GRAFTING LEAFY STEM CUTTINGS, A TECHNIQUE FOR PROPAGATING ROSES

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A method for producing rose bushes on *Rosa fortuniana* rootstock is needed to supply Florida's home gardeners and commercial cut-flower growers with superior plants. The exceptional vigor and longevity of roses on *R. fortuniana*, compared with other rootstocks under Florida growing conditions has created a demand for cultivated varieties (cultivars) grafted on this rootstock.

Callusing stem cutting grafts while roots develop under mist has proved a satisfactory method of producing large quantities of a wide range of cultivars on *R. fortuniana* stock. The small "liner" grade plants resulting from this propagation method are suitable for forcing either in containers or in field locations.

Grafted liners with root systems 6 to 8 weeks old are not currently shipped to available markets, but this is a future possibility. Small plants are more suitable than larger ones in establishing commercial cut-flower plantings. Nurserymen prepared to grow the small plants to suitable size for sale to home gardeners are another group of potential buyers of liner grade rose plants.

The present procedure for producing bush-form rose plants on *R. fortuniana* stock is a modification of the method of rooting budded stem cuttings under mist that was described previously (2). The modification includes a change in the type of scion from bud to 2-leaf stem section and a change in the wrapping material from non-adhesive to adhesive vinyl film. Substituting apical grafting for budding eliminates delay in forcing established scion buds after planting, and the several-step removal of stock above established buds is also eliminated. A better balanced scion growth develops from the 2 axillary buds of apical grafts, and the absence of exposed wound surfaces near the graft union reduces occurrence of stem dieback.

The other method changes include amending the formerly used rooting media, composed of peat and perlite, with a calcined clay. No nutrient solution is now applied during rooting. Individual fiber pots are used for rooting, in place of trays containing rooting medium. Shorter stem sections of stock are now used to produce the root system, and their bases are covered to a depth of 2 instead of 4 inches.

All standard methods referred to as apical grafts with detached scions by Garner (1), are feasible ways of joining the base of the 2-leaf scion cutting to the top of the 2-leaf stock cutting. In this grafting technique, both scion and stock are detached and leaves are kept on both throughout the period of callus and root development under mist. Steps currently used in producing grafted rose liners are described here.

**PRESENT PROCEDURE**

Scion cuttings are obtained from flowering stems or from "blind" stems of comparable age. Stock cuttings of *R. fortuniana* are obtained from maturing, unbranched canes which match the diameter of scion wood. Thorns are removed when present. Mature foliage free of leaf diseases is needed on both scion and stock cuttings. Healthy plants, not infected with crown gall, stem canker or rose mosaic, are suitable sources of cuttings. Precautions should be taken to prevent drying of the stems after they are removed from the plant.

Knives with sharp, thin blades are needed in forming and in trimming cutting grafts. Sanitation can be insured by immersing knife blades in ethyl alcohol and wiping them dry before use.

After fitting the scion cutting to a similar sized stock cutting by one of the standard methods of joining grafts, a plastic wrapping is applied to bind and seal the graft wound area. Pressure-sensitive vinyl tapes with coloring pigments added can be used successfully as graft wraps (Fig. 1), but those with no pigments allow inspection of the graft through the covering (Fig. 2). The 2 currently used transparent wrapping materials, having adhesive on one surface, are Scotch brand tapes nos. 471 and 473, both in 1-inch widths. The 3 mils thick tape no. 473 is used for wrapping firmly joined grafts, such as the whip and tongue. The 7 mils thick tape no. 471 is used for wrapping less firmly anchored grafts, such as the splice.

A 2-inch length of tape is used in applying

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Figure 1.—Stages in producing stem cutting grafts. Upper: 2-leaf scion is joined by saddle-v method to a 2-leaf R. fortuniana stock cutting, and wrapped with white pressure-sensitive tape, then placed in a rooting medium and kept moist. Lower: Leaves and buds below the wrap are removed when planting the rooted cutting-graft 35 days after grafting; the wrap is removed after planting.

the wrap. The mid-length adhesive surface is centered and attached to one side of the stem, ends are drawn around the wound area and gummed surfaces are pressed together to form a tab extending away from the stem. Tightening, by pinching the tab near the stem, completes the
wrapping. Definite-length tape dispensers are a time-saving aid in wrapping.

An individual container used for rooting each cutting graft reduces root damage in planting. Fiber pots with about 4-inch depth are suitable, if a drainage hole is punched in the bottom. The rooting medium used to fill the fiber pot is a mixture of peat, perlite, and calcined clay in 2:2:1 ratio by volume.

To stabilize the upright position of the cutting grafts and to facilitate handling, the pots of rooting media are placed in flats or suspended in portable wire frames within the propagation area (Fig. 3). A greenhouse enclosure for the propagation area should be used where possible; if outdoor locations are used wind shielding is required. A film of water coating the leaves must be supplied during daylight hours. Continuous misting will supply required water, but intermittent misting which replaces water as it evaporates gives better results.

