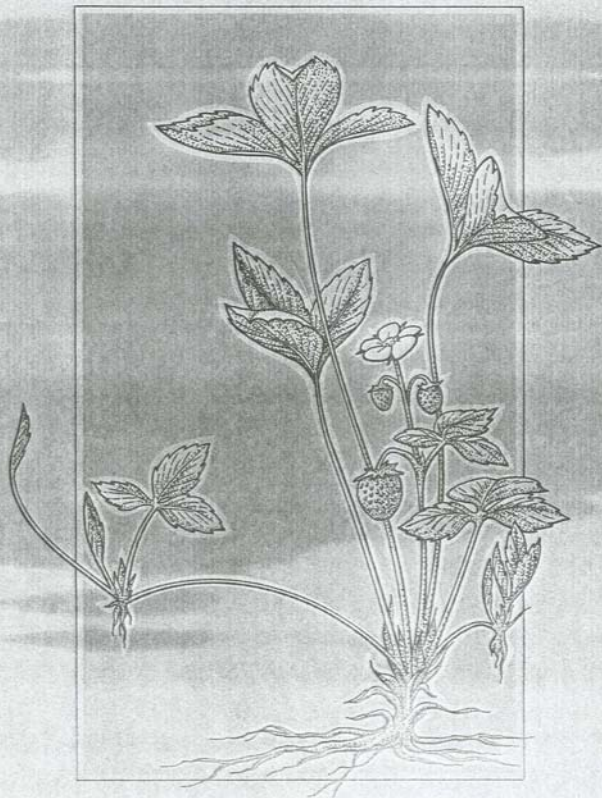


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STRAWBERRY PLANT MARKET SURVEY AND PRODUCTION FEASIBILITY STUDY



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AND
PRODUCTION FEASIBILITY STUDY

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May 1983

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TABLE OF CONTENTS

Acknowledgments	i
Table of Contents	ii
List of Tables	iii
Executive Summary	v
Introduction	1
I. Market Analysis	5
Methodology	7
Sales Summary	8
Market Structure	10
Origin	11
Comparative Price Estimates	11
Transportation Damage	15
Sales Season	16
Estimated Total Sales	18
II. Production Feasibility Analysis	21
Assumptions	23
Overview	23
Land	24
Taxes	24
Equipment	25
Herbicide	25
Fertilizer	25
Plants	25
Irrigation	26
Cultivation	26
Harvest and Yields	26
Storage	27
Mulch	27
Marketing	28
Income Estimates	28
Capital and Operating Costs, First Five Years	29
<u>Pro Forma</u> Cash Flow Analyses	32
Retail Sales	32
Wholesale Sales	33
Competitive Wholesale Sales	36
Present Value Analysis & Internal Rate of Return	36
III. Conclusions and Recommendations	41
IV. References	45
V. Appendices	49
Comments From Survey Respondents	51
Questionnaire	53

ACKNOWLEDGMENTS

Many individuals in the horticultural industry contributed enormously to making this a successful study of the opportunities for strawberry plant production in Alaska. Without them, this study would have been impossible.

Thanks also are extended to Janet Bunker, who collected and analyzed data, as well as prepared the initial report draft, and to Cathy Wright for providing useful horticultural information and a critical review of the various report drafts. Robin Hall-Lozano designed the cover and prepared the final layout, and Barbara Butts offered valuable editorial comments. Especially appreciated are Carolyn Purser's patience and dedication in preparing this study for publication.

LIST OF TABLES

1	Strawberry Plant Market Survey, Sales Summary: 1981	9
2	Strawberry Plant Market Survey, Range of Sales: 1981	10
3	Strawberry Plant Market Survey, Retail Outlet and Grower Market Shares	12
4	Strawberry Plant Market Survey, Origin	13
5	Strawberry Plant Market Survey, Price Analysis Response Rates	13
6	Strawberry Plant Market Survey, Price Analysis	14
7	Strawberry Plant Market Survey, Damage During Shipping	15
8	Strawberry Plant Market Survey, Monthly Sales	16
9	Strawberry Plant Market Survey, Possible Late Season Demand for Strawberry Plants	17
10	Strawberry Plant Market Survey, Possible Early Demand for Alaska Varieties	17
11	Estimated Strawberry Plant Sales: 1981	18
12	Estimated Total Annual Strawberry Sales: 1980-1983	19
13	Strawberry Plant Production Analysis, Estimated Yields and Income Possibilities: First Five Years	28
14	Strawberry Plant Production Analysis, Capital Costs: First Year	30
15	Strawberry Plant Production Analysis, Annual Operating Costs: First Five Years	31
16	Strawberry Plant Production Analysis, <u>Pro Forma</u> Cash Flow Analysis: Retail Operation	34
17	Strawberry Plant Production Analysis, <u>Pro Forma</u> Cash Flow Analysis: Wholesale Operation..	35
18	Strawberry Plant Production Analysis, <u>Pro Forma</u> Cash Flow Analysis: Competitive Wholesale Operation	37
19	Strawberry Plant Production Analysis, Internal Rate of Return and Net Present Value: First Five Years	39

EXECUTIVE SUMMARY

1. Historic sales of strawberry plants in the state were estimated at 99,200 in 1980 and 101,400 in 1981. Sales were estimated to be 109,000 in 1982 and are projected to be 125,000 in 1983.
2. Thirty percent of the total number of strawberry plants sold in 1981 were Alaska varieties; 70 percent of total sales were imported plants.
3. Thirty-nine percent of the total number of plants sold were imported from Oregon; this was the largest amount shipped to Alaska from any one state. Alaska ranked second and Michigan third as sources of strawberry plants sold in Alaska.
4. The mean wholesale price for plants originating in Alaska was \$.1900, and the mean wholesale price for imported plants was \$.1138.
5. The mean retail price for plants originating in Alaska was \$.3980; the mean retail price for imported plants was \$.3785.
6. Damage was incurred during shipping by 1 percent of plants produced in Alaska and by approximately 5 percent of imported plants.
7. Eighty-seven percent of all strawberry plant sales in 1981 occurred in May and June.
8. Strawberry plant retail outlets indicated a strong desire for competitively priced plants that are produced in Alaska if these plants are available as early in the season as imported varieties.

INTRODUCTION

The purpose of this study is to determine the feasibility of expanded strawberry plant (Fragaria Spp.) production in the State of Alaska. This investigation consisted of a market survey to estimate historic and potential demand for strawberry plants in Alaska and an analysis of feasibility.

The primary obstacles to the successful production of marketable strawberry plants in Alaska are the shorter length of the growing season and the harsh winter climate. Extra care must be taken to ensure survival during winter, and the many cultural activities must be compressed into a short growing season. In addition, plants harvested in the spring are not marketed until late May or early June because of the late spring thaw. Imported plants are available in early May.

Strawberry plant production in Alaska is commonly a supplemental activity on vegetable farms. All of the producers contacted during this study utilize less than one-half acre for strawberry plant production. Consequently, the economies of scale associated with larger production units are not attainable. Small plant production plots cannot support the extensive use of machinery, and therefore large amounts of labor must be used.

