

UC researchers discover cost-saving response to pathogens in restoration sites

The Issue

Introduced plant pathogens together with other invasive organisms represent the third most significant threat to biodiversity and the integrity of native ecosystems. To date, not a single exotic plant pathogen has ever been eradicated from natural ecosystems. The damage these introductions causes is irreversible and can be estimated in the billions of dollars annually for the US alone. Recently, a group of the most aggressive plant pathogens, Phytophthora, were discovered to be introduced through infested plant material used in restoration projects. These introductions establish the exotic microbes as they are placed in an ecosystem while thriving on a host. Rather than having successful restorations, there is a potential for failed restorations and disease progression into areas adjacent to these sites.

What Has ANR Done?

Working with production facilities that grow plant stock used for restoration, UC ANR has spearheaded an effort to identify more than 25 species of Phytophthoras associated with over 20 native host species in restoration nurseries. UC researchers have identified practices within plant production facilities that favor Phytophthoras, discovering and testing Best Management Practices (BMPs) to curtail their spread. UC researchers have developed two new surveying approaches that improve diagnoses and reduce costs, one of which uses dogs trained to sniff Phytophthora. UC researchers have proven that these Phytophthoras are introduced through infected plant stock which are otherwise absent from restoration projects and that they are detrimental not only to the success of restoration projects but can cause lethal disease in native flora in or near restoration projects. UC ANR has organized professional workshops to teach industry members how to identify these pathogens and reduce their spread.

The Payoff

Industry saves millions by producing clean plant stock

By working within the industry, UC ANR has proven that facilities can produce clean plant stock in just one year. There has been buy in from the industry and increased industry awareness that these Phytophthoras can cause lethal disease on native flora and that introduced Phytophthoras may have increased virulence after having passed through plant production facilities. The BMPs are poised to save tens of millions of dollars in operational costs within production facilities and ensure the success of restoration projects valued in the hundreds of millions of US dollars, preventing damage to natural ecosystems and allowing us to maintain biodiversity. In cooperation with Calflora, UC researchers have also developed the Calinvasives database management system to assist stakeholders in the ongoing work of identifying these threats.

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Coffeeberry plants killed by *Phytophthora multivora* in a San Mateo County restoration project.

