**Corn Seedling Blights and Root Rots**

- Wet, poorly drained soils can delay germination, slow corn growth, and predispose seedlings to disease.
- Several different fungi can cause corn seedling blights and root rots; symptoms can be very similar and a field diagnosis may be difficult.
- Seed treatment fungicides offer a level of protection against seedling blight pathogens, but may not eliminate the risk of disease when environmental conditions occur that favor pathogens over corn growth.

**Scouting and Identification**

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. Rainfall and wet soil conditions can continue to stress plants after emergence. Early season corn diseases affecting roots and shoots can be categorized as:

- Seed rots, which occur prior to germination,
- Preemergence seedling blights, which occur after the seed germinates, but before emergence,
- Postemergence damping-off, in which the seedling emerges before symptoms develop, or
- Root rots

Seedling diseases are caused by many different fungi. Bacteria, nematodes, and root-feeding insects can also play a role. Identification of the responsible pathogen(s) based on symptom appearance can be difficult because they often cause similar symptoms. Microscopic examination at a plant diagnostic clinic may be the only way to confirm a specific diagnosis. It is not uncommon to isolate multiple root infecting fungi from one plant sample. Several common soilborne fungi such as *Fusarium*, *Penicillium*, *Pythium*, and *Rhizoctonia* are often isolated from infected seedlings and roots.

**Causal Organisms**

*Fusarium*. At least six *Fusarium* species have been identified that cause seedling diseases and root rots in corn. Plant susceptibility to root rot increases when plants are under stress or injured by herbicide applications. *Fusarium* root rot can move into the base of the corn plant, resulting in crown and stalk rot (Figure 1).

*Penicillium*. Infected roots and mesocotyl may be discolored and rotted (Figure 2). Sometimes a blue-green fungal growth can be seen on infected seeds. *Penicillium* is favored by high temperatures.

*Pythium*. Several species of *Pythium* can rot the seed prior to germination or infect young seedlings before or after emergence. It is one of the most common fungi associated with seed rot and seedling blight of corn. This fungus requires wet soils to produce infecting spores.

*Rhizoctonia*. The most distinctive symptoms are reddish brown sunken cankers, which form on crown and brace roots of large plants. Older plants may lodge due to a poor root system.

**Other Factors and Management Considerations**

Other factors such as environmental stresses, insect feeding, or herbicide damage can produce symptoms similar to those caused by seedling blights. Make sure to take these factors into consideration when contemplating management options. Herbicide damage tends to occur in a pattern related to the equipment used and a group of adjacent plants tend to be affected.
Seedling Blights and Root Rots

Seedling Blight / Damping-off / Root Rot

Rotted seed, rotted or discolored seedlings prior to emergence, damping-off after emergence, and root decay. Typical symptoms include soft and brown seed, roots that are discolored and have a wet, slimy appearance, seedlings that yellow, wilt, and die, mesocotyl with brown lesions or soft and water-soaked tissue, and poorly developed root systems.

**Fusarium**
- Infected plants can have tan to reddish brown lesions and the root or mesocotyl may shrivel.
- Root symptoms range from very slight brown discoloration to dark black, completely rotted roots.
- Occurs under a wide range of temperature and moisture conditions
- Can cause disease in older plants
  - Root rots occurring after the seedling stage are often caused by **Fusarium**
  - **Rhizoctonia** can also cause crown and brace root rot on older plants

**Rhizoctonia**
- Initial symptoms are brown lesions on the mesocotyl and roots of seedlings and young plants. Plants may develop distinct reddish brown sunken cankers on roots. Plants may be stunted or chlorotic, but often there are no above-ground symptoms.
- Can infect corn roots between 46-82 F; tends to be more severe in irrigated corn

**Penicillium**
- Symptoms of this seedling blight include browning of leaf tips. Entire infected plants may turn yellow and die, or remain discolored and stunted the remainder of the growing season. The roots and mesocotyl may be discolored and rotted.
- Favored by high temperatures, which can inhibit other fungi
- Generally a problem on younger plants
  - **Penicillium** tends to infect plants that have yet to develop their nodal root systems
  - **Pythium** can infect anytime between planting and midseason, but is primarily a seedling problem

**Pythium**
- Symptoms include dark, slimy lesions that cause the root or mesocotyl to shrivel. The outer cortex of the root may be rotted while the inner part, or stele, remains white and intact.
- Favored by high moisture and low temperatures

Figure 4. Flow chart depicting symptoms and favorable conditions for corn seedling diseases caused by **Fusarium**, **Rhizoctonia**, **Penicillium**, and **Pythium** fungi.

Seeding diseases usually occur on scattered plants or plants found in irregular groupings, which may correspond to changes in soil type or low-lying areas of a field.

Most corn seed is treated with seed treatment fungicide, often with multiple active ingredients. These products can provide a level of protection against seedling blight pathogens, but may not eliminate all threats under severe environmental conditions that favor infection. All seed treatments have a limited period of activity, which is usually only a few weeks. To minimize the risk of developing corn seedling diseases and root rots, plant high-quality seed, use a broad-spectrum seed treatment product, plant at the appropriate depth, and plant when soil conditions will promote rapid germination and emergence.


For additional agronomic information, please contact your local seed representative.

**Individual results may vary** and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.

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