

# AN INTRODUCTION TO HARVESTING AND SELLING ALASKA CUT FLOWER PEONIES

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## Preface

by James D. Auer

This paper has been written to provide current and future Alaska peony growers background knowledge on harvesting and selling flowers at local and wholesale levels. These Alaskans have invested a lot of time and hard work into cultivating peonies; my goal is that this paper will provide the information necessary to let them take the next step and bring their product to market, and be successful in doing so.

I began this research in May of 2007 in working toward my M.S. in resource and applied economics. Much of the information presented here is rooted in my experience selling flowers grown at the Georgeson Botanical Garden (GBG) during that summer. This research would not have been possible without the resources and insight provided by Patricia Holloway, who coauthored this work, Jan Hanscom, and the rest of the students and staff at the GBG.

Cover photo: 'Sarah Bernhardt' peony bud and bloom in the Georgeson Botanical Garden.

—Georgeson Botanical Garden collection

Below: Gwen Owletuk harvesting peonies from a cut peony trial plot at the Georgeson Botanical Garden, summer 2007.

—photo by Jan Hanscom



## 1. Introduction

Since 2001, The University of Alaska Fairbanks Georgeson Botanical Garden (GBG) has conducted research on the feasibility of growing peonies as a field crop for Alaska growers (Holloway et al. 2005). The purpose of the research has been to establish guidelines for field cultivation, identify appropriate cultivars, and catalog pests and diseases that will affect management decisions for field cultivation. Since beginning this project, at least 12 growers in Alaska have planted peony fields ranging from plots of 50 plants to more than 7,000 plants. Some of these growers will have flowers ready for sale within two years.

The biggest challenge for these and other Alaskans entering the business of cut flowers is learning the techniques used in growing cut flowers for sale, the nature of cut flower markets, and how the process of selling cut flowers takes place. Throughout the years of experimenting with peonies at the GBG, information has been gathered on cut flower markets. A more formal approach was taken in the summer of 2007 by harvesting and selling peonies grown at the GBG. This paper is a summary of the process of selling cut peonies, tailored to the unique conditions of Alaska.



## 1.1. Methods

Information for this project was gathered from a literature review on all aspects of harvest, post-harvest handling, and sale of peonies with particular emphasis on research at Kansas State University on quality aspects of peony cut flowers resulting from harvest and post-harvest environments (Gast 1997). I interviewed Janice Hanscom and Patricia Holloway, Georgeson Botanical Garden, who in addition to conducting field trials also visited wholesale flower distributors and growers in Washington, Oregon, and California to learn methods of field cultivation and marketing. In 2007, I harvested cut flowers from the five-year-old trial plots at the Georgeson Botanical Garden to practice methods of flower handling and learn about peony markets by selling flowers. I attempted to sell fresh cut flower using the online auction, eBay, as well as direct phone contacts with wholesalers and brokers in Los Angeles, Minneapolis, Seattle, Miami, and Vancouver (Canada). I contacted Fairbanks businesses including florists, restaurants, and day spas; I attended the Tanana Valley Farmers' market with flowers on 30 June, 4 July, and 7 July. These trials were not replicated research trials but exploratory trial-and-error attempts to gather baseline information on flower handling and sales.

## 2. Preparing Flowers to Sell

### 2.1. Harvesting

Harvesting of peony stems can begin three to five years after planting. The seasonal timing and speed with which flowers bloom will depend on springtime weather conditions. Warmer seasons will have shorter and earlier harvest periods. With a concentrated harvest, the process will be more rigorous and labor intensive than cool seasons. Cooler seasons will have a later, more elongated growing season. In some regions, growers are able to extend the cutting season up to six weeks by planting a variety of flowers with early, mid-, and late-season blooming cultivars. In Fairbanks, the average bloom season extends from 18 June through July. When the spring is warm the cutting season may be as short as three weeks (Holloway et al. 2005).

In the weeks preceding cutting, many cultivars require disbudding (removal of lateral buds) to ensure the largest possible terminal flowers (Rogers 1995). Buds should be removed by pinching before their stems have elongated. Disbudding must be repeated regularly to ensure that all are removed as they develop.

Flowers should be harvested at least twice daily to ensure that as many flowers as possible are collected at an optimal harvest stage (Gast 1997). Because of the long day length in late June and July, Alaska growers may consider three or more cuttings per day, especially if daytime temperatures are high. Rogers (1995) recommends that only 50 to 75% of available



Back to front: Effie Schuldiner, Mia Petersberg, and Gwen Owletuck sorting flowers in GBG Basement Lab.

—photo by James D. Auer

stems be harvested per plant, so having some overmature flowers left on the plant is not a concern. If more than 25% of available stems are overmature, a revised harvesting schedule should be considered.

Some growers advocate harvesting in the early morning after dew has dried. At this time, metabolic processes are at their lowest and stems are most turgid (Rogers 1995). Others recommend harvesting in the evening when carbohydrate levels are highest to promote longer vase life (Byczynski 1997). We harvested flowers around 8 AM and again at 4 PM, this schedule being more a function of harvester work schedules than optimal harvesting time. Cutting at 4 PM, in the heat of the day, is not recommended as it will put undue stress on flowers (Armitage et al. 2003). Flowers harvested in the heat contain fewer nutrients needed to succeed in storage, and require more energy to cool (Rogers 1995). In our Fairbanks fields, a large number of flowers opened beyond a point where they were suitable for harvest due to the relatively long period between the afternoon cutting and the following morning's cutting.





Above: Cut peony trial plots at the Georgeson Botanical Garden, summer 2007.

—photo by James D. Auer



Left: James Auer sorting peonies in the GBG Basement Lab.

