

## **IPM Propagation - Use of Horticultural Oils in *Taxus* Propagation**

**By Peter Linsner  
Plant Production Manager  
The Morton Arboretum**

Fletcher scale is a common problem in *Taxus* (Yew) production. Heavily infested plants become stressed causing reduced vigor and defoliation. Feeding scales secrete honeydew, resulting in a heavy crust of black sooty mold on the needles. State nursery regulations require infested plants to be treated before they can be sold. Traditional controls require time-consuming and costly applications of pesticides, which must be applied at the precise time to be effective.

Don Orton, Plant and Pesticide Specialist with the Illinois Department of Agriculture, suggested an experiment with the use of horticultural oil to determine if it would control Fletcher scale on *Taxus* cuttings, while not reducing rooting percentages. Fletcher scale is spread when hardwood cuttings are taken from infested stock or production plants. Orton believes a viable option for control is to "clean-up" infested cuttings before propagation; scale-free cuttings will result in scale-free plants. To understand how this is possible it is useful to learn about the life cycle of Fletcher scale.

### **Life Cycle and Habits of Fletcher Scale**

One generation of Fletcher scale occurs per growing season. The second-instar nymph over-winters and matures, laying eggs in May. They begin hatching as early as June 11 in Connecticut, and as late as the first week of July in Minnesota. Oval, flat, translucent crawlers emerge and migrate a short distance on a branch in search of a feeding site. They do not crawl very far, and populations tend to concentrate on younger growth. The juvenile scale grows quickly in the early summer; this is when plant damage becomes obvious. During the rest of the season very little growth or development occurs in the scale insect. Small slightly convex nymphs, amber to reddish-brown, remain on the plant through the fall and winter. One and two year old wood that we collect for cuttings is the migration site for last spring's crawlers. The crawlers have matured and become second-instar nymphs waiting to complete their life cycle in the coming spring on our rooted cuttings.

### **Experiment 1) Horticultural Oil Drench With *Taxus* Cuttings**

200 *Taxus x media* 'Timber Creek' cuttings were collected in early January to determine if an oil drench would have any effects on rooting or subsequent growth. Some of these cuttings were infested with Fletcher scale. All cuttings were made eight inches long, basal needles stripped, then drenched in Domain fungicide, followed by a basal dip in 5000 p.p.m. K.I.B.A. (Potassium Salt Indole-3-Butyric Acid). The cuttings were then divided into four groups of fifty cuttings each. Each group was drenched in the following solutions.

- |         |   |
|---------|---|
| Group 1 | Control, clear water.                                   |
| Group 2 | 2% solution of Sun Spray (horticultural oil) and water. |
| Group 3 | 3% solution of Sun Spray and water.                     |
| Group 4 | 4% solution of Sun Spray and water.                     |

In a cool greenhouse a bench was set up with 68-70 degrees F bottom heat and filled with 100% Perlite. The cuttings were stuck in an open bench and humidity maintained daily by wetting down the greenhouse floor. The cuttings remained in the bench until early April, when they were evaluated for rooting and potted.

### **Experiment 2) Scale Infested Plant Experiment**

Sixteen one-year-old *Taxus x media* 'Timber Creek' plants that had moderate infestations of Fletcher scale were selected to determine if a horticultural oil drench would control Fletcher scale. This experiment was conducted at the same time

and in the same greenhouse as the hardwood cutting experiment. The potted plants were divided into four groups of four plants each. Each group of plants was dipped upside down to the soil line in the following solutions.

- |         |                                     |
|---------|-------------------------------------|
| Group 1 | Control, clear water.               |
| Group 2 | 2% solution of Sun Spray and water. |
| Group 3 | 3% solution of Sun Spray and water. |
| Group 4 | 4% solution of Sun Spray and water. |

## RESULTS

Of the 200 *Taxus* cuttings stuck, these were the results.

- |         |                                  |
|---------|----------------------------------|
| Group 1 | Control, 90% rooted (45/50)      |
| Group 2 | 2% Sun Spray, 88% rooted (44/50) |
| Group 3 | 3% Sun spray, 94% rooted (47/50) |
| Group 4 | 4% Sun spray, 82% rooted (41/50) |

There were no significant differences in rooting percentages or the quality of the roots between any of the four groups of cuttings.

All the rooted cuttings were potted in early April and labeled according to which group they belonged. They were observed weekly through July and then periodically for the rest of the year for scale and growth rate comparisons.

We found no evidence of scale on groups 2, 3 or 4. Scale was found on several of the group 1 cuttings. There were no differences observed in the growth rate between any of the groups of cuttings.

The sixteen scale infested plants dipped in Sun Spray solutions were also observed for one year. Scale was controlled in groups 2, 3, and 4. Crawlers and nymphs were found on control group 1 plants.

## Conclusion

The Horticultural Oil Drench with *Taxus* Cuttings Experiment showed us that the Sun Spray drench had no effects on the rooting of *Taxus x media* 'Timber Creek' cuttings. Our Scale Infested Plant Experiment proved that 2, 3, or 4 percent solutions of Sun Spray oil will control Fletcher scale. Neither experiment produced any noticeable effects on the growth rates of the plants.

## Relevance to the Nursery Industry

We believe that drenching *Taxus* cuttings in a two to four percent horticultural spray oil and water solution during the process of preparing them for sticking is a viable means to eliminate Fletcher scale on the plants they produce. This process will add one extra step in the propagation phase of *Taxus* production but should reduce or eliminate the need for more costly and time consuming applications of pesticides later. Applying horticultural spray oil as a drench is quick and easy, safe for employees and the environment, and probably the most thorough and inexpensive way to treat scale. This technique would be particularly relevant when propagating stock plants.

