The peony cultivar 'Kansas.' — Photo courtesy of the Georgeson Botanical Garden.

Production and Transportation Considerations in the Export of Peonies from Fairbanks, Alaska

A Senior Thesis

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Abstract

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Peonies are grown and harvested as a marketable cut flower worldwide. They are commercially available throughout the seasons, except for July and August. However, this is a time when they bloom in Fairbanks, Alaska. This paper examines the potential of developing peonies as a cut flower industry in this region. Specific considerations of production and transportation and the feasibility of such a venture are addressed. Methods include interviews with persons involved in the industry as well as extensive Internet research. A cost analysis table was constructed to consider potential profitability. Developing peonies as a cut flower industry in Fairbanks, Alaska is promising. However, this study serves as only a guide. Potential growers need to conduct their own research and adapt these results to their own individual circumstances.

Pink single blossoms of the domestic peony called Sea Shell. —Georgeson Botanical Garden Collection, 2001.

Introduction

There are more than 3,000 cultivars and 30 species of peonies. This aesthetically pleasing flowering plant has been known and admired for more than 10,000 years (Rogers 1995). The Chinese gave it the name “Sho Yo,” meaning most beautiful, and they honored it as the main flower in the Imperial Palace Gardens (Kansas State University 1993). They have also used it as a component of herbal medicinal remedies (Rogers 1995). In the eighth century the Japanese developed more than 300 cultivars (KSU 1993). The popularity of peonies spread to Europe and eventually to North America, where its hardiness enabled it to make the journey across the continent with those settling the west. In the years following World War II, refrigeration in the trucking industry made it possible to transport not only peonies, but also flowers that were not as hardy as the peony. Flower varieties

that previously would not have survived the overland trip competed with the peony for popularity.

Today the peony is experiencing a renewed popularity. According to Yanni Mayesh, a cut flower retailer and wholesaler in California, the flower has wide appeal, although it is particularly popular with higher income consumers (Personal communication 2001). He sells them as a high-end flower to estates and Hollywood set productions. However, they are also used in general flower arrangements, weddings, and as a cemetery flower on Memorial Day (KSU 1993).

Peony Bud. AFES photo by Deirdre Helfferich.

Peonies are perennial. They grow in temperate climates and bloom at various times. Bloom times vary depending on climatic conditions. The bloom period occurs from October in New Zealand and Australia, to early July in California (Mayesh personal communication 2001). This leaves most of July and August as a time period when there are no commercially grown peonies available for sale. However, peonies bloom in Alaska in July and August (Holloway personal communication 2001). This could mean that Alaska has the potential for filling a market niche by supplying existing markets with peonies when alternative supply sources are unavailable. Alaska-grown Alaskan-grown peonies could capture a higher price since peonies are not in season anywhere else in the world in July and August. In an initial investigation, Holloway and Lewis of the University of Alaska Fairbanks determined that at $1.60 per stem, an acre of peonies could gross $250,000 (personal communication 2001). These determinations ultimately led to their presenting the “New Crop Opportunities Proposal” to the Cooperative State Research, Education, and Extension Service, to consider the economic feasibility of producing and marketing peonies (Holloway and Lewis 2000). This proposal involves researching the horticultural requirements of peonies, analyzing the market, and determining the associated costs and returns of peonies as a cut flower industry.

The objective of this study is to determine potential cost and returns to Alaska peony growers, as well as to identify market considerations that would either benefit or hinder the success of such a venture. It is not intended to be the definitive answer as to the feasibility, but to serve as a guide for the potential grower for making his or her own determinations. This study addresses consumer preferences, growing characteristics, post-harvest care, marketing, transportation, and production costs. This study addresses each consideration and highlights major findings. Study results will be directly applicable to peony production and can also be adapted to other Alaska cut flowers that may show market potential.

