COMPARISON OF VARIOUS TREATMENTS IN ROOTING OF RHODODENDRON 'ENGLISH ROSEUM' CUTTINGS

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Abstract. Rooting of *Rhododendron* 'English Roseum' was most successful when the cuttings were basally wounded on two sides and were treated with Hormex #30 (3.0% IBA). Removal of the terminal bud also increased rooting and was additive to the response caused by wounding. Foliar applications and terminal bud applications of growth regulator were generally ineffective.

According to a 1980 survey by Nursery Business (1), Virginia was ranked 12th in the United States in the area of nursery production. Virginia's favorable climate and proximity to major markets should favor increased nursery production. Rhododendrons are becoming an increasingly popular landscape plant. In the past Virginia has not been a major producer of rhododendrons. Rhododendrons sold in Virginia have been imported from the West Coast or from the South. There are several nurseries in Virginia producing rhododendrons and increasing energy and shipping costs should encourage further rhododendron production in Virginia.

Saunders' Nursery is inexperienced in the area of rhododendron production. The object of this study was to examine a variety of treatments, both chemical and physical, in order to determine their relative influence on rooting of cuttings of *Rhododendron* 'English Roseum'. It was also conducted during the winter months using dormant plant material as this is a time when labor is readily available for propagation.

METHODS AND MATERIALS

All *Rhododendron* 'English Roseum' cuttings were taken from healthy 15-18 in plants grown under full sunlight and in two gallon containers. Cuttings were taken on February 2, 1981 and stored at 40°F until February 4, 1981 when they were stuck in the mist bed. All cuttings were 3 in long and were trimmed to uniform size leaving 4 to 6 terminal leaves. All cuttings were dipped in a benomyl suspension (1 tbsp. of Benlate 50w/gal. of water) prior to sticking. Five cuttings were used for each treatment and each treatment was replicated four times making a total of 20 cuttings per treatment. Each replication was randomized within the propagating bench.

Wounding was accomplished with a sharp knife. Two

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sides of the cutting were wounded. An individual wound was 1 in long and extended through the cambium layer

Basal application of hormone was made by using either commercially available powder formulation or by preparing liquid formulations from crystalized IBA dissolved in 40% ethanol. Application of hormone to the leaves was with a five second dip method similar to that used for making basal liquid applications. Similarly, bud applications were made by folding the leaves back and dipping the terminal bud or bud scar.

The propagation medium was peat-perlite (50/50) with bottom heat cables set at 70 to 72°F and misted 10 sec./5 min. from 8:00 am to 5:00 pm. The greenhouse air temperature was regulated at 68 to 72°F.

The rating scale used to evaluate cuttings was as follows: 0 - Dead; 1 - No roots (callus may or may not be present); 2 - Few roots, 3 - Root ball 1-2 in in diameter; 4 - Root ball 2-4 in in diameter, and 5 - Root ball greater than 4 in in diameter.

The treatments used in this study are listed in tables 1 to 4 The entire group of treatments was fully randomized within the bench and the untreated controls are therefore the same within each table

RESULTS AND DISCUSSION

As this particular study looked at a number of variables it is divided into four groups based upon the location of where growth regulator was applied. Table 1 includes basal applications, Table 2 includes foliar applications, Table 3 applications to the terminal bud, and Table 4 applications to both the

Table 1. Influence of wounding, terminal bud removal, and basal growth regulator application on rooting of *Rhododendron* 'English Roseum' cuttings *

	Growth Regulator	Basal wound	Bud excised	Rooting response
1	Untreated	−	−	2 8
15	Untreated	−	+	3 7
2	Untreated	+	−	3 1
16	Untreated	+	+	3 6
3	1 6% IBA powder	+	−	2 6
4	2 0% IBA powder	+	−	3 4
5	3 0% IBA powder	+	−	3 3
6	3 0% IBA powder	+	+	4 2
7	4 5% IBA powder	+	−	3 0
8	4 5% IBA powder	+	+	3 9
9	5,000 ppm IBA liquid	+	−	3 2
10	10,000 ppm IBA liquid	+	−	2 8

* Cuttings stuck 2/4/81 and rated on 4/24/81 Growth regulators by basal applications of commercial powder or five second liquid dip Wounding on two sides of cutting

foliage and the terminal bud. Statistical analyses were not performed on the data but the variation between replications was minimal.

