Peonies as Field Grown Cut Flowers for Alaska

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Introduction

Alaska exports oil – lots of it. Alaska also exports salmon and king crab. There is also a bit of gold left over from the 1890s Gold Rush. Alaska is not known for its agricultural exports. More than half of Alaska's agricultural industry is horticulture. However, most of that industry serves a local clientele in greenhouse-grown bedding plants, flowers, baskets, herbs and vegetables. Businesses have struggled since Gold Rush days to compete with agricultural giants in California, Oregon, Washinton and British Columbia that produce commodities so much more cheaply than the small family farms in Alaska.

The peony and a few other field-grown cut flowers might just change the agricultural export picture. Peonies in Alaska bloom at the very end of the production season of lower latitudes (Holloway et al. 2003, 2004). Our field-grown cut peonies become available the last week of June and continue with some cultivars into August. Combine flower availability with the fact that Anchorage and Fairbanks host the world's third busiest air cargo airports, and it might just be possible to develop a market for Alaska-grown cut flowers and move them around the world (Klingman 2002). Our research is designed to explore the possibility of growing and exporting field grown cut flowers from Alaska beginning with the peony.

Cultivar Trials

One hundred fifty peonies were planted in August 2001 into a 6 x 18 m plot located on a south facing slope at the University of Alaska Fairbanks Experiment Farm's Georgeson Botanical Garden (64^{o}51'N, 147 ^{o} 52'W). Planting beds included:

- ∞ Fairbanks silt loam soil, double-row raised beds, 0.75m wide
- ∞ landscape fabric covering for weed control
- ∞ double row Ro-drip® trickle irrigation tape, irrigation at Irrometer® reading of 20 centibars
- ∞ 46 cm between plants within each row and between adjacent rows
- ∞ six, single plant replicates of 30 cultivars with guard rows
- ∞ randomized complete block design
- ∞ 195 g per square meter 10-20-20 annual fertilizer

Two of the thirty cultivars, 'Nancy Nichols' and 'Vivid Rose', had poor winter survival and were eliminted from consideration as a cut flower.

Four cultivars yielded fewer than three flower buds per plant in five years and were eliminated from consideration for economic reasons: 'Gardenia', 'Better Times' 'Mons. Jules Elie' Raspberry Sundae'.

The top five cultivars averaged 9 - 10 flower buds per plant (Table 1). They bloomed from 20 June to 31 July.

Table 1. Flowering dates and yield of peony cut stems from the top fice cultivars in the annual cultivar

Cultivar	Year	Total number of flower buds per plant (mean)	Flowering Dates																						
			20-Jun	22-Jun	24-Jun	26-Jun	28-Jun	30-Jun	2-Jul	4-Jul	6-Jul	8-Jul	10-Jul	12-Jul	15-Jul	17-Jul	19-Jul	21-Jul	23-Jul	25-Jul	27-Jul	29-Jul	31-Jul
David Harum	2002	1.2					x	x	x	x	x	x	x	x	x	x								
	2003	6.5								x	x	x	x	x										
	2004	3		x					x	x	x	x	x	x	x									
	2006	11								x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Duchess de Nemours	2002	1.8						x	x	x	x	x	x	x	x	x								
	2003	4.8						x	x	x	x	x	x	x	x									
	2004	8.3	x	x	x	x	x	x	x	x	x		x											
	2006	13.2							x	x	x	x	x	x	x	x	x	x	x	x				
Felix Crouse	2002	2.3										x	x	x	x	x								
	2003	10.5									x	x	x	x	x									
	2004	8.8	x	x	x	x	x	x	x	x	x	x	x	x	x									
	2006	13.7							x	x	x	x	x	x	x	x	x							
Festiva Maxima	2002	0.8										x	x	x	x									
	2003	3.3						x	x	x	x	x	x	x	x	x								
	2004	1	x	x						x														
	2006	7.6						x	x	x	x	x	x	x	x	x	x	x						
Sarah Bernhardt	2002	3.2						x	x	x	x	x	x	x	x	x	x							
	2003	11.2						x	x	x	x	x	x	x	x	x	x	x	x					
	2004	4		x	x	x	x	x	x	x	x	x												
	2006	9.7								x	x	x	x	x	x	x	x							

Holloway, P. J. Hanscom and G. Matheke. 2003. Peonies for field cut flower production. First-year growth. University of Alaska Fairbanks Agricultural and Forestry Experiment Station Research Prog. Report 41. 4p.

Holloway, P. J. Hanscom and G. Matheke. 2004. Peonies for field cut flower production. Second-year growth. University of Alaska Fairbanks Agricultural and Forestry Experiment Station Research Prog. Report 43. 8p.

Klingman, M. 2002. Production and transportation considerations in the export of peonies from Fairbanks, Alaska. University of Alaska Fairbanks Agricultural and Forestry Experiment Station Senior Thesis ST-05-01.