Literature Review

Literature on cut flower production and marketability includes information that is applicable to peonies. North Dakota State University has investigated dried and cut flowers for commercial development that can be produced outdoors in North Dakota (Sell 1993). Sell highlights some characteristics of flowers that are ideal for a market-bound cut flower. These include high value, high production and productivity, resistance to disease and

pests, stem length of at least 46 cm, and vase life of at least seven days. In addition, a flower's potential worth increases if it can be marketed as both fresh cut and dried. While the focus of this research has been on the peony as a cut flower, Sell's work indicates that there may be a potential for the peony as a dried floral as well. He indicates that peonies are "among the choicest of fresh and dried flowers" and that the "demand currently exceeds supply for both fresh and dried flowers."

Another invaluable source to this research is "The Economics of Producing Cut Flowers Outdoors" by Robin Brumfield (1998). Brumfield discusses the costs of machinery, irrigation equipment, and labor for production of cut flowers. Some of the figures for field operations were derived from studies conducted by Dhillon and Latimer in 1986 on the outdoor production of vegetables since many of the procedures are similar. He points out that the figures reflect typical estimated costs and do not take into consideration unique circumstances due to factors such as location or managerial style.

The Cooperative Extension Service at Kansas State University has also conducted research on peonies for commercial production, and discusses soil, planting, and fertilizer requirements (KSU 1993). Cultivars are identified that possess qualities that would enhance their marketability, such as plant vigor, ample stem production, and ability to withstand shipping. These cultivars include red, white, and pink varieties—among the most popular is the red Shawnee Chief, the pink Sara Bernhardt, and the white Festiva Maxima. In addition, yields and post-harvest care are addressed. While a plant may produce 36–50 flower stems five years after planting, they advise that no more than one half of these be removed in order to maintain the health and vigor of the plant. They recommend that flowers not be immediately placed in water after harvesting, but to wait twenty minutes in order to avoid premature bud opening.

Allan M. Armitage, in a book about the commercial production of annual and perennial plants, includes topics such as the post-harvest care of cut flowers. One of the most critical aspects of handling the cut stem is cooling. Flowers that are not cooled lose water, stored food, and ultimately have a shorter vase life (Armitage 1993). He states, "Growing cut flowers without a cooler is like having a restaurant without a kitchen." He emphasizes that stems must not only be rapidly cooled, but these cool temperatures must be maintained throughout the marketing process. An ideal packing situation would require that flowers be packed in a cool building. Forced-air cooling is helpful because deterioration occurs quickly, and even if flowers are stacked in refrigerated vans without prior cooling, they will never reach recommended temperatures (Armitage 1993).

In *The International Cut Flower Manual*, by Jeremey Pertwee (2000), cut flowers that have been marketed through the Dutch auctions are highlighted. The three main peony hybrids are the Sara Bernhardt, the Duchess de Nemurs, and the Dr. Alexander Fleming (Pertwee 2000). Nearly all of the trading activity occurs in May and June. The Sara Bernhardt in May captured about 50% of the total Dutch auction sales. These sales are most likely due to the timing of blooming of the Sara Bernhardt with the wedding season. 1999 prices were highest in April at 1.32 Euros (1.16 US Dollars) per stem as compared to .86 (.75 USD) and .48 (.42 USD) Euros per stem paid in May and June respectively (Pertwee 2000). While peonies are popular, and out of season flowers capture higher prices, it is difficult to predict whether this would hold true if they were available year round.

Methods

Methods involved reviewing available literature on the cut flower industry as well as telephone interviews with those in the trade. The Internet was also used as a tool in locating sources and costs of growing supplies. This research was conducted in an attempt to determine the following:

1. Consumer and buyer preferences
- a. Market applications
- b. Colors and varieties
- c. Stem length

2. Growing characteristics
- a. Spacing requirements
- b. Blooming period
- c. Yield
- d. Longevity

3. Post harvest care
- a. Storage methods
- b. Storage life

4. Marketing
- a. Grading standards
- b. Packaging methods
- c. Pricing

5. Transportation
- a. Domestic/international carriers
- b. Regulations and restrictions
- c. Freight charges

6. Production costs
- a. Peony bed establishment
- b. Machinery and equipment
- c. Packaging
- d. Labor

The peony 'Charm.' —Georgeson Botanical Garden Collection.

