Use of Recirculating Irrigation System to Contain Soilborne Pathogen Phytophthora cinnamomi in **Operational Disease Resistance Trials** Sunny Lucas, Resistance Screening Center Manager

Background

Through a partnership with the American Chestnut Foundation, the RSC has begun screening chestnuts for disease resistance to the soilborne pathogen *Phytophthora cinnamomi*. Intentionally bringing a generalist soilborne pathogen like P. *cinnamomi* into a container nursery setting, where multiple hosts reside, requires careful consideration, planning, and precaution. In an attempt to contain the pathogen, and prevent unwanted spread of the disease, a recirculating irrigation system was constructed in the greenhouse.

System Construction









USDA Forest Service, Region 8, Forest Health Protection

System In Action

- Seedlings were grown for 13 weeks before inoculation with *P. cinnamomi*.
- Pre-inoculation, seedlings were overhead watered. Table drains were kept open and irrigation water drained directly to the greenhouse floor.
- After inoculation, flood tables were connected to the contained and recirculating irrigation system.
- Seedlings are subirrigated, sitting in water for 4 hours.
- After subirrigating, water is pumped from the flood tables to a holding tank inside the greenhouse. Water is pumped back to the tables at the next irrigation time.
- Water is reused three times during the week.
- At the end of the week, water is treated with a sufficient level of sodium hypochlorite to kill any Phytophthora propagules.
- Treated water is kept in a large holding tank until chlorine has dissipated.
- As an added precaution, everyone who enters the greenhouse is required to wear disposable plastic booties.







Acknowledgements

- FHP technicians: Kenny Frick, Barbara Williams, Brenda Minton, and Kristopher Bollo (RSC volunteer)
- The American Chestnut Foundation: Dr. Jared Westbrook, Ed Schwartzman, and volunteers
- Dr. Steve Jeffers for inoculation protocol



Future Possibilities

- Increase the number of flood tables available for Phytophthora screening. Space available to double capacity.
- Screen other Phytophthora-susceptible species using a similar recirculating system.
- Screen seedlings for resistance to other soilborne pathogens.