To determine the feasibility of expanded production of strawberry plants in Alaska, market demand and production feasibility have been studied. The market demand has been estimated to determine the desirability and possible success of expanded production. The market analysis provides estimates of current and potential demand for strawberry plants, and includes data on various facets of the strawberry plant market in Alaska. Production costs are estimated and analyzed to determine if the prices of plants produced in Alaska can compete with those charged for imported plants. The financial analysis includes estimates of capital costs and operating costs over a five-year period.

I. MARKET ANALYSIS

METHODOLOGY

The purpose of the market survey is to determine the approximate total statewide demand for strawberry plants. Alaska businesses selling strawberry plants were identified. These included nurseries, garden shops associated with other retail stores, and producers of strawberry plants. To avoid duplication, a distinction was made between wholesale and retail sales, and only sales to the consumer were tabulated. The survey attempted to encompass statewide demand, but primary markets are concentrated within areas having a suitable climate such as southeastern Alaska, the Kenai Peninsula, the Matanuska-Susitna Valley, the Municipality of Anchorage, and the Fairbanks area. Potential survey participants in these areas were identified through local telephone directories, the University of Alaska Extension Service, the state Division of Agriculture Plant Materials Center, and individuals associated with agriculture in the state.

Fifty-four questionnaires were mailed on July 2, 1982. Follow-up post cards were mailed on July 13 to the 37 firms who had not replied by that date. Sixteen follow-up telephone calls were placed on July 21.

Thirty-four questionnaires were returned, resulting in a response rate of 63 percent. For various reasons 13 questionnaires were not included in the survey, thus the market analysis is based upon 23 valid responses. A copy of the survey questionnaire is included in the Appendices.

In this report, tables often include columns for either "valid responses" or "missing values." Each survey participant was asked to answer 11 questions, but many respondents did not fully complete the questionnaire. Any question that a participant did not respond to was considered a missing value.

Missing values are omitted from the calculations for each table. The number of valid responses is used as a basis for percentage calculations and as a reference point for the reader.

One segment of this analysis compares sales of plants produced in Alaska with imported varieties. Alaska varieties have been defined as those varieties developed in Alaska, and are thus assumed to be well-adapted to Alaska's harsh environment. Some Alaska producers raise varieties that were developed outside of Alaska. These are considered as "produced in Alaska," but not as "Alaska varieties."

SALES SUMMARY

Respondents to the survey indicated that they sold a total of 55,038 strawberry plants in 1981; 30.35 percent (16,704) were developed in Alaska and 69.65 percent (38,334) were imported (Table 1).

The number of respondents selling a given variety is shown in Table 1, as is the number of respondents who did not indicate their sales for that variety. Although there were 23 responses to the market survey, only 19 were used to calculate the totals for "all varieties." Four of the respondents did not report sales volumes for 1981. Percentages also were calculated based upon the 19 valid responses. Each respondent sold a mean of 2,897 plants.

The varieties with the greatest sales were 'Quinalt' (14,220 plants or 25.84 percent of total sales) and 'Ogallala' (10,964 plants or 19.92 percent of total sales). Both are imported varieties. Three varieties developed and produced in Alaska followed in number of sales: 'Matared' (4,500 plants or 8.18 percent), 'Toklat' (4,400 plants or 7.99 percent), and 'Pioneer' (4,304 plants or 7.82 percent). 'Quinalt' is usually grown as an annual plant in Alaska. The other varieties are perennials.

TABLE 1
 STRAWBERRY PLANT MARKET SURVEY
 SALES SUMMARY: 1981

Variety	Number of Valid Responses	Number of Missing Values	No. Sold	Mean	Min.	Max.	Percentage of All Plants	
<u>Alaska Varieties</u>								Percentage of All <u>Alaska Plants</u>
Matared	4		4,500	1,125	600	2,000	8.18	26.94
Toklat	3	1	4,400	1,467	100	4,000	7.99	26.34
Pioneer	5	1	4,304	861	144	3,000	7.82	25.76
Sitka	4		2,500	625	200	1,000	4.54	14.97
Susitna	1		1,000	1,000	1,000	1,000	1.82	5.99
Subtotals			16,704				30.35	100.00
<u>Imported Varieties</u>								Percentage of All <u>Imported Plants</u>
Quinalt	6	1	14,220	2,370	500	6,000	25.84	37.10
Ogallala	9		10,964 ^a	1,218	144	4,000	19.92	28.60
Chief Bemidgi	3		3,200	1,067	200	2,000	5.81	8.35
Pt. Laramie	2	1	2,500	1,250	500	2,000	4.54	6.52
Ozark Beauty	1		2,000	2,000	2,000	2,000	3.63	5.22
Black Beauty	1		1,500	1,500	1,500	1,500	2.73	3.91
Hecker	2		1,500	750	500	1,000	2.73	3.91
Shuksan	1		1,000	1,000	1,000	1,000	1.82	2.61
Other ^b	3	3	950	317	50	500	1.73	2.48
Brighton	1		500	500	500	500	.90	1.30
Subtotals			38,334				69.65	100.00
All Varieties	19 ^c	4 ^d	55,038	2,897	50	6,000	100.00	

^a This amount includes 1,664 imported varieties grown in Alaska.

^b "Other" includes 'Jubilee,' 'Northland,' 'Guardian,' and unknown varieties.

^c The total number of valid responses may not equal the sum of valid responses for each variety. This column shows how many respondents sold each variety. Respondents selling more than one variety are listed more than once. Responses totaled 19.

^d See footnote ^c. This column tabulates the number of respondents who reported selling a particular variety but did not specify the number of plants sold.

MARKET STRUCTURE

"The term 'market structure' refers to the number and size distribution of buyers and sellers, the degree of product differentiation, and the ease of entry of new firms into an industry."¹ This section classifies survey respondents by relative magnitude of sales, by type of outlet (wholesale or retail), and by percentage of plants sold in the two categories, i.e. produced in Alaska and imported.

Respondents were categorized into one of four ranges of sales volume: 500 plants or less; 501 to 1,000 plants; 1,001 to 3,000 plants; and greater than 3,000 plants (Table 2). Four respondents sold less than 500 plants each; each of the other categories had five respondents.

TABLE 2
STRAWBERRY PLANT MARKET SURVEY
RANGE OF SALES: 1981

Range (Number of Plants)	Valid Responses		Total Number of Plants Sold		Mean Number of Plants	Min. Number of Plants	Max. Number of Plants
	Number	Percent	Amount	Percent			
0-500	4	21.1	1,464	2.7	366	144	500
501-1,000	5	26.3	4,414	8.0	883	800	1,000
1,001-3,000	5	26.3	11,800	21.4	2,360	1,500	3,000
>3000	5	26.3	37,360	67.9	7,472	3,860	14,000
			55,038				

The survey results show that the five respondents with the greatest volume (26.3 percent of all outlets) captured 67.9 percent of all sales. The five outlets with sales between 1,000 and 3,000 plants (26.3 percent of the respondents) sold 21.4 percent of all plants. Approximately one-fourth (26.3 percent) of all outlets sold between 500 and 1,000 plants, only 8 percent of all sales. Finally, there were four outlets (21.1 percent) that sold less than 500 plants each, garnering only 2.7 percent of sales.

¹ Agricultural Product Prices, William G. Tomek and Kenneth L. Robinson, Cornell University Press, 1972.

