

Crop: Daffodil
Scientific Name: Narcissus spp. (Amaryllidaceae)

I. Introduction

- A. Narcissus are grown both for cut flowers and pot plants.
- B. The origin of Narcissus is centered in Spain and Portugal and extend along the Pyrenees in southwest France. At least eight wild species are parents of current cultivars.
- C. Bulbs are produced in three major regions: the United States, England, and The Netherlands. Most bulbs forced in the United States are grown domestically or imported from The Netherlands. Domestic bulbs are thought to be best for cut flower production as they produce longer flower stalks.
- D. Bulbs are forced to flower from mid-December to April.
- E. Major forcing periods are for Valentines' Day and Easter.

II. Cultivars, Clones, Breeding, and Development

- A. Approximately 20 cultivars are used for pot forcing.
- B. Cultivars are grouped into one of the following groups: trumpet, large-cupped, small-cupped, double, cyclamieus (small trumpets) and tazetta.
- C. Consult the Holland Bulb Forcers Guide edited by Dr. A. A. DeHertogh for further information.

III. Flower Induction Requirements

- A. In contrast to the tulip and hyacinth, narcissus have an almost completely formed flower at harvest.
- B. Flowers are initiated in May shortly after the mother bulb flowers.
- C. Bulbs are given a warm-cool-warm temperature sequence in the forcing process.

- D. Bulbs for forcing must be DN I (2 1/4 blooms/bulb) or DN II (2 blooms/bulb). (DN - double nose)
 - a. Bulbs are normally sold as double nose bulbs meaning they will produce at least two flowers per bulb.

IV. Environmental Requirements

A. Light

- 1. Light after cooling is required to green the plant up and prevent excessive elongation.
- 2. For early forcing dates, bulbs are sometimes forced in the dark part of the forcing period to obtain adequate elongation especially for cut flowers.

B. Temperature

- 1. As with other "Dutch" bulbs, proper temperature is the key to successful forcing.
- 2. For early forcing dates, bulbs are harvested in July and given 1 week of 34°C (93°F) and then held at 17-20°C (63-68°F) until pre-cooled at 9°C (48°F) in August.
 - a. Bulbs to be pot forced are planted in early October and held at 9°C (48°F) until roots are formed. Then temperatures are lowered to 5°C (41°F).
 - b. After 14 weeks of cold, bulbs are forced at 16-18°C (60-65°F).
- 3. For standard forcing in mid-or late-season, bulbs are dug in late July or August and are stored at 17-20°C (63-68°F) until planted.
 - a. Temperatures are maintained at 9°C (48°F) until rooted, at 5°C (41°F) until January 1 or until shoots are 2 cm (1 inch) long (whichever comes first), and then at 1°C (33°F) until greenhouse forcing.
 - b. Bulbs are forced at 16-17°C (61-63°F) after receiving 14 to 16 weeks of cold.

C. Water

1. The growing medium must be moist during rooting and the cold treatment.
2. Pots may need watering during storage.

D. Nutrients

1. Fertilization of the growing bulbs is not required.

E. Gases

1. Bulbs should not be exposed to ethylene.

V. Cultivation

A. Propagation

1. Bulbs are propagated by the grower. Plants increase naturally by offset bulblet production.

B. Media and Planting

1. Bulbs should be planted in a loose, well drained, sterile medium.
2. Two to three bulbs are planted in a 15 cm (6 inch) pot based on the bulb size.

C. Spacing

1. Pots can be placed pot-to-pot for forcing.

D. Growth Regulators

1. With overcooling or late forcing dates, stem elongation can be excessive.
2. Ethephon applied as a 1,000 ppm spray within 2-3 days after moving into the greenhouse will control excessive stem elongation. Consult the Holland Bulb Forcers Guide for cultivars specific recommendations.

VI. Problems

A. Insects

1. Aphids are rarely a problem.

B. Diseases

1. The major disease is *Fusarium* basal rot. The disease originates in the field. Discard bulbs.
2. On certain occasions, *Penicillium* can become sufficiently pathogenic to cause bulb rot. Discard bulbs.

C. Other

1. "Bull-nosing" is a problem characterized by flower bud abortion at the "goose-neck" stage.
 - a. It is associated with excessively high greenhouse forcing temperatures.

VII. Handling, Marketing

- A. Bulbs should be moved to market in the late "pencil" or early "goose-neck" stage.

1. The "goose-neck" stage is when the bud has just tipped over to approximately 90° from the flower stalk.

VIII. Scheduling

A. Early forcing date (December 27)

Date	Growing Time for Cultural Segment	Cultural Procedure	Temperature
varies		Bulbs arrive	17°C (63°F)
	Varies	↓ V	
Aug. 26-31		Start precooling	9°C (48°F)
	5-6 weeks	↓ V	
Oct. 1-7		Plant (Rooting Room A)	9°C (48°F)
	8 weeks	↓ V	
Dec. 8		Start forcing	16-17°C (60-63°F)
	3 weeks	↓ V	
		Flower	

B. Late forcing date (April 15)

Date	Growing Time for Cultural Segment	Cultural Procedure	Temperature
varies		Bulbs arrive	17°C (63°F)
	varies	↓ V	
Nov. 8-12		Plant bulbs (Rooting Room B)	9°C (48°F)
	3 weeks	↓ V	
Dec. 1-5		Lower temperature	5°C (41°F)
	4 weeks	↓ V	
Jan. 1-5		Lower temperature	1°C (33°F)
	13 weeks	↓ V	
April 7		Start forcing	16-17°C (60-63°F)
	1 week	↓ V	
April 15		Flower	