—photo by Jan Hanscom

### 2.1.1. Grading standards

For commercial purposes, two main characteristics factor into the price of peonies: bud diameter and stem length. There are formal grading standards for these characteristics provided by the USDA, but growers and buyers we talked to were not aware of this grading system, and it is not used. Meeting grading requirements will be more important if selling flowers overseas where floral markets are more developed. Even though formal grading is not necessary in the U.S., individual growers, or co-operatives, may wish to develop their own grading system to standardize their product and create a market image.

### 2.1.2. Bud Diameter and Quality

To meet USDA grade one standards for cut peonies, buds should be no less than one inch (25mm) in diameter (USDA 1938). Top growers in New Zealand grade peonies by bud diameter and stem length. For example, at New Zealand Bloom (2007) bud diameter scale is as follows; grade AAA, 45mm (1.77"); grade AA 40mm (1.57"); and grade A 35mm (1.38"). Harvesters must be able to distinguish normally developing flower buds from "bull nosed" buds. Normal buds are round and dome-shaped, while the bull nose buds will be flat at their peak.



## 1. Flowering Stem Lengths at GBG 2002–2004

Cultivar	Yearly Maximum			Yearly Minimum		
	2002	2003	2004	2002	2003	2004
Bowl of Beauty	63.2	29.0	39.0	57.6	22.8	36.0
Therese	59.2	27.0	37.0	42.3	25.7	30.5
Felix Crouse	51.8	24.8	36.0	44.7	22.5	34.0
David Harum	47.2	26.0	34.0	42.5	20.5	27.5
Duchess de Nemours	52.1	22.3	33.7	47.0	19.5	30.7
Kansas	55.0	28.0	33.0	48.0	22.0	26.6
Gay Paree	45.2	21.3	32.5	39.0	21.3	27.5
Festiva Maxima	46.0	24.0	32.0	32.0	19.5	24.0
Shawnee Chief	32.0	19.0	32.0	32.0	16.5	25.5
Louis Van Houtte	50.7	28.2	31.0	33.0	23.6	30.0
Duchess de Orleans	-	23.5	30.0	-	23.5	28.7
Sarah Bernhardt	61.0	29.0	30.0	46.0	24.0	29.0
Edulis Superba	-	-	29.7	-	-	25.3
Raspberry Sunday	-	19.3	28.5	-	18.7	25.0
Nancy Nicholls	53.0	15.5	28.0	52.0	12.0	28.0
Jaycee	35.0	18.0	27.0	35.0	15.7	24.0
Mrs. FDR	12.0	17.0	27.0	-	17.0	27.0
Dr. Alexander Flemming	-	16.0	25.3	-	16.0	23.0
Felix Supreme	54.0	22.0	25.0	48.0	22.0	24.0
Mons. Jules Elie	42.7	21.0	23.0	35.0	21.0	21.0
Pink Parfait	45.0	21.0	23.0	41.5	20.2	21.0
Gardenia	40.0	-	21.5	35.0	-	20.0
Doris Cooper	52.8	21.0	20.0	39.6	19.0	19.0
Red Charm	-	-	20.0	-	-	19.0
Princess Bride	40.0	19.5	19.0	38.5	19.3	19.0
Better Times	50.3	21.0	17.0	41.6	20.0	16.0
Florence Bond	40.5	13.8	15.0	25.4	13.8	14.0
Vivid Rose	-	40.5	9.5	-	38.5	6.3
Karl Rosenfield	54.5	27.8	-	54.5	24.5	-
Mighty Mo	37.6	21.8	-	-	21.8	-

Figure 1. Total length of flowering stems at the GBG 2002-2004. Approximately 8" should be subtracted for cut stem length. Cultivars listed above the pink band had a maximum stem length in 2004 that would allow flowers to be cut to 24" while leaving sufficient plant material (USDA 1938).

These flowers will not fully open in the center and should not be harvested.<sup>1</sup> Other buds will develop off center from the stem. Generally, these stems should not be harvested, however some may be acceptable for farmers' market sales. Another option for these stems is to sell them with the intended use that they be floated in water for presentation.

### 2.1.3. Stem Length and Quality

Flowers with long stems are valued by consumers because they allow more versatility in arrangements. The top quality grading standard in the United States for fresh cut peonies requires stems that are relatively straight and at least 24" (60 cm) long (USDA 1938). At Omeo Peonies, a New Zealand cut flower grower organization, the minimum required cutting length for their lowest grade cut peonies is 60 cm (24 in) (2007). Some stems will be crooked or too weak to support the bud. If these flowers are harvested they should not be sold to florists or wholesalers.

Field trials at the GBG showed very long stems the first year after planting that easily meet both U.S. and New Zealand standards. However, in subsequent years stem lengths were shorter, many not meeting the 24-inch top grade standard by year three of the trials (Figure 3). The heights attained in the first year probably reflect carbohydrate reserves in the roots from their source nursery, while subsequent years reflected growing conditions in Alaska.<sup>2</sup>

In harvesting peonies there is a tradeoff between stem length and the number of stems harvested per plant. Rogers (1995) recommended leaving three sets of leaves at the base of each cut stem. Plants need a certain amount of leaves for photosynthesis, so roots will accumulate sufficient reserves to provide for growth and flowering the next season. If longer stems are needed for a particular market, fewer stems per plant can be cut

1. Personal communication, G. Matheke, December 2007. Georgeson Botanical Garden, Fairbanks, Alaska.

2. Personal communication, P. Holloway, December 2007. Georgeson Botanical Garden, Fairbanks, Alaska.

## 2. Bud Maturity Scale

Stage	Description
1.0	Hard tight bud, little petal color
1.5	Hard tight bud, slight color
2.0	Firm tight bud, petals showing color
2.5	Slightly softer bud, "squeezeable" (Marshmallow stage)
3.0	Loose or soft bud. Outer petal loosening, petals still firm
4.0	Very loose bud, "hollow feel"
5.0	Almost out, petals curved inward
6.0	Open (optimum) petals reflexed
7.0	Petals reflexed and wilted or dropping

Figure 2. Maturity scale for *Paeonia lactiflora* (Eason et al. 2002).

to ensure sufficient leaves remain for plant health. The decision between cutting fewer long stems or more short stems should be based upon the premium that longer stems command in the market as compared to the income forgone by leaving flowers on the plant.

