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## **Abstract**

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## **Keywords**

Plant Pathology

## **Disciplines**

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### Fall Tillage Considerations for Soybean Disease Management

By XB Yang, Department of Plant Pathology

Fall tillage operations become a consideration at harvest time, and plentiful soil moisture makes moisture conservation a non-issue. However, the management of soybean diseases could be a consideration if you have fields with severe disease problems this year.

Tillage is an effective way to manage many crop diseases because it reduces the pathogen infested crop residue, and adjusts soil temperature and moisture. Several of the soybean diseases prevalent in areas of Iowa this year can be effectively controlled with tillage practices, and some cannot.

#### Diseases that can be controlled with tillage

Tillage practices are very effective in reducing the risk of almost all of Iowa's soybean foliar and stem diseases – such as *Cercospora* leaf spot, brown spot, frogeye leaf spot, downy mildew, bacterial blight, brown stem rot, and *Phomopsis*. Pathogens of these diseases survive in crop residues in the absence of soybean crop. When infested crop residues are buried in soil, their decomposition rate increases and the fungi die. Tillage reduces the amount of pathogens that survive to the next crop.

Corn-soybean rotation helps reduce disease risk. The infested crop residues, especially infected leaves, will decompose during the next growing season even when left on the soil surface without tillage. In a soybean-corn rotation the infected soybean leaves may be totally disintegrated when corn is grown. However, there may be residue of infected soybean stems carried into the next soybean season.

#### Diseases that are affected by tillage

Occurrence of white mold, SDS, and *Phytophthora* rot are greatly affected by tillage practice; the first two of these are prevalent in some areas of Iowa this season. Tillage has varying effectiveness on each of these diseases. For white mold control, use of no-till while growing corn immediately after a bad soybean white mold season is effective to reduce the disease. When left on the surface, white mold sclerotia, a survival structure, will germinate during a corn season (except seed corn). Germinated sclerotia die and pose no threat to soybeans.

Soybean sudden death syndrome becomes more severe under no-till than other tillage practices. Tillage increases soil temperatures and reduces spring soil moisture which helps cut the risk of soybean sudden death. Tillage to improve soil water conditions should be considered if *Phytophthora* rot – which occurs in saturated soil - is a severe problem.

#### Diseases that cannot be controlled with tillage

Soybean cyst nematode and some soilborne diseases, such as *Rhizoctonia* root rot, would not be reduced by tillage practices. In fact, tillage practices increase the movement of soybean cyst nematode and spread the risk.



**Soybean plants with sudden death syndrome.**

*XB Yang is a professor of plant pathology with responsibilities in soybean disease extension and research.*

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