The Impact Of Planting Variability On Corn Yields

Study Guidelines

A corn demonstration trial was conducted at the Monsanto Learning Center at Scott, MS to investigate how variability in seed placement affects corn yield. The intent of the testing was to contribute to the body of knowledge on how variability affects yield, and to demonstrate a technique that can be used to collect the data. DEKALB® Genuity® VT Triple PRO® DKC62-08 brand corn was used in the testing. Plots were planted using various combinations of planter plates, vacuum pressures, and planting speeds to produce a range of variability in seed placement. After plot establishment and corn emergence, data was collected using a standard barcode reading system. A 1-centimeter resolution barcode ruler and a Motorola Symbol reader was used to count the corn plants that emerged and the placement in two, 2-meter (2 rows X 6 feet) samples from each plot (Figure 1). The data was transferred to a spreadsheet allowing further analysis, which included evaluations of established population (counting the number of observations) and calculating both standard deviation and average spacing. Data was collected to investigate the impact of variability on yield as measured by standard deviation.

Results and Conclusions

Data analysis was used to help answer the question on how variability in seed placement affects corn yield. Using the data recorded, a regression was run on standard deviation versus yield (Figure 2). Standard deviation represents a variability measurement that encompasses 68.2% of the population. A standard deviation of 2 means that 68.2% of the population is ± 2 inches from where it should be from the mean distance in the testing.

Figure 1. Barcode ruler and Motorola Symbol reader used to record the variability in uniform and non-uniform planting and seed placement.

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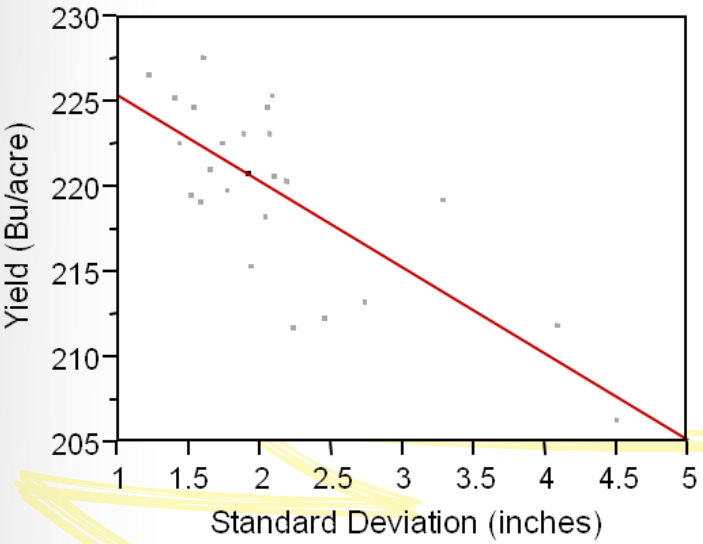

Figure 2. Bivariate fit of Yield by standard deviation (Linear Fit: Yield = 230.43 - 5.05 x Standard Deviation).

Standard deviations ranging from 1.2 to 4.4 inches were generated in this test environment where average seed spacing should ideally be 4.72 inches at a population of 35,000 plants per acre on 38-inch row spacing. With an R square of 56% and a plot mean yield of 220 bushels per acre, it was fairly accurate to regress yield and standard deviation.

The regression analysis indicated that a 1-inch increase in standard deviation gives a 5.05 bushel per acre decrease in yield (Figure 2). Planting equipment, planting speed, and field conditions can all interact to determine the ultimate variability of a planted population. Data analysis can show the impact of variability on yield as measured by standard deviation.

Summary

Data can be collected relatively easily using the techniques described in this testing. A regression on yield versus standard deviation can be run using the data collected. The methodology developed at the Monsanto Learning Center at Scott, MS can be used to quickly take this type of data and summarize results. Research conducted in the Midwest over previous years has attempted to quantify the impact of increasing variability (as measured by standard deviation) on corn yield. This testing was conducted to contribute to that body of knowledge, which can have implications on how agronomic decisions are made.

Legals

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