb. Aldrin	2.50	3.50
Plant 1X	2.64	10 lb. seed	6.00	8.64
Spray-worms	1.01	¾ lb. chemical	2.89	3.90
Total land preparation				$45.01
Cultivate 3X	$ 5.33			$ 5.33
Irrigate 3X	13.50	Electricity	$ 2.25	15.75
Total growing period				$21.08
Rent (land charge)				$35.00
Three percent risk adjustment (about 3% of total acres are never harvested)				3.03
Total cost of producing independent of yield				**$104.12**

Harvesting, grading, and packing costs based on a 5-dozen-ear crate

Operation	Equipment and labor	Materials		Total cost per crate
Pick, haul, and load	$0.16			$0.16
Cooling	.01	Electricity	$0.04	.05
Depreciation on bldg. and equipment	.04			.04
Grading and packing	.14	Crates, new	.41	.55
		Crates, used	.20	.34
		Wire boxes, used	.15	.29
Total harvesting, grading, and packing costs per crate		New crates		.80
		Used crates		.59
		Used wire boxes		.54

[1] It was assumed that the grower had 30 to 50 acres planted to other crops requiring the use of some of the same equipment.

Table 14. Estimated costs of producing, harvesting, grading, and packing a 5-dozen-ear crate of sweet corn in western Oregon by size of operation and by yield[1]

Yield of 5-dozen-ear crates per acre	Size of operation, acres of corn		
	15-25	26-60	61-100
Number		*Cost per crate*	
150	$1.32	$1.28	$1.27
175	1.21	1.18	1.17
200	1.13	1.11	1.10

[1] A used crate costing $.20 was used in calculating the packing cost. To obtain the cost for an operation using new crates, add $.21. To obtain the cost for an operation using wire boxes, subtract $.05. This table is based on the assumption that variable production inputs remained unchanged within these narrow limits of varied yield.

nonharvest than large commercial growers selling to wholesale outlets. Weather and insect damage accounted for approximately 3% of losses. Therefore, a 3% risk factor was included in the production costs presented in Table 13.

Economies of size. Few economies of size appeared in the production of fresh market sweet corn, and no apparent economies in harvesting and packing operations were indicated for the types of operation considered. Total producing costs (exclusive of harvesting, grading, and packing costs) amounted to $108.85 per acre for a 15 to 25 acre operation, and to $101.67 per acre for a 61 to 100 acre operation. Producing costs for a 26 to 60 acre operation amounted to $104.12 per acre. An increase of 400% in the size of the operation decreased per acre producing costs about 7%.

Effect of yields on costs per crate. Costs per crate for producing, harvesting, and packing with various yields per acre are presented in Table 14. Differences in yield per acre had a much greater effect on costs per crate than differences in size of operation.

A normal per-acre yield was from 175 to 200 crates of Number 1 sweet corn, which usually made up from 80 to 85% of the crop. Based on a yield of 175 crates per acre, the cost for producing, harvesting, grading, and packing a crate of sweet corn ranged from $1.21 to $1.17, depending upon the number of acres produced.

Transportation costs and brokerage fees. A transportation cost of 12 cents per crate was used for western Oregon growers shipping to the Portland market. This cost estimate included labor charges for loading and unloading and was based on an average haul of 30 miles. Transportation cost per crate averaged $.25 to Seattle, $.55 to San Francisco, and $.65 to Los Angeles during 1960-61.[9]

Brokers sold most of the Oregon sweet corn shipped out of the state. Brokerage fees ranged from 3 to 7%, depending on individual conditions. A 4% fee was used for these calculations.

Prices compared with costs

Do expected prices exceed expected costs, and if so, by how much? Results of these comparisons are presented in Table 15. Because of slight differences in costs per crate due to the number of acres of sweet corn the grower pro-

[9] Transported by itinerant carriers. Rates were obtained from wholesale trade sources.

duced, costs are used only for the 26 to 60 acre sweet corn operation.

Average wholesale prices considered are of two types. One is for the average of the three months, August, September, and October of each year, as presented in Table 12. The other is the average price for September of each year. September was selected because it was normally the month of largest production and also the month with the largest out-of-state shipments. All prices are for Number 1 grade, precooled corn.

