

Forcing Bulbs

Ann Joy and Brian Hudelson, UW-Madison Plant Pathology

Wisconsin gardeners do not have to give up growing flowers during the long winter months. Many plants grown from bulbs (also those grown from corms or rhizomes) can be forced to bloom indoors during the winter by giving them the combination of cold and dark conditions that they require to break dormancy, develop roots, and flower. If you can spare a corner of your refrigerator, you can enjoy flowering hyacinths, narcissus, tulips, crocus, or other spring-flowering plants during the winter.



Hyacinths, tulips and narcissus forced into winter bloom indoors.

What plants should I select? Look for varieties that are specifically recommended for forcing. Select top quality bulbs with no soft spots. **DO NOT** purchase bulbs that are damaged. When selecting bulbs to force, keep in mind that late-blooming varieties need longer cold treatments than early-blooming varieties. Also remember that taller varieties may need to be staked, and thus may not be appropriate in all settings.

How do I plant my bulbs? Plant bulbs from September through November for indoor bloom. Use plastic or preferably clay containers with drainage holes. Proper drainage is crucial for forcing bulbs. Use a potting mix that is equal parts soil, sharp builder's sand, and peat moss. Partially fill containers with potting mix, arrange bulbs so that their necks will be at or just below the surface, and gently add more potting mix around the bulbs. Amaryllis bulbs can be planted with the top $\frac{1}{3}$ of the bulb above the level of the potting mix. Smaller bulbs like grape hyacinth and crocus may be covered by one half to one inch of the potting mix. Separate bulbs by about half a bulb width. A container that is six inches wide and six inches deep will hold roughly 10 to 12 crocus, five tulip, four hyacinth, or three to five narcissus bulbs. Plant bulbs that have one flat side (e.g., tulip bulbs) with the flat side facing the outside of the pot. This will yield a display of large leaves towards the outside of the pot, surrounding the flower stalks. Fertilizing bulbs is not necessary, but be sure to water your bulbs if the potting mix

is very dry and add potting mix as needed if settling occurs. Bulbs require some moisture during their cold treatment, but too much moisture can promote growth of rot fungi. If the potting mix in your pots is overly wet, allow it to dry a bit before beginning the cold treatment.

Hyacinths and paperwhite narcissus can be grown without potting mix. Hyacinths are often grown in special glass containers shaped to hold a single bulb, but any container with a neck narrow enough to suspend a bulb over water will work. Paperwhite narcissus bulbs can be grown on sand, gravel, pebbles or marbles. Place whatever material you select around the bulbs high enough to support them and keep them upright. Space bulbs as described above. For both hyacinths and paperwhite narcissus grown without potting mix, add water to the container, keeping the water level just below the bottom of the bulbs. If water touches the bulbs, they will rot.

Table 1.
Recommended cold period for forcing bulbs

Flower (Latin Name)	Required cold period
Amaryllis (<i>Hippeastrum</i>)	None
Crocus (<i>Crocus</i>)	15-17 weeks
Daffodil (<i>Narcissus</i>)	15-17 weeks
Dwarf Iris (<i>Iris reticulata</i> / <i>Iris danfordiae</i>)	15-16 weeks
Glory of the Snow (<i>Chionodoxa</i>)	15 weeks
Grape Hyacinth (<i>Muscari</i>)	15-17 weeks
Hyacinth (<i>Hyacinthus</i>)	12-15 weeks
Lily-of-the-Valley (<i>Convallaria</i>)	14-15 weeks
Paperwhite narcissus (<i>Narcissus</i>)	None
Squill (<i>Scilla</i>)	15-16 weeks
Tulip (<i>Tulipa</i>)	15-17 weeks

How do I get my bulbs to bloom? Most bulbs require cold and dark conditions that simulate winter conditions in order to bloom. However, amaryllis and paperwhite narcissus bulbs do not require a cold treatment. Cold treatment guidelines for several bulb species are given in Table 1.

Ideally, temperatures should decrease gradually. Bulbs should spend the first three to five weeks developing roots at 45 to 50°F, followed by about three weeks at 38 to 42°F, and the remainder of their cold period at about 35°F. However, the constant temperature of a home refrigerator (typically between 35 and 45°F) also works. Be sure NOT to store fruit (particularly apples) in the refrigerator while forcing bulbs as ethylene gas released from fruit impairs flower development. Also be sure to shield the bulbs from light.



Amaryllis bulbs do not require a cold period to bloom.

Check moisture every few weeks. If the potting mix is very dry, add a small amount of water. When the cold period is complete, the bulbs should have shoots that are one to two inches tall. Bring sprouted bulbs out of refrigeration into a sunny spot where the temperature is between 55 and 60°F. Shoots initially will be white, but will turn green when the bulbs are brought into the light. Most bulbs will bloom about three to four weeks after they are removed from the cold. Amaryllis bulbs will bloom six to eight weeks after planting. At warmer temperatures, bulbs may grow faster, but flowers will not last as long. Keep bulbs moist, but not overly wet. Bulbs will require more water as leaves begin to grow rapidly.

What do I do with my bulbs after they have bloomed? Hyacinths, narcissus, tulips, and crocus cannot be forced two years in a row. However, bulbs that have been grown indoors in potting mix can be planted in the garden. Keep the bulbs in pots through the spring and summer, watering and fertilizing them regularly until they naturally die back. In the autumn, plant the bulbs in your garden at the recommended depth. The bulbs may bloom the following spring, but most likely will need a year of leaf growth before they rebloom. Bulbs grown without potting mix exhaust their resources and often won't bloom again, even in the garden.

To get an amaryllis to bloom again, it is important to allow the bulb to store food during its growing season and then give it a dry dormant period. After bloom, remove the flowers, give the plant plenty of sunlight, and fertilize it. Stop watering in early

September and allow the plant to dry out completely. The foliage will die back. If taken outside during the summer, bring the plant inside before frost. Starting in November or December, begin to water the bulb again to repeat the blooming cycle. You may want to consider repotting your amaryllis bulb every few years, but only into a pot no more than one to two inches wider than the diameter of the bulb.

Keeping a log. Keep records of the varieties that you force, the length and temperature of cold treatment, and weeks until bloom after cold treatment. This information can provide a valuable reference for your future winter horticulture endeavors.

For more information on forcing bulbs: See Bryan, John E. 2002. *Bulbs*. Revised edition. Timber Press, Portland, Oregon, or De Hertogh, August. 1996. *Holland Bulb Forcer's Guide*. 5th edition. Hillegom, The Netherlands, or Hays, Robert M. and Janet Martinelli, eds. 1996. *Bulbs for Indoors*. The Brooklyn Botanic Garden, or contact your county Extension agent.