

10-10-2005

Tillage considerations for disease management

X. B. Yang

Iowa State University, xbyang@iastate.edu

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Recommended Citation

Yang, X. B., "Tillage considerations for disease management" (2005). *Integrated Crop Management News*. 1468.
<http://lib.dr.iastate.edu/cropnews/1468>

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Tillage considerations for disease management

Abstract

In the 2005 growing season, we observed different soybean diseases, and no single soybean disease became a major problem for yield losses. Most diseases were prevalent with a low level of infestation. In corn, the single most significant disease was corn ear rot caused by *Aspergillus flavus*, a fungus producing aflatoxin. Often, tillage would be considered as a major management option to reduce the disease risk for the next crop. Because of the lack of precipitation this summer in some areas, especially eastern Iowa, use of tillage may not be a good practice in terms of preserving soil moisture.

Keywords

Plant Pathology

Disciplines

Agricultural Science | Agriculture | Plant Pathology



Plant Diseases

Tillage considerations for disease management

by X. B. Yang, Department of Plant Pathology

In the 2005 growing season, we observed different soybean diseases, and no single soybean disease became a major problem for yield losses. Most diseases were prevalent with a low level of infestation. In corn, the single most significant disease was corn ear rot caused by *Aspergillus flavus*, a fungus producing aflatoxin. Often, tillage would be considered as a major management option to reduce the disease risk for the next crop. Because of the lack of precipitation this summer in some areas, especially eastern Iowa, use of tillage may not be a good practice in terms of preserving soil moisture. Other methods should be selected as alternatives for disease management for soybean diseases. This article discusses the use of tillage to manage a few major diseases in soybean and corn.

Soybean foliar diseases were not as severe as they were in the 2004 growing season, but several diseases were prevalent. During this season, commonly observed foliar diseases were brown spot, Cercospora leaf spot, frogeye leaf spot, and bacterial blight. Pathogens of these diseases are carried from season to season on soybean plant residues. Conventional tillage that buries crop residues in soil increases decomposition of infested plant residues and can effectively reduce the disease risk for the next soybean crop. However, if you prefer no-till, rotation with corn is recommended if one of these diseases is prevalent in your fields. For most parts of Iowa, foliar diseases were much less than last season. Rotation with corn alone may do the job in reducing the risk of these foliar diseases.



Brown spot



Cercospora leaf spot



Frogeye leaf spot



Bacterial blight

Sudden death syndrome (SDS) was severe in some areas in central Iowa, although it was not as prevalent as in the 2004 growing season. The SDS fungus prefers cool soil for infection. Tillage reduces infection of this

disease because it helps increase soil temperature in the planting season. Delaying planting can result in a control level similar to that of using tillage. Early planting increases disease risk.

By moving planting dates a week or two after regular early planting dates, effects similar to those of tillage on soil temperatures can be achieved. Another option is to select a variety tolerant to SDS. Most seed companies offer information on varieties resistant to this disease. Choose a variety that has the highest rating if you had a significant level of SDS. Further, if the SDS-infested fields had a high level of soybean cyst nematode, be sure to use a variety that also is resistant to SCN.

Corn ear rot and mycotoxins have been production problems in eastern Iowa and part of central Iowa where the summer season was dry. There are reports of harvest corn being rejected by elevators because of having a high level of mycotoxins, mainly aflatoxin. Field reports indicated that ear rot caused by *Aspergillus flavus*, a fungus that produces aflatoxin, was prevalent in these regions because of drought conditions this summer. The occurrence of Fusarium ear rot and its products, fumonisins, have been reported, but the level of prevalence is yet to be determined.

For ear rots, tillage is not recommended as a management tool because tillage practices are unlikely to be effective in controlling ear rot diseases. The fungus caused by *Aspergillus flavus* is common in nature, and its population increases under hot, dry conditions. Studies have shown that the fungus can survive about two years deep in the soil. Tillage has little effect on the survival of this fungus; preserving soil moisture is a higher priority for your yield goal for next year. Tillage practices risk losing soil moisture and are not worth the unknown benefits in controlling ear rot.



Sudden death syndrome



Corn ear rot caused by *Aspergillus flavus*



Fusarium ear rot

X. B. Yang is a professor of plant pathology with research and extension responsibilities in crop diseases.