On the basis of net returns presented in Table 15, Seattle would have been the most profitable market for Oregon growers during 1959, 1960,

Table 15. Average wholesale prices received for Number 1 sweet corn in major west coast markets, for September and for August through October; estimated production and marketing costs; and estimated returns above costs per crate for western Oregon growers with 26 to 60 acres, 1959, 1960, and 1961

Item	Year		
	1959	1960	1961
	Dollars/5-dozen-ear crate		
Portland			
Average price received (Aug.-Sept.-Oct.)	3.01	2.57	2.04
Growing, harvesting, and packing costs	1.39	1.39	1.39
Transportation cost	.12	.12	.12
Brokerage fee	.12	.10	.08
TOTAL OF ALL COSTS	1.63	1.61	1.59
Returns above costs, 3-month average price	1.38	.96	.45
Returns above costs, using September price	1.49	1.01	.19
Seattle			
Average price received (Aug.-Sept.-Oct.)	3.43	2.90	2.67
Growing, harvesting, and packing costs	1.39	1.39	1.39
Transportation costs	.25	.25	.25
Brokerage fee	.14	.12	.11
TOTAL OF ALL COSTS	1.78	1.76	1.75
Returns above costs, 3-month average price	1.65	1.14	1.12
Returns above costs, using September price	1.44	.90	.95
San Francisco			
Average price received (Aug.-Sept.-Oct.)	2.97	2.62	2.55
Growing, harvesting, and packing costs	1.39	1.39	1.39
Transportation cost	.55	.55	.55
Brokerage fee	.12	.10	.10
TOTAL OF ALL COSTS	2.06	2.04	2.04
Returns above costs, 3-month-average price	.91	.58	.51
Returns above costs, using September price	.74	.52	.55
Los Angeles			
Average price received (Aug.-Sept.-Oct.)	2.58	2.53	2.23
Growing, harvesting, and packing costs	1.39	1.39	1.39
Transportation costs	.65	.65	.65
Brokerage fee	.10	.10	.09
TOTAL OF ALL COSTS	2.14	2.14	2.13
Returns above costs, 3-month-average price	.44	.39	.10
Returns above costs, using September price	.41	.39	.31

and 1961. Returns above costs from selling in the Portland market showed the greatest variability. In 1959, estimated returns would have been $1.49 per crate sold during the month of September in the Portland market. In September 1961, sweet corn prices in Portland dropped sharply, and returns above estimated costs fell to $.19 per crate.

Returns above costs from selling in San Francisco were more steady during 1959-1961 than in Portland, but they were considerably lower than returns from sales in the Seattle market.

Returns above costs in the Los Angeles market averaged lower than returns from sales in the other markets, except in Portland during September 1961.

A cost of $.41 for each new crate was included in the production, harvesting, and packing costs for all markets. If used crates were available and acceptable in the market for grade Number 1 corn, an additional 21 cents to 26 cents per crate could be returned to growers. A large part of the local sweet corn received in Portland was packed in used crates. Almost all Oregon-produced sweet corn shipped to out-of-state markets was packed in new crates.

Net returns for fresh market and processed sweet corn

Returns above costs for the production and marketing of sweet corn for the fresh market and for processing were compared. Returns from fresh market sales in the single month of September are probably more realistic than returns for the three months, which included prices received during the peak marketing period in Oregon. Returns from sales in the Los Angeles market for September were slightly higher than usually would be expected because hot weather and drought caused a short California supply in September 1961 (Table 16).

Returns per acre above costs for the production of processed sweet corn were estimated on the basis of (1) cost information collected in Marion County for various types of soils in 1958,[10] (2) production of 6 tons per acre,[11] and (3) a price of $25 per ton.[12] Production and harvesting costs for processed sweet corn varied among types of soils and among farmers with the same type of soil. A cost of $100 per acre was estimated to be reasonably attainable with good management and a minimum of 40 acres planted to sweet corn (Table 17). The standard land charge of $35 per acre, used for land planted to fresh market sweet corn, was added.

Estimated returns from fresh market sweet corn per acre were considerably larger than estimated returns from processed sweet corn. The returns, however, were not directly comparable. Risks associated with price changes were much greater in the production of sweet corn for fresh markets. More hand work was involved. Processed sweet corn was generally produced under contract with a guaranteed market and a specified price.

[10] Unpublished thesis, *Techniques for Characterizing Oregon Soils for Agricultural Purposes in Terms of Physical and Economic Productivities,* by Sidney Carter James, Department of Agricultural Economics, Oregon State University, June 1961.

[11] *Ibid.* and based on yields reported for processed production in the farm survey.

[12] *Vegetables—Processing:* Annual Summary, Acreage, Production and Value of Principal Commercial Crops by States, USDA Statistical Reporting Service, Dec. 15, 1961.

Table 16. Estimated returns per acre above total production and marketing costs by selected markets for the production of fresh market sweet corn by western Oregon growers, 1959-1961 average, by selected months[1]

Market	August-September-October[2]		September	
	Assumed price per crate	Net returns per acre[3]	Assumed price per crate	Net returns per acre[3]
	Dollars			
Portland	2.54	163.00	2.51	157.00
Seattle	3.00	228.00	2.79	194.00
San Francisco	2.71	117.00	2.65	106.00
Los Angeles	2.45	54.00	2.51	64.00

[1] Production costs were based on a 25 to 60 acre sweet corn operation.
[2] It was assumed that sales were made during each of the three months.
[3] Based on a per acre yield of 175 crates of grade Number 1.

