WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Forestry Technical Note

FTN-002 September 2023

MANAGEMENT APPLICATIONS:

- 40% of stumps from winter thinned (cut) trees were HRD positive following inoculation in spring (7 weeks after harvest).
- Changing winter conditions may become more conducive to HRD infection.

Figure 1. Inoculated (eight 3mm dots on sapwood/disc) 53-yr old red pine wood disc samples. Each dot contained 25 ml of H. irregulare spore suspension (6.2 x 10^4 conidia/ml).

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Susceptibility of winter cut red pine stumps to Heterobasidion root disease (HRD) infection

Project Type: Forest Health Study
Project Status: Results

Introduction

Heterobasidion root disease (HRD), is a destructive disease of conifers and a growing management concern. Infection by HRD fungus (*Heterobasidion irregulare*) most often occurs when spores, usually produced when temperature is between 5–32°C, land and germinate on freshly cut surfaces. Older stump surfaces are generally unsuitable for colonization, likely due to changes in chemical and physical properties of wood and competitor fungi which limit HRD infection. Stump protectants are effective but not used or recommended in subfreezing temperatures during winter when spores are less common. The main objective of this study was to evaluate susceptibility of winter cut trees to HRD infection following snowmelt in spring.

Methods & Results

This study was within a 53-yr old red pine plantation the Northern Highland – American Legion State Forest in Vilas County. At the time of this study, HRD was absent from the study area and region.

This study examined infection rates on 35 red pine trees harvested on February 1 then left overwinter until snowmelt began to expose stump surfaces, compared to 10 freshly cut trees harvested on March 21 (2022). Stumps were snow covered the entire time between harvest and spring sampling. Once stumps were exposed following seasonal snowmelt (March 22), we collected 10 cm thick wood discs. All spring cut stumps had at least one positive HRD dot (Fig. 1; 62.5–100% positive dots). 40% of winter cut stumps were successfully colonized with *H. irregulare* (0–87.5% of positive dots). The proportion of positive dots was not related to canopy cover or tree disk diameters.

Conclusion

Stump surfaces exposed for 7 weeks were not as suitable to *H. irregulare* colonization as freshly created stump surfaces; however, this work illustrates that *H. irregulare* can colonize older cut stumps after prolonged exposure to winter elements, beyond the expected 1–4-week period, thus potentially increasing the period of susceptibility and chance of HRD infection.

Full research publication:
Jed Meunier, Kyoko Scanlon, Adam Wallace, Linda Williams. 2023. Susceptibility of winter cut red pine (P. resinosa) stumps to Heterobasidion root disease (HRD) infection. *Canadian Journal of Forest Research*. Available online at https://doi.org/10.1139/cjfr-2023-0141.