Disease management in corn-following-corn fields

Alison E. Robertson  
*Iowa State University*, alisonr@iastate.edu

Gary P. Munkvold  
*Iowa State University*, munkvold@iastate.edu

Follow this and additional works at: [http://lib.dr.iastate.edu/cropnews](http://lib.dr.iastate.edu/cropnews)

Part of the [Agricultural Science Commons](https://lib.dr.iastate.edu/agsci/), [Agriculture Commons](https://lib.dr.iastate.edu/agrsc/), and the [Plant Pathology Commons](https://lib.dr.iastate.edu/pph/)

**Recommended Citation**  
[http://lib.dr.iastate.edu/cropnews/1156](http://lib.dr.iastate.edu/cropnews/1156)

The Iowa State University Digital Repository provides access to Integrated Crop Management News for historical purposes only. Users are hereby notified that the content may be inaccurate, out of date, incomplete and/or may not meet the needs and requirements of the user. Users should make their own assessment of the information and whether it is suitable for their intended purpose. For current information on integrated crop management from Iowa State University Extension and Outreach, please visit [https://crops.extension.iastate.edu/](https://crops.extension.iastate.edu/).
Disease management in corn-following-corn fields

Abstract
Disease management is necessary in any crop to protect yield. An integrated approach using several practices is usually recommended. In corn production, the most commonly recommended disease management tactics include hybrid selection, rotation, residue management, and fungicide applications. In corn-on-corn fields, since rotation is not being practiced, the potential for yield loss due to increased disease is greater.

Keywords
Plant Pathology

Disciplines
Agricultural Science | Agriculture | Plant Pathology

This article is available at Iowa State University Digital Repository: http://lib.dr.iastate.edu/cropnews/1156
Even though the risk management aspect of hybrid selection can instill some variability in methodology, there are certain aspects that should remain consistent among all users of yield trial data:

- only multiple-location data should be used to make selection decisions;
- increased yield doesn't necessarily mean increased profit—maturity and seed costs also must be considered;
- yield trials don't have to be performed on your farm, on your soil type, or even under your crop rotation scheme to provide relevant data;
- remember to follow all required insect resistance management protocols when using transgenic hybrids;
- single-location data should not be used for variety selection; and
- more information is better information, so use all reliable sources of data.

Remember that all of your other crop management techniques are utilized to protect the yield potential of your chosen hybrids. It makes sense to spend a little bit of effort to ensure you are maximizing that potential by using proper selection strategies.

Jim Rouse is a program manager with research and extension responsibilities in corn hybrid and soybean variety testing.

---

Plant Diseases

Disease management in corn-following-corn fields

by Alison Robertson and Gary Munkvold, Department of Plant Pathology

Disease management is necessary in any crop to protect yield. An integrated approach using several practices is usually recommended. In corn production, the most commonly recommended disease management tactics include hybrid selection, rotation, residue management, and fungicide applications.

In corn-on-corn fields, since rotation is not being practiced, the potential for yield loss due to increased disease is greater. This is because many of the common corn diseases that occur in Iowa are caused by pathogens that survive on infected corn residues. Rotation to nonhost crops of the pathogen allows time for decomposition of infected crop residues, which deprives pathogens of a food source and exposes them to antagonistic endemic soil microbes. Therefore, rotation helps to naturally eradicate many pathogens from the soil, decreases inoculum levels, and reduces the risk of disease development. Surface residues also modify the soil environment (cooler soil temperatures, higher soil moistures), which can affect disease development.

Can we mitigate disease risks in corn following corn? Yes, but it is going to take a little more thought, care, and attention than we may be used to. Getting into the field to scout for disease outbreaks will be necessary if economically effective management decisions are to be made.

Hybrid selection

Careful selection of hybrids is possibly the most important factor for managing disease in corn-following-corn situations. Knowledge of diseases that occurred in the previous crop will enable informed decisions to be made. Opt for hybrids with high yield potential, good resistance to leaf and stalk diseases, and good emergence and seedling vigor traits.
Managing residue
Strip tillage or removing residue above the planting row may be worth considering in high risk disease situations. Once again, the history of disease in each field will help in this decision. In situations where disease severity in the previous crop was high, strip tillage should reduce disease risk by burying some residue and removing residue from direct contact with the crop.

Planting date
In cooler soils, germination, seedling emergence, and seedling development are delayed thus lengthening the period when germinating seedlings are vulnerable to infection by seedling pathogens and insects. Delaying planting until soil temperatures are above 55 °F will reduce the risk of poor stand establishment due to seedling disease. Consider planting your corn-on-corn fields after planting the corn-on-soybean fields.

Fungicides
Seed treatment fungicides are a critical component of an integrated disease management strategy on corn. New active ingredients continue to be developed and adopted by the seed industry. Currently, there are additional options to purchase seed with insecticidal seed treatments as well as fungicidal seed treatments; these may contribute to seedling disease management by protecting the seed and seedling against root feeding by insects, which can be followed by fungal infection.

Over the past decade or so, the use of foliar fungicides in hybrid corn has rarely been economically feasible. However, since foliar disease incidence/severity tends to increase in high residue environments, and corn prices are more favorable, application of a fungicide in corn-following-corn fields may be warranted. The goal of any fungicide application should be to protect the ear leaf and leaves above the ear from leaf diseases during the grain fill period (siling to black layer), because these leaves contribute more than 75 percent of the carbohydrates. Since all fungicides have limited period of activity (14–21 days), timing of fungicide application is critical. Applications are necessary if a few lesions are observed on the leaves below the ear leaf prior to or at silking. Therefore, fields must be scouted regularly to determine if a fungicide application is needed, and the appropriate time for that application. Hybrid susceptibility and imminent weather conditions also should be considered before applying a fungicide.

Alison Robertson is an assistant professor of plant pathology with extension and research responsibilities in field and forage crops. Gary Munkvold is an associate professor of plant pathology and seed science endowed chair in the ISU Seed Science Center with research and teaching responsibilities in seed pathology.

---

General tips for submitting plant samples* to the Iowa State University Plant Disease Clinic

- Provide plenty of plant material. When possible, send the entire plant, including roots and top growth.
- Provide lots of information, such as a description of the soil, nearby plants, cropping history, pattern of symptoms in the field, and a history of the problem. Remember to include information about chemicals used.
- Include photos when possible.
- Provide freshly collected specimens.
- Be sure the specimen represents the problem.

- Include enough plant material to show all stages of the disease from healthy to very sick.
- Wrap specimens in paper towels or clean newspapers. Do not add moisture. Pack loosely in a plastic bag to reduce drying. Mail in a sturdy container.
- A $10 fee is charged for plant samples. Soil samples to check for corn nematodes (request a complete nematode count) cost $30 for Iowa residents and $60 for out-of-state residents. Checks should be made payable to Iowa State University.
- Please submit samples with the appropriate forms: http://www.extension.iastate.edu/Publications/PD31.pdf (plant samples) http://www.extension.iastate.edu/Publications/PD32.pdf (soil samples for complete nematode tests)

*When herbicide injury is suspected, the samples should go to the extension weed specialists: http://www.extension.iastate.edu/Publications/AG146.pdf

Alison Robertson is an assistant professor of plant pathology with extension and research responsibilities in field and forage crops. Gary Munkvold is an associate professor of plant pathology and seed science endowed chair in the ISU Seed Science Center with research and teaching responsibilities in seed pathology.

---

Corn smut galls on corn. (Paula Flynn)