Table 17. Estimated returns per acre above costs of producing, harvesting, and hauling processed sweet corn, by western Oregon growers, 1959-1961

Item	Cost or return
	Dollars per acre
Returns from sales	150.00
Production, harvesting, and marketing costs	100.00
Land charge	35.00
Total of all costs	135.00
Returns above costs	15.00

Returns per acre for fresh market sweet corn, however, were sufficiently greater for successful growers to more than offset the higher risks involved.

Limit of profitable expansion

The limit of profitable expansion of sweet corn production in western Oregon for the fresh market depends primarily upon production in other supply areas. The limit of profitable expansion can be estimated after making certain assumptions as follows:

1. Competing supply areas will make no changes in their production.
2. Fifty dollars per acre of returns above costs is the minimum point of profitable expansion.
3. Demand conditions remain unchanged.
4. Production, marketing, and transportation costs remain unchanged.
5. A yield of 175 crates of grade Number 1 corn per acre is obtainable.
6. A large part of the increased production is marketed between August 15 and October 31.
7. All increased production is graded, packed in new crates, and precooled.
8. The elasticity of demand for sweet corn in fresh markets is approximately –0.5.

To obtain a minimum return of $50 per acre above costs would require a minimum price per crate of $1.89 in Portland; $2.04 in Seattle; $2.33 in San Francisco; and $2.43 in Los Angeles.

Table 18. Estimated limit of potential expansion of fresh market sales of sweet corn by western Oregon growers by markets[1]

	Column 1 Average price Aug.-Oct. 1961[2]	*Column 2* Minimum price[3]	*Column 3* Price difference[4]	*Column 4* Unloads Aug. 15-Oct. 30, 1961[5]	*Column 5* Potential increase in unloads Season[6]
	Dollars/5-dozen-ear crate			*Carlots*	
Portland	2.04	1.89	.15	225	8
Seattle	2.51	2.04	.47	324	32
San Francisco	2.55	2.33	.22	529	23
Los Angeles	2.23	2.43	-.20	1,227	0

[1] Based on the eight assumptions listed.

[2] Based on grade Number 1 corn packed in new crates, 90% precooled, 10% of the supply not precooled.

[3] Minimum price per crate which would allow a return of $50 per acre above costs to western Oregon growers.

[4] Average price received August through October 1961, minus the computed minimum price.

[5] Unloads in the market from August through October.

[6] Items in Column 3 divided by items in Column 1. This quotient divided by 2 (since elasticity of demand is - 0.5) and then multiplied by items in Column 4.

Based on supply and demand conditions prevailing in 1961, western Oregon producers could have expanded fresh market production by 63 carlots or approximately 275 acres (Table 18). This represents about a 20% increase over the number of acres planted to fresh market sweet corn in 1961 in western Oregon.

Estimates presented in Table 18 are conservative. If growers were willing to assume the risks and take lower profits per acre, numbers of acres of corn sold fresh probably could be expanded considerably more. By carefully watching supplies in other producing areas and prices in all potential markets, fresh sales could probably be expanded by 50%. Weather in western Oregon, as well as in all supply areas, is an important factor in determining supplies, which in turn influence prices.

Unlike other cooking vegetables, U. S. consumption of fresh market sweet corn increased between 1940 and 1960.

CARROTS

The Test of Profitable Expansion

Carrots were selected as a vegetable for study because they can be produced successfully in Oregon, have a relatively long growing season, and have favorable prospects for increased fresh market sales. The same type of analysis used for sweet corn was used for carrots. Production and marketing costs of efficient western Oregon growers were compared with estimated prices which growers would have received had they sold carrots in the Portland, Seattle, San Francisco, and Los Angeles fresh markets from 1959 through 1961.

Unloads

Portland carlot unloads of carrots by state of origin and by months for 1960, 1961, and 1962 are indicated in Appendix Table 1. Oregon-grown carrots first arrived on the market during late July or August, and continued in heavy supply through January of some years. Light supplies were received from Oregon growers from February through April. The length of the Oregon marketing season depends upon the first hard freeze. Carrots once frozen will not keep and generally are not harvested. The quality of the Oregon-grown fresh market carrot is excellent from August through November. Quality generally declines during December.

From August through January of the three years, 28% of the carrots shipped to the Portland market were grown in California, 16% in Washington, and 56% in Oregon. The percentage coming from California increased in 1962, and the percentage from Oregon decreased. Most of the carrots grown in Washington and shipped into Portland during the Oregon marketing season were grown in the general vicinity of Portland on the Washington side of the Columbia River.

California shipped carrots to the Portland market during every month of the year. The number of carlots shipped from California declined sharply when Oregon and Washington production came on the market, but small quantities continued to be shipped. From 75 to 90% of the carrots shipped from California during Oregon's marketing season were packed in 1- and 2-pound cello bags carrying the brand name of a California firm.

