



**OPERATIONAL PROGRAM TO DEVELOP RESISTANCE TO
PHYTOPHTHORA LATERALIS IN PORT-ORFORD-CEDAR
(*CHAMAECYPARIS LAWSONIANA*) – THE FIRST TEN YEARS**

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The USDA Forest Service and USDI Bureau of Land Management operational program to develop populations of Port-Orford-cedar (POC) with *Phytophthora lateralis* resistance has been underway since 1996. Earlier smaller scale efforts focused on making a few hundred field selections from a portion of the native range and confirming the presence of genetic resistance. Oregon State University has provided research pathology expertise as well as artificial inoculation and assessment of vegetative material from field selections. Through 2006, over 12,500 selections for testing have been made from both public and private land in Oregon and California. These selections have been evaluated in the first phase of testing, using a stem dip inoculation test. Approximately ten percent of the parent trees in each trial are selected for a second phase of testing (a root dip inoculation test), and this stage is well underway. In this second test phase, rooted cuttings of each parent are inoculated and assessed for mortality to rate the resistance of the parent. In addition, controlled crosses, including selfs, have been made among a subset of the selections and seedlings from these are also undergoing root dip inoculation and assessment.

The native range of Port-Orford-cedar has been divided into 13 breeding zones, and screening for resistance is underway in all zones. For eight breeding zones, first generation seed orchards have been established using rooted cuttings from parent trees rated as resistant in the root dip test. Additional parent trees will be added or removed from orchards as additional test data become available. Seed from several of these orchards has been available for restoration and reforestation for several years. Field tests to validate the greenhouse and raised bed testing, examine durability of resistance, and to test the first orchard seed have been established on over 30 sites. These field plantings will be the acid test of the utility of genetic resistance to *P. lateralis*. Early results from these tests are encouraging. In many areas, genetic resistance offers the main avenue for restoring POC in ecosystems with high mortality as well as keeping it as a component of reforestation for a variety of public and private landowners. The POC program is one of the fastest moving resistance programs in forest trees. Additional research is needed on the types and number of mechanisms of resistance and their inheritance.