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KQED highlights new threat to California's wildlands

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KQED highlights new threat to California's wildlands

Researchers at the National Ornamentals Research Site at Dominican University of California are developing studies focused on controlling the spread of *Phytophthora tentaculata*, a newly discovered plant soil-borne pathogen found infecting plants in native plant nurseries and restoration sites in California. KQED Science's QUEST program recently visited the NORS-DUC site to learn more about work underway both at NORS-DUC and elsewhere in the state.

P. tentaculata, which causes root and stem rot, was first discovered in a nursery in Germany in 1993 on Chrysanthemums and in 2007 in Italy on Oregano. It has since been found in Spain, the Netherlands and China. In 2012, *P. tentaculata* was identified at a nursery in Monterey County and has since been found in additional native plant nurseries and on plants in restoration sites in four additional counties, raising concern for wildlands health.

[KQED Science's QUEST](#) program visited Dominican to talk with [NORS-DUC](#) scientists who are working to determine which plants serve as hosts to *P. tentaculata*.

"We do not know what plants are susceptible to this plant pathogen," says Karen Suslow, NORS-DUC program manager. "If we know what plants are resistant, then native plant nurseries can focus restoration projects using resistant plants vs. susceptible plants, if they have that option."

The researchers also are testing the effect of heat treatment on *P. tentaculata* in order to determine what steam temperatures kill the pathogen should it need to be eliminated from soils at native plant nurseries. This work is based on NORS-DUC's advances using steam and heat to combat *Phytophthora ramorum*, the pathogen that causes sudden oak death in the wild and ramorum blight in nurseries. The United States Department of Food and Agriculture (USDA) recently approved steaming as a management option for growers with soil infested with *P. ramorum*.

Controlling further spread of *P. ramorum* and other plant pathogens is a priority for the USDA, which funds NORS-DUC through the Farm Bill. To date Dominican has received more than \$3 million in funding in support of the NORS-DUC facility and research program.

The rapid emergence of sudden oak death in the mid-1990s spurred emergency regulatory actions designed to control the spread of *P. ramorum* within ornamental nurseries and from infested nursery stock to native wildlands. Today, growers in California face numerous restrictions when it comes to exporting plants. A nursery found to have an infected plant on its property is put under quarantine until the diseased plants are destroyed and the nursery completes the USDA Confirmed Nursery Protocol.

In 2012, NORS-DUC scientists successfully demonstrated the elimination of the sudden oak death pathogen from contaminated nursery soil substrates by using a commercial steamer to heat the contaminated soil to 1220F for 30 minutes. The researchers pumped steam into a soil bed covered with a tarp that lifts into a dome as the warmth rises inside, raising the temperature of the soil high enough to be fatal to the pathogen.

The researchers have since made considerable progress in the development of *P. ramorum* "green" technology management options for nursery growers, including steaming, solarization and the use of bio-control agents. Working cooperatively with the California Department of Food and Agriculture (CDFA), they have employed a steam treatment at four commercial nurseries in California, three of which were infested with *P. ramorum* and had been placed under federal quarantine; the fourth one had other soil pathogens, but no *P. ramorum*. All treatments were successful, with no *P. ramorum* found in the nursery soils post-treatment and the three nurseries were released from quarantine.

Currently, NORS-DUC is collaborating on a multi-state steaming project funded by USDA in collaboration with Washington State University and Oregon State University. The aim of the project is to determine the effect of different climates, soil types, soil moisture, and equipment on soil steaming.

Solarization and bio-control using beneficial micro-organisms recently were tested successfully at NORS-DUC in collaboration with partners from Oregon State University and USDA/Fort Detrick. A series of solarization experiments is on-going at a number of commercial nurseries in California with the help of CDFA and also in Oregon.