Seattle received 47% of its carrots from Washington growers during the peak marketing period, August through January (*Statistical Supplement*). For the entire year, 74% of the Seattle shipments originated in California and 3% in Oregon. From 1960 through 1962, California shippers sent 265 carlots of carrots through Oregon to Seattle during Oregon's and Washington's peak harvesting season, August through December.

San Francisco and Los Angeles markets received no carlots of Oregon-grown or Washington-grown carrots during 1960, 1961, or 1962.

Prices received

Portland average wholesale prices received for carrots from August through December for 1959, 1960, and 1961 by type of pack are indicated in Table 19. It is difficult to compare prices because of different types of

Table 19. **Wholesale prices received in Portland, Oregon, for carrots, by types of pack, August through December, 1959, 1960, and 1961**[1]

Month and year	Type of pack				
	crates 4-dozen-bunch	48-one-pound-cello-bag crate large size	48-one-pound-cello-bag crate small size	25-lb. sacks	50-lb. sacks
August					
1959	$3.50	$3.35	$.....	$1.38	$2.00
1960	3.40	3.64	2.90	1.62	2.38
1961	3.78	3.68	3.22	1.50	2.50
September					
1959	.....	3.50	2.62	1.38	1.72
1960	3.80	3.60	2.89	1.38	2.38
1961	4.20	3.38	2.90	1.32	1.88
October					
1959	.....	3.45	2.58	1.38	1.88
1960	.....	3.50	2.85	1.36	2.35
1961	4.20	3.35	2.90	1.32	1.88
November					
1959	.....	3.38	.....	1.38	1.62
1960	.....	3.50	2.70	1.30	1.42
1961	4.20	3.25	2.64	1.39	1.62
December					
1959	.....	3.64	2.45	1.44	2.18
1960	.....	3.50	2.70	1.30	1.42
1961	.....	3.30	2.58	1.30	1.75
5-month average Aug.-Dec.					
1959	3.50	3.48	2.56	1.39	1.82
1960	3.72	3.55	2.79	1.36	1.89
1961	4.05	3.38	2.89	1.35	1.85

[1] Federal Market News Service daily price quotations.

pack. In addition to weight differences among packs, there were differences in quality of carrots and in services performed. Carrots packed in 1-pound cello bags required considerably more labor and materials than those packed in loose crates, 25-pound sacks, and 50-pound sacks. Fifty-pound sacks of Number 1 carrots included some packs of Number 2 carrots (second grade) and some field-run carrots (ungraded). Many of the 25-pound and some 50-pound sacks were packed for specialized, institutional trade.

The percent of total receipts that was bunched carrot tops was not known. Receipts of bunch carrots have been decreasing, however, in all major markets in recent years; whereas, receipts of 48-one-pound-cello-bag crates and 24-two-pound-cello-bag crates have been increasing.

Carrot prices for all types of pack remained relatively steady from 1959 through 1961. Prices of 4-dozen-bunch crates had the greatest variation, and prices of 25-pound sacks showed almost no variation. Carrot prices by type of pack in Seattle were generally comparable to Portland wholesale

Table 20. Average wholesale prices received for carrots, five-month period, August through December of 1959, 1960, and 1961 by markets and by types of pack

Market and year	Type of pack				
	4-dozen-bunch crates	48-one-pound-cello-bag crate large size	48-one-pound-cello-bag crate small size	25-lb. sacks	50-lb. sacks
	Dollars per unit				
Portland					
1959	3.50	3.48	2.56	1.39	1.82
1960	3.72	3.55	2.79	1.36	1.89
1961	4.05	3.38	2.89	1.35	1.85
Seattle					
1959	3.45	3.43	2.78	1.62	2.50
1960	3.57	3.33	2.75	1.59	2.45
1961	3.55	3.51	2.81	1.57	2.16
	Weighted average prices of 48-one-pound-cello-bag crates for large and small sizes				
San Francisco					
1958	3.10				
1959	3.38				
1960	3.22				
1961	3.23				
Los Angeles					
1958	3.13				
1959	3.33				
1960	3.36				
1961	3.17				

prices (*Statistical Supplement*). Prices of 48-one-pound-cello-bag crates averaged slightly lower in Seattle than in Portland; whereas, prices of 25- and 50-pound sacks averaged slightly higher in Seattle.

San Francisco and Los Angeles average wholesale prices received for carrots packed in 48-one-pound-cello-bag crates, by months, from 1958 through 1961 are presented in the *Statistical Supplement*. Seasonal average prices were lowest in both Los Angeles and San Francisco markets during the months of August through November. This period corresponds with the peak harvesting period in the Pacific Northwest.