A table was constructed of a cash flow analysis for a one-acre drip-irrigated peony bed and was also prepared on a Microsoft Excel spreadsheet. This includes anticipated stem yield, price per stem, total income per acre and expenses. Expenses were determined based on the assumption that the one-acre plot has already been cleared and is ready for planting. The table was divided into five years. The fifth year represents an annual figure that may occur for the next 10-25 years. This range exists because of the variability of current research on plant productivity. For instance Pertwee (2000) claims that production will last for ten years, while KSU (1993) claims that productivity can last more than twenty-five years. Gross income and total expenses are also recorded as ranges due to the variability in prices paid per stem and the differences in the cost of peony crowns.

Results and Discussion

The research results were organized into the following considerations: field performance, production yields, consumer preferences, post-harvest care, packaging and transportation, and cash flow. They reflect possibilities that the prospective grower can use as a framework in designing their own business plan. Situations vary between growers, and it will be necessary for the individual grower to adjust these tables to fit their own circumstances.

Field Performance

Field performance for peonies (Table 1) provides an indication of the performance that a grower could expect from their peonies. Spacing requirements vary. While some sources indicate a wider spacing requirement such as 3 plants per square meter (Pertwee 2000), a tighter spacing was chosen for this study. The spacing would allow for nearly three times this amount. The spacing requirements are based on current spacing practices on farms in Oregon and are also being used in field trials at the University of Alaska Fairbanks. Armitage cautions that spacing plants closer than 61cm x 61cm could reduce their longevity (1993).

Table 1. Peony Field Performance

Item	
Spacing	46 cm, double rows, 25 cm apart
Blooming period	July and August in Alaska
Harvest period	4th year after planting
Peak productivity	5th year after planting
Plant longevity	10-25 years

Peonies can be expected to produce blossoms four years after planting (KSU 1993). Peak production occurs after five years and can continue for 10 to 25 years (KSU 1993, Pertwee 2000). This range makes it difficult to accurately predict plant productivity, and growers need to acknowledge this in the planning stages. In addition, the longevity of peonies grown commercially in Alaska has not been determined. However, the tighter spacing could indicate that plant longevity would be at the lower end of the predicted 10-25 year estimate. As noted, peonies bloom in Alaska in July and August, and according to Mayesh Wholesale and Retail in California, this presents a window of opportunity since supply is unavailable elsewhere at this time.

Plant Yield and Expected Revenue

Plant yields based on the International Cut Flower Manual's (Pertwee 2000) harvestable stems per plant of 10 are shown in Table 2. It is indicated in the manual that harvesting more than this amount may adversely affect subsequent harvests.

Prices vary according to quality and time of year. Mayesh (2001) has indicated ranges in 1999 from .75 cents to $4.00 per stem. Alaskan producers could receive a price premium due to the absence of alternative supply sources. Applying the reported prices to the predicted yield of 10 stems per plant and 100,000 stems per acre results in potential gross revenue between $75,000 and $400,000. A note of caution is warranted in reviewing this return since it is unclear whether the tighter spacing will consistently yield an average of 10 stems, and for how long.

Table 2. Production Yields for a One-acre Drip-irrigated Peony Flower Bed

Item	Quantity
Plants/acre	10,000
Harvestable stems/plant	10
Harvestable stems/acre	100,000
Selling price/stem	.75-$4.00
Returns/acre	$75,000-$400,000

Unforeseen circumstances such as plant disease or frost damage may also affect yield. Snow is another consideration in the Fairbanks area. Snow provides an insulating cover for peonies, and a low snow year could damage or kill crowns. Mulching may help to offset this possibility, or even the use of an artificial snow-making machine.

Consumer Preferences

Another important aspect of this study was to identify consumer preferences (see Table 3). Corals and whites are most popular followed by light pink, dark pink, rose, and red. In addition, doubles are preferred over singles (Stimart 1988). As previously noted, the three main peony hybrids are the Sara Bernhardt, a pink double, the Duchess de Nemurs, a white double, and the pink double Dr. Alexander Fleming (Pertwee 2000). Other hybrids have also been identified that are both popular and possess qualities that may enhance their marketability. For instance, KSU has identified the white double Festiva Maxima, as one of the most popular cultivars that would be suitable for commercial production (KSU 1993). While the cut flower trade has primarily dealt with the three cultivars highlighted by the ICFM, this could indicate that other varieties possessing similar qualities would also have market potential.

