

*Slow Release Natural/Organic Fertilizers
in Nursery Crop Production*

Recent studies have reviewed the use of slow release and controlled release fertilizers in nursery container production. In addition, topics such as fertilizer run-off, release rates, salt residues, etc., were also discussed.... [But we found] no side-by-side comparisons of natural organic slow release fertilizers and conventional controlled release fertilizers.

In an effort to address this lack of information, a proposal was made to Northeast Region - SARE Program 1999 to conduct an experiment using Osmocote controlled release fertilizer (14-14-14) and natural organic fertilizers manufactured by the Fertrell Co. (Holly Care 4-6-4, Gold SS 2-4-2, Super N 4-2-4). To effect the comparison of these two different fertilizer systems, a number of regularly grown nursery crops were chosen:

Group 1 (360 total; purchased from Appalachian Nurseries, Waynesboro, Pennsylvania, in 2.5-inch pots). *Spiraea japonica* 'Little Princess', *Juniperus horizontalis* 'Blue Rug', and *Euonymus atropurpureus* (dwarf burning bush).

Group 2 (100 total; purchased from Musser Forests Inc., Indiana, Pennsylvania, in 2.5-inch pots). *Juniperus scopulorum* 'Moonglow' and *Chamaecyparis* 'Gold Thread Cypress'.

Group 1 plants were potted in used one-gallon nursery containers. The potting medium consisted of composted landscaper waste (donated by Organic Recycling, Inc., Old Tappan, New York, three parts by volume), red shale (two parts), mushroom compost (one part), and peat (one part). The pH was 6.5. Potting was completed in early May, 1999. Plants were sorted so as to have equal amounts of small, medium, and large ... [sizes] in each group of 30 plants.

All plants were randomly coded. Fertilizers were top-dressed as per manufacturers' directions and covered with a small amount of potting soil. All plants were watered with a kelp/fish solution (two tablespoons per gallon).

[Group 1] plants, in groups of 30, were fertilized as per the following:

Osmocote 14-14-14

Fertrell 3-3-3 (50/50 blend 2-4-2/4-2-4 with Araganite) on *Spiraea*

Fertrell 4-6-4 on *Juniperus*

Control

Fertrell poultry compost 3-5-4 (mixed into potting soil, 10 pounds per cubic yard).

Group 2 plants were potted in used two-gallon nursery containers. The potting medium consisted of the same materials (except red shale volume was decreased). The pH was 6.8. Potting was completed in early July, 1999. All of the ... [plants] received were very uniform in size. Fertilizers were top-dressed as per manufacturers' directions and covered with a small amount of potting soil. All plants were watered with a kelp/fish solution, as above.

[Group 2] plants, in groups of 25, were fertilized as per the following:

Osmocote 14-14-14

Fertrell Holly Care 4-6-4

There were no controls.

Soil and water tests were performed by A&L Eastern Agricultural Laboratories, Inc., Richmond, Virginia. In addition, a Solvita™ Soil Life Test (Woods End Research Laboratory, P.O. Box 297, Mt. Vernon, ME 04352, phone 207-293-2457), which measures approximate levels of carbon dioxide respiration, was performed in October, 1999. The Solvita™ test showed "ideal" to "high" soil biological activity. Based on soil test analyses, the potting soil was blended to achieve a balanced level of nutrients. Water test

results indicated that all components tested for were at "low" or "safe" levels; pH was 7.9....

With the assistance of our collaborators and technical advisor, a meeting took place at North Slope Farm on October 5, 1999, at the end of the growing season, to evaluate the fertilizer/plant combinations.

Each group of plants was evaluated for growth (size), color, and saleability:

Group 1. *Juniperus horizontalis* 'Blue Rug', all about the same, no difference in growth or color; *Spiraea japonica* 'Blue Princess', fertilized plants were bushier and slightly larger than control plants, color about the same; *Euonymus atropurpureus* (dwarf burning bush), all about the same growth and color.

Group 2. *Juniperus scopulorum* 'Moonglow', all about the same growth and color; *Chamaecyparis* 'Gold Thread Cypress', all about the same growth and color; one evaluator considered the Holly Care group "bushier" [than the Osmocote group].

Saleability for the entire group was not considered. None had reached the requisite size.

Our farm site in Zone 5 (2000 feet elevation, possibly Zone 4) usually means we have about 100-105 frost-free growing days. Drought in 1999 was widespread and was a factor in the growth rates for this experiment. Irrigation was used on a regular basis.

Conclusions

The inclusion of large amounts of various composts in the potting medium had a very strong influence on the growth and color of all of the plants. In light of the current literature concerning the use of compost in container production, this is not surprising. There was a slight advantage gained by the addition of fertilizer, either Osmocote or Fertrell Holly Care or Fertrell 3-3-3 [blend].

"Ideal" soil biological activity (as per the Solvita™ test) contributed to the overall availability of plant nutrients throughout the growing season.

Our past experience in container production of nursery crops has included composts from various sources. We were pleased to see how well these compost-based systems performed this past year.

Rooted cuttings [as purchased for this experiment] have usually taken us two years to get to marketable size. During the first year—the "transplant" year—the plant seems to be going through a process of acclimation. As roots begin to fill the potting medium, growth in the second season is usually quite drastic. During the 2000 growing season, we will continue to monitor and evaluate these [experimental] plants. We expect that the slight advantage (bushier, etc.) of the fertilized groups will continue to improve relative to the control plants....

Collaborators: Kimberley J. Miller, Pennsylvania Dept. of Agriculture; David Mattocks, Fertrell Co.; Ron Phelps, Pocomo Northeast RC & D; Robert Muller, Jr., Wayne Conservation District; Diane Johnson, Master Horticulturist.