Prices of 48-one-pound-cello-bag crates in Portland and Seattle markets were not directly comparable to prices of 48-one-pound-cello-bag crates in Los Angeles and San Francisco, where prices were a weighted average of prices for crates of large size carrots and for crates of small size carrots. Available data were not sufficiently detailed to permit determination of the elasticity of demand for carrots in any of these four markets.[13]

Monthly average prices for five months, August through December, were determined for each of the four markets for 1959, 1960, and 1961. They are presented in Table 20.

[13] Unpublished thesis, *Potential Expansion of Fresh Market Sales as an Outlet for Oregon-grown Vegetables,* by William David Gorman, Department of Agricultural Economics, Oregon State University, June 1962, pp. 142-145.

Table 21. **Estimated cost of producing, harvesting, and packing fresh market carrots in western Oregon; 21 to 50 acre operation, 1961**[1]

Operation	Labor and equipment Cost/acre	Materials Kind and cost/acre	Production Costs/acre
Subsoil 1X	$ 5.30		$ 5.30
Plow 2X	6.25		6.25
Disk 2X	3.34		3.34
Harrow 2X	1.56		1.56
Fertilize 1X	1.58	100 lb. 10-20-20....$4.50	6.08
Spray 1X	.73	4 lb. Aldrin 10.00	10.73
Plant 1X	2.97	1¾ lb. seed 3.45	6.42
Replanting risk	2.71	seed 1.73	4.44
Total land preparation			$44.12
Cultivate 3X	5.09		5.09
Irrigate 2X	9.00	Electricity 1.20	10.20
Spray 2X	1.47	Stove oil 17.10	18.57
Hand labor			30.00
Total growing period			$63.86
Rent (land charge)			35.00
Total preharvest cost			$142.98
10% risk (about 1 out of 10 acres is not harvested)			14.30
Digger cost (machine and operator)			2.27
Total cost of producing independent of yield			**$159.55**

Harvesting, grading, and packing costs

Per crate (48 1-lb. cello bags—total weight—58 lbs.)

Operation	Equipment and labor	Materials	Total cost per crate
Pulling, field sorting and hauling to shed	$ 0.22		$ 0.22
Washing and grading	.10		.10
Packing	.17	48 1 lb. bags .....$ 0.48	.65
		Lid ..... .07	.07
		Crate ..... .15	.15
		Liner ..... .03	.03
Total harvesting, grading, and packing costs per crate			**$ 1.22**

[1] It was assumed that the grower had 20 to 30 acres planted to other crops requiring the use of some of the same equipment.

Cost data

Producing, harvesting, and packing costs for fresh market carrots were determined for two different size operations; 21 to 50 acres (Table 21) and 10 to 20 acres (*Statistical Supplement*). It was assumed that a grower of 10 to 20 acres of carrots would also have from 10 to 20 acres planted to other crops. Hence the number of acres requiring use of machinery, other than specialized carrot implements, was based on a 20 to 40 acre vegetable farm. Machinery-use rates for a 21 to 50 acre carrot operation were based on a 41 to 80 acre vegetable farm.

Producing operations. Seedbed preparation normally consisted of subsoiling once, plowing twice, disking and harrowing twice, fertilizing once,

and spraying once. Subsoiling was performed in the spring and was normally done 16 to 18 inches in depth about 3½ feet apart in both directions; that is, across the field and lengthwise. The next operation performed in the spring was the second plowing. If the land was extremely rough, however, it was disked once prior to the second plowing. The seedbed was then disked and harrowed twice before planting. Broadcasting prior to planting was the normal method of applying fertilizer.

Carrots were generally planted in beds of either three or four rows depending upon the planter used. Seeding rates varied from 1.5 to 2 pounds per acre. The most commonly grown varieties of fresh market carrots were Imperator, Nantees, and Morse Bunching.

Fresh market carrot production is a rather high risk enterprise, and it is necessary to replant if the crop is lost early in the season because of unfavorable weather. Fifty percent of the acreage originally planted was estimated to have been replanted. Therefore, a risk cost for replanting was charged against the carrot operation. The risk charge was based on one-half the cost of one plowing, disking, harrowing, and planting operation, including one-half the seed cost.

During the growing period, four major operations were performed: (1) cultivate three times, (2) irrigate twice, (3) spray for weeds twice, and (4) hand weed. The number of irrigations depended on the weather. Some years it was not necessary to irrigate at all, or only once. Other years, particularly if replanting was necessary, three or more irrigations were performed. The average water application was about three inches for each irrigation. Excessive irrigation of fresh market carrots causes them to grow thick and short. Consumers prefer a carrot 8 to 11 inches long, and narrow. Some varieties, such as the Imperator and Morse Bunching, taper gradually to the tip, whereas the Nantees variety has a blunt tip. The longer type, Chantenay, may prove very satisfactory in Oregon. Both types of carrots are acceptable in the fresh market, although certain outlets have preferences for one type over the other.

