Pesky Problem with Propagation of *Acer palmatum*: *Pseudomonas*

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I would like to broaden the assigned topic of my paper from the propagation of *Acer palmatum* 'Red Feather' to include the production of *A. palmatum* cultivars in general, specifically a pesky disease problem we have experienced for several years.

In preparation for this paper I could not find any reference to *Pseudomonas* in any of our Proceedings nor in any of the books in our library. It appears to be a relatively recent disease affecting Japanese maples and because of the extent to which it affects the success, or lack of it, of our grafted Japanese maples crops it needs to receive much more attention. I hope by this paper to generate that attention, hopefully leading to successful preventive measures.

Pseudomonas, also known as "black stem", is a soil-borne bacteria which consists of several strains. Our first evidence of the disease in our program dates back about 8 years. We graft our maples in February on understocks which are potted the previous spring. Most of these were what we call low grafts (about 1 to 1-1/2 in. above the soil level) and are plunged into a peat/perlite medium in greenhouse benches after grafting. The remaining are top grafted, either 12 or 20 in. high. The graft union is covered with a mixture of part beeswax and paraffin.

In our first experience we lost a good portion of the bench crop from what appeared to be a blackening of the bark of the understock at the base. This was also observed in its vascular system when the uncallused scion was removed. Top grafts were not as affected. In the 2 years following we continued battling the problem before hearing from others who were having similar experiences, subsequently diagnosed as resulting from *Pseudomonas*.

As a result of many discussions with others it was determined that the disease is translocated in a moist warm environment such as the peat/perlite medium we were plunging them into. The top grafts were not plunged but set on benches or the floor. It appeared that the exposure to circulating air and their not being plunged kept the disease from spreading. At one point we thought the disease entered through the scionwood but now have determined it's in the understock.

With this understanding it was necessary to learn how to treat it. We found that the University of Oregon has done the most extensive research on *Pseudomonas* because of the extensive propagation of Japanese maple in the Northwest. Treatments that were recommended relied on the use of Cocide (copper hydroxide) and Agristrep (streptomyacin). Treatment begins immediately after potting of understocks in the spring. Treatment begins with a combination of Cocide and Agristrep sprayed as a drench followed by a second application 1 week later. This is followed by alternating applications of each pesticide every 2 weeks until dry warm weather, which for us is about late June. The spring program is repeated when cool, moist weather returns (about September) and continued until understocks are brought into the greenhouse. At the time the grafts are plunged in the medium they should be watered in with the addition of the Cocide/Agristrep combination.

After we started this program we noticed a marked improvement in the percentage of healthy successful grafts. However, we still see the presence of some *Pseudomonas* so we are not satisfied that it is 100% effective. This may be because we have recently learned that there is evidence of strains of Pseudomonas that are resistant to this treatment. So the question still remains: **JUST WHERE ARE WE WITH THIS DISEASE?**

An Oregon nurseryman, who believes that prevention is fundamental to growing disease-free plants has apparently found a way to produce *Pseudomonas*-free seedlings by growing in plugs without exposure to native soils. Understocks which we have purchased from him seemed to have proven him correct.

This experience leads me to believe that a fundamental basic knowledge of plant science and plant diseases is necessary for everyone in our industry, especially plant propagation. This will lead to proper preventive practices which will in turn yield healthier plants and better crops.

Rooting Lilacs from Softwood Cuttings

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I'd like to begin my talk on lilac rooting with a little history. Prior to 7 years ago, French hybrid lilac cuttings were taken the first week of May from a stock block or containerized material. Very soft cuttings were taken and treated with IBA (indole-3-butyric acid) in talc or with an IBA solution [water and alcohol, (1 : 1, v/v)]. Results were very uneven and the continued growth of the liners was uncertain, at best.

As demand for lilacs from our customers increased, tissue-cultured lilac liners were purchased to supplement the lining-out stock propagation was generating. Cuttings were made from these young plants and we were very successful in rooting the cuttings from these juvenile micropropagated liners. I wondered if the higher rooting percentages would continue through successive generations. Because additional tissue-cultured liners were purchased for a second spring, I was able to compare the results from these plants with cuttings from second generation tissue-culture liners. Our rooting results were quite good. Most of the 20-plus cultivars tried rooted over 80%, whether the cuttings were from micropropagated liners or second-generation micropropagated liners. The juvenility of the parent plant from which the cutting was made seemed to be the most important factor.

As far as actual propagation of lilac cuttings, we start of course with our young liners. They are kept at 35 to 40F most of the winter. As their leaves fall in late autumn, we blow the leaves off the plants and onto the greenhouse floor, where they can be raked up and disposed of. The plants are pruned to about a 2-in. height. In mid February, the night time heat is increased to 55F. The liners begin to grow and by late March, the new growth is long enough to use for cuttings. Enough length of stem is removed to allow a two-leaf and one-node cutting to be made. We try to finish our wood gathering by 10 AM so the cuttings are fresh and turgid.

The cuttings are made in a work room next to the sticking greenhouse. After being prepared, they are dipped in one of two IBA preparations. For French hybrids, we