### 2.1.4. Harvesting Stage

All flowers at the GBG were harvested at the "marshmallow" stage which refers to the firmness of the flower bud at harvest. When holding the stem at the base of the bud between the index and middle fingers and pressing down on the top of the bud with the thumb, the bud has about the firmness of a stale marshmallow. No solid spots can be felt in the core of the bud. At the GBG, Jan Hanscom and I chose this method for its simplicity and because of our lack of experience harvesting flowers.

Several detailed bud maturity scales have been developed to identify optimum peony cutting stage. The scale presented was used by Eason et al. (2002, Figure

## 3. Recommended Cutting Stage

Cultivar	Description	Stage
Coral Sunset	Coral Semi-Double	1.5-3.0
Festiva Maxima	White Double	1.5-4.5
Maestro	Red Semi-Double	2.5-4.5
Nick Shaylor	Blush-Pink Double	2.0-3.5
Pink Hawaiian Coral	Pink Semi-Double	1.5-4.0
Sarah Bernhardt	Rose-Pink Double	2.0-4.0

Figure 3. Recommended cultivar cutting stage used by Eason et al. (2002).

1). It is simple compared to other scales employed, but requires practice by growers and harvesters to recognize bud stages and differences in optimum cutting stage among cultivars (Figure 2).

Eason's study showed that the cutting stage significantly influenced vase life of flowers. However, the differences in vase life were usually less than one day and therefore not significant for commercial purposes (2002). Eason also found that cutting flowers early led to a longer time between cutting and full bloom which is significant commercially.

Eason recommended that flowers be cut at the latest possible stage for the most uniformity in time to opening and subsequent vase life flowers. Cutting at a late stage also means buds will be more open and therefore more susceptible to bruising or damage during shipping. Late stage cutting is acceptable when selling flowers locally, but when flowers must be shipped long distances they will be more susceptible to damage than buds cut at an early stage.

### 2.2. Post Harvest

After flowers have been harvested, the first step is to cool them to the

desired storage temperature as quickly as possible. Rogers (1995) recommends immediately cooling dry flowers for 20 minutes followed by pulsing for 15-30 minutes. Pulsing means treating flowers with a floral preservative in water prior to long-term storage. However, Gast (1999) found that many cultivars show no significant response to pulsing in bloom size, vase life, and time to opening following cold storage. From a logistical perspective pulsing adds an additional step of handling, which increases the chances of flowers being damaged and should thus be avoided unless benefits are significant. Given these findings it may still be beneficial for farmers to do their own pulsing trials to determine this treatment's value.

### 2.2.1. Storage

Some type of on-farm cold storage is necessary regardless of farm size or sales method. The first purpose of storage is to remove field heat from flowers quickly, which will improve cold storage performance and extend cut flower life. Quickly removing field heat will suppress enzymatic degradation and respiratory activity, slow water loss, inhibit growth of decay-producing organisms, and minimize reaction to ethylene (Wilson et al. 1999b). Secondly, cold storage is used to hold flowers until they are ready to be sold. Cold storage may involve holding flowers for a few days until the next farmers' market, or up to several weeks to accumulate stems for a wholesale shipment.

Before any long-term storage, flowers should be checked for signs of infection or decay. Do this by closely examining samples for any cuts, severe bruises, or rotting tissue (Wilson et al. 1999a). Optimal storage conditions are 32–34°F (0–1°C) air temperatures and 75-80% relative humidity with as little fluctuation as possible (Armitage et al. 2003). Although flowers should be stored at high humidity, they need to remain dry to reduce the likelihood development and spread of disease (Byczynski 1997) especially *Botrytis*. Frequent sanitation should be employed, such as cleansing





From left to right: James Auer, Effie Schuldiner, Mia Petersberg, and Gwen Owletuck sorting and bunching peonies in the GBG Basement Lab.  
—photo by Jan Hanscom

storage areas frequently with diluted chlorine bleach (Wilson et al. 1999a). A full-sized walk-in cooler is ideal; however, a household refrigerator may be sufficient for storing small quantities of flowers for a short time. Under proper conditions peonies can be stored up to four weeks before vase life is reduced (Gast 2000; Pertwee 2000). Growers should conduct on-farm trials to test the maximum amount of time flowers can be stored in the unique conditions of their cooler. For some events such as weddings, flowers may not need a long vase life, and storing flowers longer than four weeks may be possible.

There are many options for on-farm coolers, from storage sheds cooled with modified household air conditioners to prefabricated walk-in refrigerators with humidity control (Byczynski 1997; ASCFG 2007; Farmhouse Flowers 2007) At the GBG we used both a walk-in cooler and a refrigerator for storing flowers. The walk-in cooler is a multipurpose facility that also serves as a main entrance to a basement laboratory. Consequently, we found it impossible to maintain constant temperatures and relative humidity in the cooler as workers moved in and out. This temperature fluctuation led to significant losses from flowers opening while in storage. To avoid such problems, many growers use a two-stage cooler, with one room for initial cooling, sorting, and grading, and a second for long-term storage. We attempted to increase humidity with our cut



Effie Schuldiner examining peony buds while sorting.