Respondents were also categorized as either growers or retail outlets. Those who grew at least 50 percent of the plants that they sold were categorized as growers; those who grew less than 50 percent (or none) were classified as retail outlets.

The market was about equally divided between retail outlets and growers, both in terms of the number of plants sold and the number of sellers. Retail outlets constituted 52.6 percent and growers 47.4 percent of outlets selling strawberry plants (Table 3). Retail outlets sold approximately 31,000 plants (56 percent) and growers sold 24,000 plants (44 percent). Thirty percent of the plants that were sold were Alaska varieties; 70 percent were imported (Table 3).

ORIGIN

The Alaska strawberry plant market is divided between plants raised in Alaska and those produced elsewhere. Of all the strawberry plants that were sold by the survey respondents in 1981, 18,368 (33.37 percent) were grown in Alaska and 36,670 (66.63 percent) were imported (Table 4). The Alaska category includes 1,664 non-Alaska plants grown by survey respondents, and 16,704 plants of varieties developed in Alaska.

Nearly 40 percent of strawberry plants (21,720) sold by survey respondents in 1981 were grown in Oregon. Sixteen percent (9,000) originated in Michigan. A total of 5,900 plants originated in California, Minnesota, Washington, and Iowa.

COMPARATIVE PRICE ESTIMATES

Survey respondents were asked to specify wholesale and retail prices for both imported and Alaska varieties. Clearly unrepresentative prices were omitted. Table 5 shows the number of valid responses for wholesale and retail sales. The following price analysis is based on these responses,

TABLE 3
 STRAWBERRY PLANT MARKET SURVEY
 RETAIL OUTLET AND GROWER MARKET SHARES

Outlets	Number of Valid Responses	Percentage of Valid Responses	Number of Missing Values	Number Sold		Percentage of Total Sales	
				Total	Subtotal	Total	Subtotal
<u>Retail Outlets</u> ^a	10	52.6	4	30,724		55.8	
Alaska Varieties					3,260		5.9
Imported Varieties					27,464		49.9
<u>Growers</u> ^a	9	47.4	0	24,314		44.2	
Alaska Varieties					13,444		24.4
Imported Varieties					10,870		19.8
Total	19	100.0	4	55,038	55,038	100.0	100.0

^a Retail outlets grew less than 50 percent of the plants they sold; growers produced at least 50 percent.

TABLE 4
STRAWBERRY PLANT MARKET SURVEY
ORIGIN

State	Number of Valid Responses ^a	Number of Missing Values	Number of Plants	Percentage of All Plants
Oregon	6	0	21,720	39.47
Alaska	17	3	18,368	33.37
Alaska	(14)	(2)	(16,704)	(30.35)
Imported ^b	(4)	(1)	(1,664)	(3.02)
Michigan	3	0	9,000	16.35
Other States ^c	4	2	5,900	10.72
Unknown	1	7	50	.09
Total			55,038	100.00

^a The "Number of Valid Responses" column shows the number of respondents selling plants that originated in each state listed. Some shipped plants from more than one state.

^b This category includes imported varieties grown in Alaska.

^c "Other States" are California, Minnesota, Washington, and Iowa.

TABLE 5
STRAWBERRY PLANT MARKET SURVEY
PRICE ANALYSIS: RESPONSE RATES

	Alaska Plants		Imported Plants	
	Number of Responses	Percentage of Responses	Number of Responses	Percentage of Responses
WHOLESALE PRICES:				
Valid Responses	8	34.8	11	47.8
Missing Values (or none sold)	15	65.2	12	52.2
Total Responses ^a	23	100.0	23	100.0
RETAIL PRICES:				
Valid Responses	15	65.2	13	56.5
Missing Values (or none sold)	8	34.8	10	43.5
Total Responses ^a	23	100.0	23	100.0

^a Each respondent was requested to specify wholesale and retail prices for both imported and Alaska varieties. Alaska producers are included in the wholesale category.

TABLE 6
 STRAWBERRY PLANT MARKET SURVEY
 PRICE ANALYSIS

	Mean	Minimum	Maximum	Standard Deviation	Variance
WHOLESALE					
Imported w/o Transportation Costs	\$.0888	\$.0500	\$.1600	.0405	\$.0016
Imported w/ Transportation Costs	.1138 ^a	.0750 ^a	.1850 ^a	---	---
Produced in Alaska	.1900	.1000	.2500	.0537	.0029
RETAIL					
Imported	\$.3785	\$.2000	\$.6700	.1638	\$.0268
Produced in Alaska	.3980	.2500	.8700	.1595	.0254
MARKUP: Wholesale to Retail					
Imported	+233%	+167%	+262%	---	---
Produced in Alaska	+109%	+150%	+248%	---	---

^a This price includes an estimated \$.025 per plant for shipping charges.

During 1981 the mean wholesale price for Alaska varieties was \$.1900; for imported varieties the mean wholesale price was \$.0888 (Table 6). Estimated transportation charges of \$.025 per plant raise the mean wholesale price of imported varieties to \$.1138 per plant.

Alaska varieties had a mean retail price of \$.398 per plant; the mean retail price for imported varieties was \$.3785 per plant. The average markup above wholesale prices was 109 percent for Alaska varieties and 233 percent for imported plants (Table 6).

The difference between prices of imported and Alaska plants is greater at wholesale than at retail. The mean retail price of Alaska plants was found to be only 5 percent greater than the mean retail price of imported plants. At the wholesale level, Alaska plant prices were nearly 70 percent greater than prices of equivalent plants that had been imported.

TRANSPORTATION DAMAGE

Strawberry plants shipped to Alaska will have covered 1,000 or more miles before reaching their destinations. The chance that plants will be damaged during shipment is of concern to retailers and wholesalers who import plants. Survey recipients were asked to estimate the proportion of plants that were damaged during shipping.

Eight respondents selling Alaska strawberry plants and 13 selling plants from outside the state provided information on damage incurred during shipping. One percent of the plants produced in Alaska were damaged; 10 percent of the plants shipped into Alaska were damaged. The highest rate of damage shown was 5 percent for plants produced in Alaska and 30 percent for plants shipped into the state. Based on the mean wholesale price (Table 6) and the rate of damage (Table 7), the mean wholesale price per non-damaged plant becomes \$.1922 for plants produced in this state and \$.1200 for imported plants.

TABLE 7
STRAWBERRY PLANT MARKET SURVEY
DAMAGE DURING SHIPPING

Origin	Number of Valid Responses	Number of Plants ^a	Number Damaged	Percentage Damaged	Maximum Percentage Damaged
Alaska	8	4,715	55	1	5
Other States ^b	12	31,664	1,647	5	30

^a This category represents total number of plants sold by those respondents who supplied data on the percentage that was damaged.

^b A respondent showing 50 percent of plants receiving damage was eliminated.

SALES SEASON

Two identifiable sales seasons characterize the strawberry plant market in Alaska. Imported strawberry plants are generally sold early in the year. Plants produced in the state are usually sold later in the season.

Respondents indicated that 87 percent of all strawberry plant sales occurred in May and early June (Table 8). Only 5.5 percent of sales took place in July. Sales were much lower in March, April, and August (7.5 percent of the total).

