

Cleaning Up From *Thielaviopsis* (Black Root Rot) - 5/27/11

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The common name for *Thielaviopsis* is “Black Root Rot”, aptly named for the characteristic discoloration of the root system of affected plants. The black color is a testimony to the resilient spores that overtake the root tissue over time as they inhibit the plants ability to take up water and nutrients.

A recap of the characteristics of this disease points out the urgency of successfully executing a thorough clean-up after an infection. *Thielaviopsis* is a fungal disease that has a fairly wide distribution in soils. It can persist without a plant host for a year or more thanks to the abundance of resting spores that it produces called chlamydospores. These spores survive in the dust on greenhouse floors, tools, transplanting equipment, used plastics and other locations. Plants under stress are more likely to be infected. Infected plugs and liners will usually pass the initial inspection given to incoming plant material because obvious symptoms may not yet be evident. Within a few weeks of transplanting signs of infection gradually become apparent. Infected plants will gradually appear stalled, making little or no growth when compared to surrounding healthy plants. They may start to exhibit symptoms that can be confused with a nutrient deficiency at this stage. Removing the transplant and examining the roots often shows that the roots never grew out of the original root ball. Some white roots may still be present along with patches of dark roots as the disease progresses. The slow decline that leads to an inconsistent looking crop can lead growers to blame themselves thinking they watered too heavily, grew them too cool, etc., not realizing that *Thielaviopsis* is actually behind the decline.

There are prudent steps growers can take to reduce the risk from *Thielaviopsis*.

- Rigorous sanitation is essential.
- Control fungus gnats since they can spread spores throughout the crop in their travels.
- Reduce plant stress by proper temperature, light and moisture management. A soil pH of 5.7 or below inhibits the development of *Thielaviopsis*.
- Educate workers about disease spread and symptoms.
- Test suspicious plants at a plant diagnostic lab and quickly dispose of infected plants off-site.
- Susceptible liners and plugs* should be treated with an approved fungicide at planting. Infected plants will not be cured; the treatments are to protect adjacent healthy plants. Recommended fungicides are listed in the Griffin Insecticide and Fungicide Options bulletin and the GGSPRO Reference Guide.



Figure 1 *Thielaviopsis* symptoms can resemble a nutritional problem

- Consider recycling rather than re-using plastic pots and trays from infected plants. If plastics are to be re-used a rigorous two-step process of cleaning then disinfecting is required as described below.

*Partial list of susceptible plants: Bacopa, Begonia, Browallia, Calibrachoa, Fuchsia, Gerbera Daisy, Pansy, Petunia, Phlox, Poinsettias, Salvia, Snapdragon, Tomato, Verbena, Vinca (flowering)

The persistent nature of *Thielaviopsis* calls for a thorough sanitation effort at the end of the spring season. A two step process is required for good success. Start with a thorough cleaning of the growing facility. Remove all crop debris from the greenhouse and then sweep, scrub or power wash organic matter off of all surfaces. The next step is to apply Strip-it™ by spray, brush or foam at 5-8 ozs per gallon. Strip-it™ is a combination of acid based cleaners and surfactants that does a superior job of removing organic matter and mineral deposits from benches, sidewalls, floors, walkways, etc. Don't forget to include hand tools and machinery as they can also harbor *Thielaviopsis* spores. Thoroughly cleaned surfaces are now ready for the second step. Products such as Kleengrow™, Xeroton-3™ and Zeritol® can be used to disinfect the cleaned surfaces. Use the maximum label rates of each and take steps to keep treated surfaces wet for 10 minutes or longer for best results.