—photo by Jan Hanscom

stems by storing them in plastic containers inside the walk-in cooler, but excessive moisture buildup inside the containers caused severe *Botrytis* problems leading to further losses.

A household refrigerator was also used, but it did not have the capacity to hold sufficient flowers for a wholesale shipment. Also, cold spots along the edges caused losses due to flowers freezing. We had no control of humidity levels in the

refrigerator, and many flowers dried out to a point where they were unsalable.

If cut flowers are only part of a grower's operation, other products must be stored in separate coolers. The reason for this is that some fruits and vegetables release ethylene, a colorless, odorless gas, while ripening. When flowers are exposed to ethylene, the gas can cause leaf, flower, and bud abscission; bud abortion; rapid flower senescence; and epinasty (Dole et al. 2005). The gas is also contained in car and heating oil exhaust that has not completely combusted as a result of poorly tuned motors. All of this should be considered when designing and maintaining a cooler.

### 2.2.2. Sorting and Bunching

Flowers sold at wholesale markets or through a flower broker must be sorted and bunched. Flowers should be handled very carefully; damaged flowers will not only be less appealing to consumers, but damage can also allow avenues for the spread of decay (Wilson et al. 1999c). Because of the importance of keeping flowers cool, sorting and bunching flowers should be done in a walk-in cooler or air-conditioned room. The grower needs to be well organized to expedite the process and minimize handling of flowers. If flowers are harvested over several days, measures should be taken to ensure that bunches contain flowers of similar cutting date. Bunches will contain five (most common) or ten stems (Stevens 1997)—*not* half-dozens and dozens. Each bunch contains flowers of like cultivar, stem length, and bud quality and size. When flowers are shipped each box should contain bunches of like cultivar, stem length, and bud quality, and these data should be labeled on the box. If a box contains bunches which are of varying characteristics this should be clearly labeled on the box.<sup>3</sup>

In our GBG trials, we separated peonies by cultivar, then bud size, before beginning to bunch flowers with the longest stems. In a bunch, all flowers were cut to the same length. Forming bunches with the longest stems first minimized the

## 4. Flower Commodity Chain

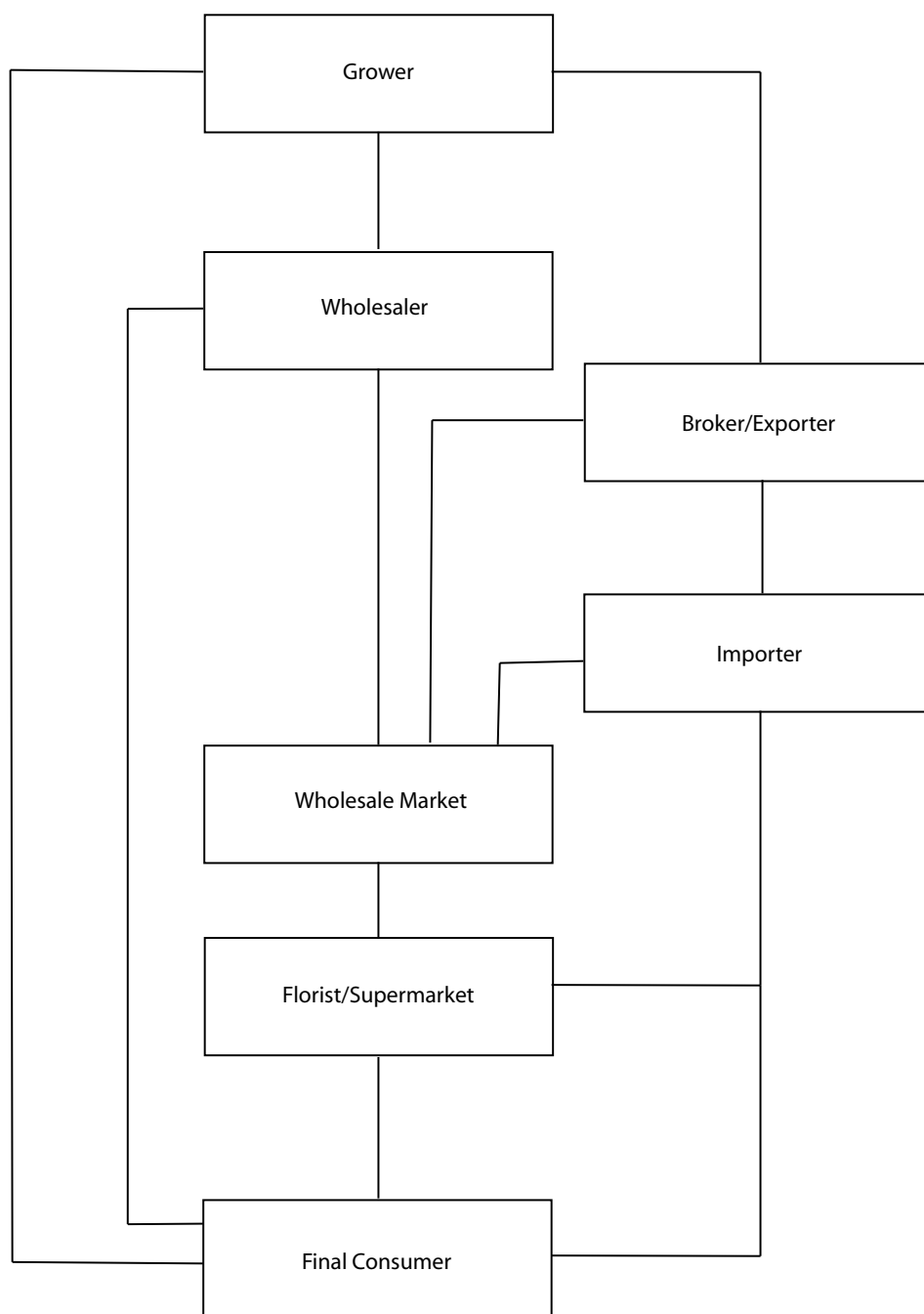


Figure 4. Cut flower marketing chain.

amount cut off to make bunches of flowers with shorter stems. Flowers were secured in bunches with a rubber band two to three inches above the base of the stem, making sure the band was tight enough to hold flowers together, but loose enough that stems would not break. Flowers were placed back in the cooler, again keeping them in order by cutting date.

