

PORT-ORFORD-CEDAR RESISTANCE TESTING AND BREEDING: An Update From The Dorena Tree Improvement Center

USDA Forest Service, Umpqua National Forest
May 2002
Issue #3

***PHYTOPHTHORA LATERALIS* DISEASE RESISTANCE CURRENT STATUS**

Overview

- ❑ Since the mid-1980's, the USDA Forest Service and USDI Bureau of Land Management have been working with Oregon State University to screen Port-Orford-cedar trees for resistance to the exotic root pathogen, *Phytophthora lateralis*.
- ❑ There appears to be resistance to the introduced pathogen, however, the incidence of resistance appears to be very low. Resistant Port-Orford-cedar offers an avenue for restoration and reforestation in areas devastated by *Phytophthora lateralis*.
- ❑ Greenhouse testing indicates that excellent gains in resistance appear to be possible from traditional tree selection and breeding. The best families tested show 0-10% mortality in the greenhouse versus 80-100% mortality for susceptible families.
- ❑ Traditional breeding of Port-Orford-cedar can be used to strengthen resistance while maintaining genetic diversity and adaptability.



Validating the Resistance Screening Process

- ❑ Over 10,000 selections have been greenhouse tested using a stem inoculation technique and over 1100 have been chosen for further evaluation. These 1100 genotypes are being propagated and maintained at the Dorena Tree Improvement Center.



Rooting POC Cuttings
At Dorena

- ❑ A second phase of testing began in 2000 using a root inoculation technique to validate and refine the initial screening results. By the end of 2002, 49% of the trees at Dorena will have been retested. Preliminary analyses from the retesting show almost half of the clones have 50% or more survival.
- ❑ Since 1999, 18 field validation sites have been established in Oregon and California throughout the native range of Port-

Orford-cedar. Field sites are designed to validate the greenhouse screening results, provide information on the durability of the resistance, and serve as demonstration plantings.

- Field validation sites have been established thanks to the cooperation and effort of many individuals from the Forest Service, Bureau of Land Management, County officials and private landowners.

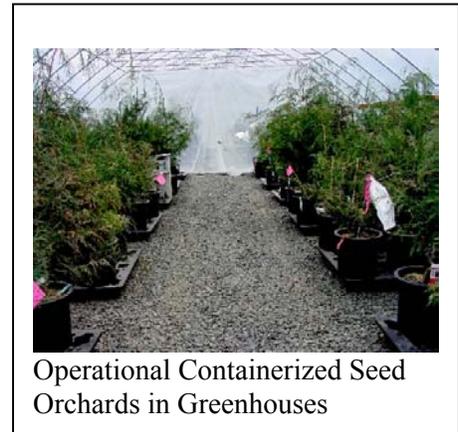
<u>Cooperator</u>	<u>No. Of Field Sites Established</u>
Bureau of Land Management	5
Siskiyou National Forest	5
Six Rivers National Forest	1
NIPF Landowner in Hiouchi, CA	1
Coos County	1
Oregon State University	2
Menasha Forest Product Corp.	1
Plum Creek Timber Co.	1
Moore Mills Co.	1
TOTAL	18



Seedlings At Dorena Ready For Outplanting

PROVIDING RESISTANT SEED

- Several operational containerized seed orchards were established this year at Dorena using results from the 2000 and 2001 root inoculation screening.
- In 2001 and 2002, Dorena sold a small amount of resistant seed from a few parents to the Oregon Department of Forestry at Phipps Nursery. The state is currently growing seedlings and making them available to landowners.
- Seed production at Dorena is expected to be high and we anticipate seed will be available for both the public (first priority) and private sector this year or in the near future. Contact Joe Linn, Dorena Center Manager, at jlinn@fs.fed.us for further details.



Operational Containerized Seed Orchards in Greenhouses

<u>Operational Seed Orchards Established At Dorena</u>			
<u>Breeding Block</u>	<u>Elevation Band</u>	<u>Total Parents</u>	<u>Total Trees</u>
North Coastal	0-1500 feet	65	130
North Coastal	1501-3000 feet	82	164
North Coastal	3001-4000 feet	5	10
South Coastal	0-1500 feet	5	10
South Interior	1501-3000 feet	8	16

- Although the current size of several of these orchards is small at this point, we anticipate producing at least 250,000 resistant seed in 2002. More genotypes will be added as testing and analysis of screening results continues.

OUTREACH AND COOPERATION

- ❑ Dorena personnel have attended several conferences in the past year, providing posters, presentations and coauthoring several publications on the Port-Orford-cedar resistance testing and breeding program.
- ❑ We would like to continue to encourage the tremendous cooperation we have received among all Port-Orford-cedar landowners in assisting in the resistance testing and breeding program and reaching out to communities to educate about this disease.
- ❑ A special thanks to the efforts of the Powers Ranger District, Siskiyou NF this year for working with local city and school officials and planting resistant Port-Orford-cedar on Arbor Day with seedlings grown at Dorena.
- ❑ Field validation sites are needed for the 2002/2003 planting season. Sites should be readily accessible and have evidence of *Phytophthora lateralis*. If you have an interest in cooperating in the planting program please contact Leslie Elliott at ljelliott@fs.fed.us or Richard Sniezko at rsniezko@fs.fed.us.

PERSONNEL CHANGES

- ❑ Andy Bower (Assistant Geneticist at Dorena) returned to graduate school to pursue his Ph.D. at University of British Columbia, we hope to fill the vacancy soon.
- ❑ We welcome Katherine Fitzgerald and Heather May, biological technicians, who are now assisting part-time with the operational resistance program at Dorena.



Pollination at Dorena.



- ❑ Starting in June, Frank Betlejewski is the new U.S. Forest Service Program Manger for Port-Orford-cedar; Frank is currently a Silviculturist with Medford BLM who has a solid history of working with POC. We look forward to working with Frank in this new capacity.

MEETINGS

- In March 2002, an inter-agency Steering Committee was established to help with strategic planning of disease resistant activities at Dorena. The next meeting of the committee is scheduled in early June.
- The bi-annual POC Technical and Oversight Committee meeting is scheduled for the first week in June in Coos Bay, Oregon.

VISITORS AND QUESTIONS WELCOME

We would like to encourage anyone who has questions or would like to stop by and see our operations to give us a call at (541) 767-5700 or visit our website at <http://www.fs.fed.us/r6/dorena>. We look forward to continuing to work with all of you on this cooperative effort in developing the Port-Orford-cedar disease resistance program.

Joseph M. Linn

Joseph M. Linn
Dorena Center Manager

Richard Sniezko

Richard Sniezko
Dorena Center Geneticist

Leslie Elliott

Leslie Elliott
Dorena POC Operations Coordinator