

Crop: Hyacinth
Scientific name: Hyacinthus orientalis (Liliaceae)

I. Introduction

- A. Hyacinths originated in the area from Greece to Asia Minor.
- B. Most commercial bulbs are grown in Holland.
- C. Hyacinths are forced for pot flowering from late December to late April.
- D. Major holidays are Valentines Day and Easter.
- E. Bulbs require a cool moist period prior to forcing in the greenhouse.
- F. Bulb size used varies.
 - 1. Plant four 15/16 cm bulbs per pot
 - 2. Plant three 17/18 cm bulbs per pot
 - 3. Use at least 16/17 cm bulbs for early Valentine's Day forcing
 - 4. Smaller 12/14 cm bulbs can be used for late forcing sequences. Plant February 1 and force after 8 weeks old.

II. Cultivars, Clones, Breeding, and Development

- A. Approximately 20 cultivars are used for forcing in the United States.
- B. Cultivars are available in the following colors: red, pink, blue, white, and violet.
- C. Consult the "Holland Bulb Forcers Guide" for specific cultivars and forcing periods.
- D. Primary cultivars include 'Carnegie' (white), 'Anna Marie' and 'Eros' (pink) and 'Delft Blue' and 'Blue Jacket' (blue).
- E. Color selection is about 1/3 each of white, pink, and blue.

III. Flower Induction Requirements

- A. Bulbs are vegetative when first harvested.
- B. For prepared bulbs, (used for December and January flowering), bulbs are dug in mid-June.
 - 1. They are held at 30°C (86°F) for 2 weeks, at 26°C (78°F) for 3 weeks, and then at 23°C (73°F) until the uppermost floret reaches stage A2 (Double sets of perianth and androecium are visible).
 - 2. Bulbs are then held at 9-12°C (48-55°F) until planted in September.
- C. For midseason and late forcing, bulbs are dug in late June and early July and are stored at 17°C (63°F) until planting (late September to mid-November).

IV. Environmental Requirements

- A. Light
 - 1. Hyacinths force rapidly and light is only necessary to prevent excessive stretch.
 - 2. A minimum of 250 foot-candles ($50 \mu\text{mol s}^{-1}\text{m}^{-2}$) is preferred.
 - 3. For early forcing using prepared bulbs, dark conditions for the first 4-5 days in the greenhouse may be necessary to obtain adequate elongation as the flower stalk tends to be short on these bulbs.
- B. Temperature
 - 1. Temperatures relative to flower initiation have been described above.
 - 2. During programming prepared bulbs, the potted hyacinth bulbs are placed directly in Rooting Room B (See Chapter on Tulips) and maintained at 9°C (48°F). Bulbs are placed in Rooting Room B for 2 reasons.
 - a. Prepared bulbs only require 10-12 weeks of cold which is less than the 13 weeks for regular hyacinth bulbs.

- b. In addition, 9°C (48°F) is the optimum temperature for prepared bulb development.
 - c. Bulbs are forced in the greenhouse at 23°C (73°F) during H-1 or Hyacinth period 1 (December 20 to January 13) and 18°C (65°F) during H-2 (January 14 to February 8).
 3. During programming regular bulbs, pots are placed in Rooting Room B at 9°C (48°F) until approximately December 1-5 when the temperature is lowered to 5°C (41°F). About January 1-5, temperatures are lowered to 1-2°C (33-35°F).
 - a. Temperatures are lowered to 5°C (41°F) when roots are growing out of the bottom of the pot.
 - b. Temperatures are lowered to 1°C (33°F) when the shoot reaches 4-5 cm (1 1/2 - 2 inch) in length.
 - c. The forcer must observe the bulbs and lower the temperature based on their development. The calendar dates are just a guide.
 - d. Plants are forced in the greenhouse at 18°C (65°F) for H-2 and H-3 (January 14 to February 28) and at 16°C (60°F) for the remainder of the season.
 - e. Soil and bulbs should not be allowed to freeze during the cold treatment (See section VI C).

C. Water

1. During the cold treatment, the soil must be kept moist for proper root development.
2. Pots may need watering during the cold treatment so they should be checked regularly.
3. Soil should be moist during forcing.

D. Nutrients

1. Hyacinths do not require fertilization during forcing.

E. Gases

1. Bulbs should not be exposed to ethylene.

V. Cultivation

A. Propagation

1. Bulbs can be scooped or scored. As propagation is not a concern of the forcer, it will not be discussed here.

B. Medium and Planting

1. Bulbs should be planted in a well-drained, sterile medium with a pH of 5.5 to 7.5.
2. Hyacinth can be forced on water.
 - a. Prior to being placed on water, any bulblets should be removed.
 - b. Be certain only the basal plate touches the water. The bulb should not be immersed.
 - c. The water level must be maintained during the cold period in the rooting room.

C. Spacing

1. Pots can be placed pot-to-pot in the greenhouse during forcing.

D. Support

1. Support or staking is sometimes required to hold the flower stalks upright, especially for later forced bulbs.

E. Growth Regulators

1. Ethephon is the chemical of choice for height control. Apply at 1,000-2,000 ppm when the leaves and stalk are 3 to 4 inches in length. Flowers should not be showing any color. Foliage should be dry. Best time for application is late afternoon. See the Holland Bulb Forcers Guide for specific cultivar recommendations.

2. Ancyomidol (A-Rest) is also effective in controlling scape elongation. However, large quantities are required which makes the use of ancymold very expensive. If used, apply 2-4 mg per 15 cm (6 inch) pot. Application should be 1 day after the start of forcing. Taller cultivars require 4 mg/pot.

VI. Problems

A. Insects

1. Aphids are a problem only occasionally.

B. Diseases

1. *Penicillium* is the most common disease. It is most common when relative humidities are high. It is a problem when it attacks the basal plate. Control by keeping bulbs well ventilated or by fungicidal dips.

C. Physiological

1. "Spitting" is a disorder where the entire stalk is released from the basal plate.
2. It is most common when bulbs have been frozen and then thawed rapidly.

VII. Handling, Harvesting, Shipping

- A. Hyacinths should be marketed when the flower color first becomes visible.
- B. Buds develop very rapidly at warm temperatures.
- C. Late in the season, bulbs often only require a few days in light to green up prior to sales.

VII. Scheduling

A. Early date (January 3)

Date	Growing Time for Cultural Segment	Cultural Procedure	Temperature
late Aug.		Bulbs arrive (prepared bulb)	9-13°C (48-55°F)
	varies	↓ V	
Sept. 17-23		Potted	9°C (48°F)
	10 weeks	↓ V	
Dec. 1-5		Lower temperature	5°C (41°F)
	2 weeks	↓ V	
Dec. 15		Move to greenhouse	23°C (73°F)
	2 weeks	↓ V	
Jan. 3		Flower	

B. Late date (April 15)

Date	Growing Time for Cultural Segment	Cultural Procedure	Temperature
varies		Bulbs arrive	17°C (63°F)
	varies	↓ V	
Nov. 15		Potted	9°C (48°F)
	2 weeks	↓ V	
Dec. 1-5		Lower temperature	5°C (41°F)
	4 weeks	↓ V	
Jan. 1-5		Lower temperature	1°C (33°F)
	14 weeks	↓ V	
April 5		Move to greenhouse	16°C (60°F)
	10 days	↓ V	
April 15		Flower	