If fields are big enough that enough flowers can be collected in a day for bunching it is probably best to do so immediately after the initial cooling. This will aid in keeping flowers in order. If too few flowers are harvested for bunching they will have to be accumulated over time and bunched when quantities are sufficient to do so.

3. Personal communication, R. Gray, February 2008. Sunset Flowers. Orgeon City, Oregon.



### 3. Sales

Cut flowers are a perishable product and must reach customers quickly to ensure the highest quality product and minimize storage costs to the grower. To do this contact with buyers should be made as early as possible. There are three general categories for sales: direct to consumer (farmers' market), through a single intermediary (florist), and mass markets (wholesale). Each of these groups differ in the price they will pay, quantity of flowers they can handle, requirements of the grower, and development stage of the cut flower bud.

Between grower and buyer there are a number of businesses or groups through which flowers will pass. This is called a marketing chain (Figure 4). All members of the marketing chain must maintain communication, and work together to ensure that the finest possible product is delivered to consumers. One of the main goals of a successful marketing chain is to ensure a cold chain is maintained. Maintaining the cold chain means taking steps to ensure flowers are kept at proper temperatures throughout shipping to maintain flower quality. To do this it is important to choose shippers with the infrastructure to keep products cool and identify points where flowers will be changing hands so the time they spend in uncontrolled environments can be minimized.

#### 3.1. Direct Sales

When selling direct to the consumer, flowers change hands only once between grower and consumer. These flowers should be cut at a late stage of bud development to ensure they are fully open, or will soon be fully open when presented to customers. Selling direct to consumers will provide the highest prices for flowers, but labor and marketing costs are higher than other methods. Specific examples of direct to customer sales include farmers' markets, roadside stands, and on-farm sales.

##### 3.1.1. Farmers' markets

Farmers' markets are considered entry-level markets, a place for new growers to sharpen their skills and cultivate higher-level markets (Bachmann 2006). Farmers' markets usually pay relatively higher prices with lower expectations of the grower (Stevens 1997), but the low volume of sales may limit income (Stevens et al. 1992).

Although farmers' markets yield a high price for flowers, the costs are significantly higher than other methods of selling. Fixed costs of selling at a farmers' market include buckets to display flowers; a tent, awning or umbrella to protect flowers from the sun; a portable cooler to store flowers not being displayed; business signs; chairs and tables; a cash box. All of these outlays are required before any income is realized, but over the lifespan of these supplies the costs are relatively minor. More important are the variable costs. These include the price of market space, any percentage of sales taken for market fees, packaging materials for flowers, and wages. Wage costs will

### 5. Farmers' Market Income Sheet

<b>Revenue</b>		
Flowers Sold (No.)	66	
Price per stem (\$)	4.00	
<b>Total Revenue</b>		<b>264.00</b>
<b>Variable Costs</b>		
<b>Wages</b>		
Hours	22	
At Wage (\$)	11.87 <sup>a</sup>	
		<b>(261.14)</b>
<b>Transportation</b>		
Fuel (gallons)	1	
\$/gallon (\$)	3.00	
		<b>(3.00)</b>
<b>Packaging Supplies (\$)</b>		
Bags and Paper	1.00	
<b>Total</b>		<b>(1.00)</b>
<b>Market Fees</b>		
Table cost (\$)	15.00	
Pct. Sales Fee (\$)	26.40	
<b>Total Market Fees</b>		<b>(41.40)</b>
<b>Total Variable Costs</b>		<b>(306.54)</b>
<b>Income Less Variable Costs</b>		<b>(\$42.54)</b>
<sup>a</sup> Average wage for retail workers in Alaska		

Figure 5. Income and variable costs from sales at the Tanana Valley Farmers' market.

be a major factor when comparing farmers' markets to other sales venues. Figure 5 provides a brief analysis of the income and variable costs of selling GBG flowers at the Tanana Valley Farmers' market.

Lynn Byczynsky (1997) offers the following tips for selling at a farmers' market:

- Display is important: make as big a visual splash as possible.
- Mass buckets where they are most visible and raise them off the ground.
- Use attractive signs that are visible from a few meters away to let customers know prices.
- Identify flowers wherever possible.
- Give good instructions on how to handle flowers.
- Experiment with pricing structure.

Further recommendations I would add:

- ▷ Most people who go to farmers' markets want more than just products. They want an experience: engaging people in small talk about how to grow flowers, and talking about your farm is helpful. Have photo albums or posters of the farm in bloom.
- ▷ The most frustrating part of the farmers' market is seeing people who are clearly interested in your flowers, but for whatever reason pass by. Make an effort to draw attention to your flowers by being vocal and inviting to customers.
- ▷ Bring only enough flowers to keep displays full throughout the day to ensure that no extra flowers are subjected to the rigors of transport and the less than ideal storage conditions available at the market.
- ▷ Perhaps join with another market vendor selling vases or pottery to display both items for sale.