Table 3. Consumer Preferences

Item	
Popular hybrids	Sara Bernhardt Duchess de Nemurs Dr. Alexander Fleming
Preferred colors	Corals and whites followed by light pink, dark pink, rose and red. Doubles most popular.
Preferred stem length	50-60 cm
Applications	Memorial Day, weddings, general floral arrangements, arrangements for estates, parties

Post-harvest Care

Another consideration that consumers and thus the grower must pay attention to is quality. This is an area that according to Mayesh is in need of improvement (Personal communication 2001). Top-quality care and handling must be provided to the flowers at every stage of production and transportation. This involves not only ensuring that the flowers are properly cooled, but protecting them from rough handling, since the cut flower is still alive and can experience shock that will ultimately affect quality (Mayesh personal communication 2001).

While these flowers are hardy, and can be stored for up to 12 weeks, fresher flowers are desired for quality (Sell 1993). In addition, according to the ICFM, storing flowers may shorten vase life (Pertwee 2000). Vase life, as reported in Table 4, ranges from 2-10 days. KSU reports a vase life of 5-10 days, while the ICFM reports 2-7 days (KSU 1993, ICFM 2000). KSU also suggests that differences in vase life can be expected between cultivars and the application of floral preservatives (KSU 1993). Stems should be placed in water approximately 20 minutes after harvesting for 1-2 hours at 5°C to prevent premature blooming, then removed, air-dried, and stored horizontally at 0° to 4° C (KSU 1993).

Table 4. Post-harvest Considerations

Post-harvest care	20 minutes after harvesting soak in water for 1-2 hours at 5°C
Storage life	4-12 weeks at 0°- 4°C
Vase life	2-10 days
Grading	
US No 1	overall length not less than 51 cm usually not less than 61 cm bud not less than 2.54 cm straight stems, no damage, fresh overall length not less than 46 cm
US No 2	usually not less than 51 cm bud not less than 2.2 cm not badly curved stems, no damage, fresh

Cooling is critical to quality. This means that field heat should be removed as soon as possible after harvesting. In addition, a cool temperature should be maintained during packing and transport. If flowers are not cooled, deterioration will take place that will affect quality. If temperatures are allowed to rise, the buds may open prematurely.

The cooling requirement could possibly addressed in several ways. A cooled service building could to be constructed. This could serve as a grading and packing facility as well as to house equipment. A refrigerated container van could also serve the purpose. However, a stack of boxes containing freshly picked flowers will not reach recommended temperatures even in a refrigerated van (Armitage 1993). A vacuum cooler though, can lower flower temperatures in about 25-40 minutes (Southern Vacuum Cooling personal communication 2001). While this would be a substantial investment, it may be worthwhile since the higher quality flowers receive higher prices.

Another post-harvest consideration involves grading. USDA standards for length and bud size are provided in Table 4. Grading may also consist of stem bunches classified as light, medium, and heavy that contain 10, 8, and 6 stems respectively (Stimart 1988). Flowers of different grades should not be mixed.

Packaging

When considering packaging (Table 5), there is not a standard box size. However, Mayesh recommends that boxes be approximately 61 cm x 76 cm x 25 cm. Boxes will hold about 20-40 bunches of flowers with 5-10 in a bunch depending on bloom size (Mayesh personal communication 2001). KSU recommends the use of No. 30 rubber bands approximately

8-10 cm from the stem bases and No. 18 rubber bands approximately 13-15 cm from the bud bases (KSU 1993). Each box should be packed tight with flower heads at either end. Wooden cleats that run across the width of the boxes and that are secured with nails or staples from the outside prevent the flowers from shifting during transit. To prevent them from tearing through the cardboard, Mayesh recommends that the staples or nails be driven through bottle caps from the outside. In addition high quality plain shredded paper should be placed between the heads to prevent them from creasing. The stems are not packed with water. Multiple small refrigerant gel packs are added to help maintain even temperatures (Mayesh personal communication 2001).

