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This cultivar, Kansas, was one of 25 varietes tested. —Georgeson Botanical Garden Collection

Peonies for Field Cut Flower Production First-Year Growth

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Peonies grow well in interior Alaska and have been a favorite garden flower for more than 50 years. Given ample snow cover and a warm, sunny location, the plants bloom reliably for many years. Because of the short growing season that begins in early May, peonies do not bloom until mid to late summer. This bloom cycle contrasts with lower latitudes, where peonies bloom mostly in May and June (Gast 2000). More than half (52%) of all peony cut flower stems sold at Dutch flower auctions occur in May followed by June with 44% of total sales (Pertwee 2000). Because of this difference in bloom time, peonies grown as cut flowers in Alaska may provide an extended commercial season for the national cut flower markets. No large-scale commercial production of peonies has been attempted in Alaska. With the exception of home garden trials, little is known

Cultivar Karl Rosenfeld. —Georgeson Botanical Garden Collection

about cultivation, especially as a field-grown cut flower. The purpose of this project is to identify peony cultivars suitable for use in commercial cut flower production in Alaska and to identify potential pest and disease problems that might influence management of commercial fields. This progress report shows results of the first season following planting. Because peonies are not commercially harvested until at least the fourth year after planting, the data are preliminary.

One hundred fifty peonies were purchased during the fall of 2000, potted into ProMix horticultural peat-lite mix, and stored at 35°F (4°C) until April 2001. Pots were moved to a greenhouse with a minimum night temperature of 50°F (10°C) until 1 June, when they were moved to a cold frame for hardening and additional growth. The containerized peonies were planted between 15-20 August into a 2 x 9 ft (6 x 18 m) plot located on a south-facing slope at the Fairbanks Experiment Farm's Georgeson Botanical Garden.

Peonies were planted in Fairbanks silt loam soil in double-row raised beds covered with landscape fabric; each row was equipped with a double row of Ro-drip trickle irrigation. Spacing was 18 inches (46 cm) between plants within each row and between adjacent rows on the same 39-inch-wide (1.0-m) raised bed. Each raised bed was 59 inches (1.5 m) on center between rows. Experimental design consisted of six replicates with a single plant each of thirty cultivars listed below. Guard rows of 'Sarah Bernhardt' peonies were planted at the ends of each row and along the length of each row on the east and west edges. Plots were mulched with spruce branches in October 2001. Because stems were not harvested, no data were analyzed statistically during year one.

Most peonies survived the winter despite a lack of snow early in the season. Cultivars showed a great diversity in vegetative growth, ranging from less than one vegetative stem per plant to more than 12 stems (Table 1) Plant height is related to latitude and duration

Table 1. Vegetative growth and flowering of peonies 1 year after field establishment.

