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# Flowering of Begonias

*What begonias are you growing? Are your plants flowering too early or too late? This e-GRO Alert will cover what controls flowering for different begonias.*

Begonias are one of the most popular herbaceous plants grown during spring... and for good reasons! If you are looking for a begonia to fit a specific need, you can probably find one that will do the trick. These bedding plant classics are commonly propagated from seed or rooted cuttings. Some begonias are well-suited for landscape beds, whereas some cultivars are best grown and shown in baskets or patio containers.

One consequence of this diversity in begonias is a large variety of products grown. Just look at container sizes, ranging from 6-plant packs to 14-inch hanging baskets. We try to produce plants that are proportional to their container, as well as having a good ratio of flowers and foliage. Begonias with improperly-timed flowering is a common

Figure 1. Premature flowering of angel wing begonias in a hanging basket. Ideally, this crop should still be vegetative during the bulking phase.

problems- either delayed flowering resulting in overgrown plants, or early flowering when plants are small (Fig. 1).

Depending on the species, one of several factors may influence flowering: photoperiod, light intensity, juvenility, temperature, and stress. However the flowering requirements are different across the different types of begonias. We will review the different flowering responses of the most popular types of begonias in this e-GRO Alert.

### Tuberous begonias
Tuberous begonias are frequently grown as a hanging basket crop because of their colorful, pendulous flowers. However, since these crops are frequently produced in hanging bas-

kets, it poses two challenges. First, crops produced in hanging baskets require a longer time to finish due to the larger container size. Alternatively, recently transplanted cuttings that begin flowering immediately (Fig. 2) will be producing flowers during the entire crop, diverting some energy from vegetative growth and dropping old flowers onto substrate, including those plants grown below hanging baskets.

The critical photoperiod for tuberous begonia is 12 hours. That is, photoperiods longer than 12 hours promotes the growth of leaves and flowers. Alternatively, when the photoperiod is less than 12 hours the plants will develop tubers; this comes at the expense of shoot growth and, there-



Figure 2. The tuberous begonias in this container are just starting to reach the edge of the container, yet flowers have started to open.

fore, flowering. The longer the daylength, the more flowering is promoted.

In order to keep tuberous begonias from going dormant and forming tuber, begonias must be grown under long-day conditions in the greenhouse. If the daylength is not long enough to get plants flowering, photoperiodic lighting should be provided . Long days conditions can be created by extending the length of the day with light ("day-extension") or providing light from 10:00 p.m. until 2:00 a.m. ("night interruption"). Several different lights can be used for this purpose, including high-pressure sodium (HPS) lamps, light-emitting diodes (LEDs), or incandescent light bulbs. The key is to provide at least 10 foot candles (2 µmoles·m$^{-2}$·s$^{-1}$) of light at plant height.

### Hiemalis begonias
Reiger, heimalis, and elatior begonia- these are all different common names for the same plant. We commonly think of these plants as potted plants for indoors. However, they also make annuals that will flower well in shady locations.

Hiemalis begonias differ from tuberous begonias in that there are a few more causes of flower induction, including daylength and several types of "stress".

Once your begonias have gotten to around two-thirds of their target final size, it is time to induce flowers. Like tuberous begonias, reiger begonias are photoperiodic. However, they are classified as short-day plants. To maintain plants in a vegetative state, such as during propagation or after transplanting to bulk up vegetative growth, provide long days as described in the previous section. To induce flowering, provide short days. There are only two ways to have a short-day environment in a greenhouse: 1) when the day is naturally short; and 2) when black cloth is used to shorten the day. Remember, when using shade cloth use material that is aluminized on one side so heat from the late afternoon and evening sub does not build up under the cloth. Two to three weeks of short days is generally enough time induce flowering, but err on the longer time during periods of vigorous growth

(such as late spring and summer).

For growers who do not have or do not want to use black cloth to induce flowering of hiemalis, there are other options available. Imposing stresses such as lowering air temperatures, reducing fertilizer applications, and/or reducing irrigation and growing plants drier can be used to induce flowering. Although flowering can be delayed if the stress is too mild, be careful not to take these measures to extremes and damage your crop!

### Wax begonias
Wax or fibrous begonias are most commonly grown for use in landscape beds. As such, wax or fibrous begonias are produced in packs and marketed in flats. Premature flowering of wax begonias can be a problem. However, due to the fact that wax begonias are grown in small containers a more common problem is plants that are too large because flowering was delayed and delayed marketability.

Wax begonias are different than other begonias, such as tuberous begonias and reiger begonias, in that flowering is not affected by photoperiod. While the length of the day does not affect flowering, the amount of light a plant receives affects flowering. Although wax begonia can be grown in the shade in the landscape, the time to flower is usually shorter with increasing light intensity. While it may not be economical to provide supplemental lighting to large numbers of flats of begonias, consider increasing light during propagation with supplemental light. This can be a very efficient way to provide more light to wax begonia crops during production.

### Cane begonias
There are a few other types of begonias that are commonly grown, including the angel and dragon wing begonias (Fig. 3). These be-



Figure 3. A hanging basket crop of dragon wings begonias that are appropriately sized for the container and in flower. *Image courtesy of Roberto G. Lopez.*

gonias cay also be called "cane begonias", a reference to the stems that grow upright, *Begonia aconitifolia* and *B. coccinea*. This more recently popularized class of begonias has not received much attention with respect to identifying what controls flowering. However, there is some indication that daylength and stress influence flowering.

Some reports suggest that flowering of dragon wing begonias is slightly promoted by short days. However, the cane-type begonias will flower under long days as well. For all practical purposes, photoperiod is not used to manage flowering of this crop. If you are interested in inducing flowering of this crop, you can use stress as for a promoting effect, similar to hiemalis begonias. Lowering the substrate EC, cool air temperatures, and drying down substrate all can contribute to flower induction.

## Foliage begonias
The type of begonias that are frequently produced for their foliage and texture of vegetative growth, there is not much concern about neither inhibition nor promotion of flowering. The flowers are not particularly showy or attractive, so there is no need to promote flowering, while the flowers are not very large so they may not be much of a strong sink competing with vegetative growth.

## Take home message
Begonias are excellent plants for the garden and there is a reason why so many are being produced in the spring greenhouse. However, with this many types of begonias being grown, be sure which type or species you are growing when planning greenhouse production. Schedule the correct treatments to induce flowering on time, or to keep plants vegetative to bulk them up.

*The author would like to thank Mike Gooder for information on flowering of cane begonias.*