Table 5.Packaging Considerations

Item	
Stems/bunch	5-10 stems
Bunches/box	20-40
Packing method	Dry, tight with buds at either end, plain shredded paper in ends of boxes, wooden cleats to hold flowers in place, multiple gel packs

Transportation

Transportation considerations (Table 6), indicates that currently there are daily flights available to Germany and the Netherlands and twice a week to Japan from Fairbanks on Lufthansa. While there are not any restrictions for importing cut flowers to Europe, Japan requires a phytosanitary certificate issued at the port of export (USDA personal communication 2001). This is to ensure that the product is free of disease and pests. Domestic air service providers include Alaska Airlines with daily flights to destinations such as Los Angeles. The peony buyer commonly pays the freight charges (Mayesh personal communication 2001). In addition, since peonies are hardy and can be stored for

Table 6. Transportation Considerations

Item
International flights to Europe from Fairbanks: Lufthansa—daily flights to Frankfurt
International flights to Japan from Fairbanks: Lufthansa—every two days to Tokyo
Domestic flights to Los Angeles: Alaska Airlines—daily flights
Restrictions/regulations Germany: none Netherlands: none Japan: phytosanitary certificate at port of exit
Freight charges: Wholesale buyer often pays freight charges.

a long time, it may also be possible to ship them by refrigerated semi-trailers to markets in the contiguous United States. However, it should be remembered that the fresher the flower, the higher the quality.

The cultivar 'Karl Rosenfeld.' —Georgeson Botanical Garden Collection.

Cost Analysis

A cost analysis for the production of a one-acre drip-irrigated peony bed is outlined in Table 7. The values presented represent estimated expenses that have been derived from a variety of sources, including interviews; the Internet; and, when costs have been difficult to determine such as with fertilizers and herbicides due to variations in soil requirements and consumer preferences, from Brumfield (1998). It is not the intention of this study to arrive at exact costs, but to provide a general model of considerations for the prospective peony grower. This table is broken up into anticipated yearly expenses and gross income. Depreciation, which is often done when preparing taxes, has not been included in this analysis. It is also assumed that the plot has already been cleared and is ready for planting. It is projected to five years, at which point the flowers should be in full production. Since this production could continue for another ten or more years, it is difficult to predict with certainty when exactly production levels will drop off. Therefore the values for the fifth year are assumed to be the annual values up to 25 years.

While peak production is obtained five years after planting, plants will begin to produce flowers in the fourth year. According to KSU, 20-30 stems could be expected during the fourth year, though only one-third of these should be harvested (KSU 1993).

They also report that the fifth-year plant could produce 36-50 flowers, though they suggest that no more than half of these should be harvested. These figures are higher than the ICFM yield predictions of ten harvestable stems per plant during peak production (Pertwee 2000). The differences may be accounted for in the tighter spacing suggested by the ICFM. KSU suggests a spacing of 73cm x 110cm, compared to the ICFM spacing of 60cm x 60cm (KSU 1993, Pertwee 2000). Pertwee also states that harvesting more than ten stems could affect the next year's crop (2000). Therefore, for purposes of this study it is assumed that peak production for years five through twenty-five yields ten stems while the first three yields nothing and the fourth yields five.

Table 7 presents expenses and gross income at half the full production level during the fourth year. The annual expenses and gross income for years five through twenty-five

Table 7. Cost analysis for a drip-irrigated peony flower bed, Fairbanks, Alaska 2001