Plants are removed from the propagation area when roots penetrate the sides of the fiber pot (Fig. 3). The graft union is usually completed during the rooting period, but it should be viewed through the transparent covering to determine the extent of callus development before removing the wrap (Fig. 4). Most cutting grafts on R. fortuniana stock are ready for planting 35 days after grafting; those that are not rooted after 45 days should be discarded.

Leaves, axillary buds and sucker shoots are removed from the stock after rooting; buds and suckers are broken rather than cut, to minimize wounding of stems and to reduce additional sucker development. All scion shoots are maintained but flower buds are not allowed to develop. Any roots that develop from the scion under the wrap should be removed when the grafts are unwrapped after planting.
Experience with the Technique

The former method of propagating budded stem cuttings of *R. fortuniana* (2), was tested in commercial nursery operation at Auburndale, Florida 1957-58. The results showed no advantage over budding stock plants that were rooted and growing in containers.

The modified procedure described here showed scion growth advantages and improved survival when tested at Gainesville. These tests in which the whip and tongue method was used to join apical scions to similar size stock cuttings, gave more than 80 percent graft survival of 4 hybrid tea and 2 miniature rose cultivars. The miniature roses were grafted on 1-foot standards to produce tree-form plants; the hybrid teas were grafted on shorter stock cuttings to produce bush-form plants.

More extensive testing of the modified procedure in commercial propagation was undertaken in a rose production nursery at Apopka, Florida in 1961. The testing resulted in the procedure
described being adopted as the standard method of propagation in the operation of this nursery. Wedge (cleft) grafting was selected as the most efficient method of joining the stem cuttings. About 65,000 plants were propagated from wedge grafted stem cuttings and were grown to salable size in containers, 1961-63. These plants consisted of 50 hybrid tea, grandiflora and floribunda cultivars grafted on R. fortuniana stock; they included grafts made with fresh scions from plants in the nursery and grafts made from scion wood shipped to the nursery.

When fresh scions were used, 16 of the 50 cultivars gave 80 to 99 percent survival, which was comparable to the graft survival obtained at Gainesville. The other cultivars used ranged from 30 to 79 percent survival. When grafts were made with shipped scion wood, the survival of all cultivars was consistently less than 30 percent. These results demonstrated the importance of using fresh stem cuttings they also showed the expected differences in compatibility to be found among cultivars grafted on any single rootstock.

Needed Improvement

The technique described has given best results when the R. fortuniana “mother” plants were actively producing vegetative growth, May until January. Under field conditions, the least amount of vegetative growth is produced January through April; a decreased survival of cutting grafts made during this period is related to an increased failure of the R. fortuniana stock cuttings to initiate roots. While this seasonal limitation in the yearly schedule for propagating cutting grafts has not seriously impaired commercial production of container-grown roses, obtaining more uniform, year-long production of grafted liners does represent a desirable objective for the future.

LITERATURE CITED


FREEZE-HARDY ORNAMENTAL PLANTS FOR CENTRAL PENINSULAR FLORIDA

Andrew A. McCornack1 and Thomas B. Mack2

The freezing weather that occurred on December 12 and 13, 1957 and again on December 13 and 14, 1962 points out that Florida is subject to periods of weather that are damaging to many of the ornamental plants we grow as well as subtropical fruit trees.

The low temperatures recorded at the Citrus Experiment Station, Lake Alfred, on December 12 and 13, 1957 were 24° F. and 20° F. respectively. A strong, cold wind dropped temperatures on the morning of December 12 to the low 20’s on high and low ground locations in northern and central districts of Florida (1). On December 13 and 14, 1962 the low temperatures for these dates recorded at the Experiment Station were 16° F. and 22° F. respectively. The night of December 13 was windy with no temperature difference between high and low ground locations. It was classified by the Weather Bureau at Lake-land as the severest freeze of this century (2).

Ornamental plants on the protected side of lakes or sheltered by buildings show less injury during freezing weather than more exposed plants of the same variety. The vigor of individual plants is an important factor in cold hardiness. Vigorous plants in a dormant or semi-dormant condition can endure colder weather without injury while weak plants of the same species and variety growing in the same location may be seriously injured. Factors contributing to lack of freeze hardiness are: disease, insect or nematode infestation, lack of soil moisture and poor cultural conditions during the growing season. Late fall pruning of hedges, clipped plants and tender ornamental trees should be avoided as it encourages tender, succulent growth which is easily frozen. Late fertilizing or excessive watering after a dry spell in the fall encourages succulent winter growth especially if accompanied by warmer weather. Adequate moisture in the soil is most desirable to resist the drying effect of cold weather and the winds that frequently accompany such weather.

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