Stove oil application was the principal weed control practice during the growing period. About 95 gallons of stove oil were applied per acre during two spray applications. An average of 30 hours of hand labor was required per acre for weeding and other hand operations. When stove oil and Aldrin applications were not effective, more than 30 hours of hand labor were required. When the spray application was particularly effective, less than 30 hours of hand labor were required per acre.

About 10% of the total acres of carrots planted was not harvested due to freezing and other causes. Therefore, a 10% risk cost was charged to each acre harvested.[14]

Harvesting and packing operations. The first harvesting operation performed was the digging or lifting of the carrot beds. The purpose of the digger was to loosen the carrots so they could easily be pulled out by hand. The carrots were then hand pulled, the tops knocked off, sorted for size, and placed in a box or basket. Extra large and small carrots were left in the field. The carrots were then loaded and hauled to the packing shed.

There were several methods by

[14] The risk cost was based on 10% of all costs prior to harvesting, including land rent.

which carrots were prepared for the market. Some producers graded on the basis of Number 1 and Number 2 carrots, while others did not grade. Many fresh market carrots were washed on the farm. Packing operations depended upon the type of pack. Producers who sold their carrots in sacks or bulk crates had very few packing operations to perform.

Grading and packing operations for which costs are presented in Table 21 are for growers who put up a consumer pack, i.e., 48 one-pound or 24 two-pound-cello bags to a crate. The trend in recent years has been for more carrots to be packed in consumer-type packages at the farm level. It was estimated that from 10 to 20% of the carrots grown for the fresh market in Oregon were packed on the farm in either 1-pound or 2-pound-cello bags.

Economies of size. Few economies of size appeared in the production of fresh market carrots, but some economies were indicated in harvesting, grading, and packing operations for growers packing consumer-type packages on the farm.

A 100% increase in number of acres of carrots per farm resulted in only a 3% decrease in production costs per acre, and in a 12% decrease in harvesting, grading, and packing costs per crate. Economies of size realized in packing operations were the result of more efficient packing shed layouts, specialized labor, and specialized labor-saving equipment.

Effect of yields on costs per crate. Costs per crate for various yields per acre are indicated in Table 22, by size of operations. Yield per acre and size of operation were important factors in determining per crate costs. The highest cost operation ($1.99 per crate) was for the 10 to 20 acre units with yields of 275 crates per acre. The lowest cost tested ($1.56 per crate) was for the 21 to 50 acre units with yields of 475 crates per acre. A normal or average yield was from 350 to 400 crates of Number 1 and Number 2 carrots per acre.[15]

Transportation costs and brokerage fees. An estimated transportation cost of $.10 per crate was used for western Oregon growers selling in the Portland market. This cost estimate included loading and unloading labor, and was based on an average haul of 20 miles.

Transportation costs per crate averaged $.27 to Seattle. Carrots were not shipped to San Francisco or Los Angeles from western Oregon during 1960-1962, therefore no actual rate

[15] Carrots generally graded out 70 to 80% Number 1, depending upon the variety and the growing season.

Table 22. Cost of producing, harvesting, grading, and packing carrots—48 one-pound cello bags—in western Oregon by size of operation and by yield per acre

Crates per acre[1]	Size of operation	
	10-20 acres	21-50 acres
Number	*Cost per crate*	
275	$1.99	$1.80
350	1.86	1.68
400	1.80	1.62
475	1.74	1.56

[1] A weight of 58 pounds was used as the average weight of a crate. Yield includes only Number 1 and Number 2 carrots.

Table 23. Average wholesale prices received for carrots (48-one-pound-cello-bag crate, large size) in major west coast markets, August through December 1959, 1960, and 1961; estimated production and marketing costs for western Oregon growers by size of operation; and returns above costs

Item	Year 1959		1960		1961	
	Size of operation in acres					
	10–20	21–50	10–20	21–50	10–20	21–50
	Dollars/crate					
Portland						
Average price received[1]	3.48	3.48	3.55	3.55	3.38	3.38
Growing, harvesting, and packing costs[2]	1.86	1.68	1.86	1.68	1.86	1.68
Transportation cost	.10	.10	.10	.10	.10	.10
Brokerage fee[3]	.14	.14	.14	.14	.14	.14
TOTAL OF ALL COSTS	2.10	1.92	2.10	1.92	2.10	1.92
Returns above costs	1.38	1.56	1.45	1.63	1.28	1.46
Seattle						
Average price received[1]	3.43	3.43	3.33	3.33	3.51	3.51
Growing, harvesting, and packing costs[2]	1.86	1.68	1.86	1.68	1.86	1.68
Transportation cost	.27	.27	.27	.27	.27	.27
Brokerage fee[3]	.14	.14	.13	.13	.14	.14
TOTAL OF ALL COSTS	2.27	2.09	2.26	2.08	2.27	2.09
Returns above costs	1.16	1.34	1.07	1.25	1.24	1.42
San Francisco						
Average price received[1]	3.48	3.48	3.32	3.32	3.33	3.33
Growing, harvesting, and packing costs[2]	1.86	1.68	1.86	1.68	1.86	1.68
Transportation cost	.60	.60	.60	.60	.60	.60
Brokerage fee[3]	.14	.14	.13	.13	.13	.13
TOTAL OF ALL COSTS	2.60	2.42	2.59	2.41	2.59	2.41
Returns above costs	.88	1.06	.73	.91	.74	.92
Los Angeles						
Average price received[1]	3.43	3.43	3.46	3.46	3.27	3.27
Growing, harvesting, and packing costs[2]	1.86	1.68	1.86	1.68	1.86	1.68
Transportation cost	.75	.75	.75	.75	.75	.75
Brokerage fee[3]	.14	.14	.14	.14	.14	.14
TOTAL OF ALL COSTS	2.75	2.57	2.75	2.57	2.74	2.56
Returns above costs	.68	.86	.71	.89	.53	.71

