

# Early Season Soybean Diseases

By Laura Sweets

This could be an interesting year for early season soybean diseases in Missouri. Because of the erratic weather patterns, soybean planting is well behind average. However, the unusual fluctuations in both soil moisture and soil temperatures could increase the potential for *Pythium* seed decay and seedling blight as well as *Phytophthora* seedling blight. The early season soybean diseases include those that cause seed decay, seedling blights and root rots of soybean. Most of these early season soybean diseases are caused by fungi in the soil that are found wherever soybeans are grown. *Pythium*, *Phytophthora*, *Rhizoctonia* and *Fusarium* are the most common of these early season pathogens, although *Macrophomina* (charcoal rot fungus) may also cause early season seedling problems.

Soybean seedling blights have the potential to cause losses in Missouri soybean fields every year. The specific seedling blights that occur and their severity vary with the environmental conditions each season. With the changes in weather patterns this spring and soybean planting delayed in much of the state because of wet soil conditions, it is difficult to predict which, if any, seedling blights may occur or may cause significant problems this season.

*Pythium* and *Phytophthora* are favored by wet conditions and are more likely to be serious problems when wet conditions exist at or just after planting. *Rhizoctonia* and *Fusarium* are not as restricted by soil moistures and soil temperatures but still need some moisture to initiate infection. *Macrophomina phaseolina* grows best at temperatures between 82-95°F. Infection of seedlings with *Macrophomina* is most likely to occur if conditions of high soil temperatures and low soil moisture exist during the first two to three weeks after planting.

Symptoms of *Pythium damping-off* range from seed rot or preemergence damping-off to early postemergence damping-off. Affected tissue develops a soft, watery brown rot. *Pythium damping-off* is most likely to occur in cool (50-55°F), wet soils.

*Phytophthora* can cause seed rot, preemergence damping-off and early postemergence damping-off. Initially affected tissue develops a soft, watery brown rot. Within several days the affected plant parts may dry out and shrivel up becoming dark, dry and brittle. This early stage *Phytophthora* is difficult to distinguish from *Pythium damping-off*; it may be necessary to submit a sample to the Plant Disease Clinic for an accurate diagnosis. *Phytophthora* can also cause a seedling blight in which established seedlings turn yellow, wilt and die. Generally the entire seedling is affected and roots may be poorly developed and rotted. *Phytophthora* root rot is more likely to occur in heavy, wet soils, low areas or compacted areas, but it may occur in light soils or better drained areas if heavy rains occur after planting.

*Rhizoctonia* can cause seedling blight and root rot of soybean. Affected stands may have an uneven appearance and seedlings appear pale green in color and stunted in growth. The identifying feature of this disease is a small, reddish lesion on one side of the stem at or just below the soil line. This lesion develops into a sunken, cankered area at the point of infection. Sometimes the lesion will expand to completely girdle the stem. On severely infected seedlings, the entire hypocotyl may be discolored and shriveled into a dry, stringy or wiry stem.

*Fusarium* can also cause root rot of soybean. Infection is usually confined to roots and lower stems. The lower part of the taproot and the lateral root

system may be discolored, deteriorated or completely destroyed. General roots show a nondescript brown discoloration and a dry, shrunken rot. Above ground portions of plants may appear off-color and stunted. Plants with severe *Fusarium* root rot may die prematurely.

Charcoal rot, caused by *Macrophomina phaseolina*, may be more commonly recognized as a mid to late season disease on maturing soybean plants, but it can also occur early in the season on seedlings. Infected seedlings tend to show a reddish brown discoloration from the soil line up the stem. The discolored area changes from reddish brown to dark brown to black. Foliage may appear off color or begin to dry out and turn brown. If the growing point is killed, a twin stem plant may develop. Under hot, dry conditions, infected seedlings may die. Under cooler, wetter conditions, infected seedlings may survive but carry a latent infection. Then symptoms may reappear later in the season with hot, dry weather.

Once the crop has been planted, there is little that can be done to reduce incidence or severity of soybean seedling diseases. Additional stress from poor growing conditions, herbicide injury or other factors may compound problems with soybean seedling diseases. Prior to planting it is important to consider variety selection (especially in fields with a history of *Phytophthora*), fungicide seed treatment, crop rotation, seedbed preparation and conditions at planting.

Laura Sweets  
SweetsL@missouri.edu  
(573) 884-7307

Visit our Web site at [ppp.missouri.edu](http://ppp.missouri.edu)