			Year1[1]	Year 2	Year 3	Year 4	Years 5-25[2]	5 Year Total
		Harvestable stems/acre	0	0	0	50,000	100,000	
		Price/stem	0	0	0	.75–4.00	.75–4.00	
		GROSS INCOME $/acre	0	0	0	37,500–200,000	75,000–400,000	112,500–600,000
VARIABLE EXPENSES[3]	Quantity	Price/Unit ($)						
Peony Crowns	10,000	1.90-3.67	19,000-36,700					
Grow bags	10,000	0.4	4,000					
Pro-mix		32.95/.2m3	1,033					
Fertilizer		1,100*		1,100	1,100	1,100	1,100	
Herbicide		1,100*		1,100	1,100	1,100	1,100	
Shears, spades, hoes		122	488					
Plastic buckets		2.86 FOB Fairbanks				3,243	3,243	
Boxes		1.45 FOB Fairbanks				8,471	15,504	
Rubber bands		2.99/.45kg				150		
Wooden cleats		0.08				195	390	
Gel packs		12.15/case FOB Fairbanks				2,576	5,005	
Labor/benefits		12/hr	5,412	1,353	1,353	14,731	29,462	
FIXED EXPENSES[3]								
		Price/unit						
Well/pump		2,725*	2,725					
Drip irrigation		1,000	1,000					
Landscape fabric		210 FOB Fairbanks	3,388					
Freezer		600			2,400			
Rototiller 10hp		2,000*	2,000					
Flattop wagon		1,500*			1,500			
Delivery truck		15,000*			15,000			
Service building		12,000*		12,000				
Vacuum cooler		138,000			138,000			
TOTAL EXPENSES			39,046–56,746	15,553	160,453	31,566	55,804	330,435–348,135

1 Assumes a one-plot cleared plot ready for planting
2 Annual gross income and expenses yr 5-25
3 Shipping costs not included unless otherwise noted

*Brumfield 1998

are assumed to reflect a full production level. However, during this time, plans should be made to divide crowns and expand the acreage size in anticipation for when productivity drops. The expense of this would be considerably lower than the initial establishment since new crowns will not need to be purchased.

Some of the expenses involved with establishing a peony bed include purchasing the crowns. This study has determined that if peonies are spaced 46 cm apart in double rows that are 25 cm apart, then a one-acre plot could accommodate 10,000 crowns. Prices for these crowns vary according to cultivar. Prices listed at the Here and Now Gardens website, a cut flower farm in Oregon, range from $1.90-$3.67 for each crown at sales of 1,000 or more.

Typically, peony crowns can be planted directly into the soil (KSU 1993). However, the soils in the Fairbanks region are usually frozen by the time that the crowns are available to purchase in the fall. Peonies require a dormancy period, which means that they need to be kept cool and protected from freezing throughout the winter. This will require a large space since the crowns will be planted in small pots and require growing space as they develop. The use of plastic grow bags instead of pots may be less expensive and require less room.

Cooler space in Fairbanks is a problem however. Currently, there are no facilities for this purpose that are available to the public. Large walk-in coolers could be purchased; however, they would only be needed for that first winter. A possibility that may be worthy of consideration is the networking with local farmers for the use of their potato storage sheds. It may also be worthwhile to construct a building that could later be used as an indoor packing and storage facility. In addition, cooler space in Seattle could be used and the crowns shipped up to Alaska in the spring.

Other peony production costs include drip-irrigation equipment and landscape fabric. The cost to the individual grower will vary according to their circumstances. For instance, herbicides could be used in place of the more expensive landscape fabric. This is an option that may be determined by a preference for a chemical-free product, or a need to minimize initial expenses. Well systems could also already be in place at some locations, thereby eliminating this as an expense.

A major expense for growers shipping flowers to either international or domestic markets, is freight cost. Transportation costs are very high in Fairbanks, and often exceed the direct product cost. For instance, in the price quote obtained for this study from Uline, a shipping supply specialist, the cost for 2,505 boxes is $3,632, that does not include a shipping cost of $4,845. However, this is an expense that would not need to be paid for until the fourth or fifth year, since there would not be a need for them until then. In addition, the returns on this venture could offset these high freight expenses.

The second and third year expenses include fertilizing and applying herbicides, if used. A service building could be built during this time and has been figured into the second year. The cost of this would vary according to the size and type. Brumfield estimates that a 37m^2 building would cost $12,000 (1998). This building, if built larger could be used as a multi-purpose building that would store peonies the first winter and later be used as a packing house and storage facility.