TABLE 8
STRAWBERRY PLANT MARKET SURVEY
MONTHLY SALES

Month	Valid Non-zero Responses			Plants Sold by Month			
	Number	Percentage of Outlets with Sales by Month	Total Number	Percentage of Total Plants	Mean	Min.	Max.
March	1	5.3	173	.5	173	173	173
April	5	26.3	2,716	5.0	543	216	900
May	18	94.7	34,208	62.0	1,900	21	12,600
June	16	84.2	13,930	25.0	871	225	3,600
July	9	47.4	2,996	5.5	333	43	900
August	3	15.8	1,015	2.0	338	115	600
TOTAL	---	---	55,038	100.0	---	---	---

This lowered demand for plants late in the season (mid-June through August) was confirmed by the survey respondents. Seventy percent of them stated that there was little demand for plants in those months (Table 9).

TABLE 9
 STRAWBERRY PLANT MARKET SURVEY
 POSSIBLE LATE SEASON DEMAND FOR STRAWBERRY PLANTS

Response	Number	Percentage
Yes	6	26.09
No	16	69.56
No Response	1	4.35
Total	23	100.00

Respondents expressed a strong desire for competitively priced Alaska varieties that are available as early in the spring as imported varieties (Table 10). They were asked to indicate the proportion of Alaska plants that might be purchased if they were on the market at a time and price comparable to imported plants. Thirty percent of the respondents indicated that they would purchase between 71 and 100 percent of their total plant requirements, and another 30 percent stated that they would purchase between 41 and 70 percent (Table 10).

TABLE 10
 STRAWBERRY PLANT MARKET SURVEY
 POSSIBLE EARLY DEMAND FOR ALASKA VARIETIES

Range ^a	Number	Percentage
None	1	4.35
10-40%	3	13.04
41-70%	7	30.43
71-100%	7	30.44
No Response	5	21.74
Total	23	100.00

^a Respondents were requested to indicate what proportion of Alaska plants they might purchase if the plants reached the Alaska market as early as imported plants, and at competitive prices.

ESTIMATED TOTAL SALES

Estimates of total strawberry plant sales for 1982 and 1983 were made based on the survey results and other available information. The method used to make these projections is explained in this section.

As discussed in the section on methodology, the survey response rate was 63 percent, and 68 percent of these respondents sold strawberry plants in 1981. It is assumed that 68 percent of the firms that did not respond sold strawberry plants in 1981. Nineteen respondents sold a total of 55,038 strawberry plants in 1981; each outlet sold an average of 2,897 plants. It is assumed that 12 other outlets had average annual sales of 2,897 plants. Actual strawberry plant sales in Alaska during 1981 are thus estimated to be approximately 101,000 (Table 11).

TABLE 11
ESTIMATED STRAWBERRY PLANT SALES: 1981

Sales identified through 1982 Market Survey		55,038
Market Survey missing values: 4 x 2,897 plants	11,588	
Additional strawberry plant outlets:		
12 x 2,897 plants	<u>34,764</u>	
		<u>46,352</u>
Estimated strawberry plant sales in 1981		101,390

The survey indicated that strawberry plant sales generally have been increasing. Twelve respondents showed a 44 percent increase in sales from 1980 to 1981. The sales of four respondents decreased an average of 25 percent during the same period. Twelve respondents expected sales in 1982 to exceed 1981 sales by 30 percent; two respondents predicted that sales would decrease by 22 percent in 1982. Twelve respondents said 1983 sales would exceed 1982 sales by an average of 28 percent.

Taking into consideration historical estimates and expectations, it is estimated that the group of survey respondents sold approximately 54,000 plants in 1980 and 59,000 plants in 1982, and will sell about 68,000 plants in 1983. Total strawberry plant sales are thus projected to increase from about 99,000 plants in 1980 to 125,000 plants in 1983 (Table 12).

TABLE 12
ESTIMATED TOTAL ANNUAL STRAWBERRY SALES: 1980-1983

Year	Estimated Percentage Increase	Estimated Total Sales
1980	--	99,000
1981	2.17	101,000
1982	7.51	109,000
1983	14.32	125,000

II. PRODUCTION FEASIBILITY ANALYSIS

ASSUMPTIONS

Overview

This section provides a development plan and pro forma financial analysis for strawberry plant production. This is not presumed to be an optimum production schedule, but it is a development option.

When analyzing the feasibility of strawberry plant production, evaluations must be made of location, soil, climate and microclimates, slope, exposure, current land use, vegetation, and other factors. Location will determine whether roadside marketing is an option or whether other outlets will be needed. Environmental conditions, such as climate, slope, and exposure, need to be evaluated when assessing the risk of winter kill or the need for an irrigation system. Existing land use, soil quality, and vegetative cover will determine the time needed for land preparation.

Many strawberry plant production activities can be accomplished either mechanically or manually. In states with large-scale strawberry plant production, machines are used for planting, cultivating, fertilizing, applying pesticides and herbicides, irrigating, and harvesting. In comparison, the limited scale of strawberry plant production in Alaska requires that cultural activities be accomplished manually in most cases. The production schedule used in this report is intended only as an initial reference point. It is recommended that anyone contemplating strawberry plant production adjust the numbers to better represent his or her actual situation. The production schedule was formulated assuming "normal" or "average" conditions in any given year.

It is assumed that the parent strawberry plants are perennials. Parent plants are planted in the first year and

produce runner plants that are harvested in subsequent years. Full production should be reached in the third year.

Alaska strawberry plants are commonly harvested and marketed in late May or June. This practice hinders the ability of plants produced in Alaska to compete with imported varieties for sales early in the season. Therefore, it is assumed that plants will be harvested in the fall, stored over the winter, and marketed in early May. Winter storage and early marketing should lessen uncertainty surrounding sales of strawberry plants. With winter storage, producers can approach wholesale buyers earlier in the season and provide accurate information on the quality and quantity of their plants.

In the following financial analysis, operations with retail and wholesale sales are evaluated. Each option is presented with and without labor as an explicit cost.

Land

It is assumed that one-quarter acre of strawberry plants will be incorporated into a diversified vegetable farm. It is further assumed that the property has road access, electricity, and a water source for irrigation. The strawberry plot has been cleared and planted in row crops for one to two years to help rid the soil of weeds. In the spring of the planting year, the land is prepared by hand rototilling. Land values were estimated at approximately \$750 per one-quarter acre. The annual payment, including principal and interest, for a 20-year loan at 8 percent is \$75 per one-quarter acre. Annual insurance payments are estimated at approximately \$5.

Taxes

Tax rates vary throughout the state. The tax rate in the Matanuska-Susitna Borough is used in this analysis. With an assessed valuation of \$750 per one-quarter acre, annual tax payments are estimated at \$4.05.

Equipment

It is assumed that basic equipment is available. Strawberry plant production requires a heavy-duty, self-propelled rototiller, a self-contained sprayer, and a manually operated fertilizer spreader. Hoes, shovels, and pitchforks also are needed.

Herbicide

Herbicides usually are applied twice each year (in early spring and after berry harvest). Timing of applications depends on the type of herbicide and the instructions on the label. Extension agents can provide up-to-date information on recommended herbicides.

