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Assess soybean disease risk in spring planting

X. B. Yang
Iowa State University, xbyang@iastate.edu

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Abstract
During a planting season, there are four fungal diseases that may be a concern. Infections by the fungi that cause these diseases occur at early stages of soybean development, and understanding the biology of these diseases helps in properly assessing and consequently effectively managing the risk of these diseases. A simple way to assess disease risk for fields that had disease problems previously is to use soil conditions after planting. A pathogen attacks soybean within a range of soil temperatures, and severe damage occurs only when soil temperature and moisture are optimum for infection.

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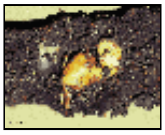
Table 1. Soil temperature conditions for infection by soybean disease pathogens.

Fungus	Disease	Temperature (F) (Range/Optimum)	Moisture	
Pythium	Damping-off	50-68/<59	Saturated;	
Rhizoctonia	Damping-off	60-86/80	30-60% water holding capacity	
Phytophthora	Damping-off	59-86/77-80	Saturated; weekly periodic rain	
Fusarium	SDS and root rot	50-86/59	Wet to saturated	

Cool-temperature diseases. There are several *Pythium* species that may infect soybean in Iowa under cool soil temperatures. Therefore, early planted soybean often has higher risk for Pythium damping-off than later planted soybean, especially in fields that had the disease previously. If risk is high, consider seed treatment. Many seed treatment chemicals on the market are effective in controlling Pythium damping-off.



Soybean damping-off.

Enlarge [1]

Although sudden death syndrome (SDS) usually is most common after mid-August in Iowa, infections of the *Fusarium* fungus occur in the early growth stages of soybean when soil temperature is low. Therefore, early planted soybean would have a higher SDS risk

compared with late-planted soybean.

Warm-temperature diseases. Damping-off caused by *Phytophthora* and *Rhizoctonia* requires warm soil temperatures, with the optimum temperature approximately 80°F. Therefore, these diseases often occur in soybean planted in mid- to late spring when soil warms up. However, there is still a possibility that infections by these fungi can occur in early planted soybean because the fungi infect soybean in relatively wide temperature range (Table 1).

Keep in mind that these pathogens also require high soil moisture for infection. If spring soil moisture is low, the disease risk is low, regardless of soil temperature. For *Phytophthora*, periodic rains at weekly intervals are essential to severe damping-off. The fungus needs free moisture from one rainfall to initiate germination and another rainfall (4-5 days after) to germinate and infect plants.

If you think the risk of these diseases is high, consider management options. Seed treatments are effective for controlling damping-off diseases. Refer to the March 2002 issue of *Integrated Crop Management*, page 29 [2], for information on soybean seed treatments.

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