### 3.1.2. Subscription Services

A subscription service involves the periodic delivery of a seasonal selection of flowers to the subscriber's home or office (Stevens 1997). It offers upfront payment for scheduled delivery of flowers (Kantor 1999). To enter this market, it is important to contact potential buyers well ahead of time so they will be able to make purchasing arrangements. Flowers must be fully open, already in a vase or other container, and pest free. Subscription sales can provide steadier income than selling flowers direct to customers by other methods, but only if enough buyers can be located. Once accounts have been established, wage costs will be less than at a farmers' market; however, transportation and flower packaging expenses will be higher.

Subscription services are probably better suited to growers who can offer a more diversified floral product than just peonies, both to extend the service duration, and provide a greater diversity of arrangements. Also, marketing flowers by subscription leads to direct competition with local florists, which may cause a conflict of interests. During summer 2007, I contacted fifteen Fairbanks businesses including hotels, restaurants, catering services, and day spas, for potential subscription service. The response from all but one business was that they had no use for fresh flowers. The one exception, a day spa, had already made arrangements with a local florist for flower deliveries.

### 3.1.3. Other direct sales methods

Other methods for selling directly to customers include roadside stands, on-farm sales, or cut your own (CYO). Prices received will be about the same as the farmers' market, and transportation costs and market fees can be reduced or eliminated (Dole et al. 2005). Roadside stands work well for flowers that can be harvested for a major flower-giving holiday,

but none occur during the Alaska peony season. It may be possible to develop a market for red and white peonies for 4 July, but currently no market exists. If selling on-farm or CYO, the opportunity cost associated with selling flowers can be reduced by doing other farm work when there are no customers present. However, visitors causing damage to plants and beds adds to the cost of selling CYO flowers (Byczynski 1997). The problem with these three methods is lack of visibility. If the farm is in a remote area, or if a good location for a roadside stand is not available, attracting customers will be a major challenge.

The Internet is another option for Alaska flower growers, but shipping costs may be prohibitively high if selling small quantities of flowers. For this reason it may be more profitable to focus Internet efforts on supplying weddings or other large events to mitigate shipping costs. Peonies from the GBG were posted on E-Bay for two weeks in bunch sizes of five for \$15, ten for \$30, fifty for \$80, and one hundred for \$200. No bids were received. One possible reason for this failure may be that E-Bay is not foremost in buyer's minds when searching for cut flowers. A better option might be to build a cut flower website from scratch, or find an existing website where flowers can be posted such as [www.LocalHarvest.com](http://www.LocalHarvest.com) (2007).

## 3.2. Sales through a single intermediary

Sales to retailers, such as florists and supermarkets, will generally provide the next highest prices by comparison to direct sales for flowers, and higher quantities per customer (Stevens 1997). Because flowers are not going directly to the end customer from the grower, they must be cut in an earlier stage of development, allowing time for them to be arranged and/or put on display before flowers fully open. Because a retailer will be displaying the flowers, the marketing costs to the grower are less than those when selling direct to customers. Another cost will be purchasing a universal product code (UPC) if required by the retailer. Variable costs include transportation, delivering flowers and visiting the store to remove flowers from display, and label and packaging materials for retail. Labor costs for the grower will be lower than direct sales because the grower need not be present at the time of sale.

### 3.2.1. Florists

Florists may require a fairly large quantity of flowers depending on demand in the area, holidays, and season. Flowers should be delivered at a point where they will take no longer than a day to open, but not fully open, so they may be arranged before display. Bachmann (2006) recommends approaching florists with a bucket of free samples, a flyer that lists the flowers for sale, delivery schedule, payment terms, and business card. It may be beneficial for growers to call the florist ahead of time to make sure that the owner or flower buyer will be available and the shop will not be too busy.



In late June when the first flowers were harvested, I visited five of the florists in Fairbanks. None purchased flowers from GBG. All florists indicated they did not carry peonies in stock, but rather special ordered them at customer request. Two of the five florists I visited showed interest in purchasing flowers locally for improved freshness, but price would need to be competitive with wholesale prices. One florist refused to allow peonies in her shop because of past experience with insect pests. She indicated that local flower growers attempted to sell cut flowers such as delphiniums to florists, but the flowers were “covered with bugs.” Despite the fact that the GBG peonies were bug free, she was not interested in purchasing GBG flowers unless the plants were fumigated. None of the established flower growers I have contacted fumigated their flowers. No wholesaler I contacted expected domestically grown peonies to be fumigated. This issue will need to be resolved through education and working to develop good relationships with florists.

### 3.2.2. Supermarkets

Supermarkets sell large volumes of flowers, but it can be difficult to establish accounts (Kantor 1999). How flowers are purchased varies among businesses. Of the two major supermarkets in Fairbanks that carry cut flowers, one purchases flowers in house, while the other uses a national buyer for all floral purchases. Byczynski (1997) notes that the main disadvantage of selling to supermarkets is the amount of time preparing flowers for sale. It is the grower’s responsibility to package flowers suitably for display in supermarkets, which have a higher standard than for farmers’ markets or florists (Stevens 1997). Other costs of selling flowers to supermarkets include delivery, which will need to be coordinated with supermarket loading schedules; wages for time spent maintaining floral displays in the store; and the cost of a UPC label.

### 3.3. Wholesale and Brokers

Wholesalers and brokers fill the gap between growers and retailers/consumers. A wholesaler buys flowers from the grower, then distributes the flowers to buyers, sometimes at wholesale flower markets. A broker may never have flowers in their possession: their goal is strictly to connect those who want flowers with those who have flowers. Both of these groups can take responsibility for a large part, if not all, necessary marketing, allowing growers to concentrate their efforts to the farm. Selling to wholesale florists or brokers requires specific grading, uniformity, consistency, and packaging standards. Because there will be a large number of flowers that do not make grading standards for wholesale it is important to have an alternative market where secondary cuts can be sold. Prices at wholesale will be lower than in other markets but volumes are higher (Stevens 1997). Costs associated with selling wholesale will include boxes, packing material, and transportation of flowers to shippers (Klingman 2002). Shipping costs are paid by the wholesaler. However, finding the best shipping prices



Buckets of peonies for sale at Mayesh Wholesale Florist, in Los Angeles, California.

