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BLACK ROOT ROT OF ORNAMENTALS

Black root rot (BBR), caused by *Thielaviopsis basicola,* is one of the most serious soil-borne diseases of ornamentals in greenhouses, nurseries, and landscapes. This pathogen has a wide host range and attacks hundreds of species in 30 plant families. The most common herbaceous ornamentals that are susceptible to the disease include pansy, calibrachoa, petunia, poinsettia, lavender, phlox, cineraria, and salvia. Some woody ornamentals, such as boxwood, holly, and lilac, are also susceptible to BBR. The root rot causes slow growth, even death of plants.

SYMPTOMS AND DIAGNOSTICS

Common above-ground symptoms of the disease include yellowing of leaves, stunted growth, and wilting of plants (Figures 1 and 2), which often present irregular, scattered distribution in the variety or species. Chlamydospores, thick-walled black resting spores in roots (Figure 3), appear black bands in sections of white healthy roots (Figure 4). In some cases, root tips turn black (Figure 5). Unlike root rot caused by *Pythium* spp. or excessive water, BBR can cause blackening of roots, but infected roots tend to be firm and mixed in portions of healthy white roots (Figure 6). An accurate disease diagnosis is the first step for both managing the problem and preventing it in the future. For a correct diagnosis and confirmation, plant samples can be sent to the Plant Disease Information Office at CAES.

DISEASE DEVELOPMENT

Chlamydospores can survive in the soil for many years. The pathogen can be dispersed through infected propagation materials and transplants, infested soil, contaminated water, tools, or containers. Fungus gnats, common insects in greenhouses, can spread the pathogen within the greenhouse. Susceptible plants that are stressed from drought or

Figure 1. Slow and stunted growth of lavender.

Figure 2. Wilting and stunting of salvia.

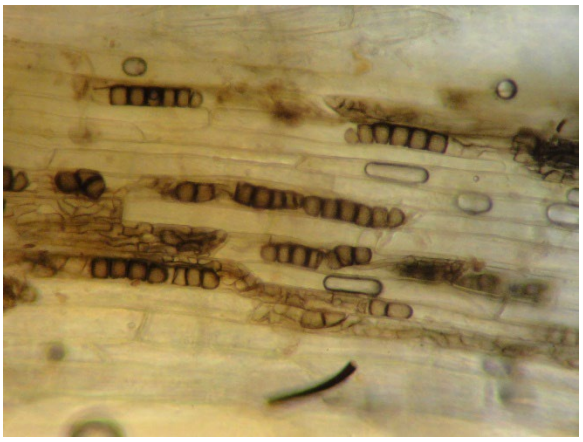

Figure 3. Chained chlamydospores in a portion of phlox root.

Figure 4. Blackening of a portion of calibrachoa root.

Figure 5. Blackening of root tips of a boxwood rooted cutting.

Figure 6. A mix of white and black roots of diseased salvia plants.

excessive water are more vulnerable to BRR. The disease development prefers lower temperatures (55-61°F) and less acidic or alkaline growing media.

MANAGEMENT

Cultural practice: Inspect incoming plant materials. Use pathogen-free transplants. Remove and destroy severely infected plants. Adjust growing media below pH 5.6 if possible. Wash and sterilize all equipment, tools, and benches between crop cycles. Avoid water splashing to prevent spore dispersal between plants. Avoid re-using pots, plug trays, and potting mix. If plastic trays pots are reused, wash them thoroughly before disinfecting them.

Fungicide: A preventative fungicide program is an effective component of BRR management in greenhouses and nurseries. Fungicides that are registered for BRR control include thiophanate-methyl, fludioxonil, triflumizole, and bio-fungicides containing *Trichoderma harzianum* var. Rifai. Rotate fungicides with different mode of actions to prevent resistance development. Fungicide treatments in landscapes are not effective and not recommended.

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