

## **SPATIAL PRECIPITATION VARIABILITY IN THE CHOICE OF NITROGEN FERTILIZATION RATES**

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### **ABSTRACT**

In order to determine how measured spatial precipitation variability might impact farm management decisions, choice of nitrogen fertilization strategies was used as an example management decision based on precipitation data. Corn and soybean yield were simulated using DSSAT (Decision Support System for Agrotechnology Transfer) v. 3.5, based on four nitrogen fertilization strategies and three sources of precipitation data, for a farm in eastern Indiana. The nitrogen strategies included two different ratios of fertilizer use to corn yield, and whole-field application versus site-specific application on 1 ha grid cells. Precipitation data sources included a National Weather Service (NWS) station directly on the farm, the nearest non-urban NWS station, and a weighted mean of the three nearest non-urban NWS stations. The three precipitation inputs and four nitrogen application strategies produced different distributions of site-specific yield, over 35 years of simulations. The overall corn yield for each strategy, for each set of precipitation data, was calculated and compared to determine the optimal application strategy. All three sources led to the choice of variable-rate application, but on-farm precipitation data led to a different choice of nitrogen-to-yield ratio than the other two sources. This suggested that having precipitation data on the farm, or at least at scales smaller than the NWS network, could be useful for improving management decisions.

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