PROPAGATION WITH KLIPKLEEN PRUNING SHEARS

T. E. BILDERBACK

North Carolina State University
Box 7609
Raleigh, North Carolina 27695

A gravity feed, fluid delivery system for use with hand-held pruning shears has been advertised in nursery trade magazines and demonstrated at nursery trade shows. A paper introducing the KlipKleen™ Pruning Systems was presented at the *1987 SNA* Research Conference (1). Initially the intended use of this device was for sterilizing the base of stem cuttings prior to placing them into a rooting medium. However, it may have considerable advantages as a means of collecting and treating cuttings with root-promoting compounds at the time of severance. For nurserymen this one-step procedure could eliminate time-consuming cutting *preparation prior to sticking cuttings. Treating cuttings at the time* of severance from stock plants might improve hormone movement into cuttings and increase the rooting response. In August, 1988, at the SNA Research Conference, results of two experiments completed at North Carolina State University using KlipKleen pruning shears as a propagation tool were reported (2).

The objective of this study was to compare use of quick-dip and KlipKleen propagation techniques after waiting periods between severance and hormone application or severance, recutting the stem, and hormone application.

MATERIALS AND METHODS

Application of rooting compounds with the KlipKleen™ Systems and standard cutting preparation techniques were compared. *Ilex* 'Nellie Stevens' holly cuttings were collected August 9, 1988. Cuttings were placed in Tray Masters of Florida #24 (2 ¾ × 3 ⅛ × 4 ⅜ in.) cellular trays filled with a steam-pasteurized medium of 1 part sphagnum peat moss:1 part coarse perlite (v/v). Cutting preparation and treatments were as follows:

1. Water quick-dip: Cuttings were removed from stock plants with pruning shears, the basal 1 in. (2.5 cm) immersed in distilled water and stuck immediately in propagation trays.
2. IBA quick-dip: Cuttings were removed from stock plants with pruning shears. The basal 1 in. was immersed for 5 sec. into a solution of 0.5 percent (5000 ppm) indole-3-butyric acid (IBA). (The solution was prepared by dissolving reagent-grade IBA in isopropyl alcohol and diluting with distilled water to a final IBA concentration in 35 percent isopropyl alcohol.) Cuttings were immediately stuck in propagation trays following treatment.

3. Cut-wait-IBA quick-dip (CW-IBA): Cuttings were taken with pruning shears, but were not prepared for sticking until after a two-hour waiting period. At that time, a 5-sec. immersion was made into the 5000 ppm IBA solution.
4. Cut-wait-recut IBA quick-dip (CWR-IBA): Cuttings were handled similarly to treatments two and three except after the two-hour waiting period stems were recut before immersion.
5. IBA KlipKleen: Cuttings were removed from stock plants with pruning shears fitted with the KlipKleen system. Cuttings were placed in the propagation trays after two hours.
6. IBA KlipKleen-recut: Cuttings were removed utilizing KlipKleen pruning shears and IBA solution. After two hours the basal 1 cm was recut with the KlipKleen pruning shears. Cuttings were then stuck in trays.
7. Cut-wait-KlipKleen (CW KlipKleen): Cuttings were removed from stock plants with pruning shears. After 1 hour, the basal 1 cm was recut with KlipKleen-adapted shears containing the 5000 ppm IBA solution.
8. Wood's KlipKleen: Cuttings were removed from stock plants with KlipKleen adapted shears. The reservoir was filled with a solution of 1 part Wood's Rooting Compound:1 part distilled water. Cuttings were immediately stuck in trays.

Cuttings were placed in trays in a completely randomized block design. Twenty-four replications of each treatment resulted in 196 cuttings. Trays containing cuttings were placed in a greenhouse under intermittent mist operating 5 sec. every 5 min. from 8 am to 6 pm daily. Evaluation for rooting percentage and number of primary roots per rooted cutting was made on October 14, 1988, after 9 weeks. A cutting was considered rooted if one or more roots was present and greater than 2 mm in length.

RESULTS

All treatments had 100 percent rooting, which was not unexpected. Differences in rooting response did occur in the mean number of primary roots formed. Many more primary roots developed in the IBA quick-dip treatments in comparison to the numbers produced by the KlipKleen-treated cuttings. The greatest number of primary roots developed on cuttings dipped immediately after severance. Waiting two hours before dipping cuttings reduced the number of primary roots, and was not significantly improved by recutting the stem.

Recutting stems after severance did increase primary root

development in KlipKleen treatments. There was no difference between immediate KlipKleen treatment, and after a two-hour wait before KlipKleen treatment. The Wood's Rooting Compound KlipKleen treatment gave the highest number of primary roots of KlipKleen treatments (Table 1).

Table 1. Effects of propagation technique on percent rooting and number of primary roots of *Ilex* 'Nellie Stevens'.

Treatment	Rooting percentage	Mean number roots/rooted cutting
1. Water Q-Dip	100a[y]	18.4e[y]
2. IBA Q-Dip	100a	247.4a
3. CW-IBA Q-Dip	100a	183.8b
4. CWR-IBA Q-Dip	100a	211.6b
5. IBA KlipKleen	100a	22.0e
6. CWR IBA KlipKleen	100a	65.7cd
7. CW-IBA KlipKleen	100a	46.1de
8. Wood's KlipKleen	100a	84.6c

[y]Mean separation within columns by Duncan's Multiple range test 5% level. Each value represents the mean of 24 cuttings.

These results are similar to those of the two earlier studies (2). 'Nellie Stevens' holly produced more roots on cuttings that received quick-dip application immediately after severance than those treated with the same solution at severance in the KlipKleen treatments.

The results appear to be a function of fluid movement or absorption into the stem tissue. More fluid appears to be taken up when quick-dip methods are employed. However, relatively few nursery crops have been studied, and response has been variable among species. Fluid uptake, particularly movements in the xylem, is highly dependent upon internal plant water status and could produce quite variable propagation results.

The KlipKleen Pruning System does appear to reduce time and labor involved in preparing cuttings for propagation, and results indicate that well-rooted cuttings can generally be produced with the procedure. More experimentation by nurseries and universities would be highly desirable to improve technique and propagation results.

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LITERATURE CITED

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