In summary, the keys to this simple propagation process are cleanliness, the right container, the proper environment for spore germination, a supply of viable fern spores, and patience.

LITERATURE CITED

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Propagation of Summer Blooming Azaleas

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INTRODUCTION

In the 1940s Ed Mezitt saw the need for extending the flowering season in the New England landscape. He began working with native azaleas and was successful in developing a wide range of flower colors and plant habits. These plants begin blooming after mid-June in Hopkinton, Massachusetts, and add color at a time when most woody plants have finished blooming. Several are sufficiently winter hardy to thrive in all but the northmost areas of New England.

MATERIALS AND METHODS

Plant Material. The cuttings are collected from container-grown plants from this year's growth. The plants are allowed to put on 5 to 6 in. of growth before taking the cuttings. The top 4 in. is collected. The cuttings are taken first thing in the morning, moistened in a plastic bag and placed in a cooler at 48F. Enough cuttings are collected for 1 day's work. The bottom 2 in. of foliage is stripped off each cutting and a fresh cut is made at the base of the cutting. Cuttings are dipped in a solution of Dip N Gro (1 : 20, v/v) for 10 sec. The cuttings are kept moist at all times prior to sticking.

Medium. The medium consists of aged pine bark, peat moss, and coarse perlite (2 : 1 : 1, by volume) to which 1 lb Aqua-gro granular and 2 lb dolomitic limestone are added per 21 ft^3 of medium. After all components are in the mixing machine, enough water is added to thoroughly moisten the mixture.

Propagation House. Two 21 ft × 96 ft hoop houses are used for all the azalea, shrub, and tree cuttings. A 63% shade cloth is utilized on top of the greenhouses. All propagation plug trays are placed on the ground. Three inches of pea stone covers the floor with a weed control mat placed over the pea stone. Prior to sticking cuttings, the whole house is treated with Green Shield.

Fog is utilized for rooting the cuttings. Time clocks are used to control the output; the cycle varies depending upon the weather conditions. On hot, sunny summer days, the fog is on 1 min every 5 min. No bottom heat is utilized, but the air temperature is allowed to reach 95F.

The bottom-air-intake end vents of the greenhouse are blocked with air allowed into the houses only from the upper convection tube opening. A poly curtain is set up 6 ft into each house. This allows for even distribution of air flowing into the houses and also protects the main electricity areas.

Several hundred cuttings are prepared and stuck all at once. Cuttings are direct stuck into the plug trays on the floor. The cuttings are inserted 1 to 1-1/4 in. in depth into the medium and thoroughly watered in. The medium is checked on a regular basis for any drying that might occur. Depending on cultivar, rooting occurs in 6 to 10 weeks. On average 90+% rooting can be obtained.

Post Rooting. Once rooting has occurred, the cuttings can be hardened off and moved into another house for overwintering or left in the propagation house for overwintering. The house is set at 35F night temperature and the vent temperature is set on 42F.

The average speed for taking field cuttings, preparing the medium, filling plug trays by hand, preparing the cuttings, and sticking the cuttings is 130 cuttings per worker hour per person per day.

Control of Root Outgrowth by Copper Hydroxide in Capillary Mat Plug Production

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Capillary mat subirrigation offers several advantages over standard overhead watering. It provides a relatively constant supply of water reducing fluctuations in the water content of the medium caused by evaporation between overhead watering cycles. Also, it is a viable option to meet new or pending regulations for managing water and water effluent for greenhouse production. The drawback for plants grown on capillary mats is root outgrowth from the container into the capillary mat (Koranski and Kessler, 1991). Root outgrowth reduces the life of the mat, can make removal of plants from the mat difficult, and reduce the quality of the seedling for transplanting.

The objective of this study was to determine the efficacy of treating the outside, bottom of plug containers with Spin Out™ (a commercially available formulation of copper hydroxide in latex paint) to control root outgrowth into capillary mats during plug production of marigold seedlings.

Seeds of marigold (*Tagetes* Little Devil hybrids) were sown into plug flats and moved to capillary mats. Three square-plug flats—512, 406, and 288, and two octagonal-plug flats—384 and 288 (differing in volume and shape but with a constant height of 2.5 cm) were compared for seedling development. The outer, bottom surface of half the 16-celled flats were dipped in Spin Out™ (Griffin Corp, Valdosta, Georgia) containing 100 g $Cu(OH)_2$ $liter^{-1}$ (7%, w/w). Seedlings were evaluated for leaf area, shoot and root dry weights, and root length. Root length in 13-day-old seedlings was determined from 8-bit digital images obtained using a Coho video camera and analyzed using a Quadra 700 Macintosh computer.