

Crop: Rose (from dormant canes)
Scientific Name: Rosa hybrida (Rosaceae)

I. Introduction

- A. Pot roses traditionally were grown in 15 cm (6 inch) pots from dormant cane plants. Many roses today are being grown from cuttings in 10 cm (4 inch) pots. This chapter is limited to production of dormant cane plants.
- B. Pot roses are forced into flower primarily for the holiday market of Easter and Mothers day.
- C. Some production occurs for Valentine's day. Production for this holiday is limited in the northern parts of the U.S.

II. Species, Cultivars, Breeding, Development

- A. Two main cultivars groups exist for greenhouse pot forcing, the Garnettes and the Kosters.
- B. The Garnettes are vigorous upright growing plants. Flowers are double. Cultivars include 'Garnette', a red rose, and 'Bright Pink Garnette', a pink rose.
- C. The Kosters grow shorter, have more, thinner breaks and have flowers with fewer petals than the Garnettes. Cultivars include 'Dick Koster' orange colored, 'White Koster' white flowers and 'Mothers Day' is a popular, red Koster growing type cultivar.
- D. The so called miniature and Mini-Flora roses are also being produced for Easter and Mothers day.

III. Flower Induction Requirements

- A. Flower buds initiate as the shoot grows. Initiation is not influenced by photoperiod.
- B. For flower initiation and continued flower development, high light intensities are required.

- C. Under low light conditions, flower buds abort and the shoots go blind.

IV. Environmental Requirements

A. Light

1. Plants should be grown under full sunlight without shade. Maximum light is desired, especially in early spring.
2. High intensity light following low light (i.e. rain) may cause burn on new growth.
3. High intensity discharge (HID) lights may be necessary for Valentines' production. In the Northern U.S., 250 foot-candles ($50 \mu\text{mol s}^{-1}\text{m}^{-2}$) for a minimum of 12 hours a day is required to produce marketable plants.

B. Temperature

1. Plants can be grown in wide range of temperatures. Night temperature of 10-20°C (50-68°F) are acceptable. Higher light levels are essential at 20°C (68°F) to prevent flower abortion.
2. The growth rate and flowering date can easily be controlled by temperature.
3. Higher night temperature will result in faster growth but softer stems and lower petal number may result.
4. Large, high quality bushes (XXX quality) can initially be grown at 10-13°C (50-55°F) night temperature or at 16-17°C (60-62°F). After the shoots are 7-13 cm (3 to 5 inches) in length, the temperature can be increased to 18°C (65°F).

C. Water

1. Plants require constant moisture. If the roses dry out once, there will be severe leaf yellowing and leaf drop. Miniature roses are especially sensitive to drought.

D. Nutrition

1. Roses are heavy feeders.
2. Constant feed of 250-300 ppm of N and 200-250 ppm of K from $\text{Ca}(\text{NO}_3)_2 + \text{KNO}_3$ would give a good result.

E. Gases

1. CO_2 enrichment (900-1,000 ppm) improves quality.

V. Cultivation

A. Propagation

1. Grafted plants are dug from the field, stored in cold storage and then shipped for forcing.
2. The desired cultivars are budded on a suitable root stock. *Rosa multiflora* is a root stock with good performance in the greenhouse.

B. Media and planting

1. The potting mix should be well drained with a pH in the range of 6.0 to 7.0.
2. Roots and canes on grafted plants are pruned to approximately 15-20 cm (6-8 inches) prior to potting. The plants should be placed deeply into the pots so that the graft is near the soil line after potting.
3. Suitable pot size for Garnette and Koster types is 15 cm (6 inch).

C. Spacing

1. Good spacing is required to decrease diseases and to improve light conditions.
2. Appropriate spacing for 10 cm (4 inch) pots is 4-4.5 pots per ft^2 and for 15 cm (6 inch) pots, 1-1.5 pots per ft^2 .

D. Pinching

1. Some cultivars have a dominating shoot that disrupts the symmetry of the plant. This shoot should be completely removed when it is 3-4 inches in length to improve plant quality.
2. Fast growing shoots on grafted and cutting propagated plants may be pinched to 4-5 leaves.

E. Growth regulators

1. The most effective growth regulator is Bonzi.
2. Cycocel may control height on some cultivars but in general, is ineffective.

VI. Problems

A. Insects

1. The worst pest is spider mite.
2. Aphids, thrips and loopers can also cause problems.

B. Diseases

1. Powdery mildew is the most common disease on roses. Control humidity and maintain chemical control to prevent the spread.

C. Physiological

1. Blind shoots are a problem under low light.
2. Bull heads can be induced by rapid changed in environmental factors such as large temperature fluctuations.
3. Pesticides and other chemicals can cause phytotoxicity in roses. The damages appear as severe leaf burn and leaf deformations. If in doubt of the response, test the pesticide or growth regulator on a few plants before treating the whole crop.

VII. Harvesting, Handling, and Marketing

- A. Plants should be shipped under refrigerated conditions, 0-2°C (32-35°F).
- B. Shipment at ambient temperatures, 21°C (70°F), for 5-6 days induces bud drop and leaf abscission.
- C. Excessive heat during dark transportation can cause bud blast and leaf abscission.
- D. Plants should be placed in bright light in the home and watered adequately.

VIII. Scheduling

Growing Time for Cultural Segment	Cultural Procedure	Temperature
	Plant	13-17°C (55-62°F)
4-5 weeks	↓	
	Bud visible	13-17°C (55-62°F)
3-5 weeks	↓	
	Flower	