Mound Layering of *Rhododendron flammeum* (Michx.) Sargent (Oconee Azalea)©

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Deciduous azaleas (*Rhododendron* species) can often be difficult to root from stem cuttings. Mound layering is an in-field propagation whereby stock plants are severely hedged and emerging shoots are covered with substrate allowing for adventitious root formation. Subsequent roots grow into the surrounding substrate and rooted stems can then be severed from the stock plant. The objective of this study was to determine if *R. flammeum* could be successfully propagated by mound layering and if the additional treatments of indolebutyric acid (IBA) or wounding affected rooting or root system quality. Mounding treatments were applied in March and June. Additional treatments of wounding and IBA application were applied, in a factorial arrangement, to stock plants that were mounded in June. The March mounding treatment resulted in 64% rooting, 10 rooted cuttings per mound, and produced a high percentage of symmetric root systems with an average root collar diameter of 6 mm (0.24 in). Wounding and IBA application did not affect rooting or root system quality of plants mounded in June. The June mounding treatment resulted in average of 51% rooting, 6 rooted cuttings per mound, and a mean root collar diameter of 4.8 mm (0.2 in).

INTRODUCTION

The native, North American azaleas (*Rhododendron* species) have tremendous ornamental merit and can serve as outstanding landscape plants. Unfortunately, many of the native species have proven difficult to propagate from stem cuttings on a scale suitable to the nursery industry (Galle, 1987). Development of dependable and efficient propagation protocols would greatly expand the potential of these plants.

Mound layering is a propagation technique that involves severely pruning or hedging stock plants, then covering the new shoots with a suitable rooting substrate to promote adventitious rooting prior to removing rooted stems. The severe pruning helps to maintain vegetative/juvenile growth that typically has a higher capacity for adventitious root formation (MacDonald, 1986). Covering the shoots also results in etiolation that can decrease the light-induced breakdown of indoleacetic acid (IAA) and retard tissue differentiation, resulting in more parenchyma cells with greater potential for root initiation and development (Koukourikou-Petridou, 1998). Wounding and/or an IBA application may also be combined with mounding to increase rooting percentages (Maynard and Bassuk, 1996). Mounding is a viable option for propagating difficult to root plants and is used extensively with temperate fruit trees and *Aesculus* species (McNiel and Elkins, 2002; Pathak et al., 1978). This technique also lends itself to mechanization in field situations. Upright habit and the ability to produce many new shoots fol-

lowing pruning are characteristics of plants that could be successfully propagated by mound layering (MacDonald, 1986).

The objective of this project was to evaluate the potential for propagating *R. flammeum* by mound layering with mounding applications in March and June and to evaluate additional treatments of wounding and IBA application on the rooting percentage, number of plants produced, and root system quality.

MATERIALS AND METHODS

All plants were pruned to 6 in. (15 cm) above the root collar in March 2006. Plants were then mounded on either 13 March 2006 or 14 June 2006. Mounding consisted of covering plants with 18 in. (46 cm) of composted pine bark that was held in place by a 24 in. (61 cm) diameter cylinder constructed from chicken wire. Prior to mounding in June, stems on each plant were either wounded or not wounded and treated or not treated with 5,000 ppm KIBA using a spray bottle, representing a 2×2 factorial.

All shoots were harvested 5 March 2007 and evaluated for rooting percentage, number of rooted plants produced per mound, root collar diameter (RCD), relative root score, and root system symmetry. Root collar diameter was measured at the stem to root interface. A relative root score was based visually on size of the root ball with small roots systems receiving a 0, intermediate sized root systems receiving a 1, and large root systems receiving a 2 (Fig. 1). Symmetrical root systems had at least two roots 130° apart around the stem (Fig. 1). The experimental design was a randomized complete block design with 5 blocks of 10 plants. The treatments were randomly applied to pairs within the blocks with one set of two being mounded in early March and the other four sets of two pairs (eight plants total per block) being mounded in June. Replication of mounding times in subsequent growing seasons will allow for more complete analysis.

RESULTS

March mounding resulted in 64% rooting and 10 plants per mound. Each plant had an RCD of 6 mm (0.24 in.), a 1.23 relative root score, and 78% of the root systems were symmetrically arranged around the stem (Figs. 2 and 3). During June mounding, the application of IBA or the addition of wounding did not significantly affect either rooting percentage or the root system quality of plants (ANOVA not presented). In every June treatment, approximately 51% of stems rooted producing 6 plants per mound. On average, the June-mounded plants had an RCD of 4.8 mm (0.2 in.), a 0.60 relative root score, and 57% of the root systems were symmetrically arranged around the stem (Figs. 2 and 3).

