

# The 5 Ws of corn production

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As of late, many uncertainties have been sprouting up in corn production. Researchers and producers have been wondering if precision agricultural technologies can improve crop yield and quality or reduce their variability. Farmers have been asking a number of questions from, which hybrid should I plant for best yield and quality, to does applying nitrogen fertilizer at a uniform rate produce a better crop outcome, and if not, what nitrogen fertilization strategy does produce a better crop in yield and quality"

Scientists at China Agricultural University, the Precision Agriculture Center of University of Minnesota and Mosaic Crop Nutrition have been attempting to answer those questions by investigating the potential impact of precision nitrogen management on corn yield, protein content and test weight in a study funded by Cargill Crop Nutrition (now Mosaic Company), Cargill Dry Corn Ingredients and Pioneer Hi-Bred International, Inc. The results from this study are published in the September-October 2007 issue of the *Soil Science Society of America Journal*.

Precision agriculture is defined as the usage of available technology to develop custom management of soil and crops to fit specific conditions of a small area that is within a larger unit, such as a field. This practice has revolutionized modern farming by allowing farmers to choose the best management strategy at a specific time and place in their fields. It has the potential to increase agricultural resource use efficiency, reduce environmental contamination, and maintain or increase crop yield. Corn farmers use this application by varying the rate of fertilizer depending on

differences in potential crop yield, soil type and landscape features across the field. As grain markets shift to a greater emphasis on ethanol, more attention is being directed to optimizing grain quality, where traditionally the emphasis was on quantity. The significant variability of abundance in a given area and abundance over a period of time in crop yield and grain quality has not influenced use efficiency or profit of products made from the crops, but made it difficult for farmers to get premium prices for their products.

The study was conducted on two commercial corn fields in eastern Illinois in 2001 and 2003 involving two corn hybrids and five different N fertilizer application rates across the landscape. Nitrogen response of corn yield and quality were fitted at different within-field locations, and the potential impacts of different N management strategies were evaluated against a uniform rate of N application that is a common farmer's practice in the region.

The results indicated that one hybrid was found to have higher yield, quality and distribution to suppliers than the other hybrid under either a uniform or varied nitrogen application. Results also showed that varying nitrogen applied to localized within-field conditions and hybrid differences could either increase corn yield with similar or higher nitrogen rates or maintain yield with less nitrogen application, without any significant improvement of grain quality.

View the abstract at:

<http://soil.sci.journals.org/cgi/content/abstract/71/5/1490>

Source: Soil Science Society of America

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