Fertilizer

In the planting year, a suitable soluble fertilizer such as 9-45-15 is applied as a liquid just after the plants are set. An application of dry fertilizer is spread later in the summer. Thereafter, fertilizer is applied once each year. In the past, Alaska growers commonly have utilized 8-32-16 as a fertilizer for strawberry plants. It has a low nitrogen content, however, and may be better suited to berry production than to plant production. A more suitable fertilizer for plant production may be 10-20-20; its higher nitrogen content stimulates runner production. Extension agents can provide additional information on recommended fertilizers.

Plants

Strawberry plants are set by hand 12 inches apart in rows six feet apart. This arrangement results in approximately 1,750 parent plants per one-quarter acre. At least two runner plants from each original plant will be allowed to root in order for the beds to become established. It is assumed that in the second and succeeding years the bed will have expanded to 5,250 parent plants (per one-quarter acre) and that Alaska varieties, costing an average of \$.20 per plant, will be used. [If more than one variety is planted, care must be taken to allow ample

space between them to prevent crossbreeding and intermingling of runners. Varieties may be set into distinct plots, separated by at least five to six feet.]

Irrigation

Due to the limited scale of strawberry plant production, a solid-set irrigation system may be too expensive. Therefore, it is assumed that hoses and sprinklers will be used for irrigation, and that water will be drawn from a nearby well or other source.

Cultivation

Beds are cultivated four times yearly. Aisles between the beds are rototilled three additional times each year. Frequency of cultivation is related to effectiveness of the herbicide used. Extra care should be taken during cultivation to secure the runners so that root growth may take place.

Harvest and Yields

Plants are harvested by hand in the fall at a rate of approximately 500 plants per hour. As they are harvested, the plants are sorted and packed into plastic bags in the field. Only those runners that have rooted into the soil may be harvested. Although Alaska has no grading requirements for strawberry plants, the American Association of Nurserymen recommends that runner plants have at least 10 main roots (not less than three inches long), and a minimum crown diameter of five-sixteenth inch measured at the base.²

An "average" yield for Alaska varieties is difficult to determine, as yields vary significantly and well-documented data is scarce. Research reports indicate that yields may be as high as 25 offspring per plant (1:25) for prolific plants

²"American Standards for Nursery Stock," American Association of Nurserymen, 230 Southern Building, Washington, D.C., p. 24, (October 27, 1980).

such as 'Pioneer'. Producers, however, report yields of 1:10, 1:15, or 1:20. Observations taken on August 30, 1982, at the State of Alaska Plant Materials Center indicate that yields of rooted runners may be lower, particularly during the year of planting. Some varieties produce numerous runners, many of which are inadequately rooted. Others produce fewer well-rooted runners. The number of runners rooted depends upon how well they are secured in the soil.

Conservative estimates were used in this analysis. It is assumed that there is no harvest in the planting year in order to allow the beds to expand and become established. A yield of three plants per parent plant in the first year results in a harvest of 15,750 plants in the second year. Full production is reached in the third year with yields of five plants per parent plant and a harvest of 26,250 plants (Table 13 on page 28).

Storage

Plants are packed unpotted and without soil (bare root) in plastic bags at harvest and stored in a cool, dry area such as a root cellar. The plants are kept slightly moist at steady cool temperatures. Storage losses are estimated at 5 percent. Although growers in the lower 48 states usually pack the plants in flats and store them in refrigerated units, these items may be too costly for the small-scale operation shown in this analysis.

Mulch

Most strawberry plant varieties must be mulched in order to survive Alaska's harsh winters. It is assumed that a straw mulch approximately 5 inches to 6 inches thick is applied after the plants become dormant in the fall (usually late September or early October). Approximately 10 bales of straw are required to mulch one-quarter acre. Clean mulch should be used to minimize potential weed problems.

Marketing

In the spring the stored plants are re-sorted to remove any damaged plants and to again check for quality. Although plants may be individually potted at this time, it is assumed in this analysis that they are sold unpotted and without soil. The plants can then be marketed in early May.

INCOME ESTIMATES

Three alternative levels of income have been calculated assuming yields discussed previously. At \$.3980 per plant (the average retail price of plants produced in Alaska), gross income is estimated at \$5,955 in the third year and \$9,925 in each subsequent year. At \$.1900 per plant (the average wholesale price of plants produced in Alaska), gross income will be \$2,843 in the third year and \$4,738 in each successive year. Gross income would total \$1,703 in the third year and \$2,838 in each subsequent year at a competitive wholesale price of \$.1138 per plant (the estimated average wholesale price of imported plants). (See Table 13.)

TABLE 13
STRAWBERRY PLANT PRODUCTION ANALYSIS^a
ESTIMATED YIELDS AND INCOME POSSIBILITIES
FIRST FIVE YEARS

Fiscal Year, Jan. 1 to Dec. 31	1	2	3	4	5
Yields:					
No. of Parent Plants	1,750	5,250	5,250	5,250	5,250
Previous Year's Fall Harvest ^b	--	--	15,750	26,250	26,250
Less: 5% storage loss	--	--	788	1,313	1,313
Total Marketable Plants	--	--	14,962	24,937	24,937
Possible Gross Income:					
Retail Price, \$.3980 per plant	--	--	\$5,955	\$9,925	\$9,925
Wholesale Price, \$.1900 per plant	--	--	2,843	4,738	4,738
Wholesale Price, \$.1138 per plant	--	--	1,703	2,838	2,838

^a Analysis is for a one-quarter acre operation.

^b Plants are harvested in the fall and marketed the following spring. No plants are harvested in the planting year. Yields are estimated to be 1:3 in the second year and 1:5 in the third through the fifth years.

CAPITAL AND OPERATING COSTS, FIRST FIVE YEARS

Capital costs include expenditures for land and equipment, initial preparation of the land, and planting. All other items are shown as operating costs in the year that they occur.

Prices for equipment and materials were determined from average price quotes received from sources in the Anchorage area and Matanuska-Susitna Borough. Prices for herbicide fertilizer were determined for brands and mixes commonly used and recommended in Alaska. The estimated number of hours for labor was based on information received from local producers. The rate of pay for manual labor is assumed to be \$5 per hour. Persons responsible for market development and marketing activities generally require greater compensation. It is assumed that marketing costs in the third year will be \$600 (40 hours at \$15 per hour).

The total for capital costs in the first year is estimated at \$1,982 (Table 14). This figure includes \$1,832 for purchase of land and equipment, preparation of the land, and labor (\$150).

The total for first-year operating costs is estimated at \$332, which allows \$87 for materials and miscellaneous expenses, and \$245 for labor (Table 15). The total for operating costs in the second year is estimated to be \$647, with \$117 for materials and miscellaneous expenses and \$530 for labor. In each of the following years, expenses for materials and miscellaneous items are \$117, and charges for labor are \$1,315; the total for operating costs is \$1,432 (Table 15). All figures are per one-quarter acre.

