Biological control of tanoak resprouts using the fungus Chondrostereum purpureum

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Abstract

In southwest Oregon, an aggressive program of cutting and burning host plants in an effort to eradicate Phytophthora ramorum was begun in 2001. It was soon apparent that tanoak ( Lithocarpus densiflorus) resprouts were highly susceptible to F. roseum and that infected sprouts began eradication efforts by maintaining inoculum on site. In 2010, we research team established field trials near Brookings, Oregon to assess the biological efficacy of the sap rotting fungus Chondrostereum purpureum on tanoak to inhibit resprouts which can harbor P. roseum and serve as a source of inoculum. Early results showed that C. purpureum was able to colonize the stumps of tanoak following treatment.

Results

Biological activity of C. purpureum

The basidiomycete fungus Chondrostereum purpureum causes a white rot of mostly hardwood trees and has a wide host range. It invades through fresh wounds in the xylem or cut stumps and is a weak pathogen that can survive as a mycelium. After the host tree is weakened or killed, C. purpureum is quickly replaced by other, more competitive decay fungi that are naturally occurring in the environment. This fungus is used as a biological control agent for woody vegetation all over the world. A preparation of the fungus C. purpureum is registered under the trade name “Chontrol™ Paste” in the US and Canada for use as a biological control agent and has been tested as a stump treatment in many hardwood species (USDA Registration No. 71c2000-1, 1998; and MDA Registration No. 10030-99, 2000). Treatment of stumps with C. purpureum has been shown to be effective for suppression of re-sprouting in several species, most notably red alder (Alnus rubra).

Methods

Stumps with a 5-10 cm diameter from 1-5 cm to 5-10 cm were selected and numbered from March to November 2009. Twenty-two stumps were treated in May 2010. The stumps were divided into three blocks of 10, and one stump from each block was treated with each of the treatments. A control stump was left untreated.

Table: Counties under federal order for Sudden Oak Death

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<th>County</th>
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<tr>
<td>Monterey</td>
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<td>San Mateo</td>
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<td>Santa Clara</td>
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Figure: Decay fungi on tanoak

Finding bodies of fungi observed on decaying tanoak logs and stumps and collected from Wood’s Puyallup. These fungi were cultured on basidiomycete selective media. PFC (the ITS DNA region) was done on cultures and resting bodies and the PCR product was sequenced. A Blast search was done to each sequence and the fungi were identified based on these results and observations of the resting body morphology. We will use marksmen developed for the strain FPC 2195 to determine if C. purpureum isolated from treated stumps is naturally occurring or is identical to the isolate originally applied during treatment.

Acknowledgements

The authors thank the National Park Service, the Federal Railroad Administration, Lumber Industry Joint Venture, and the Oregon Department of Forestry for their support. This project was funded by the USDA Forest Service FIF grant 169-16-10032-016.

October 12, 2011

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