The Lowdown On Daffodils

The Longwood Gardens grower presents his recipe for successful daffodil container production, from force to finish.

by **JUERGEN STEININGER**

THE growers at Longwood Gardens force tens of thousands of daffodils into flower every winter, providing a glimpse of what's to come: spring. Now, I want to empower you with the essentials you need to grow equally impressive daffodils.

Daffodil Basics

Daffodil bulbs can be obtained in different grades, as well as standard dry bulbs or pre-cooled bulbs. The standard grades of daffodils are: Double-Nose I (DN I), Double-Nose II (DN II) and round bulbs. DN I bulbs promise the most flowers, but flowers vary greatly among the different cultivars.

For forcing, I rely on DN I bulbs while smaller grades are an economic alternative for dry bulb sales. We are fortunate to have plenty of cooler space, so we can work with standard dry bulbs, which are more economical than pre-cooled bulbs.

For forcing early in the season, coolers are indispensable. But for late-season growing, cold frames will do just fine in regions where temperatures approach freezing. Inconsistent cooling due to weather will result in uneven crops and poor flowering.

One of the most important decisions you'll make is choosing a reliable supplier. It took me several years and some patience to find the right companies. Particularly challenging for the companies working with me is the fact that the Longwood Gardens' forcing program consists of more than 100 daffodil cultivars for an average year.

Frequently, displays consist of small numbers of pots. So I need only a few hundred bulbs for each cultivar. In these instances, I am below minimum order and my suppliers not only tolerate me, but they support our program.

Many suppliers are set up to work with you to find the right selection of cultivars, so they are happy to provide you trial samples to promote their cultivars. Each year, I plant some extra pots of new cultivars. This gives me an opportunity to practice with these product lines and see how they perform and fit into my program.

Because commercial operations generally focus on fewer cultivars, they avoid some challenges I have experienced. Good suppliers will help you identify suitable cultivars as well as make sure you're getting quality bulbs for a fair price.

Bulb quality is also essential. You need to inspect each bulb crate upon arrival. Dispose of any soft or diseased bulbs. If something goes wrong during shipping or bulbs are infested with fusarium, tell your sales representative. You should be informing your supplier as soon as possible to get a refund or a substitute shipment. I have found combining orders and storing bulbs in a cooler will save on shipping costs. Bulbs can be stored for several weeks in a cooler with a set point of 63°F.

Potting Guidelines

A number of commercially available potting media have been suggested for growing daffodils. These media include Metromix 350 and Sunshine Mix 4. Longwood Gardens uses a custom bulb mix for the production of potted daffodils. This media is 55 percent peat moss, 35 percent coarse sand, 15 percent vermiculite and RootShield, a biological fungicide by BioWorks at a rate of 1.5 pounds per cubic yard of media.

Pulverized dolomite lime is added to adjust the pH to 6.0 to 6.5. I add sand to increase drainage as well as add substance and weight to the pots. The weight of the sand will help later in holding up plants

in the pot, as well as anchoring bulbs into their place. At times, I notice bulbs pop out of pots when using peat light mixes.

Bulbs are best forced in bulb pans, which are available in sizes of 5, 6 and 8 inch. I select the size according to the different cultivars. Large cultivars should be planted into the large-sized 8-inch pan. More compact cultivars generally fit well into 6-inch bulb pans. Small and miniature daffodils should be planted into 5-inch pans.

On average, I fit five to seven bulbs per pot. The pots are filled with bulbs with little space between. Take care not to overcrowd containers.

Vernalization & Forcing

Pots are watered in well after planting and placed in coolers for a cool treatment. Most daffodils require 15 to 17 weeks cooling. Some cultivars, such as 'Early Sensation,' are fine with just 12 weeks cooling. Pots should stay evenly moist. The quality of the crop can be affected negatively by uneven moisture during cooling. Crops should be checked at least weekly for watering and to determine their developmental stage. Cooler temperatures are reduced at certain intervals. The developmental stage governs the timing of decreasing temperatures.

Stage 1: 48°F. Roots begin to show at drainage holes of the pots.

Stage 2: 41°F. The shoots start growing. Then, move pots before they are 1-inch tall.

Stage 3: 33°F. Maintain this temperature for the remainder of the cooling period.

Once the chilling requirement is completed, pots should be moved to a forcing compartment in your greenhouse. Choose a well-lit growing area (2,500 footcandles) and maintain a temperature range of 63°F to 68°F. Manipulating day and night temperatures can alter plant height. The bench time or forcing time varies greatly among the cultivars but ranges generally between 15 and 30 days. If you have time, you can grow plants at lower temperatures like 55°F or 60°F.

Forcing at a lower temperature usually results in more compact and sturdier plants with stronger flowers. One has to weigh the prospect of better quality product with the cost of the bench space.

Often, people ask me when to plant bulbs and when to take them out of the cooler. This all depends on the display date, or for a commercial greenhouse operation, the ship date – and for a person trying to win a blue ribbon at the flower show, the date of the show. Determining the proper planting date is a basic equation and simple to calculate. It is best done using a spreadsheet.

Subtract from the display date (DD) the time it takes to force (FD) the crop in the

More Online
Juergen Steininger lists his top four daffodils for pot production at **GreenhouseGrower.com.**

greenhouse and the time crops need to vernalize in coolers (VD). The result will be the potting date (PD). So again: PD = DD – (FB+VD).

Plant Health & Crop Quality

Provide good ventilation and air circulation to control humidity. This will be a good strategy to manage botrytis. However, fungicide application prior to shipment may be advisable.

Over the last few years, I've had very little trouble with root born diseases. Currently, many growers still drench their crops with fungicides several times during vernalization – and even when forcing the crop in the greenhouse. I have had good results with adding RootShield to my potting media. I think by working with clean bulbs, keeping the coolers clean using RootShield, a lot of drenching could be eliminated. This would be good for the environment and save money on chemicals.

Plant height and compactness can be managed with DIF treatments and/or plant growth regulator (PGR) applications. A PGR labeled for use on daffodils is Florel Brand Ethephon, and I have had good results, especially with the larger-sized cultivars.

Plants can be sprayed once or twice starting with the pencil stage. This is a developmental stage when the scape is still short and its form looks like a pencil. Also, make sure to manage your vernalization schedule well. Plant on time according to your delivery schedule. Over-chilling, as well as under-chilling, will affect the compactness of your crop.

Keeping the pots too long in the cooler will likely result in lanky and floppy plants. Under-chilling can result in a more compact crop and, at times, become uneven in flowering.

Harvest & Sale

Make sure you have arranged for swift distribution of your crop. Daffodils are highly affected by temperature. At a temperature range of 45°F to 55°F, daffodils exhibit a remarkable longevity of two and sometimes three weeks. At temperatures above 65°F, flowers may last only a few days.

Therefore, the shelf life of a crop is limited and flowering pots can be held for only a limited amount of time in coolers. Infrequently, I have held crops for about 14 days in a cooler with a set point of 32°F. When holding crops longer in the cooler, plant quality will deteriorate. Please note that plants held for some time in the cooler have a shorter lifespan on display or on the shelf. They do not last nearly as long as plants that were never held in a cooler.

Speed of distribution and temperature control during transportation to the sales shop are essential. It would even be worthwhile to have several potting dates with fewer pots per succession. So when delivering plants to the store, a smaller number is delivered on subsequent delivery dates, providing fresh merchandise over several weeks. **GG**