A vacuum cooler could be purchased during the fourth year in anticipation of the next year's harvest. These vary in size from capacities that hold from one to six pallets. The cost of these as quoted by Southern Vacuum Cooling Inc. for a cooler with a 454 kg per pallet capacity range from $66,000-$216,000 (Personal communication 2001). For the purposes of this research, a mid-size cooler capable of holding three pallets at $138,000 was chosen. These prices do not include freight. In addition, this manufacturer requires that the cooler be paid off in full within thirty days of installation.

Fourth year expenses include harvest and packaging supplies. The boxes, plastic buckets, and gel packs include shipping prices to Fairbanks, Alaska. Labor costs increase this year as well and are based on hourly labor estimates from Brumfield (1998). However, instead of a minimum wage, a rate of $12 per hour was used, and total hours was increased by a factor of four in an effort to account for the larger production and wage earnings in Alaska.

The fifth year—the first full production year, doubles from that of the fourth year. Required packing materials and associated labor costs double as well. These cost levels can be expected to continue into subsequent years. However, this will fluctuate with the success of the crop and individual maintenance requirements. At some point between ten and twenty-five years, production will drop off; however exactly when this will occur is unclear. In order to maintain a steady supply of peonies, the grower will need to plant new crowns early enough so that they will be blooming when production drops in older plants.

Overall, it can be expected that a one-acre drip-irrigated peony bed with an anticipated yield of 100,000 stems can return between $75,000 and $400,000 annually at peak production. This range is based on Mayesh's quote of .75-$4.00 per stem (Personal communication 2001). As previously noted, Alaskan peony growers could potentially receive the price premium with an out of season, high-quality product. The overall expenses associated with this production through five years would be approximately $327,980-$344,680. This range is accounted for by differences in the purchase price for bulbs. Total estimated gross income over five years could fall between $112,500 and $600,000 depending on quality and time of year (Table 7). Since it is unlikely that the entire crop will fall at either one of the extreme ranges, a median value of $356,250 could perhaps be a more likely projected return. This figure is somewhat higher than the anticipated expenses for five years, and indicates a net income ranging from $11,570-$28,270. This is not a significantly high income for five years, however some of the expenses may not need to be paid for all at once, and could be spread out over a number of years. In addition, individual circumstances may not require some growers to purchase all the supplies suggested in Table 7 as they already own them, or can obtain them from other sources. Selling excess peony crowns that are produced when the crowns are divided could also provide another potential source of income.

Summary and Conclusion

Based on the results of this research, it can be concluded that producing peonies for the cut flower industry in Fairbanks, Alaska, deserves consideration. Peonies bloom in this region at a time when they are unavailable elsewhere in the world. Therefore, growers have the potential of providing existing markets with peonies at a time of very limited supplies. While the associated freight prices of production supplies and equipment to Alaska may be high, the returns paid on the stems could offset these costs.

Transportation of the peonies to markets does not appear to be major obstacle. Regulations and restrictions are minimal to both international and domestic destinations. In addition, the expense of shipping the peonies outside of Alaska should not be an obstacle either, since the buyer often assumes this responsibility.

Peonies marketed at lower latitudes are now sold directly from the field, which means the later-blooming Alaska crop would have little competition. However, if peonies grown elsewhere were held in cold storage, they would directly compete with Alaska-grown flowers. Other factors that should be considered are the variability of expenses. The figures in this study could be higher or lower depending on individual circumstances. In addition, prices paid per stem for peonies vary depending on the time of year and quality. In order to land the higher prices, and realize an acceptable profit margin, measures will need to be undertaken to ensure a consistently high-quality product. This may mean an initial higher investment for equipment, such as a vacuum cooler. However, this is clearly to the grower's advantage, for as they build a reputation for producing quality cut flower peonies, they will obtain higher stem prices and most likely find their product in demand.

Producing peonies in Fairbanks is an opportunity worth investigating. Profitability will depend on a ready market, low overhead, and a quality product. These are variables that at any given time are subject to change. While some of these considerations may be out of the control of the grower, there is room for manipulating others. The grower will need to take all of this into consideration as well as to examine how their own unique set of circumstances will affect their potential success.

'Charm' peony grown at the Georgeson Botanical Garden—Georgeson Botanical Garden Collection

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