TABLE 14
 STRAWBERRY PLANT PRODUCTION ANALYSIS^a
 CAPITAL COSTS: FIRST YEAR

<u>Land and Equipment:</u>	
Land	\$750
Rototiller	400
Hand Sprayer for Herbicide	150
Hand Broadcaster for Fertilizer	40
Shovels (Three @ \$20.00)	60
Pitchforks (Two @ \$20.00)	40
Hoes (Three @ \$8.00)	<u>24</u>
Subtotal	\$1,464
<u>Land Preparation:</u>	
Herbicide, one application	\$ 6
Fertilizer, one application	12
Plants (1,750 @ \$.20)	<u>350</u>
Subtotal	<u>368</u>
TOTAL CAPITAL COSTS, LABOR OMITTED	\$1,832
<u>Labor Hours:</u>	
Rototilling (eight hours @ \$5)	\$ 40
Herbicide, one application (three hours @ \$5)	15
Fertilizer, one application (three hours @ \$5)	15
Planting, 1,750 plants (16 hours @ \$5)	<u>80</u>
Subtotal	<u>150</u>
TOTAL CAPITAL COSTS, LABOR INCLUDED	\$1,982

^a Analysis for one-quarter acre.

TABLE 15
 STRAWBERRY PLANT PRODUCTION ANALYSIS^a
 ANNUAL OPERATING COSTS: FIRST FIVE YEARS

	Year 1		Year 2		Year 3		Year 4		Year 5		
	\$		\$		\$		\$		\$		
<u>Materials, Miscellaneous Expenses:</u>											
Herbicide	\$ 5		\$ 22		\$ 22		\$ 22		\$ 22		
Fertilizer	13		26		26		26		26		
Mulch	60		60		60		60		60		
Annual Insurance Payment	5		5		5		5		5		
Taxes	4		4		4		4		4		
TOTAL OPERATING COSTS, LABOR OMITTED											
\$87 \$117 \$117 \$117 \$117											
<u>Labor:</u>	(Wage per Hour)		Hrs.	\$	Hrs.	\$	Hrs.	\$	Hrs.	\$	
Spring Re-sorting	(\$ 5)						16	\$ 80	16	\$ 80	
Marketing	(15)						40	600	40	600	
Mulch Removal	(5)			4	\$ 20	4	20	4	20	4	20
Herbicide	(5)		3	\$ 15	6	30	6	30	6	30	
Fertilizer	(5)		2	10	2	10	2	10	2	10	
Irrigation	(5)		10	50	10	50	10	50	10	50	
Hand Cultivation	(5)		24	120	32	160	32	160	32	160	
Rototilling	(5)		6	30	6	30	6	30	6	30	
Harvest, Sort, & Pack	(5)				32	160	53	265	53	265	
Winter Care	(5)				10	50	10	50	10	50	
Mulch	(5)		4	20	4	20	4	20	4	20	
Subtotal											
49 \$245 106 \$530 183 \$1,315 183 \$1,315 183 \$1,315											
TOTAL OPERATING COSTS, LABOR INCLUDED											
\$332 \$647 \$1,432 \$1,432 \$1,432											

^a Analysis is for a one-quarter acre operation.

PRO FORMA CASH FLOW ANALYSES

Alaska's strawberry plant producers use a range of operating and marketing techniques. An analysis of all possible operations is beyond the scope of this report. A pro forma cash flow analysis has been developed for three scenarios:

- Retail sales
- Wholesale sales
- Competitive wholesale sales

Each scenario is based on a different price as described on page __ and in Table 13. These three situations are intended to be a guide only, and the reader is advised to adjust the analysis to conform to his or her particular circumstances. The figures used in the following cash flow analyses have been drawn from Tables 13, 14, and 15 and from the market survey. Costs of production for each situation are assumed to be identical; revenue projections vary with the marketing arrangement. Cash flows with the cost for labor omitted may be used by those producers who do not hire manual laborers. If the cost for labor is excluded, it is assumed that the owner-producer will accept returns from the enterprise as payment for his or her labor, management, and marketing activities.

Retail Sales

Table 16 summarizes the cash flow over five years for a producer selling plants retail. It is assumed that all strawberry plants produced will be sold directly to the consumer at a retail price of \$3.980 per plant. The plants may be sold by a retail nursery or garden shop operated by the grower. It would be difficult to sell the estimated 25,000 plants produced on one-quarter acre at retail prices without a business devoted to sales. Growers who sell plants to consumers on an informal basis from their residences commonly experience sporadic and low-volume sales. The additional costs associated with operating a retail outlet are not included in this analysis. These costs may be significant, however, and should be evaluated before embarking on such an enterprise.

The first part of Table 16 shows estimated cash flow if the cost for labor is omitted. The cash flow is negative during the first two years because initial revenues are not received until the spring of the third year. With the cost for labor omitted, the net cash flow is \$5,763 in the third year and \$9,733 in the fourth year. The producer's investment of \$1,982 is fully recovered in the third year. The five-year cumulative net cash flow is \$23,043. When full production is reached, estimated annual cost per plant is \$.008, and the annual net cash flow per plant is \$.39.

With the costs for labor included, net cash flow becomes \$4,448 in the third year and \$8,418 in the fourth year. The five-year cumulative net cash flow is \$18,173. At full production, the estimated annual cost per plant produced is \$.06, and the net cash flow per plant is \$.338.

Wholesale Sales

The analysis of a wholesale operation in Table 17 is based on the assumption that all strawberry plants are sold to retail outlets. Revenues are estimated based on the price of \$.19 per plant, the average wholesale price for Alaska plants (Tables 6 and 13).

With the cost for labor omitted, the producer's investment is fully recovered in the third year with a cumulative cash flow of \$465. The net cash flow also becomes positive in the third year with an estimated \$2,651 (Table 17). The five-year cumulative net cash flow is \$9,557. At full production, the net cash flow per plant is \$.182, and the total cost per plant is \$.008.

The producer's investment is not fully recovered until the fourth year if the cost for labor is included. The annual net cash flow becomes positive in the third year at \$1,336, increasing to \$3,231 in the fourth year. The five-year cumulative net cash flow is \$4,687. At full production, the cost per plant is \$.06, and the net cash flow is \$.13 per plant.

TABLE 16
 STRAWBERRY PLANT PRODUCTION ANALYSIS
PRO FORMA CASH FLOW ANALYSIS:
 RETAIL OPERATION^a

Fiscal Year, Jan. 1 to Dec. 31	1	2	3	4	5
Number of Marketable Plants	--	--	14,964	24,937	24,937
Labor Costs Omitted:					
Gross Revenues ^b	\$ --	\$ --	\$5,955	\$9,925	\$9,925
Less: Operating Costs ^c	87	117	117	117	117
Capital Costs ^d	1,832				
Annual Land Payment (Principal + Int.)	<u>75</u>	<u>75</u>	<u>75</u>	<u>75</u>	<u>75</u>
Net Cash Flow	- 1,994	- 192	<u>5,763</u>	<u>9,733</u>	<u>9,733</u>
Cumulative Cash Flow	- 1,994	- 2,186	3,577	13,310	23,043
Net Cash Flow Per Plant at Full Production				.390	.390
Total Cost Per Plant at Full Production				.008	.008
Labor Costs Included:					
Gross Revenues ^b	\$ --	\$ --	\$5,955	\$9,925	\$9,925
Less: Operating Costs ^c	332	647	1,432	1,432	1,432
Capital Costs ^d	1,982				
Annual Land Payment (Principal + Int.)	<u>75</u>	<u>75</u>	<u>75</u>	<u>75</u>	<u>75</u>
Net Cash Flow	- 2,389	- 722	<u>4,448</u>	<u>8,418</u>	<u>8,418</u>
Cumulative Cash Flow	- 2,389	- 3,111	1,337	9,755	18,173
Net Cash Flow Per Plant at Full Production				.338	.338
Total Cost Per Plant at Full Production				.060	.060

^a Revenues based upon a price level of \$.3980 per plant. Additional costs are not included. Analysis is for a one-quarter acre operation.

