

GENETIC RESISTANCE TO *PHYTOPHTHORA LATERALIS* IN PORT-ORFORD-CEDAR (*CHAMAECYPARIS LAWSONIANA*)

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Native forest ecosystems as well as reforestation and restoration efforts in forest trees can be severely impacted by pathogens and insects, especially non-native ones. In many of these cases, the future viability and utility of a species may depend heavily upon efforts to harness any naturally occurring genetic resistance. Port-Orford-cedar (POC), *Chamaecyparis lawsoniana*, a long-lived conifer native to northwest California and southwest Oregon, and also used horticulturally internationally, is highly susceptible to a non-native root disease, caused by the oomycete pathogen *Phytophthora lateralis*. An applied program to develop populations of POC with genetic resistance has identified both qualitative and quantitative resistance based on seedling inoculation trials. Families from some parent trees show high survival, consistent with the expectation of resistance from a single major dominant gene. Seedlings from families with quantitative resistance show a differential rate of mortality within a family over 3 years. The level of quantitative resistance varies by family with some families reaching 100 percent mortality by the end of 3 years, while other families still have low to moderate survival. Parents (or their seedling progeny) with each type of resistance are being incorporated into containerized seed orchards for each breeding zone, and breeding to increase the level of quantitative resistance is underway. Early data from field trials is encouraging, and restoration and reforestation with resistant seedlings is underway. The applied resistance program in POC can offer some guidance to other programs contemplating the development of resistant populations to help maintain viable populations of forest tree species affected by non-native pathogens or insects.

The full paper was published in *Plants, People, Planet*
<https://nph.onlinelibrary.wiley.com/toc/25722611/2020/2/1>

The reference for the published paper is:

Snieszko, R.A.; Johnson, J.S.; Reeser, P.; Kegley, A.; Hansen, E.M.; Sutton, W.; Savin, D.P. 2020. Genetic resistance to *Phytophthora lateralis* in Port-Orford-cedar (*Chamaecyparis lawsoniana*) – Basic building blocks for a resistance program. *Plants, People, Planet*. 2(1): 69–83. <https://doi.org/10.1002/ppp3.10081>.

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Citation for proceedings: Nelson, C. Dana; Koch, Jennifer L.; Snieszko, Richard A., eds. 2020. Proceedings of the Sixth International Workshop on the Genetics of Host-Parasite Interactions in Forestry—Tree Resistance to Insects and Diseases: Putting Promise into Practice. e-Gen. Tech. Rep. SRS–252. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 170 p.