What Was <u>My</u> Attainable Yield Potential for Corn in 2003?

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A useful parameter in developing site-specific soil and crop management plans is an estimate of the attainable yield of the specific sites being managed. Comparison of the attainable yield to the yields being experienced defines the site-specific yield gap available to exploit. Crop simulation models of the past have generally under-predicted corn yields in high yield environments and have required input data not readily available. Hybrid Maize is a crop simulation model just completed by our research team at the University of Nebraska and is our attempt to overcome both of these limitations. It will be available to the public within the next few months.

The model is designed to either run on site-specific input data or utilize default input values when actual data are unavailable. Weather inputs are standard temperature and solar radiation data available from weather stations. Data for the current season can be utilized as it is available and historical data used for the remaining season for real-time simulation of yield. Additional inputs include date of seeding or emergence, date of maturity or growing degree day requirements for maturity, plant population, seeding depth, precipitation and irrigation amounts, initial topsoil moisture content, topsoil and subsoil texture and bulk density, and maximum rooting depth.

The high yielding 2003 season provided a good test of the accuracy of Hybrid Maize. **Table 1** shows predicted and actual yields measured in the studies summarized later in this article series. The yields shown are for the input combination that provided the highest treatment mean for each experiment or factor level shown in the table. The model was in very good agreement with the measured yields, which reflects well on model accuracy. Since the model assumes that nutrient and pest stress is minimal, these results also suggest that nutrients and pests were not likely limiting yields in the specific treatments reported. ∎

Table 1. Comparison of measured corn yields to those predicted by Hybrid Maize in 2003 studies.		
	Grain yield, bu/A	
Location – treatment	Measured[1]	Predicted
U. of Nebraska (Lincoln) –corn following soybeans; 35,000 ppa; intensive management	285	287
Kansas State U. (Scandia) – 28,000 ppa; 300 lb N; 4-way split; high P, K and S application	223	219
Kansas State U. (Scandia) –42,000 ppa; 230 lb N; 4-way split; high P, K, and S application	251	252
U. of Illinois Morrow Plots –corn/oats/hay rotation; lime plus commercial fertilizer	261	240[2]

[1] Treatment with highest yield in the study. (ppa=plants per acre)
[2] Default values used for dates of critical growth stages, initial soil moisture, soil bulk density, and rooting depth.