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Soybean seedling diseases in 2004

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Soybean seedling diseases in 2004

Abstract

Seedling diseases cause stand reduction in soybean in the spring season, with severity varying from year to year. Once severe stand reduction happens, it is important to determine if a fungal disease is involved before the decision to replant is made. If damping-off is the cause of stand reduction, seed treatment may be needed for replanting. Proper identification of seedling disease is essential for correcting problems in the future. It is also important to know what fungi caused the seedling disease because different fungicides are effective in controlling different fungi.

Keywords

Plant Pathology

Disciplines

Agricultural Science | Agriculture | Plant Pathology

INTEGRATED CROP MANAGEMENT

Soybean seedling diseases in 2004

Seedling diseases cause stand reduction in soybean in the spring season, with severity varying from year to year. Once severe stand reduction happens, it is important to determine if a fungal disease is involved before the decision to replant is made. If damping-off is the cause of stand reduction, seed treatment may be needed for replanting. Proper identification of seedling disease is essential for correcting problems in the future. It is also important to know what fungi caused the seedling disease because different fungicides are effective in controlling different fungi.

This spring, temperatures have been fluctuating with frost occurring over the weekend in most of Iowa, which can complicate our scouting efforts in identifying the cause of stand reduction. Some early planted soybeans, if emerged before the frost, may have frost injury. Frost-injured seedlings are easy to differentiate from seedlings attacked by pathogens. Seedlings with seed injury will have the upper portions of the plants damaged but there will not be any root rot symptoms. If not killed, these plants will re-grow.

For plants infected by fungal pathogens, damping-off can occur either before or after soybean emergence. When seeds fail to emerge because of fungal attack, seed rot or pre-emergence damping-off can occur. *Pythium* and *Phytophthora* are two fungi causing pre-emergence damping-off in Iowa. When the fungi attack seeds before germination, seed rot occurs. Seeds which were dead before germination will be soft and rotten, with soil adhering to them. If infection occurs after germination, seeds may fail to emerge and dead plants have a short and discolored root.

If a plant is killed at seedling stage (after emergence), the disease is called seedling blight or post-emergence damping-off. Diseased plants may stand alone or in small circular groups, particularly in low spots in the field, or they may occur scattered over an entire field. *Pythium*, *Phytophthora*, *Rhizoctonia*, and *Fusarium* are the fungi causing seedling blight in Iowa.

Symptoms of seedling blight by *Pythium* are very similar to those by *Phytophthora*. One normally cannot separate the two without further laboratory tests. When seedling blight occurs, dead seedlings are visible on the ground. Infected plants that die before true leaf stage will have a rotted appearance (Figure 1). If leaves are present, those of infected seedlings will have a gray-green color before turning brown. A few days later, the plants die and have a rotted appearance. Diseased plants are easily pulled from the soil because of rotted roots. Seedling blight by *Phytophthora* can be differentiated from *Pythium* after V2 growth stage or later. Plants infected by *Phytophthora* have a brown discoloration extending from the root and up the stem (Figure 2). Soybeans planted in cold, wet soil are most likely to be attacked by *Pythium*. If disease occurs in warm conditions, it is more likely caused by *Phytophthora*. This spring, it would be difficult to say which fungus is more likely to occur due

to fluctuating temperatures.



Soybean damping-off.

[Enlarge](#) [1]



Soybean damping-off.

[Enlarge](#) [2]

Rhizoctonia and *Fusarium* also can cause seedling diseases. Seedling diseases by these fungi are different from those caused by *Pythium* and *Phytophthora*. Seedling blight by *Rhizoctonia* normally appears as the weather becomes warm. Unlike *Pythium/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 and the lower stem that do not extend above the soil line. The reddish brown color is a good symptom to aid in diagnosing the disease. Compared with other fungi, seedling disease by *Fusarium* has been a minor problem.

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