—photo by Dick Hanscom

available is important to maintaining a marketing chain and will be beneficial to all parties involved.<sup>4</sup> In addition to price it is also important to make sure that selected shippers have the proper infrastructure to properly ship cut flowers.

A per-stem price is negotiated between grower and wholesaler prior to shipping. The wholesaler receives and stores the flowers for a short time before selling them at a negotiated price plus a wholesale markup. After the flowers have sold the grower is paid by the wholesaler regardless of whether flowers are sold.<sup>5</sup> Wholesale allows the possibility that a farmer’s entire crop can be sold in a single phone call. The minimum quantity of flowers a wholesaler will require depends on the size and diversity of the wholesaler. A more sophisticated with more infrastructure (workers, storage space, vehicles, etc.), and more venues of sale available to them will be more willing to accept smaller shipments.<sup>6</sup> The minimum for a sophisticated wholesaler will be whatever the minimum quantity for shipping is.<sup>7</sup>

Brokers search the world in order to connect growers (or grower organizations) with flower buyers, and expedite transfers

4. Personal communication, Ray Gray, February 2008. Sunset Flowers. Oregon City, Oregon.

5. An exception may be if flowers are sold on consignment. However, this is not common in today’s industry.

6. Personal communication, E. Pinkus, July 2007. Third Branch Flowers, Roxbury, Vermont.

7. Personal communication, R. Kennicott, July 2007. Kennicott Brothers Wholesale, Chicago Illinois.



Figure 6. Flowers packaged for wholesale.

—photo by James D. Auer

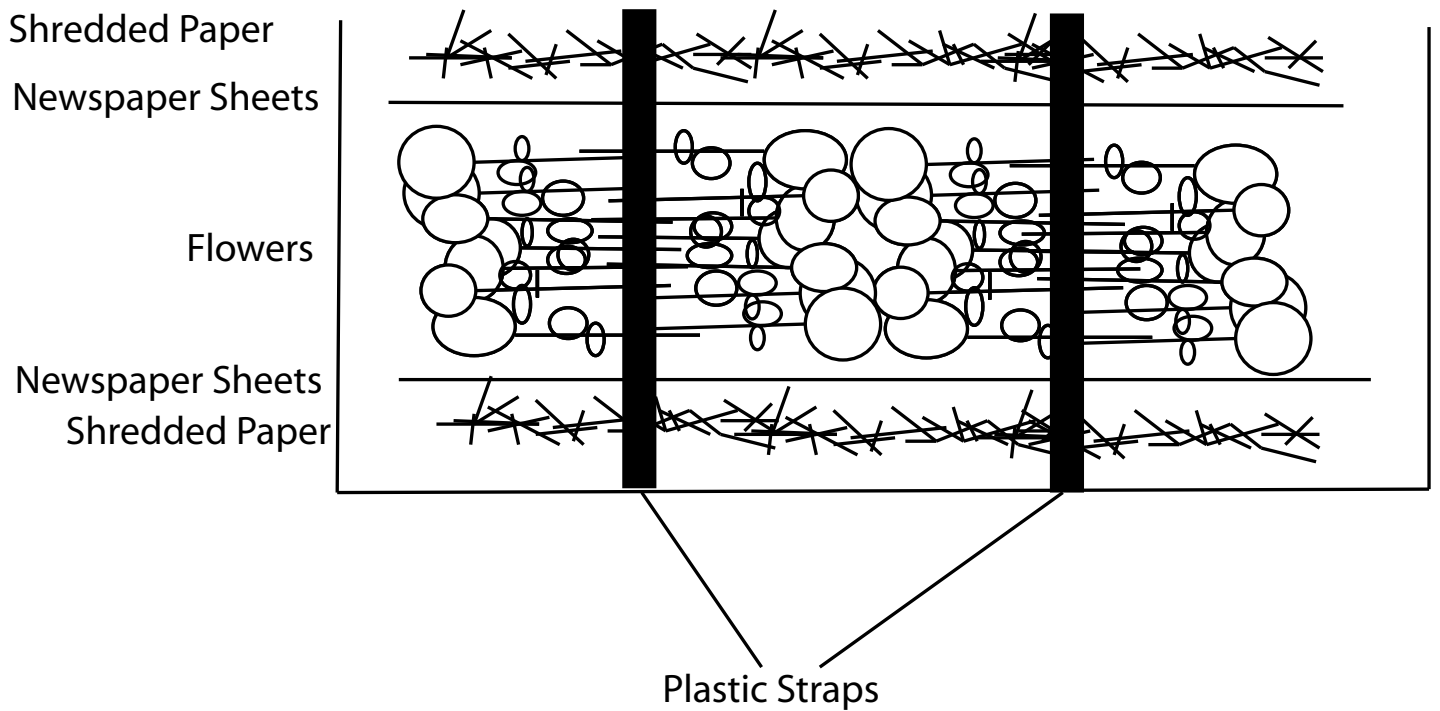


Figure 7. Cross-section diagram of flowers in box.





Jan Hanscom at Mayesh Wholesale Florist, Inc., in Los Angeles, California.  
—photo by Dick Hanscom

between these groups. Growers can accept or reject offers to buy, and quantities vary based on demand. The broker will be paid either as a percentage of sales, or a per box sold fee.