Cultivar	Number of flower buds per plant (mean)	Number of flower buds (min-max)	Number of unopened flower buds per plant (mean)	Maximum flowering stem length- cm (mean)	Minimum flowering stem length - cm (mean)	Maximum height of foliage - cm (mean)	Number of vegetative stems per plant (mean)	Earliest date of first color	Flowering dates																				
									June	July																	Aug		
									30	2	4	6	8	10	12	15	17	19	21	23	25	27	29	31	2	4	6
Better Times	2.5	1-5	0.16	50.3	41.6	41.1	0.8	30-Jun	x	x	x	x	x	x	x	x	x	x											
Bowl of Beauty	2.5	0-4	0.33	63.2	57.6	49.3	5.2	1-Jul		x	x	x	x	x	x	x	x	x	x										
David Harum	1.0	0-3	0.2	47.2	42.5	34.3	5.2	30-Jun	x	x	x	x	x	x	x	x	x	x											
Doris Cooper	0.7	0-2	0.3	50.2	39.6	34.8	3.3	30-Jun	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
Duchess de Nemours	1.3	0-2	0.5	52.1	50.0	38.0	3.3	30-Jun	x	x	x	x	x	x	x	x	x												
Felix Crouse	2.2	0-3	0	51.8	44.7	36.8	5.7	8-Jul					x	x	x	x	x	x											
Felix Supreme	0.3	0-2	0	54.0	48.0	41.0	0.3	30-Jun	x	x	x	x	x	x	x	x													
Festiva Maxima	0.3	0-1	0.5	46.0	32.0	38.4	4.6	8-Jul					x	x	x	x													
Florence Bond	1.0	0-2	1	40.1	37.8	31.5	1.0	30-Jun	x	x	x	x	x	x	x	x	x	x											
Gardenia	0.2	0-1	0.5	40.0	35.0	30.0	1.8	30-Jun	x	x	x	x	x	x	x	x	x												
Gay Paree	1.5	1-3	1.7	45.2	39.0	28.4	1.3	8-Jul					x	x	x	x	x	x											
Jaycee	0.0		0.83	35.0	35.0	34.0	6.2																						
Kansas	0.5	0-3	0	55.0	48.0	42.5	6.1	8-Jul					x	x	x	x	x												
Karl Rosenfield	0.2	0-1	0	54.5		41.3	8.5	8-Jul					x	x	x	x	x	x	x										
Louis Van Houtte	0.3	0-2	1	51.0	43.6	42.8	8.3						x	x	x	x	x	x											
Mighty Mo	0.2	0-1	0	37.6		34.3	5.0	1-Jul		x	x	x	x	x	x	x													
Mons. Jules Elie	1.0	0-3	1	47.4	35.0	36.6	3.0	1-Jul		x	x	x	x	x	x	x	x												
Mrs. FDR	0.0		0.16	0.3		29.7	2.2																						
Nancy Nicholls	0.8	0-3	0	53.0	52.0	39.8	4.5	15-Jul								x	x	x	x	x									
Pink Parfait	1.0	0-3	0.16	50.5	45.0	37.0	2.0	8-Jul					x	x	x	x	x	x	x	x	x	x	x	x	x	x			
Princess Bride	0.8	0-2	1.3	38.5	40.0	34.0	2.0	8-Jul						x	x	x	x												
Sarah Bernhardt	1.7	0-3	1.16	61.0	46.0	46.8	3.0	30-Jun	x	x	x	x	x	x	x	x	x	x	x										
Shawnee Chief	0.0		0.33	32.0	32.0	33.8	12.1																						
Therese	1.5	0-5	1.5	59.2	42.3	41.8	4.0	30-Jun	x	x	x	x	x	x	x	x	x	x											
Vivid Rose	0.8	0-3	0.16	38.5	40.5	29.6	3.8							x	x	x	x												

of winter chilling temperatures. For instance, average stem length in Fremont, California, is 25 cm; in Pantego, North Carolina, 45 cm; and in the upper Midwest states, 60–90 cm (Stimart 1985). First-year stem length in our trials averaged 46 ± 12 cm and ranged from 0.3 cm to 63 cm.

All cultivars bloomed except for Jaycee, Mrs. FDR, and Shawnee Chief. The bloom season began 30 June and extended through the first week of August. All of the chosen cultivars were listed in commercial sources as early- or mid-season bloomers at lower latitudes, with May and June bloom times (Stimart 1985, Gast 2000). Some differences in bloom times were recorded for the Alaska-grown plants, but factors such as number of blooms per plant and number of plants with blooms have an influence on length of bloom season. The bloom time shown in Table 1 does not correspond with the harvest time for cut flowers because no stems were harvested. The data show total bloom times for first-year garden plants.

The most common diseases of peonies are gray mold *(Botrytis cinerea)*, Peony leaf blotch (*Cladosporium paeoniae)*, Phytophthora blight *(Phytophthora cactorum)*, root rots (*Fusarium* sp., *Rhizoctonia solani, Sclerotinia sclerotiorum* or *Thielaviopsis basicola*), and root-knot nematode (*Meloidogyne* sp.). Gray mold can be so severe as to jeopardize cut flower production for many years (Stevens et al. 1993, Stimart 1985). No disease or insect pests were recorded on any of the cultivars during the first season.

This first-year project has shown that a variety of cultivars may be grown in Alaska, and future selections may be possible for seasonal bloom times. Additional cultivar selection for late-season cultivars may extend the harvest season into late August. Floral stem lengths were well within the range of cut flower production from lower latitudes, but one season is too early to predict flower quantity and quality in each cultivar. This project will be continued for at least nine years.

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