



## Arkansas Plant Health Clinic Newsletter

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### Tomato

#### Pith Necrosis

Pith Necrosis caused by the bacterium *Pseudomonas corrugata*, and other *Pseudomonas* spp. is widespread in some tomato growing regions. It primarily affects older plants and symptoms usually do not show until fruit begin to develop. Early symptoms are wilting of young foliage and chlorosis and wilting of older leaves. Leaves often curl up and turn brown on their margins. Dark brown to black lesions develops on the surfaces of lower stems. Inside the affected stems, the pith tissue is darkly discolored and eventually becomes chambered and hollow. Adventitious roots may grow from these sections of symptomatic stems. The symptoms may advance up the stems with eventual collapse and death of the plant. Pith Necrosis is more common with low night temperatures, high nitrogen levels, and high humidity. It is thought that the disease is possibly seedborne. Control recommendations are avoidance of excessively high nitrogen fertilizers, and overhead sprinkler irrigation. Workers should avoid working among the plants while foliage is wet. Rotation is perhaps the best tool.

### Tomato Pith Necrosis- *Pseudomonas corrugata*



Photo by Sherrie Smith, University of Arkansas  
Cooperative Extension

#### Tomato Bacterial Wilt

The symptoms of Tomato Bacterial Wilt, caused by *Ralstonia solanacearum*, are wilting of younger leaves, followed by a rapid wilting of the entire plant. This bacterial disease is easily distinguishable from other bacterial and fungal wilts. If the stem is cut and suspended in water, a white, milky stream of bacterial cells and slime start flowing from the cut end in 3-5 minutes. If the infection is severe the water becomes milky in 10-15 minutes. The best defense against this bacterial wilt disease is the use of resistant cultivars and crop rotation.



## **Tomato Bacterial Wilt-*Ralstonia solanacearum***



Photo by Sherrie Smith, University of Arkansas Cooperative Extension

### **Tomato Bacterial Canker**

Bacterial Canker is caused by the bacterium *Clavibacter michiganensis* subsp. *michiganensis* and is easily confused with Bacterial stem rot. Bacterial Canker also causes a wilt of the plant. First symptoms are a downward turning of lower leaves, marginal necrosis of leaflets, wilting of leaflets, and the

upward curling of leaflet edges. Adventitious roots may develop on the stem and a prominent white zone is often found at the nodes. Stems may or may not develop externally discolored streaks with stem cankers forming. Stem cankers do not, however, always form. Internally, the stem tissue first becomes streaked with light yellow to brown streaks which later turn reddish brown. This is particularly obvious at the nodes. What differentiates this Bacterial Canker and Bacterial stem rot from Bacterial wilt is the absence of copious amounts of bacterial streaming from a cut stem. Bacterial Canker produces only a moderate amount of streaming. Sometimes pale green to creamy-white blister-like leaf spots may be found. These spots are surrounded by dark rings of dead tissue. The fruit symptoms have similar spots, referred to as bird's-eye spot. Clean seed and disease-free transplants are the best methods of avoiding bacterial Canker. Clippers and pruning tools should be disinfected between plantings and rows. Stakes that are reused should be washed with a 1% bleach solution. Tomato debris should be removed from the field or incorporated to aid in decomposition. Crop rotations for 3 seasons with a non-host crop are very helpful in fields with a history of bacterial canker.



## Tomato Bacterial Canker- *Clavibacter michiganensis* subsp. *michiganensis*



Photo by Sherrie Smith, University of Arkansas  
Cooperative Extension

## Tomato Bacterial Canker- *Clavibacter michiganensis* subsp. *michiganensis*



Photo by Sherrie Smith, University of Arkansas  
Cooperative Extension

## Bacterial Spot of Tomato and Pepper

Bacterial diseases of **tomato and pepper** are endemic wherever these crops are grown. Bacteria Spot, caused by *Xanthomonas campestris* pv. *vesicatoria*, affects all aboveground parts of the plant. Lesions are generally brown and circular on the leaves, stems, and fruit spurs. The spots are water soaked during wet or rainy periods. During dry periods the center of the lesions may fall out, giving a tattered appearance. Fruit lesions begin as tiny, raised blisters. They reach 6.35mm (1/4inch) in diameter as they age, becoming brown, and scab-like. A developing lesion may have a faint to prominent halo that eventually disappears. The pathogen survives in seed, crop debris, and volunteers. Control measures consist of crop rotation, using clean transplants, seed treatments, elimination of cull piles near production areas, and the timely application of bactericides when necessary. Kocide is labeled for tomato in Arkansas for bacterial diseases.