The first experience at the GBG with the wholesale floral industry came in 2006, when a wholesale distributor from the United Kingdom attempted to purchase peonies to be shipped direct to England by way of charter airlines carrying fresh fish from Anchorage. The wholesaler, Flamingo Holdings Ltd.,<sup>8</sup> wished to purchase 100,000 stems per week at \$0.50 per stem. Through the summer of 2007, I attempted to contact two wholesalers in Seattle, Washington, one wholesaler and one broker in Vancouver, British Columbia, and a wholesaler in Minneapolis, Minnesota. None purchased flowers, and only one of these distributors expressed an interest in Alaska peonies. The primary obstacle I encountered was finding distributors who were willing to talk to me. Many phone calls were not returned, and when a buyer was reached they often quickly dismissed me. In spite of this difficulty, 1,000 stems were sold to a wholesaler in Los Angeles. This distributor had been contacted in 2001 by the GBG for a previous peony study (Klingman 2002). Further contact had been made in 2006 when a trial shipment of 250 stems was sent for evaluation. Flowers from the GBG received \$1.25 per stem, nearly twice what Oregon grown peonies had received earlier in the season.<sup>9</sup>

8. Personal communication, P. Holloway, December 2007. Georgeson Botanical Garden, Fairbanks, Alaska.

9. Personal communication, J. Hanscom, July 2007. Georgeson Botanical Garden Fairbanks, Alaska.

### 3.3.1. Packaging Flowers for Wholesale

Flowers sold wholesale from the GBG were packed in three boxes gathered from florists in Fairbanks. Boxes used for shipping flowers come in various shapes and sizes. The recycled boxes we used were 40"x20"x12" with a board stapled across the width at both ends to protect boxes and flowers from being crushed during shipping. Preprinted labels on the boxes were covered with spray paint to ensure there was no confusion by handlers.

A layer of shredded newspaper was laid in the bottom of the box for padding, then full sheets of newspaper on top to separate shredded paper from flowers (Figures 6 & 7). Bunches of flowers, each in a paper cone sleeve, were arranged in the box on top of the newspaper in four rows. The first and fourth rows were placed with the buds at the ends of the box, the second and third rows had the buds in the center with stems overlapping the first and fourth rows. Four gel packs per box were placed among the overlapping stems to aid in maintaining temperatures during shipping. Gel packs were wrapped in paper to avoid damage to flowers by freezing. On top of the flowers was a layer of full sheets of newspaper with shredded newspaper on top of this. Plastic straps were used around each set of overlapping stems to hold the flowers in place. The box top was secured with packing tape.

The three packages weighed approximately 140 lbs, making freight rates available. The wholesaler had an existing account with Alaska Airlines that hangar personnel accessed using the wholesaler's name. All shipping costs were charged to the wholesaler's account; insurance was not purchased. After dropping the flowers off at the hangar, I contacted the wholesaler to inform them of the flowers' scheduled arrival time. Because the flowers were to leave on an early flight, which would be loaded before the airline office opened, it was necessary to deliver them the night prior to shipment. At the hangar, the flowers were kept in cold storage at my request.

## 4. Conclusions

For Alaskans to be successful as cut flower growers it is important that they use proper practices in harvesting and storing flowers. Using good practices, developing the unique skills required, and building strong relationships with all businesses involved will allow for the highest quality cut flower to be achieved in the most efficient manner possible. Attaining top quality flowers will allow growers to get the highest possible price for their product, while maximizing efficiency will lead to higher prices attained at market while minimizing costs—which together will lead to Alaska's cut flower industry being a success.



'Sarah Bernhardt' peony bud growing in the Georgeson Botanical Garden cut flower peony trial plot, June 17, 2007.

—photo by James D. Auer

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Fully open pink peony.

—photo from Wikimedia



## About the Agricultural and Forestry Experiment Station

The federal Hatch Act of 1887 authorized establishment of agricultural experiment stations in the U.S. and its territories to provide science-based research information to farmers. There are agricultural experiment stations in each of the 50 states, Puerto Rico, and Guam. All but one are part of the land-grant college system. The Morrill Act established the land-grant colleges in 1862. While the experiment stations perform agricultural research, the land-grant colleges provide education in the science and economics of agriculture.

The Alaska Agricultural Experiment Station was not originally part of the Alaska land-grant college system. In 1898, the station was established in Sitka, also the site of Alaska's first experiment farm. Subsequent branches were opened at Kodiak, Kenai, Rampart, Copper Center, Fairbanks, and Matanuska. The latter two remain as the Fairbanks Experiment Farm and the Matanuska Experiment Farm. The USDA established the Fairbanks experiment station in 1906 on a site that in 1915 provided land for a college. The land transfer and money to establish the Alaska Agricultural College and School of Mines was approved by the U.S. Congress in 1915. Two years later the Alaska Territorial Legislature added funding, and in 1922, when the first building was constructed, the college opened its doors to students. The first student graduated in 1923. In 1931, the experiment station was transferred from federal ownership to the college, and in 1935 the college was renamed the University of Alaska. When campuses were opened at other locations, the Fairbanks campus became the University of Alaska Fairbanks.

Early experiment station researchers developed adapted cultivars of grains, grasses, potatoes, and berries, and introduced many vegetable cultivars appropriate to Alaska. Animal and poultry management was also important. This work continues, as does research in soils and revegetation, forest ecology and management, and rural and economic development. As the state faces new challenges in agriculture and resource management, the Agricultural and Forestry Experiment Station continues to bring state-of-the-art research information to the people of Alaska.



Peony growing at the Geophysical Institute, University of Alaska Fairbanks, June 24, 2004.

—AFES file photo

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