GROWERTALKS

Features

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Boosting Perennial Blooms with Long-Day Lighting

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Spring is always an exciting time in the greenhouse. The promise of a new season inspires gardeners to flock to the garden centers with a craving for color. For perennial growers it takes considerable planning to have this color ready for them, but do you always seem to have an assortment of perennials that won't bloom in the spring? Maybe you need to apply some simple lighting techniques to boost the springtime blooms on these
varieties.

In the January issue of *GrowerTalks*, we discussed how to obtain predictable blooms on perennial crops that aren't daylength sensitive for flowering. We learned that predictability depends upon:

- The maturity and vernalization of the plug used.
- Proper scheduling of planting dates.
- The temperature vernalized liners are provided in the finished container.

If you plant a well-bulked and thoroughly cold-treated perennial plug in the proper media and pot size, it will bloom in a predictable number of weeks given the proper temperature program. Perennials that aren't daylength sensitive must be forced using minimum day and night temperatures of 68F (20C) for the predictable program to work.

A string of long-day lights at Swift Greenhouses. These work well for larger areas spaced at 10 ft. apart to help initiate growing

Long-day basics

For the vast majority of perennial species, the above three conditions must be met to achieve predictable blooms. However, there are a number of prominent perennial varieties

that may not grow properly and won't bloom for spring sales unless one more condition is met—the proper photoperiod. This select group of perennials, known as long-day perennials includes asclepias, *Campanula carpatica*, *Coreopsis verticillata*, echinacea and many rudbeckia varieties.

As the classification implies, long-day perennials are generally summer bloomers (greater than 12 hours of day length). These plants, after emerging from dormancy, tend to actively grow for a period of time before developing flower buds. Because it's a lengthy process, scheduling long-day perennials to bloom can be a little more challenging; there are many variables to control, especially if you're in hardiness Zones 4 or colder. Fortunately, long-day perennials tend to stay in bloom for a longer period of time than spring bloomers, so there's a little leeway than there is for a crop such as aquilegia.

Over the course of a three to four-month crop time, the days will gradually get longer and warmer. You need to take into account that the rate of crop development will increase. And then there is the universal variable we all encounter—weather. If it happens to be a colder and cloudier spring than usual, the crop will naturally develop at a slower rate. Similarly, if it's an earlier spring, or you're in a warmer hardiness zone, flower development will be hastened.

Referring to the table, count back from the target ship date the number of weeks it takes the slowest variety to bloom. For example, rudbeckia (such as Goldilocks) and buddleia take 10 to 12 weeks to bloom (WTB). If the target ship date is Week 16, you'll need to plant these during Week 4. Keep the other varieties with shorter WTB in a cool greenhouse or cooler at 32F to 40F (0C to 4C) until the appropriate planting week. For example, plant Coreopsis Moonbeam Week 7. Generally, it's easier to hold blooms on these varieties rather than to force them; it's best to allow a little extra time if it's vital to have color on your target date.

Environmental specifics for long-day varieties

Plant one dormant liner per pot, preferably in a peat-based media. Echinacea and agastache prefer a slightly higher pH of 6.2 to 6.5 than many other perennials. When deciding on where to place your crop of long-day perennials, it would be ideal to have them together in a separate house or area of a greenhouse for several reasons.

First, these varieties need photoperiodic lighting; this is where many growers can go wrong. Although these plants are usually called "long day," more accurately they're "short night" perennials. The night (dark period of time) should be no longer than eight hours to initiate flowering.

Next, not only do these varieties require lighting to initiate flowering, they often require artificial lighting to consistently break dormancy and begin to grow—especially if the liners are well-vernalized (a requirement for consistent flowering). Long-day lighting, sometimes called mum lighting, is very easy to implement and doesn't require special equipment. Most commonly 75W to 150W incandescent or compact fluorescent light bulbs are used and plugged or wired into a basic 24-hour timer. One light hanging 4 to 8 ft. above the crop is enough to adequately light 100 sq. ft. For larger areas, a string of lights spaced at 10 ft. apart works well. However, the light produced from these bulbs is not "quality" light. It's low intensity and contains more wavelengths in the far red spectrum than HID lighting.

Low-light intensity added to warm nighttime temperatures can lead to excessive stretch. Timing your long-day lighting correctly can help control some of this stretch. The industry recommendation is night interruption lighting by turning the lights on at 10:00 p.m. and off at 2:00 a.m., breaking the night into two shorter periods. An alternative approach to long-day lighting would be day extension. This means turning lights on at 2:00 a.m. until sunrise. If you use a negative DIF temperature program, which is very effective on many perennials, the drop in air temperature can be programmed to coincide with the lighting. Therefore, having cooler temperatures during the lighting period can help to control the stretch.

Long-Day Perennial Varieties	Weeks to Bloom
Agastache Sinning Sonoran Sunset	9-10
Asclepias tuberosa	10-11
Buddleia davidii	10-12
Campanula carpatica	9-10
Coreopsis Moonbeam	8-9
Hemerocallis Stella de Oro	9-10
Lysimachia Beaujolais	7-8
Rudbeckia hirta (most varieties)	10-12
Scabiosa Butterfly Blue	10-11

Last, it's absolutely essential to force the vernalized liners out of dormancy with warm temperatures. Spring-blooming perennials such as aquilegia and bellis will grow when forced at cool temperatures (but they won't bloom as predictably); many long-day perennial varieties won't begin to grow without a minimum temperature of 68F (20C). The day temperatures can be higher as solar gain permits, but the night temperatures have to remain at least 68F (20C) for 2 to 3 weeks. For this reason, it's more economical to have these varieties in a separate house to avoid heating an unnecessarily large area.

After the crop is actively growing, night temperatures can be gradually lowered to 65F (18C) Weeks 3 and 4, then to 60F to 62F (15C to 16C) Weeks 5 through 7. Day temperatures can be gradually reduced to 60F to 62F (15C to 16C) by Week 7, relative to crop and flower development. Unless the crop is fully developed, it's not recommended to maintain day or night temperatures below 60F (15C) because flower development can stall. Once the blooms are showing color and the crop is ready to sell, temperatures can be dropped to 50F (10C) for holding. Long-day lighting needs to be continued until April 1.

Now you know how easy it is to implement long-day lighting on your summer-blooming perennials. Using a simple light bulb can boost your blooms and give you more color in the garden center when you want it. What an eye-catching surprise that will be sure to satisfy your customers' cravings! **GT**

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