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Scouting for soybean seedling diseases

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Scouting for soybean seedling diseases

Abstract

When soybeans start to emerge, a few of us may experience stand reductions caused by seedling diseases. Several fungi can cause stand establishment problems either before or after soybean emergence. *Pythium*, *Phytophthora*, *Rhizoctonia*, and *Fusarium* are fungi that cause seedling blight in Iowa. Research shows that the first three fungi account for about 90 percent of disease-related stand reduction problems in Iowa. *Fusarium* is a minor problem. Determining which fungi are the cause of a problem in a particular field is a main task of scouting.

Keywords

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Disciplines

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INTEGRATED CROP MANAGEMENT

Scouting for soybean seedling diseases

When soybeans start to emerge, a few of us may experience stand reductions caused by seedling diseases. Several fungi can cause stand establishment problems either before or after soybean emergence. *Pythium*, *Phytophthora*, *Rhizoctonia*, and *Fusarium* are fungi that cause seedling blight in Iowa. Research shows that the first three fungi account for about 90 percent of disease-related stand reduction problems in Iowa. *Fusarium* is a minor problem. Determining which fungi are the cause of a problem in a particular field is a main task of scouting.

How to identify seedling diseases. When seed fails to emerge because of fungal attack, it is called seed rot or preemergence damping-off. The causal fungi cannot be determined without aboveground symptoms.

Pythium damping-off will be the first seedling disease to occur in the growing season because this fungus prefers cold soil temperatures. Dead seedlings may be visible on the ground with infected plants killed before the true leaf stage. Plants often have a rotted appearance. Leaves of infected seedlings first will be gray-green and then turn brown. A few days later, the plants will die. Diseased plants are easily pulled from the soil because of rotted roots.

The symptoms of *Phytophthora* damping-off are very similar to those of *Pythium* damping-off. However, the *Phytophthora* fungus prefers warm soil (about 80° F). If symptoms similar to those caused by *Pythium* occur when soil temperatures are warm or in late-planted soybean, the disease is more likely caused by *Phytophthora*. Another way to determine the causal fungus is to check for stem rot. In June or early July, *Phytophthora* damping-off may continue to develop on the soybean stem resulting in chocolate brown discoloration from the soil line up, a unique symptom of this disease.



[1] **Seedling disease by *Rhizoctonia*.**



[2] **Damping-off caused by *Pythium*.**



[3] **Damping-off by *Pythium/Phytophthora*.**



[4] **Phytophthora stem rot.**

Seedling disease caused by *Rhizoctonia* exhibits different symptoms from those caused by *Pythium* and *Phytophthora*. Seedling blight by *Rhizoctonia* normally appears when the weather becomes warm. Unlike *Pythium* and *Phytophthora* damping-off, stem discoloration by *Rhizoctonia* is usually limited to the cortical layer of the main root and hypocotyl. Infected stems remain firm and dry. Typical symptoms are localized brown to reddish brown lesions on the hypocotyl.

What to do if you find seedling diseases. There are three situations to watch for that could indicate damping-off problems:

0. scattered dead plants across a field but no significant stand reduction,
1. obvious stand reduction but replanting is not needed, and
2. severe reduction. If no significant stand reduction has occurred, you do not need to be concerned if the disease is *Pythium* or *Rhizoctonia* damping-off. If the disease is *Phytophthora* damping-off and it occurs on a *Phytophthora*-resistant variety, your resistance has been defeated by the fungus. Consider using a variety with a better resistance gene for the next soybean crop.

Although replanting is not always needed with stand reduction, root rot, especially *Rhizoctonia* root rot, may follow stand reduction in plants that are infected but not killed as seedlings. Take good disease notes and use preventive measures such as seed treatment to reduce the likelihood of a disease problem in the next soybean crop.

If replanting is necessary, you can avoid disease damage in the replanting by considering seed treatment to reduce the risk of further damping-off, especially for *Rhizoctonia* and *Phytophthora*. Select chemicals according to the fungi that cause the seedling blight. See the April 13, 1998 ICM newsletter article, [Soybean seed treatments](#) [5], pages 41-42. You also could work the ground to provide a better seed bed, particularly if the disease occurs in no-till fields.

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[1] <http://www.ipm.iastate.edu/ipm/icm//irhizoct.html>

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[4] <http://www.ipm.iastate.edu/ipm/icm//istemrot.html>

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