The data in Table 1 shows that removal of the terminal bud and wounding each increased rooting. Removal of the terminal bud continued to increase rooting when used in conjunction with hormone treatment. This shows at both the 3.0 and 4 5% IBA concentrations. Hormone concentrations of 2.0% IBA and 3.0% IBA gave higher rooting values than the 1.6% or 4.5% concentrations A liquid quick dip of 5,000 ppm IBA dissolved in 40% ethanol gave results nearly equal to the 2.0 and 3.0% IBA powder. It is not known if removal of the terminal bud would further increase rooting of the liquid treatments.

Table 2. Rooting response of *Rhododendron* 'English Roseum' cuttings following foliar application of growth regulator *

Growth Regulator	Basal wound	Bud excised	Rooting response
Untreated	−	−	2 8
Untreated	−	+	3 7
Untreated	+	−	3 1
Untreated	+	+	3 6
5,000 ppm IBA liquid	−	−	2 6
10,000 ppm IBA liquid	−	−	2 1
10,000 ppm IBA liquid	−	+	2 6
10 000 ppm IBA liquid	+	+	3 9

* Cuttings stuck 2/4/81 and rated 4/24/81 Wounding two sides of cutting. Growth regulator applied by dipping the upper 1″ of leaves as a five second dip

In an earlier study McGuire and Sorenson (2) found that terminal application of IAA was effective in promoting rooting of *Rhododendron* 'Dr. Dresselhuys'. The foliar application of IBA to *Rhododendron* 'English Roseum' did not give a positive response in this study. Various reasons could be responsible

Table 3. Rooting response of *Rhododendron* 'English Roseum' cuttings following application of growth regulator to the intact or excised terminal bud *

Growth Regulator	Basal wound	Bud excised	Rooting response
Untreated	−	−	2 8
Untreated	−	+	3 7
Untreated	+	−	3 1
Untreated	+	+	3 6
5,000 ppm IBA liquid	−	−	2 0
10,000 ppm IBA liquid	−	−	2 0
10,000 ppm IBA liquid	−	+	2 4
10,000 ppm IBA liquid	+	−	3 7

* Cuttings stuck 2/4/81 and 4/24/81 Growth regulator applied to intact terminal bud or to wound created by terminal bud removal

for the lack of response with *Rhododendron* 'English Roseum' There is no way of knowing how much chemical enters the plant as a result of such applications However, these data indicate that the IBA may have been applied at supraoptimal concentrations. The greater reduction in rooting at 10,000 ppm IBA would support this hypothesis and the fact that application to both the foliage and terminal bud reduced rooting response more than foliage application alone would further support this hypothesis.

In summary, there are many factors that control rooting. Hormone application is well accepted as an aid to rooting. In this study with *Rhododendron* 'English Roseum' wounding and removal of terminal bud are shown to be equally as important as the hormone treatment.

Table 4. Rooting response of *Rhododendron* 'English Roseum' following application of growth regulator to both the foliage and the intact or excised terminal bud *

Growth Regulator	Basal wound	Bud excised	Rooting response
Untreated	−	−	2 8
Untreated	−	+	3 7
Untreated	+	−	3 1
Untreated	+	+	3 6
5,000 ppm IBA liquid	−	−	1 8
10,000 ppm IBA liquid	−	−	2 0
10,000 ppm IBA liquid	−	+	2 4

* Cuttings stuck 2/4/81 and rated on 4/24/81

LITERATURED CITED

1 Morey, Dick 1980 The Wholesale Nursery Industry — 1980 *Nursery Business* Sept 1980

2 McGuire, John J , and David C Sorenson, 1966 Effect of terminal applications of IBA on rooting of woody ornamental plants *Proc Inter Plant Prop Soc* 16 257-260