Phytophthoras in Native Habitats Work Group, CNPS Phytophthoras Committee,
Northern California Native Nursery Network

Answers to some attendee questions from a "Buy-ins seminar", November 15, 2021

Contact Janice Alexander, (jalexander@ucanr.edu) with further questions.

1. What is the *Phytophthora* infection rate in annual plants?

Phytophthora species are most common on woody perennials, but herbaceous annual plants may also become infected. In a nursery, the *Phytophthora* infection rate on annuals can be very high if the plants are exposed to the pathogen early in propagation when they are very small and tender. Many common annual horticultural plants are susceptible to *Phytophthora* but the *Phytophthora* infection rate for annual plants in nurseries, gardens, restoration areas or natural areas is expected to be highly variable. In Australia, Crone and others (2013) report *Phytophthora* infection on roots from annual plants that showed no symptoms, indicating the complexity of this problem.

2. When baiting, what other than Phytophthoras might cause similar symptoms on pears?

Pythium, *Phytopythium* and related species are the most common microbes that cause pear lesions that might be confused with those caused by *Phytophthora*, but it is usually possible for trained observers to distinguish between them based on several characteristics. Some fungi will cause limited lesions at wounds, but these are generally quite different in appearance from *Phytophthora* lesions. There are also some abiotic factors related to pear storage and handling that can cause surface discoloration that may resemble *Phytophthora* lesions, but unlike *Phytophthora*, these discolored areas do not expand in size over time. Instructions for pear baiting, with many pictures of typical lesions, are posted at http://phytosphere.com/soilphytophthora/pearbaitingPhytophthora.htm.

3. Has anyone been in touch with Master Gardeners about their plant sales?

If you know of Master Gardener plant sales, please let us know by emailing Janice Alexander, (jalexander@ucanr.edu). We would like to share precautions for preventing plant pathogen spread with all plant resellers.

4. I have 1000 plants from an outside nursery and am testing groups of 40 at a time. How many groups of 40 do I need to test to feel good about the whole batch?

Unfortunately, there is not a single simple answer to this question. The condition of the source nursery, the location where the plants are going to be used, the number and types of plant species involved, the testing methodology used and test conditions and other factors need to be taken into account when figuring out an acceptable testing plan. For a more complete discussion of this topic see http://phytosphere.com/BMPsnursery/testingshell.htm and the PDF document at http://phytosphere.com/BMPsnursery/Phytosphere_BMP_nursery_bench_testing_use_limitations.pdf.

5. Do any nurseries provide refunds for positive plants?

Because there are no specific regulations related to this issue, policies for refunds for *Phytophthora*-positive nursery plants are at the discretion of each nursery. If you are purchasing plants under a contract or purchase order, language that covers this situation can be included and would have to be agreed upon by the nursery. If you are purchasing plants directly from nursery inventory without a contract, we recommend that you ask about the nursery's policy for refunds for positive plants.

Unfortunately, the actual cost of *Phytophthora*-infected plants can be much greater than the price of the sick plants. If the pathogen spreads to the landscape or wider in a nursery, the detrimental effects to plant health can increase exponentially. The situation you ask about brings out the importance of accreditation and best management practices to prevent disease development so that purchasers do not have to worry about dealing with infected plants.

6. What is the comparison in *Phytophthora* detection efficacy of pear baiting vs. ELISA strips?

Johanna Del Castillo, UC Davis compared efficacy of several *Phytophthora* detection techniques in restoration nurseries. In a small study on coffeeberry inoculated with *Phytophthora cactorum*, she found: "*P. cactorum* detection success with the leachate baiting method was 100% at 8- and 12-weeks post inoculation. *Phytophthora* detection with immunostrips was highly variable, ranging from 0 to 33% detection." Del Castillo (2021) concluded "Results suggest that the leachate baiting method is the most effective at detecting *Phytophthora."*

References

Crone, M., McComb, J.A., O'Brien, P.A., & Hardy, G.E.S.J. (2013). Survival of *Phytophthora cinnamomi* as oospores, stromata, and thick-walled chlamydospores in roots of symptomatic and asymptomatic annual and herbaceous perennial plant species. Fungal biology, 117(2), 112-123.

Del Castillo, J. 2021. Evaluating the efficacy of Phytophthora detection methods to support best management practices for restoration nurseries. Abstract. APS Pacific Meeting.