Shading Experiments

In July 2005, 'Sarah Bernhardt' and 'Duchess de Nemours' peonies were planted in east to west raised beds at 60 cm spacing in single rows. The objective of the experiment was to learn if flowering could be delayed and stem length increased with shading. We anticipated that shade would delay snowmelt, promote cooler soils and thus delay shoot emergence and flowering. Plantings included:

- ∞ landscape fabric, fertilizer and irrigation identical to the cultivar trial
- ∞ shading with plastic fencing material at 0, 10 and 60 % average shade located approximately 50 cm south of the row at a height of 114 cm
- ∞ randomized complete block design with ten plants per treatment and three replicates
- ∞Data were analyzed with ANOVA.

During the first three growing seasons following planting, treatments did not differ significantly in the number of flower buds, amount of bud blast, flowering and vegetative stem length and number of stems. Very few flowers were produced, and all bloomed between 30 June and 5 July. Like the spacing study, individual plant response was highly variable.

Summary

Six cultivars were eliminated from cultivar trials because they died or productivity was too low for commercial production: Better Times, Gardenia, Mos. Jules Elie, Nancy Nichols, Raspberry Sundae, Vivid Rose

The five most productive cultivars were Dr. Alexander Fleming, Duchess de Nemours, Sarah Bernhardt, Felix Crouse, David Harum and Festiva Maxima. We recommend starting with Sarah Bernhardt and Duchess de Nemours because they are the most popular colors, they are well known in the flower trade, they are productive, and flower quality is good.

Amending soils with compost or peat moss has not shown a consistent effect on peony growth and productivity in the first three years. Variation among individual plants was so great. it masked any treatment effects.

A within row plant spacing of 30 cm, 45 cm or 60 cm has shown no consistent difference in plant growth in the first three years. Variation among individual plants was so great. it masked any treatment effects.

No differences were recorded in plant growth during the first two growing seasons between 'Sarah Bernhardt' and 'Duchess de Nemours' with varying amounts of shade (0, 10 and 60 percent).

Wholesale distributors indicated a willingness to purchase Alaska-grown peonies. Hooray!

Spacing and Soil Amendments

In 2002, a second trial plot identical in size and similar in layout on raised beds to the cultivar trials was planted with 'Sarah Bernhardt' peonies as follows:

- ∞ 3 spacing treatments: 30, 45 and 60 cm between plants.
- ∞ three soil amendments tilled into the silt loam soil: none, 15 cm Lemeta peat, garden plant-based compost
- ∞ row spacing fertilizer, irrigation identical to cultivar trials
- ∞ split plot design with ten plants per spacing/amendment combination.
- ∞ data analysis: analysis of variance for split plot design

Total number of flower buds, amount of bud blast, number of vegetative stems, height of flowering and vegetative stems and flower bud diameter did not differ significantly among treatments. Since planting, the between-plant variation was very large and masked any treatment effects. Even four years after planting, there is significant variation from plant to plant. For example, the number of flowering stems on the soil treatment at 30-cm spacing ranged from no flowers to 17 flowers per plant (mean 10 flowers per plant). Even with a single cultivar, the variation in growth among plants was very large.

Potential Markets

In May- July 2006, we visited wholesale flower markets in Los Angeles and San Francisco. The wholesale distributors provided basic information on flower maturity as well as cut flower packing and marketing. They agreed to evaluate a sample of Alaska-grown peonies when they were harvested in early July. Our findings are summarized below:

a. The flower markets are composed of individual wholesalers and growers who rent space in big warehouses mostly for local sales. Flowers are sold to florist shops and other retailers early in the morning. Some stores also sell direct retail later in the day.

b. Shipping boxes for peonies are 6 inches deep and 18-24 inches wide and 3-4 feet long; some boxes are 12 inches deep. They are packed 10 bundles to a box, five facing each end with 3 lb gel packs wrapped in newspaper in the center. A pad of macerated newspaper covers the entire contents, and this is secured with wires to the sides of the box. The flowers don't move in shipment.

c. Flowers are sold in bundles of 10. They sometimes come to the wholesalers bundled in different numbers, but they are re-bundled before being sold. Stem length did not seem to be a big issue with wholesalers or buyers.

d. Flowers arrive at the wholesaler at different stages of maturity depending on cultivar. The dark red peonies were tight bud, while the whites were more open.

e. California wholesalers receives peonies in late June or early July from one grower in Vermont. Other wholesalers were finished with peonies by the third week of June.

f. 'Sarah Bernhardt' is a favorite cultivar, and many wholesale distributors know to request it by name. Others are sold by color, not cultivar name. Other popular cultivars are Coral Charm and Red Charm. Avoid Karl Rosenfeld. The flowers are poor quality.

g. If flower buds were loaded with a sticky residue, some florists did not like them stating they attracted bugs in the retail shop.

h. Our trial cutting of peonies was received favorably by the Los Angeles Distributor. They offered to purchase peonies at $1.25 per stem.