## Tomato Bacterial Spot- *Xanthomonas campestris* pv. *vesicatoria*



Photo by Sherrie Smith, University of Arkansas Cooperative Extension

## Pepper Bacterial Spot-*Xanthomonas* *campestris* pv. *vesicatoria*

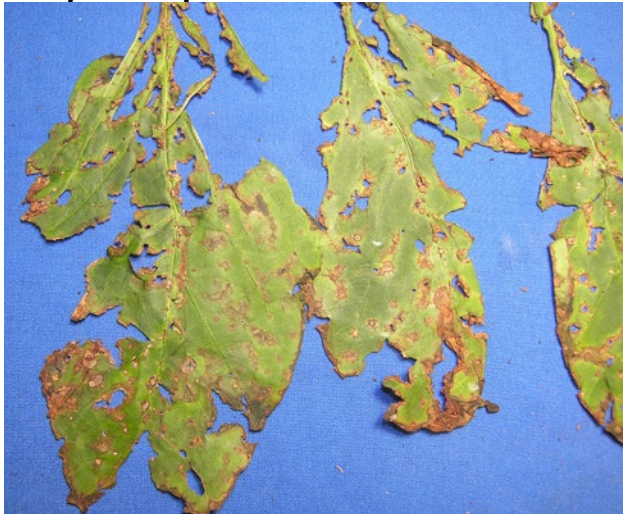


Photo by Sherrie Smith, University of Arkansas Cooperative Extension

## Tomato Bacterial Speck

Bacterial Speck is caused by *Pseudomonas syringae* pv. *tomato*. Lesions on leaflets are round, dark brown to black. Large areas of tissue may be killed as spots coalesce. Lesions on stems and peduncles are elongated. Fruit lesions are minute specks that are dark and rarely exceeding 1mm (.04inch). A dark green halo may be associated with the fruit spot. Controls are the same as for bacterial spot.

## Tomato Bacterial Speck- *Pseudomonas syringae* pv. *tomato*



Photo by Sherrie Smith, University of Arkansas Cooperative Extension



## Tomato Bacterial Speck- *Pseudomonas syringae* pv. *tomato*



Photo by Sherrie Smith, University of Arkansas Cooperative Extension

## Tomato Bacterial Speck- *Pseudomonas syringae* pv. *tomato*



Photo by John Gavin, University of Arkansas Cooperative Extension

## Fusarium Wilt of Tomato

Young plants are often stunted with drooping leaves. The bases of infected stems become enlarged. On older plants the symptoms often develop on one side of the plant with leaflets turning yellow and drooping. The remaining foliage eventually turns yellow followed by wilting and eventual collapse of the plant. The pith remains healthy, but the vascular tissue becomes dark brown. This symptom is adequate for diagnosis of Fusarium Wilt. There is no cure or treatment. Plants with Fusarium Wilt should be pulled up and destroyed. Resistant varieties are available.

## Tomato Fusarium Wilt-*Fusarium oxysporum* f.sp. *lycopersici*



Photo by Sherrie Smith, University of Arkansas Cooperative Extension

## Late Blight

Late Blight, caused by *Phytophthora infestans*, is a very destructive disease of both tomato and potato. The clinic has been seeing more Late Blight than usual due to the continual cool, wet



**Sherrie Smith**  
**Rick Cartwright**

weather. Leaf symptoms begin as indefinite, water-soaked spots, which enlarge rapidly into pale green to brown lesions and cover large areas of the leaves. When humidity is high, the undersides of the lesions may be covered with a gray to white moldy growth. Infected stems and leaves become brown, shrivel, and die. Fruit lesions appear as dark, olive-green to brown greasy spots that may enlarge and encompass the entire fruit. Soft rot of the fruit follows. Eliminating cull piles and tomato crop debris is vital in reducing inoculum sources for this disease. There are no real sources of resistance. Fungicides are essential when weather conditions favor the development of Late Blight. Quadris, Cabrio, Ridomil gold, and Gavel are labeled for Late Blight.

This bulletin from the Cooperative Extension Plant Health Clinic (Plant Disease Clinic) is an electronic update about diseases and other problems observed in our lab each month. Input from everybody interested in plants is welcome and appreciated.

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## **Tomato Late Blight-*Phytophthora infestans***



Photo by Sherrie Smith, University of Arkansas Cooperative Extension

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