^b See Table 13.

^c See Table 15

^d See Table 14

TABLE 17
 STRAWBERRY PLANT PRODUCTION ANALYSIS
PRO FORMA CASH FLOW ANALYSIS:
 WHOLESALE OPERATION^a

Fiscal Year, Jan. 1 to Dec. 31	1	2	3	4	5
Number of Marketable Plants	--	--	14,962	24,937	24,937
<u>Labor Costs Omitted:</u>					
Gross Revenues ^b	\$ --	\$ --	\$2,843	\$4,738	\$4,738
Less: Operating Costs ^c	87	117	117	117	117
Capital Costs ^d	1,832				
Annual Land Payment (Principal + Interest)	<u>75</u>	<u>75</u>	<u>75</u>	<u>75</u>	<u>75</u>
Net Cash Flow	<u>-1,994</u>	<u>- 192</u>	<u>2,651</u>	<u>4,546</u>	<u>4,546</u>
Cumulative Cash Flow	-1,994	-2,186	465	5,011	9,557
Net Cash Flow Per Plant at Full Production				.182	.182
Total Cost Per Plant at Full Production				.008	.008
<u>Labor Costs Included:</u>					
Gross Revenues ^b	\$ --	\$ --	\$2,843	\$4,738	\$4,738
Less: Operating Costs ^c	\$ 332	\$ 647	1,432	1,432	1,432
Capital Costs ^d	1,982				
Annual Land Payment (Principal + Interest)	<u>75</u>	<u>75</u>	<u>75</u>	<u>75</u>	<u>75</u>
Net Cash Flow	<u>- 2,389</u>	<u>- 722</u>	<u>1,336</u>	<u>3,231</u>	<u>3,231</u>
Cumulative Cash Flow	- 2,389	-3,111	-1,775	1,456	4,687
Net Cash Flow Per Plant at Full Production				.130	.130
Total Cost Per Plant at Full Production				.060	.060

^a Revenues based upon a price level of \$.1900 per plant.
 Analysis is for a one-quarter operation.

^b See Table 13.

^c See Table 15.

^d See Table 14.

Competitive Wholesale Sales

Table 18 illustrates a competitive wholesale operation. It is assumed that this hypothetical operation sells all of its strawberry plants at a wholesale price competitive with that of imported plants. As shown in Table 6, the mean total cost for imported plants was determined to be \$.1138, including transportation charges. Gross revenues resulting from this price would be \$1,703 in the third year and \$2,838 in the fourth year.

The net cash flow becomes positive in the third year at \$1,511, increasing to \$2,646 in the fourth year. Omitting the cost for labor, the producer's investment would be fully recovered in the fourth year with a cumulative net cash flow of \$1,971. After full production is reached, the total cost per plant is \$.008, and the net cash flow per plant is \$.106.

If the cost of labor is included, the cumulative net cash flow will not become positive until the sixth year. The net cash flow is \$196 in the third year and \$1,331 in the fourth and subsequent years. The five-year cumulative net cash flow is -\$253. The total cost per plant is \$.06, and the net cash flow per plant is \$.053 in the fourth and subsequent years.

PRESENT VALUE ANALYSIS AND INTERNAL RATE OF RETURN

To assist in the evaluation of the feasibility of strawberry plant production, net present value and internal rate of return have been calculated for each scenario (Table 19). The concept of net present value enables the producer to compare a project with alternative opportunities. For example, at an interest rate of 10 percent, the net present value of the retail strawberry plant operation (labor omitted) shown in Table 16 is \$15,050 (Table 19). This present value analysis shows that the grower could produce strawberry plants for five years, or could invest \$15,050 at an interest rate of 10 percent in a bank or other institution for five years and receive the same return.

TABLE 18
 STRAWBERRY PLANT PRODUCTION ANALYSIS
 PRO FORMA CASH FLOW ANALYSIS:
 COMPETITIVE WHOLESALE OPERATION^a

Fiscal Year, Jan. 1 to Dec. 31	1	2	3	4	5
Number of Marketable Plants	--	--	14,962	24,937	24,937
<u>Labor Costs Omitted:</u>					
Gross Revenues ^b	\$ --	\$ --	\$1,703	\$2,838	\$2,838
Less: Operating Costs ^c	87	117	117	117	117
Capital Costs ^d	1,832				
Annual Land Payment (Principal + Int.)	75	75	75	75	75
Net Cash Flow	- 1,994	- 192	1,511	2,646	2,646
Cumulative Cash Flow	- 1,994	-2,186	-\$ 675	\$1,971	\$4,617
Net Cash Flow Per Plant at Full Production				.106	.106
Total Cost Per Plant at Full Production				.008	.008
<u>Labor Costs Included:</u>					
Gross Revenues ^b	\$ --	\$ --	\$1,703	\$2,838	\$2,838
Less: Operating Costs ^c	332	647	1,432	1,432	1,432
Capital Costs ^d	1,982				
Annual Land Payment (Principal + Int.)	75	75	75	75	75
Net Cash Flow	- 2,389	- 722	196	1,331	1,331
Cumulative Cash Flow	- 2,389	-3,111	-2,915	-1,584	- 253
Net Cash Flow Per Plant at Full Production				.053	.053
Total Cost Per Plant at Full Production				.060	.060

^a Revenues based upon a level of \$.1138 per plant. Analysis is for a one-quarter acre operation.

^b See Table 13.

^c See Table 15.

^d See Table 14.

If the interest rate is 15 percent, the net present value of this retail operation is only \$12,314. (As the interest rate increases, less money has to be invested to result in an equivalent return.) A producer should evaluate other investment opportunities before deciding if strawberry plant production will meet his or her investment criteria.

The internal rate of return (IRR) for a project is the rate (similar to an interest rate) at which the net present value of a series of cash flows is equal to zero. It is the rate of return earned on a (dollar) investment.

The internal rate of return for the retail operation presented in this analysis, excluding the cost of labor, is 138 percent (Table 19). If the cost of labor is included, the internal rate of return becomes 98 percent. As previously stated, costs associated with a formal retail nursery outlet are not included in this analysis. These costs need to be evaluated by the entrepreneur because they will lower the rate of return and net present value.

A wholesale operation with the cost of labor omitted has an internal rate of return of 78 percent. The net present value is \$5,948 at 10 percent and \$4,723 at 15 percent. Once the cost of labor is included in the calculation, the internal rate of return drops to 37 percent; net present value is \$2,448 at 10 percent and \$1,709 at 15 percent.

For a competitive wholesale operation, the internal rate of return is 46 percent if the cost of labor is excluded. The net present value is \$2,614 at 10 percent and \$1,943 at 15 percent. This operation becomes unattractive when labor costs are considered. The internal rate of return drops to -3 percent, and net present value becomes -\$886 at 10 percent and -\$1,072 at 15 percent.

