Seedling Diseases in Corn

Key Points

• Seedling disease can occur in the form of seed rots, seedling blights, and/or root rots.

• To reduce the incidence of seedling diseases, plant high quality seed at the appropriate planting depth and soil conditions to promote rapid germination and emergence.

• Soil-applied fungicides or seed treatments can provide a level of protection against seedling diseases.

Know What to Look for

The period following planting is an important time to observe the health and vigor of corn stands and determine the success of stand establishment. Seedling diseases in corn have the potential to reduce plant population; sometimes to the point at which replanting becomes necessary. When you notice a stand establishment problem, it is important to determine its cause so that proper action can be taken to prevent it from happening again.

Survival of corn seedlings depends on a healthy kernel and mesocotyl (region between the seed and permanent root system), which should remain firm and white throughout at least the V6 growth stage (Figure 1). From germination until around V6, the corn seedling is dependent on the kernel endosperm for energy and the seminal root system and mesocotyl for moisture and nutrients. Until the nodal or main root system is fully developed, the mesocotyl is also responsible for transporting nutrients from the kernel and seminal roots to the other plant tissues.

Common Pathogens and Symptoms

Corn seedling disease symptoms may look similar to other environmental stresses, insect feeding, or herbicide damage. Seedling disease can occur in the form of seed rots, seedling blights, and/or root rots. If the root system is damaged, slow emergence, stunted or purple plants, and stand loss can occur. Pythium and Fusarium are two of the most common fungi associated with seed rot and seedling blight of corn. Rhizoctonia, Penicillium, and Diplodia are fungi that occasionally cause seedling diseases. Symptoms and conditions are described below:

• Fusarium infected plants can have tan to reddish brown lesions on the roots and the root or mesocotyl may shrivel (Figure 2). Root symptoms range from very slight brown discoloration to dark black, completely rotted roots. This disease can occur under a wide range of temperature and moisture conditions. Fusarium root rot can move into the base of the corn plant resulting in crown and stalk rot at later growth stages.

• Pythium infection is favored by wet, cool soils. Pythium can rot the seed prior to germination or rot the mesocotyl tissue of the seedling after emergence (Figure 3). Pythium can infect anytime between planting and midseason, but is primarily a seedling problem (Figure 4).

• Penicillium seedling blight is favored by warmer temperatures. A common above-ground symptom is necrosis of leaf tips which may occur in streaks or as large areas. Infected plants may turn yellow and die, or remain discolored and stunted throughout the growing season (Figure 5).

• Rhizoctonia infected plants may have distinct sunken, reddish brown lesions on the roots. Plants may be stunted or chlorotic, but often there are no above-ground symptoms.
You may not be able to distinguish which fungus is associated with a seedling blight because the symptoms are often similar and more than one fungus may be present on the same plant. All of the fungi can cause darkening of the roots and stem as well as hinder root development. In general, symptoms will be worse in areas that are wet, compacted, or have heavier soil. Symptoms may appear on scattered plants throughout the field or in patches.

**Disease Management**

Management options are generally the same for all corn seedling diseases. Wet and cool soil temperatures (less than 50° to 55° F) can delay seed germination and emergence and predispose corn seedlings to disease. Seedlings become more susceptible to infection the longer a seed is in the ground before emergence and the more stress germinating corn endures. Be sure to plant high quality seed at the appropriate planting depth and soil conditions to promote rapid germination and emergence. Fields that have good drainage and warm quickly should be targeted for earlier planting. Fields that have a tendency to stay wet or have a history of seedling disease should be planted slightly later in the season when soil temperatures are more favorable for germination. Avoid mechanical injury to the seed and herbicide injury, as these stresses may influence the occurrence of seedling diseases.

**Seed Treatments Can Offer Early Protection**

Soil-applied fungicides or seed treatments can provide a level of protection against seedling diseases, but may not eliminate all threats under severe conditions that promote infection. Most corn seed is treated with a fungicide seed treatment that contains a combination of compounds which are active against a variety of seedling pathogens. Seed treatment fungicides have a limited period of activity, which is usually three to four weeks.

If you observe reduced stands, evaluate with your Channel Seedsman to determine if replanting is the best option. Your replanting decision should be based on stand uniformity, remaining population, target replanting date, and the costs and risks associated with replanting.

**Sources**


Web sources verified 2/6/15.