[1] All prices were for grade Number 1 carrots.
[2] Based on yield of 350 crates (58 lbs./crate).
[3] Based on a 4% brokerage charge.

data were available. Transportation rates were assumed to be $.60 per crate to San Francisco and $.75 per crate to Los Angeles. These costs were based on rates for similar commodities shipped to San Francisco and Los Angeles during 1961.[16]

Although most Oregon growers did not sell through brokers, it was assumed that growers' selling costs were equal to or greater than brokerage fees, which would average about 4%.

[16] All transportation rates are by itinerant carriers. Rates to Seattle were obtained from wholesale trade sources.

Table 24. Estimated returns per acre above total production and marketing costs for fresh market carrots produced in western Oregon, by selected markets, 1959-61 average[1]

Market	Size of operation	
	10-20 acres	21-50 acres
	Dollars/acre	
Portland	480.00	542.00
Seattle	405.00	468.00
San Francisco	274.00	337.00
Los Angeles	224.00	287.00

[1] Based on an average yield of 350 crates of Number 1 carrots per acre.

Prices compared with costs

Final step in the analysis was to compare producing, harvesting, packing, selling, and transportation costs with prices received in the Portland, Seattle, San Francisco, and Los Angeles markets during 1959, 1960, and 1961. Results of these comparisons are presented in Table 23 for two sizes of operation. Wholesale market prices used were computed by averaging prices from August through December for 48 - one - pound - cello - bag crates, large size. (See Tables 19 and 20.) This time period corresponded with the marketing season in western Oregon.

Returns above costs from sales of fresh market carrots sold by western Oregon growers differed considerably among markets. On the basis of these returns, Portland would have been the most profitable market in which to sell during these three years. Returns above costs from selling in the Seattle market would have averaged $.22 to $.38 less than returns above costs from selling in Portland. However, prices were relatively high in Seattle during 1961, and net returns from selling there were within $.04 per crate of net returns from selling in Portland.

Had Oregon carrots been sold in San Francisco and Los Angeles markets, net returns would have averaged considerably less than net returns from sales in Portland and Seattle from 1959 through 1961.

Net returns for fresh market and processing carrots

Latest data available on average costs of producing processed carrots were for the year 1958.[17] These estimates were based on records from 9 growers on Newberg soil in Marion County. The average number of acres of carrots grown for processing was between 40 and 50; the exact average is not known. After allowing $35 per acre land rent charge, average returns above all costs amounted to $236.40 per acre for processed carrots.

Average returns per acre above total production and marketing costs for fresh market carrots are presented in Table 24. Estimated returns from selling in all markets, except Los Angeles, were greater than returns per acre above costs for growing processed carrots.

[17] Unpublished thesis, *Techniques for Characterizing Oregon Soils for Agricultural Purposes in Terms of Physical and Economic Productivities.* Sydney Carter James, Department of Agricultural Economics, Oregon State University, June 1961.

Limit of profitable expansion

It appears possible that an increase in production of fresh market carrots could occur in Oregon without major reduction in per-acre grower profits. The fresh market appears to be more profitable than the processed market for successful growers, although many factors must be considered in choosing one type of outlet over the other. California growers in 1962 shipped 50 carlots of fresh carrots into Portland, and 135 carlots through Oregon and into Seattle during six months of Oregon production. Presently there is a trend toward on-farm packing of consumer-type packages which require no repacking in wholesale and retail markets. Growers now planning to enter the Portland and Seattle fresh markets should consider packing 1-pound and 2-pound cello bags in order to meet the needs of the market.

However, a grower who contemplates starting or expanding production of carrots for fresh market should be able to answer the following questions affirmatively:

1. Will my operation be of sufficient size to permit efficient growing and packing practices?
2. Do I have suitable land and sufficient experience in carrot production to avoid unnecessary losses, and to obtain high yields of quality carrots?
3. Before planting have I established a definite market outlet for the product at as favorable prices as market conditions warrant?

