

Forcing Requirements For Six Herbaceous Perennials

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Winter hardy herbaceous perennials are commonly used in the landscape as border plantings, in rock gardens and in naturalized settings. Planting several species in the landscape will provide a range of foliage types, growth habits and colors from early spring through to frost. A summary of flower color, season of bloom and winter hardiness rating for six herbaceous perennials appears in Table 1.

Table 1.

Scientific Name	Common Name	Season of Bloom	Flower Color	Zone Hardiness
<i>Aquilegia x hybrida</i> Sims	Columbine	May to June	Red, Pink, White Yellow, Blue, Purple	4
<i>Astilbe x arendsii</i>	Astilbe	June to July	Red, Pink, White Lavender	5
<i>Aurinia saxatilis</i> (L)	Basket of Gold	April to May	Yellow	4
<i>Chrysanthemum x superbum</i>	Shasta Daisy	June to Frost	White rays Yellow disk flowers	5
<i>Dicentra spectabilis</i>	Bleeding Heart	May to June	Outer petals red Inner white	4
<i>Lupinus</i> 'Russell Hybrid'	Lupine	June	Red, Pink, White Yellow, Blue, Purple	4

The popularity of perennials in the landscape and the range of unusual flower types create an opportunity to market some species as bedding plants or as pot crops. Forcing techniques can be used to produce popular or unusual species for these specialty markets. Controlled forcing can be used to produce perennial bedding plants in bloom, a characteristic consumers expect. Controlled forcing can also be used to produce flowering holiday pot crops, i.e. Bleeding Heart for Valentine's day.

Many perennial species will not flower until a certain minimum size or stage of development is attained. Once this juvenile stage is surpassed specific cultural conditions are required. A summary of some of these requirements appears in Table 2.

Table 2.

Perennial Species	Stage of Development to Induce Flowering	Minimum Weeks in Cold Storage (40°F)	Weeks to Bloom or (Visible Bud)	Temp. (°F)	Day Length (hrs)
Columbine	10-12 leaves (3 months)	10	9(6)	55	18
			11(9)	55	10
Astilbe	Fall harvest	12	14	57	Natural
Basket of Gold	10 Crowns/pl. (7 months)	12	4(1)	55	18
			6(3)	55	10
Shasta Daisy	Multiple crowns (3 months)	16	8(2)	65	18
			11(6)	65	10
Bleeding Heart	2-3 eye crowns	(In light)	3	59	24
	Fall harvest	16	7	59	8
Lupine	6 months	12	5(3)	65	18
			7(5)	65	10

Cold storage prior to flower forcing is not an absolute requirement for all species. Lupine can be forced to flower from seed by maintaining 16 hr days and 56°F temperatures. This process requires about 9 months with 80% of the plants producing flowers. In comparison, 100% of the plants will flower when cold stored plants are forced under long-day conditions. Vegetatively propagated tip cuttings of Bleeding Heart can be forced to produce flowers under long-day conditions, an alternative to cold storage of the crowns. Shasta Daisy can be forced from seed, however cultural requirements will vary from plant to plant. Some plants will respond to cool

growing temperatures, some to long days and others will require both. The process, if successful, will require 6 to 8 months. Subjecting the crowns to 16 weeks of cold storage will insure that all plants flower.

Following cold storage, the time required to produce a flower will vary with day length and temperature. In general, as photoperiod and temperature increase, the time to flower will decrease. Conversely, a longer period will be required to flower when low temperatures and short day lengths are used.

Long day lengths will typically increase flower number as well as flower weight and diameter. One negative effect of forcing with high temperatures and long days is the undesirable increase in plant elongation. The plant growth regulators B-NINE and A-REST can be used to maintain a compact plant. Applications of B-NINE at rates of 2000 to 5000 ppm or A-REST at 50 to 100 ppm prior to flower elongation have been found to be effective in controlling elongation.

References:

- De Hertogh, A. 1984. *Guidelines for forcing of 'Astilbe' (False Spirea)*. **Bulletin 12**. Holland flower bulb technical services.
- Lopes, L. C. and T. C. Weiler. 1977. *Light and temperature effects on the growth and flowering of *Dicentra spectabilis* (L)*. **Lem. J. Amer. Soc. Hort. Sci.** 102(4):388-390.
- Shedron, Karen G. and Thomas C. Weiler. 1982. *Regulation of growth and flowering in *Basket of Gold, Aurinia saxatilis* (L)*. **Desv. HortSci.** 17(3):338-340.
- Shedron, Karen G. and T. C. Weiler. 1982. *Regulation of growth and flowering in *Aquilegia X hybrida* Sims*. **J. Amer. Soc. Hort. Sci.** 107(5):878-882.
- Shedron, Karen G. and Thomas C. Weiler. 1982. *Regulation of growth and flowering in *Chrysanthemum X superbum* Bergmans*. **J. Amer. Soc. Hort. Sci.** 107(5):874-877.
- Shedron, Karen G. and Thomas C. Weiler. 1982. *Regulation of growth and flowering in *Lupinus Russell-Hybrid**. **HortSci.** 17(5):807-809.
- Shedron, Karen G. and Thomas C. Weiler. 1982. *Producing perennials as bedding plants*. **American Nurseryman** May 15 pp. 45-47.