Low-Tech Fern Propagation

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Fern propagation has been discussed a number of times in past Proceedings, most recently in 1993 (O'Dell). In order for fern spores to germinate, and eventually produce fern plants, certain requirements must be met: a ready supply of viable spores; sterile, or at least pasteurized, growing medium; a clean, translucent watertight container; a certain amount of light; and a continuous supply of moisture. Although the basics of fern propagation remain unchanged, a method that uses small, recycled containers may be useful to small nurseries and to teachers for classroom demonstrations.

Grocery stores and restaurants frequently use hinged plastic containers for take-out salads, nuts, alfalfa sprouts, and other perishable foods. Normally these have a clear lid for product viewing and either a clear or opaque bottom. These leftover containers, once thoroughly cleaned, make excellent growing chambers for fern spore germination. Normally, the lid has an interlocking rib that connects the lid to the bottom, forming a fairly tight seal. I get these containers from my home and from students or friends who have been alerted to the need for such containers.

The growing medium I use is a sterile peat-lite, fine-textured mix. The mix is thoroughly moistened with excess moisture squeezed out by clean hands, and then placed in the bottom part of the container. Since the fern plants will not spend a great deal of time in the container once they are large enough to transplant, the depth of medium need not be more than 1 inch. It is more important to leave head space in the container so that the young plants have enough room to develop.

Fern spores are distributed over the surface of the moistened medium and are "watered in" with a spray mist bottle. This brings the spores into close contact with the medium and assures the greatest opportunity for germination. Once the spores germinate, they produce a multicellular structure, often heart-shaped, called the prothallus. This structure contains the antheridium and the archegonium. For fertilization and subsequent formation of a plant, sperm must swim from the antheridium across the prothallus in a film of water to the archegonium. Although the humidity level will remain very high inside the closed container there is no assurance that the prothalli will remain wet enough for this process to take place. Periodically (approximately every 2 weeks) I remove the lid and mist the surface of the medium. This reestablishes the water "bridge" which facilitates fertilization. I continue this process until I am ready to transplant the young fern plants.

Because I use clear plastic, tightly closed containers I cannot put them in a place where they will receive direct sunlight. The best place I have found is under greenhouse benches near the rear edge. Although somewhat dark in this location, the process works quite well and reduces the chance that sunlight will strike the container, causing excessive heat buildup.

I raise the ferns in a greenhouse that is heated year-round. For hardy ferns it usually takes about 1 year from the sowing of the spores until transplanting. This can be shortened, perhaps, by transplanting at a very small size and placing the new plants under mist to reduce transplant shock.

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

O'Dell, K. 1993. Fern propagation from spores. Comb. Proc. Intl. Plant Prop. Soc. 43:462-463.

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.