Hybrid selection for corn following corn

Jim R. Rouse
Iowa State University, rouse@iastate.edu

Follow this and additional works at: http://lib.dr.iastate.edu/cropnews

Part of the Agricultural Science Commons, Agriculture Commons, and the Agronomy and Crop Sciences Commons

Recommended Citation
http://lib.dr.iastate.edu/cropnews/1151

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 Users are hereby notified that the content may be inaccurate, out of date, incomplete and/or may not meet the needs and requirements of the user.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/.
Hybrid selection for corn following corn

Abstract
Good crop production strategies will not increase the yield of the hybrids you grow. Instead, good production practices help hybrids yield closer to their genetic potential by reducing yield-robbing factors in the field. This concept underscores the significance of hybrid selection. Since there are no management techniques to increase the genetic potential of hybrids, it is important to select hybrids with high yield potential.

Keywords
Agronomy

Disciplines
Agricultural Science | Agriculture | Agronomy and Crop Sciences
Good crop production strategies will not increase the yield of the hybrids you grow. Instead, good production practices help hybrids yield closer to their genetic potential by reducing yield-robbing factors in the field. This concept underscores the significance of hybrid selection. Since there are no management techniques to increase the genetic potential of hybrids, it is important to select hybrids with high yield potential.

Growing corn following corn presents a variety of management challenges compared with corn following soybeans. Hybrid selection procedures, however, remain the same regardless of your crop rotation. This article will highlight the most important aspects of hybrid selection and some pitfalls to avoid.

Two mistaken beliefs that often mislead growers are:

- corn-following-corn data are different from corn-following-bean data; and
- data from a field near your farm are more useful than data from sites farther away.

These false perceptions produce selection errors by causing growers to focus on single-location information. Single-location data can be used to view the relative performance of hybrids for the current growing season but not to make predictive decisions about next season.

The information from a single location is a measure of the yields produced by the interactions of the hybrids (genetics) with the environment—soil type(s), soil conditions, weather, nutrients, pests, and pathogens during that season. But the only factors in this equation that you can know for next season will be the soil type(s) where you plant and the hybrids you choose. Because of this you cannot expect the results from a single yield trial in one season to be duplicated in another season.

Some people point out that hybrid rankings will differ between a corn-following-soybean site and a corn-following-corn site. But the missing information in this scenario is that hybrid rankings also differ between various corn-following-soybean sites and between various corn-following-corn sites, too. This variability is caused by the hybrid/environment interactions mentioned above. Because of the unpredictable nature of the interactions, and because one cannot predict the weather for the upcoming growing season, it is prudent to select hybrids that will perform well regardless of the environment. This is done by using the multiple-location summaries of yield trial reports.

Regional summaries combine data from several locations, and each location is a different environment. A hybrid with consistently good performance in several environments is more likely to perform well on your farm next season. Even though it seems contrary to expectations, research has shown that combined data from a few locations will give more reliable predictive information than single-location data from a trial on your own farm! Regional summaries of experiments from outside your normal maturity range also may be useful, particularly if they contain hybrids that can be grown in your area.

Hybrid selection is composed of two distinct but related components. The first is selecting high-yielding hybrids for your operation. The second is risk management, as defined by the number of hybrids you select, their mix of maturities, seed treatments, traits, and acreage allocation. If hybrid selection was just about finding a high-yielding hybrid, it would be a simple task: use district summaries to identify the top hybrids. It is the risk management element that makes hybrid selection difficult. Growers will use yield trial data in different ways to reach their appropriate combination of hybrids, maturities, etc.
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.