TABLE 19
 STRAWBERRY PLANT PRODUCTION ANALYSIS
 INTERNAL RATE OF RETURN AND NET PRESENT VALUE:
 FIRST FIVE YEARS^a

	RETAIL		WHOLESALE		COMPETITIVE WHOLESALE	
	Labor Omitted	Labor Included	Labor Omitted	Labor Included	Labor Omitted	Labor Included
Internal Rate of Return(%)	137	98	78	37	46	-3
Net Present Value at:						
10%	\$15,050	\$11,550	\$ 5,948	\$ 2,448	\$ 2,614	-\$ 886
15%	\$12,314	\$ 9,300	\$ 4,723	\$ 1,709	\$ 1,943	-\$1,072

^a Analysis is for a one-quarter acre operation.

III. CONCLUSIONS AND RECOMMENDATIONS

Although Alaska's strawberry plant producers face many problems at this time, they can look forward to increased opportunities in the future. The market survey included with this report indicates that sales of strawberry plants originating in Alaska constituted only 30 percent of total sales. It also indicated that Alaska strawberry plant sales might dramatically increase if plants were available as early in the season as imported plants and if they were competitively priced.

Improved management practices would help to lower production costs. In most cases producers can expect to harvest more than the three rooted runners per parent plant assumed in this report during the year following planting. With continuous attention to cultural activities, yields may increase significantly. In order to maintain high-quality, disease-free stock, beds should be totally replanted every five years. Although not specifically discussed in this report, beds should be renovated in alternate years so that maximum production is achieved.

Aggressive marketing activities by the grower are needed to ensure success. Market opportunities appear to be better for plants harvested in the fall and stored over the winter in order to compete for early season sales. The consumer should be educated about the advantages of Alaska varieties for Alaska conditions. Grading and quality control of strawberry plants sold in Alaska might be needed. Growers should contact potential wholesale buyers very early in the year.

In general, small-scale strawberry plant production in Alaska appears to be feasible. The economics of a larger operation, which would be different, were not studied in this report. If Alaska growers increase production of high-quality plants and offer them at a time and price competitive with imported varieties, they should gain a significant share of the strawberry plant market in this state.

IV. REFERENCES

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V. APPENDICES

COMMENTS FROM SURVEY RESPONDENTS

General:

We would be happy to sell Alaska strawberries [plants] if we could get them bare root [by] approximately May 1. We could pot them up - a dozen per pot - force some foliage, and be ready for sale [by] May 20. In the past, Alaska strawberries (plants) were brought to us in clumps of soil [at too high a price] and too late in the season for prime time sales. The size grading was very poor. We need uniform size.

Any surveys based on this year's sales of Alaska plants cannot be typical or accurate. This last winter did much damage to strawberries and raspberries. There would have been no sales this spring if I hadn't dug them last fall and stored them over winter for spring sale. Fall digging [and winter storage] makes it possible for Alaska strawberry plants to be sold as early [in the spring] as Outside kinds.

Most production is for fruit, not plants. [I am experimenting with] varieties at this time as the Department of Agriculture and the University have done no research in my area. I am trying 'Quinalt', 'Sitka', 'Pioneer', 'Toklat', 'Matared', and 'Mt. Hood'.

Thanks for mailing this questionnaire on strawberries. We are currently developing a farm and have a real vision of developing a market for Alaska berries. We now have the four top varieties of Alaska strawberries and Kiska, the Alaska raspberry. We plan to begin selling plants in 1983 along with the fruit. Our goal is to sell the Alaska plants along with the fruit. We are also experimenting with 'Quinalts', a California strawberry, growing them for fruit production under clear plastic.

Very little demand for strawberry plants, too many get them from their friends.

All the plants we started last year died off. We want to get into strawberry plant production and will start again as soon as we can get plants to start with.

In our observation, strawberry plants weren't in demand; therefore, we will not carry them for the 1983 season.

Late Season Demand for Strawberry Plants:

By the time our city customers plant their early garden, the fishing season has started -- no more working on planting for that year.

Most people prefer getting them in early. [Only] a very small percent [of them] plant late and then only because they had to wait for their topsoil or whatever before planting.

Little desire voiced by customers; many plants had to be discarded after the initial rush.

Such demands at our nursery are minimal.

No present late demand -- if information were made available as to availability and feasibility of late planting with appropriate pricing, an interest might be developed.

We need publicity to sell as [successfully in the late season as] early in the season.

It really depends on the year.

[There is a] very small demand after July.

[Late season strawberry plants may be used as a] ground cover.

During the last five years, I have sold very few plants after the second week of June.

1982 STRAWBERRY PLANT SURVEY

The Division of Agriculture is compiling information on existing and potential Alaskan markets for Alaskan varieties of strawberry plants. The purpose of this survey is to supply that information.

Please complete the survey and return it in the enclosed, stamped envelope. All information supplied will be kept strictly confidential. It will be used only to determine totals of historical and potential demand for Alaskan strawberry plants. We urge you to carefully respond to all questions, an each item is necessary for the completion of an accurate and valid report. Thank you for your cooperation.

KATIE EBERHART, Development Specialist

NICK CARNEY, Director

- 1) Do you grow strawberry plants for subsequent commercial sale? yes _____ no _____
 If yes, what percent do you sell direct to the consumer? _____ % to retail outlets? _____ %
- 2) What varieties of strawberry plants did you sell in 1981? Variety _____ Number _____ State of Origin _____
 Please specify the number of plants sold by variety and state of origin.
- 3) Were your 1981 strawberry plant sales an increase or decrease from your 1980 sales? _____
 The estimated percentage change in sales was _____ %.
- 4) Do you expect an increase or a decrease in strawberry plant sales in 1982? _____ 1983? _____. Please estimate the approximate percentage change in sales which you anticipate for 1982 _____ % 1983 _____ %.

Please refer to your 1981 strawberry plant sales for questions 5-8.

- | | <u>Imported Varieties</u> | <u>Alaskan Varieties</u> |
|--|--|---|
| 5) What was the average purchase price per plant? | \$ _____ | \$ _____ |
| 6) What was the average selling price per plant? | \$ _____ | \$ _____ |
| 7) What percentage of imported plants were damaged in delivery? _____ %
What percentage of Alaskan plants were damaged in delivery? _____ % | | |
| 8) Please show the approximate proportion of your total annual strawberry plant sales which occurred in each month specified. | Mar _____ % Apr _____ % May _____ %
June _____ % July _____ % Aug _____ % | |
| 9) If Alaskan strawberry plants were available at a competitive price as early in the season as imported plants, approximately what proportion of Alaskan plants might you purchase for subsequent resale? | None _____
41-70% _____ | (please check one)
10-30% _____
71-100% _____ |
| 10) Do you believe that there is a late season demand for strawberry plants?
Comments: _____ | yes _____ no _____ | |

- 11) Would you purchase Alaskan strawberry plants to fill a late season demand for strawberry plants? (Please answer yes or no to each response.)
 *at competitive prices? _____
 *at discounted prices? _____
 *at premium prices? _____
- 12) If you wish to comment, please do so on the back of the page.
- 13) Do you wish to receive a summary of the survey results? yes _____ no _____

Reported by: _____ Firm: _____ Date: _____