

## DISEASE MANAGEMENT: Bacterial Wilt



### *Ralstonia solanacearum*

#### SIGNS & SYMPTOMS:

- Initial symptom is wilting of upper leaves during the warmest part of the day, which may recover in the evening.
- The whole plant becomes completely wilted or stunted and may die under conditions favorable to the disease.
- Wilted leaves maintain green color usually until desiccated and do not fall as disease progresses (**Figures 1 & 4**).
- Vascular tissues in the lower stem of diseased plants show a dark brown discoloration (**Figure 3**).
- As a sign, ooze from lower stem in water is an important indication of this bacterial pathogen.

#### DISEASE CYCLE & EPIDEMIOLOGY:

- Infested soil and surface water, including irrigation water, are the primary sources of inoculum.
- The pathogen infects roots of susceptible plants, usually through wounds.
- Bacterial wilt is favored by high temperature (85-95°F) and high soil moisture.
- The pathogen has a wide host range, including tomato, pepper, potato, tobacco, eggplant, geranium, hydrangea and many weeds and other plants.

#### FIELD SIGNATURE:

- The disease usually occurs in foci associated with water accumulation in lower areas.
- In furrow-irrigated crops, it is common to find wilted plants in sequence due to inoculum spread through water channels.

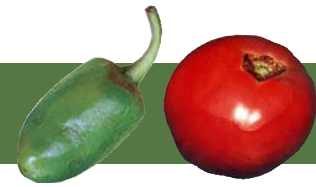
#### PHOTOS:

**Figure 1.** Wilted leaves due to bacterial wilt on tomato. Photograph by: Hank Dankers.

**Figure 2.** Severe bacterial wilt in tomato field. Photograph by: Hank Dankers.

**Figure 3.** When sliced open, stems of infected plants display dark brown coloration of the vascular tissue. Photograph by: Hank Dankers.

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### CULTURAL CONTROLS:

- Pathogen free soil, irrigation water, transplants, and operation tools are important to exclude or reduce disease.
- Raise soil pH to 7.5-7.6 and increase available calcium (liming).
- Use non-host crops, such as sorghum-sudan, rye and corn, as cover crops or for rotation.

### RESISTANT CULTIVARS:

#### TOMATO:

Some moderately resistant cultivars are commercially available, such as FL7514 and BHN 466.

Resistance may be limited to certain regions since it may fail across locations.

Acibenzolar-*S*-methyl (Actigard®) was shown to enhance resistance of some moderately resistant cultivars in field experiments in Florida.

#### PEPPER:

No known resistance to bacterial wilt currently available in commercial cultivars.

Acibenzolar-*S*-methyl should not be used on pepper due to potential adverse effects.

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### CHEMICAL CONTROL:

- Soil fumigation with chloropicrin has been reported to achieve limited success if combined with other control methods.
- Thymol, a plant-derived volatile chemical, was shown to reduce disease incidence and increase yield in field experiments (not commercially available).

### RESISTANCE MANAGEMENT:

- Chemical control should be integrated with cultural and other methods to reduce selection pressure for pathogen resistance.



**Figure 4.** Severe wilt symptoms. Photograph by: Hank Dankers.

### References:

Ji, P., M.T. Momol, S.M. Olson, P.M. Pradhanang and J.B. Jones. 2005. Evaluation of thymol as biofumigant for control of bacterial wilt of tomato under field conditions. *Plant Dis.* 89:497-500.

Momol, M.T., P.M. Pradhanang and C.A. Lopes. 2003. Bacterial wilt, pp. 7-8. *In* K.L. Pernezny, P.D. Roberts, J.F. Murphy and N.P. Goldberg (eds.), *Compendium of Pepper Diseases*. American Phytopathological Society, St. Paul, MN.

Pradhanang, P.M., P. Ji, M.T. Momol, S.M. Olson, J.L. Mayfield and J.B. Jones. 2005. Application of acibenzolar-*S*-methyl enhances host resistance in tomato against *Ralstonia solanacearum*. *Plant Dis.* 89: 989-993.