



## DISEASE MANAGEMENT: Fusarium Crown and Root Rot on Tomato



### *Fusarium oxysporum* f. sp. *radicis-lycopersici*

#### SIGNS & SYMPTOMS:

- Symptoms on tomato plants first appear as yellowing of the oldest leaves about the time that fruit is nearing maturity.
- Symptoms progress up the plant as the yellowed leaves turn brown (**Figure 4**).
- Plant wilting first occurs during the warmest part of the day, and plants appear to recover at night.
- The entire plant wilts and dies or it may persist in a weakened state.
- Infected plants may be stunted.

#### DISEASE CYCLE & EPIDEMIOLOGY:

- The fungus invades plants through wounds and natural openings created by newly emerging roots.
- Long-range dissemination of the fungus can occur through infected transplants, contaminated soil, and on contaminated shoes, plant stakes, machinery, transplant trays and other equipment.
- The fungus survives for long periods of time in the soil.
- The disease is favored by cool temperatures 50-68°F, low soil pH, ammoniacal nitrogen and water-logged soil.

#### FIELD SIGNATURE:

- Crowns and roots, when sectioned lengthwise, have extensive, internal brown discoloration (**Figure 2**).
- Abnormal amounts of adventitious roots may occur above the infected region (**Figure 5**).
- Stem lesions may be covered with masses of white fungus with yellow to orange.

#### PHOTOS:

**Figure 1.** Severe external stem damage. Photograph by: Ken Pernezny.

**Figure 2.** Internal damage caused by Fusarium root and crown rot (FCRR), note the brown color of the plant vascular tissue. Photograph by: Ken Pernezny.

**Figure 3.** Field view of infected tomato plants, note that patches of plants are affected rather than as a uniform pattern throughout the field. Photograph by: Ken Pernezny.

Prepared by: Dr. Pam Roberts

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### CULTURAL CONTROLS:

- Avoid ammoniacal nitrogen and maintain the soil pH at 6 to 7.
- Avoid movement of infested soil or contaminated equipment.
- Disinfect wooden tomato stakes before reuse, or use new stakes.
- Rotate with a nonsusceptible crop.

### CHEMICAL CONTROL:

- Use a preplant fumigant.
- Fungicides are not effective to control this soilborne pathogen.

### RESISTANT CULTIVARS:

- Some resistant cultivars, such as 'BHN 586', 'Crown Jewel', 'Sebring', and 'Soraya' are available for commercial use. **See pgs. 10-11 for resistant cultivars.**



**Figure 4.** Wilt symptoms from mild to severe which represent early to late stage infection. Photograph by: Lawrence Datnoff.



**Figure 5.** Proliferation of adventitious roots caused by FCRR in a non-fumigated plot. Photograph by: Lawrence Datnoff.

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