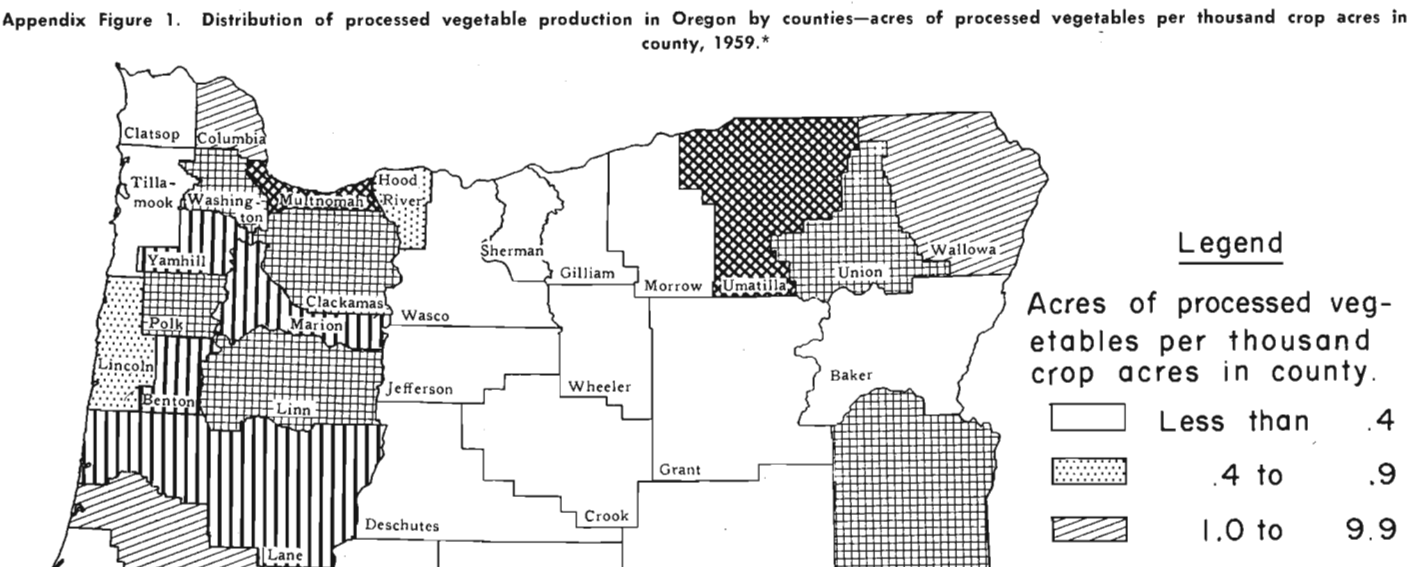
APPENDIX

Appendix Table 1. Carlot unloads of carrots by rail and truck in Portland, Oregon, by state of origin, by months, 1960, 1961, 1962[1]

Total 3 yrs.	Month	Oregon 1960-1961-1962			Washington 1960-1961-1962			California 1960-1961-1962			Others 1960-1961-1962			Total 1960-1961-1962		
								Number carlots								
94	January	4	14	17	1	2	2	27	9	18	....	....	....	32	25	37
95	February	1	7	4	2	1	....	29	23	26	2	....	....	34	31	30
115	March	1	4	1	1	1	....	38	33	36	....	....	....	40	38	37
100	April	....	2	2	....	....	....	33	30	33	....	....	....	33	32	35
110	May	....	....	....	....	....	....	38	37	35	....	....	....	38	37	35
92	June	....	....	....	....	....	....	31	25	35	1	....	....	32	25	35
81	July	....	....	1	....	....	....	29	25	26	....	....	....	29	25	27
72	August	8	14	3	7	6	5	4	9	16	....	....	....	19	29	24
65	September	13	15	7	6	1	4	8	4	7	....	....	....	27	20	18
72	October	16	20	13	4	4	7	2	3	3	....	....	....	22	27	23
75	November	21	19	13	2	3	10	1	5	1	....	....	....	24	27	24
82	December	24	20	18	2	3	5	1	4	5	....	....	....	27	27	28
1,053	Total	88	115	79	25	21	33	241	207	241	3	....	....	357	343	353

[1] *Fresh Fruit and Vegetable Unloads in Western Cities.* By Commodities, States and Months, AMS-428, USDA, Agricultural Marketing Service, Fruit and Vegetable Division, Market News Branch, Washington, D. C., Feb. 1963.

Appendix Figure 1. Distribution of processed vegetable production in Oregon by counties—acres of processed vegetables per thousand crop acres in county, 1959.*



** Based on unpublished data from the Oregon Crop and Livestock Reporting Service, the USDA Statistical Reporting Service, and the Oregon State University Extension Service.*