



Seedling Diseases of Corn

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INTRODUCTION

Seedling diseases are caused by several soil or seed-inhabiting fungi or fungus-like organisms (oomycetes) that are favored by cool, wet soil conditions during and after planting. This publication describes the symptoms of seedling diseases commonly observed in Kentucky, conditions that favor disease development, and preventative management practices that minimize risk of disease.

SYMPTOMS

Symptoms of seedling diseases can be observed after planting and into the early vegetative stages of growth. Symptoms are typically first observed in areas of the field with poor emergence, patchy stands, and/or stunted plants (FIGURE 1). Infected seeds may rot after germination, preventing emergence and leading to the patchy appearance of plants in a field. Affected plants that do emerge may be yellow, stunted, and have brown or purple discoloration on roots, or a soft and decaying mesocotyl. In severe cases, large areas of plants may die as the result of an inadequate root system, leading to reduced stand (FIGURE 2).

CAUSES & DISEASE DEVELOPMENT

Two of the most common seedling diseases of corn in Kentucky are caused by *Pythium* and

Fusarium species, but other fungi, such as species of *Rhizoctonia*, can occasionally cause seedling disease. *Fusarium* species can infect seedlings, occasionally progressing to the crown, resulting in a crown and stalk rot that is observed later in the season.

Soil conditions that delay germination and emergence favor infection and disease development. Seedling diseases are commonly associated with poorly drained or ponded areas of the field and with areas that have heavy or compacted soils. Cool, wet soils at or after planting slow plant growth and development and give seedling disease organisms more time to infect and damage the seedling.

It is very difficult to accurately determine the specific organism responsible for a suspected seedling disease issue in the field. Symptoms of *Pythium*, *Fusarium*, and *Rhizoctonia* seedling blights are very similar and are difficult to diagnose in-field, even for trained professionals. In addition, seedling blight symptoms can be confused with several abiotic disorders, including planter malfunctions, nutrient deficiencies, herbicide injury, soil compaction, compacted side walls, and general moisture stress or “wet feet.” Submitting samples through a county Extension agent to a University of Kentucky Plant Disease Diagnostic Laboratory can help determine the cause of the symptoms observed.



FIGURE 1.
CORN PLANTS THAT ARE AFFECTED BY SEEDLING DISEASE MAY HAVE POOR EMERGENCE WITHIN A ROW OR AN AREA IN THE FIELD.

FIGURE 2.
CORN FIELD WITH A SEVERE REDUCTION IN STAND DUE TO SEEDLING DISEASE.

DISEASE MANAGEMENT

Plant seed into drier, warm soils

While it is often necessary to plant into less than ideal soil conditions, the risk of seedling disease increases when planting into cool and/or wet soils. The risk decreases when corn is planted into drier soils with soil temperatures above 50° F. These conditions allow seeds and seedlings to germinate and emerge rapidly. Whenever possible, postpone planting fields with a history of severe seedling blight until the soil temperature is at least 50° to 55° F at a 2-inch depth when measured in early morning.

Fungicide seed treatments

Corn seed is often treated with a combination of fungicide active ingredients to help protect against seed decay and seedling diseases. However, these fungicide active ingredients work against specific organisms, and efficacy of a given product can vary for seedling blight organisms such as *Pythium* and *Fusarium*. Therefore, obtaining an accurate diagnosis of the seedling blight in a given field is important to ensure the correct fungicide seed treatment active ingredients are used effectively. Higher rates of

specific products may be needed in fields when there is a history of severe loss due to a specific seedling disease.

Standard corn fungicide seed treatments provide a short window of protection against seedling diseases, typically up to a few weeks after planting. Soil or environmental conditions that delay emergence and growth for several weeks may mean plants are at risk for seedling blight issues, even when seed treatments are used, because the seedling may not have the full protection of the seed treatment.

ADDITIONAL RESOURCES

- Plant Pathology Extension Publications – Corn <https://plantpathology.ca.uky.edu/extension/publications#cornsorghum>
- Crop Protection Network – Corn <https://cropprotectionnetwork.org/crops/corn>

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