EC3029

Specialty Crop Diseases Observed After Hailstorms

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Figure 1a. Rhizopus head rot.

Figure 1b. Rhizopus head rot.

Figure 2. Bacterial brown spot.

Figure 3. Bacterial leaf spot.

Figure 4. Bacterial wilt.

Figure 5b. Bacterial blight.

Figure 5a. Bacterial blight.

The environment plays a major role in the process of infection and disease development in several specialty crop plants by providing the conditions needed for certain pathogens to cause disease. Hail accompanied by summer thunderstorms will often cause damage that can kill or severely wound plants. This type of injury can not only be lethal to plants by itself, but also opens wounds that can then assist in the entry of opportunistic pathogens, particularly bacteria. The bacteria all are favored by warm and moist conditions.

Disease	Description and Symptoms
Rhizopus head rot of sunflower *Rhizopus* spp.	Head rot disease is caused by several species of this genus, including *R. stolonifer*, *R. oryzae*, and *R. microsporus*. The fungus is a common soil inhabitant and infection begins when spores enter heads via wounds *(Figure 1a)*, followed by high humidity and warm temperatures. The fungus grows throughout heads, causing shredding *(Figure 1a)* and seed loss.
Bacterial brown spot of dry bean *Psuedomonas syringae* pv. *syringae*	Brown spot is a warm weather disease, causing the most damage during periods when temperatures range from 80–85° F. Size of lesions can vary, but generally they are small, circular, and brown, often surrounded by a yellow zone. When they coalesce, they form linear necrotic streaks on infected tissues *(Figure 2)*. The centers of old lesions fall out, leaving tattered strips or "shot holes" on affected leaves.
Bacterial leaf spot of sugarbeet *Pseudomonas syringae* pv. *aptata*	Bacterial leaf spot is disease favored by warm (77°F to 86°F) temperatures and moist conditions. Early infection on young plants consists of dark brown spots with grayish white centers on both pods and leaves *(Figure 3)* that may be confused with Cercospora leaf spot. As leaf spots coalesce, foliage may appear to be blighted.
Bacterial wilt of cowpea *Curtobacterium flaccumfaciens* pv. *flaccumfaciens*	Wilt is favored by very hot temperatures (>90° F). Symptoms consist of leaf wilting during periods of warm, dry weather or periods of moisture stress. Infected plants also exhibit interveinal, necrotic lesions *(Figure 4)* initially surrounded by bright yellow borders. These symptoms may be confused with those caused by the common bacterial blight pathogen.
Bacterial blight of pea *Pseudomonas syringae* spp.	Blight is caused by a complex of at least two pathogens, including *Pseudomonas syringae* pv. *pisi* and *Pseudomonas syringae* pv. *syringae*. Moderate to warm temperatures are required for optimal infection and disease development. Symptoms consist of circular, often angular, water-soaked lesions on both leaves and pods that dry with time *(Figures 5a and 5b)*.

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