

NEW YORK FARM VIABILITY INSTITUTE

Small Grants Program to Enhance Specialty Crop Production Businesses

2004-2005 Supplemental Project Report

Title of project.

Evaluating IPM Strategies and Alternative Fungicides for Reduction of Rhabdocline Needle-cast on Douglas Fir.

Project leader(s) and contact information.

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Background situation.

Douglas-Fir is a major component of the Christmas Tree and Nursery industries in NY state. Over 40 growers and nurseries are producing Douglas-fir in Monroe and Wayne Counties alone. In addition, most retail nurseries and garden centers sell large volumes of this evergreen species. The landscape industry of both counties relies heavily on Douglas –fir in commercial and residential settings. During random visits to several wholesalers and growers alike, we noted trees infected with Rhabdocline needle-cast were poor in quality. Often the infections are so severe that affected trees have cast such a large percentage of 2nd year needles as to become unacceptable, as either Christmas trees or landscape specimens, and thus are lost. One grower estimated losses of approximately \$10,000 per year due to this needle-cast disease. Reports in Cornell's ornamental pest newsletter, *Branching Out*, indicate the problem is statewide.

Fungicides currently labeled for controlling Rhabdocline on Douglas-fir are perceived as costly and require repeated application. Also, over-use of these labeled products is suspected to have potential for adverse environmental effects and pest resistance. A variety of federal, state and local legislation calls for the reduction of chemical pesticide use, and the "green industry" is attempting to comply with increasing restrictions on effective materials. Certainly, "organic" alternatives are being sought in nearly all phases of agriculture, and they are increasingly demanded by homeowners with children and

pets. Even the perception of a hazard can influence farm neighbors and customers, particularly at Cut-Your-Own operations.

Current IPM strategies recommended to control Rhabdocline include: weed control (mowing), lower branch removal, selecting plant sites with good air drainage, and removal of severely infected trees. However there have been problems with IPM implementation involving lack of grower's time to perform the labor-intensive tasks involved and a lack of efficacy information on possible alternative products.

Expected outcomes of project.

By evaluating results from applications of alternative fungicides, we hope to determine the feasibility of utilizing some of these materials to control Rhabdocline needle-cast of Douglas-fir thus reducing losses and, possibly, reducing management costs.

Project activities.

Two local Wayne Co. growers provided sites for the trials. At each site 20 trees exhibiting needle-cast were selected per treatment. At the Dittmar site we applied active compost-tea and copper hydroxide. The Aman's site was treated with potassium carbonate and lime-sulfur. The industry standard, chlorothalonil, was applied at both sites for comparison. Rates and frequency of application were from the label or manufacturer's recommendations.

Treatments began with a dormant application of lime-sulfur on May 11. Regular treatments began when new growth was inch long and visual examination indicated sporulation had begun.

In spring of 2006 follow-up visits were made to evaluate efficacy. Four twig samples from each tree, one from each quadrant, were taken at random from the remaining trees (some were sold or otherwise absent or untraceable). Ten needles from each twig were examined and the number of needles with rhabdocline lesions was recorded. An overall percentage of infected needles for each treatment was calculated.

Results and Farmer/business-level impacts.

Cost: Material costs for the alternatives were highest for the compost tea (\$5.04/tree/season) and lowest for potassium carbonate (\$0.80/ tree/season). In comparison to chlorothalonil (\$0.12/tree/season) all alternatives were substantially more expensive. In addition, both the lime-sulfur and copper hydroxide require the use of personal protective equipment (PPE) which is an extra expense plus an increase in labor time.

Labor: Chlorothalonil only required three (3) applications while all the alternatives tested required more. The potassium carbonate and compost tea required four (4), the lime-sulfur five (5) and the copper hydroxide was the most labor intensive with seven (7).

Efficacy:

Site 1:

Chlorothalonil:	Percent needles with lesions: 2%
Lime-Sulfur:	Percent needles with lesions: 0%
Potassium bicarbonate:	Percent needles with lesions: 7%

Site 2:

Chlorothalonil:	Percent needles with lesions: 0%
Copper Sulfate:	Percent needles with lesions: 1%
Compost Tea:	Percent needles with lesions: 3%

In general, it was a relatively low infection season in the study area, probably due to the lack of rainfall events during the sporulation period. This, along with several other factors, makes definitive conclusions problematic however some indications can be mentioned.

The standard, Chlorothalonil, was lowest in terms of both product and labor costs and gave acceptable control. Of the alternatives, Potassium bicarbonate was least costly but did not provide acceptable protection. The Copper Sulfate Pentahydrate product cost was \$2.24 per tree per season, had the highest number of applications (7) thus the highest labor costs and required PPE (personal protective equipment). Control was acceptable. The Compost Tea did not give an acceptable level of control, left a black residue similar to sooty mold and had the highest product costs. The Lime-Sulfur gave excellent protection but at \$1.28 per tree per season and high labor cost (5 applications, requiring PPE) it may not be economically viable. The double rate dormant application left a noticeable white residue on older foliage that persisted into the following season. If acceptable control can be achieved without the dormant application, and fewer seasonal applications, the costs may be brought within reason.

Producer participation.

Mr. Steve Aman, proprietor of Aman's Nursery 2480 Arcadia-Zurich Road, Newark, NY 14513. (315) 331-8128 The initial interest in pursuing this project was a result of Mr. Aman's desire for a suitable alternative to chlorothalonil. Aman's Nursery donated space on their Palmyra farm to conduct the project.

Mr. Henry Dittmar, 1274 Hydesville Road, Newark, NY 14513. (315) 331-6103. Donated space on their Newark nursery to conduct the project.

Other participants.

Dr. George Hudler, Cornell University, Pathology advisor.

Mr. Brian Eshenaur, NYSIPM Ornamental Team..

Elizabeth Lamb, NYSIPM Ornamental Team Coordinator.

Debra Marvin, NYSIPM Technician.

Outreach & media.

A press release resulted in a regional and a local newspaper printing articles on the project. Articles also appeared in both the Wayne Co. and Monroe Co. extension newsletters. Presentations were made to the Genesee-Finger Lakes Nursery Association, at three garden centers and in a report to the Wayne CCE Board of Directors. Others are planned once the final results have been tallied.

Producer evaluation.

The participating growers, and other growers we encountered, were pleased that we were looking into this disease and alternative methods of managing it. They also liked the fact that the study was confined to a small percentage of their production area and didn't interfere with normal operations.

Your evaluation.

While the economic information on material and labor costs should give growers useful guidelines when selecting a treatment approach, no treatment, as tested, gave us a clearly superior alternative to Chlorothalonil.

Follow-up activities, spin-off effects.

The inability to predict infection periods or detect the early stages of infection are both areas requiring further research. Further testing of lime-sulfur may yield an acceptable solution for those growers seeking an organic approach.