DISCUSSION

Both mounding times were effective as a propagation method for *R. flammeum* as evidenced by their rooting percentages. In addition to providing a dark environment for the entirety of shoot development, the earlier mounding time allowed for a longer root development time. This may explain the larger size of the root systems as compared to those produced in the June mounding treatments.

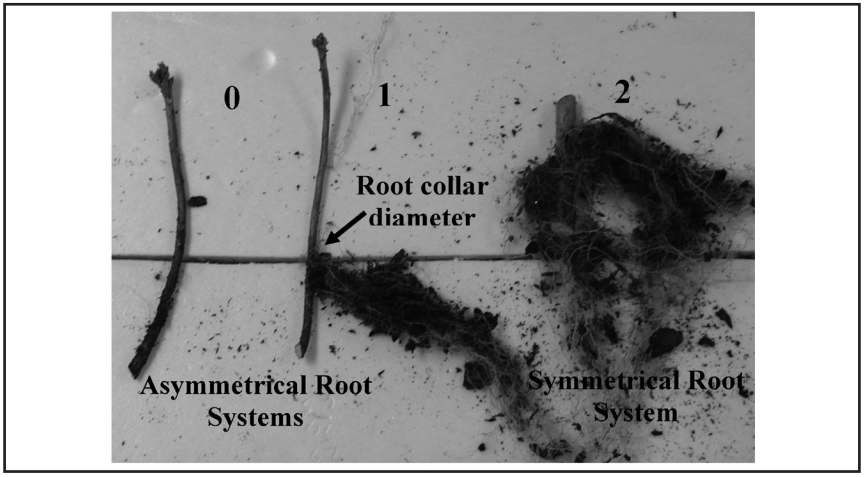

Figure 1. Root system quality for *Rhododendron flammeum* illustrating relative root scoring, root collar diameter measurement, and root system symmetry determination.

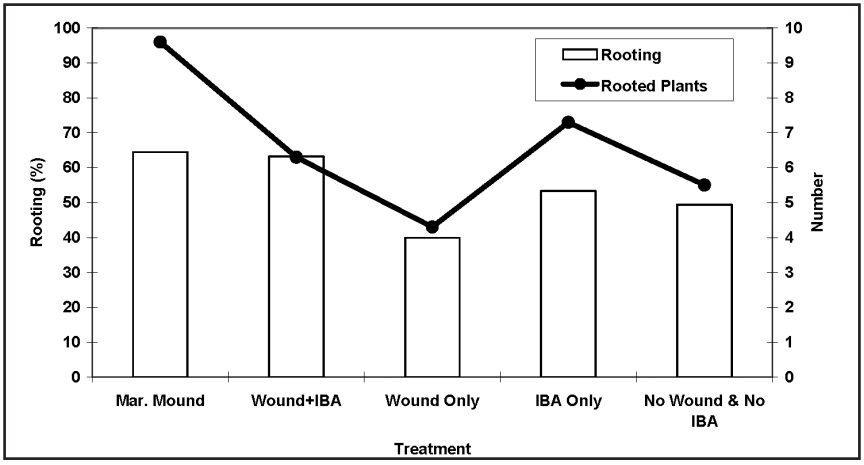

Figure 2. Rooting percentage and number of plants produced per mound for March and June mounding treatments of *Rhododendron flammeum*.

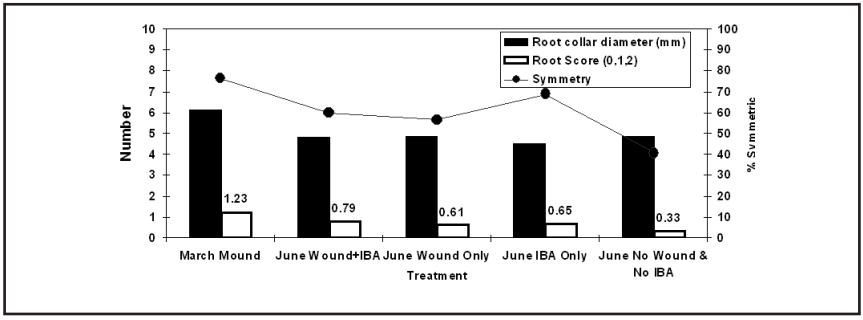

Figure 3. Root system quality for *Rhododendron flammeum* showing root collar diameter, a relative root score, and percent symmetric root systems.

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