

Enhanced growth

MAGNOLIA

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OBJECTIVE

Compare the growth of magnolia with and without mycorrhizal inoculation using different fertilizers and growing media.

METHODS

Uniform rooted cuttings of *Magnolia stellata* obtained from Monrovia Nursery (Dayton, OR), were transplanted into 1.18 l plastic containers. The experiment included 30 different treatments: five growing media, three levels of fertilization and two mycorrhizal treatments (with mycorrhizal inoculant (*Glomus intraradices*) and without). The materials used for media preparation were sphagnum peat moss based growing medium (M), Douglas fir bark (B) and sand (S). The different media consisted in different blends of these materials. There were 1: 1M: 1B: 1S (MBS); 2: 3B: 1S (BS); 3: 1M: 1B (MB); 4: 1M: 1S (MS) and 5: (M).

Each mycorrhizal treatment received mycorrhizal inoculum and the non-mycorrhizal treatments received a filtrate (filtered through a 5 mm membrane in order to preserve the microflora) of the inoculum. The inoculum, or filtrate, was placed in the planting holes directly under the plants prior to transplanting. After planting, 3 g, 5 g or 7 g Osmocote (18-6-12) was top dressed on each container according to their treatment. Plants were grown in a greenhouse until spring then moved to a lath house for hardening-off and then to a gravel nursery bed. Plants were watered as needed with drip irrigation in the greenhouse and with overhead irrigation outdoors. Two applications

of 200 ppm of N from Peter's 20-0-20 and 20-20-20 fertilizers were applied to the mycorrhizal and non-mycorrhizal plants, respectively.

After seven months growth, the aerial portions of the plants were removed from the roots and fresh weights were measured. The roots were washed from the growing media and a sample was taken for mycorrhizal colonization determination. After air-drying for one hour, root fresh weight was measured. Roots and shoots were oven dried at 60°C for 4 days, or until stable dry weights were obtained.

RESULTS

Mycorrhizal inoculation increased shoot and root dry weight of plants grown at all three fertilizer rates. At the highest fertilizer rate, colonized plants had higher dry weight yield with the exception of those which grew in Douglas fir bark.

These results clearly show that an ideal fertilization for good plant growth can be compatible with mycorrhizal inoculation in nursery pot grown magnolia. A close watch on plant nutrient requirements and a good monitoring of nutrients in the leachate, to prevent nutrient build up, are the best practices for optimal use of mycorrhizae with magnolia. By reducing the fertilizer rate, a lower nutrient charge is obtained in the leachate while the growth of magnolia continues to meet grower standards.

