

Efficient Swiss Needlecast Management Field Trial Research

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Abstract:

Douglas firs have been an important part of NY Christmas tree and Nursery Production. Recently they have fallen out of favor due primarily to the perceived need to spray several times in the spring to prevent a needlecast disease. However, there is strong evidence to show that Douglas firs can be grown without many of the sprays currently being applied. With reduced spray requirements, the Douglas fir would be a viable option to grow and contribute to diversity among the evergreen plantings that are important for a robust industry. Through research and extension, this project is demonstrating that Douglas fir can be grown successfully with fewer sprays and possibly with fungicide with lower environmental impacts.

Project Justification:

Evergreen tree farming on nurseries and Christmas tree farms is a multi-million-dollar industry in temperate regions of the U.S.; providing trees for decoration and live specimens for transplant. In the most recent USDA Census of Agriculture, NYS is seventh in the U.S. for Christmas tree producers (844 farms) and total trees harvested (348,043 trees); with an estimated farmgate and consumer retail value of \$8.8 and \$14.2 million, respectively. Douglas fir trees are adaptable to various soil conditions, are relatively quick growers and over the last 20 years contributed to the success of the Christmas tree industry in New York. However, some Christmas tree farmers in NY and elsewhere in the Northeast have moved away from Douglas fir because of the requirements for fungicide applications to manage needlecast diseases. Other growers continue to plant Douglas fir due to its resistance to deer damage and tolerance to warmer climates that can be found in the lower Hudson Valley and Long Island.

Summary

Grower opinion indicates Douglas fir still has a role in the NY Christmas tree industry. Keeping Douglas fir in the mix of tree species grown in NY increases field diversity and reduces the exposure growers may face from insect, disease and environmental problems. We believe that this project can demonstrate that healthy Douglas fir trees can be grown with half of the 3, 4 or more sprays for needlecast diseases that the majority of growers report using. The reduction is anticipated based on research on the fungus that causes the disease and studies conducted in the Pacific Northwest and our preliminary research.

Since the cost to spray Douglas fir can range from \$50 to \$80 or more per acre eliminating even two sprays a year could save growers \$500 per acre in the years it takes to bring the trees to a salable size.

Procedures

Based on our 2016 Springwater NY research results we learned that timing of the spray greatly affects the efficacy of the treatment. We also found that repeated weekly applications did not yield greater control than a single well-timed spray.

Based on the indications that a single spray can be effective. We wanted to follow-up and look at the timing of individual sprays singly or in combination.

Treatments were made to tagged branches on four trees. Treatments were replicated so each tree was an entire experimental unit.

2016 Douglas Fir Treatments Springwater NY

Treatment	Treatment Applied Tree Phenology & Avg. approx. length terminal bud (starting at base of terminal bud)	Date(s)
Early	Swollen green to 1.29 cm	5/20/2016
Week 1	2.96 cm	5/27/16
Week 2	5.67 cm	6/2/16
Week 3	7.33 cm	6/10/16
Weeks 1 & 2	2.96 cm & 5.67 cm	5/27/16, 6/2/16
Weeks 1, 2 & 3	2.96 cm & 5.67 cm & 7.33 cm	5/27/16, 6/2/16 & 6/10/16

Results & Discussion

Results of the 2016 treatments were rated in May of 2017.

In our 2017 research results (figure 1.) the control water treatment had approximately 25% disease severity index (DSI) rating. When a single treatment was applied at early, at an average length of 1.29cm the DSI dropped in half to approximately 12%. The treatment made when the shoot length averaged approximately 3 cm reduced the DSI to 1%, the treatment made when the shoot length averaged approximately 5.5 cm reduced the DSI to .05%. And the treatment made when the shoot length averaged approximately 7 cm reduced the DSI to .05%. When two treatments were made at both 3 and 5.5cm the DSI was zero. A zero DSI was also the result when three applications were made at shoot lengths of 3, 5.5 and 7cm.

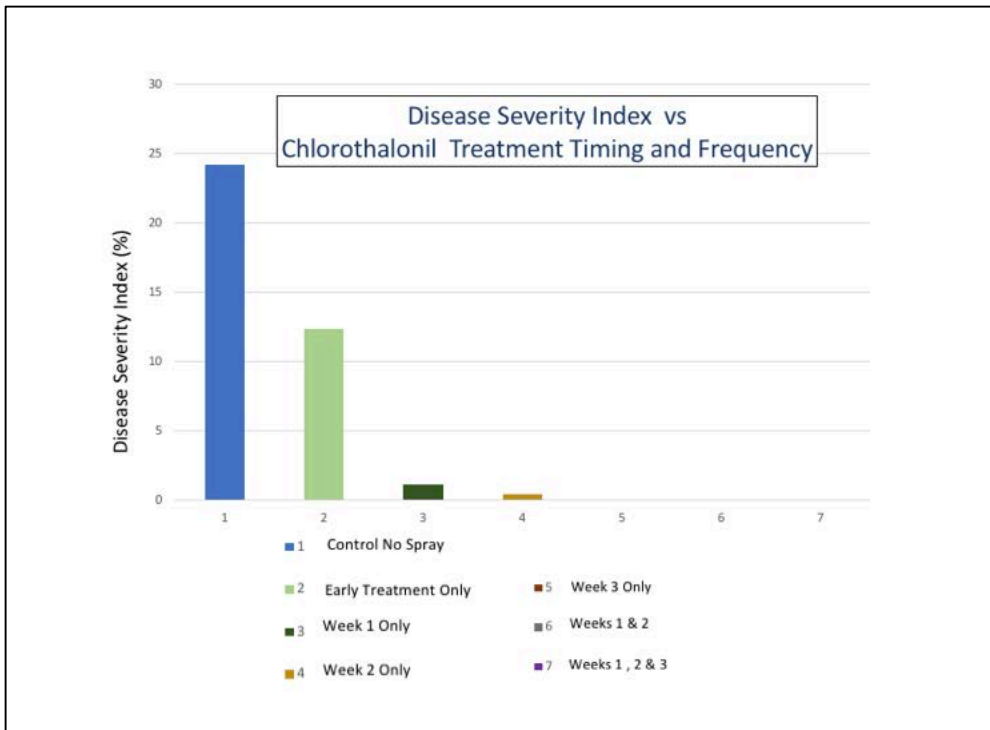


Figure 1: Treatment timing's result on the disease severity index.

This information indicates that growers who are able to achieve good spray coverage should be able to reduce the number of sprays to disease control if they wait until the average length of new growth is approximately 4cm when the application is made.

To help determine if other fungicides in addition to Chlorothalonil may be effective in the spring of 2017 we made treatments with newer and locally systemic fungicides in addition to Chlorothalonil. The results of those treatments will be read in the field in the spring of 2018.

Also in 2018 we plan to advance at the treatment timing work. Our spray studies will work to further correlate the shoot length with treatment times to help determine the optimum shoot length to make fully effective single treatment.