

Nitrogen rate recalibration for corn in North Dakota

Southwest North Dakota Update 12/2012

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Current nitrogen fertilizer recommendations for corn in North Dakota are outdated and need to be reexamined with fresh field evaluations. Outside of land costs, fertilizer costs are the highest input for most corn farmers. Nitrogen recommendations that are relevant to today's hybrids and cultural practices are needed to remain profitable and avoid undue environmental scrutiny.

The cost of N to North Dakota growers has ranged from \$100 million to \$300 million per year over the last several years (assumes 2 million acres of corn, average N rate 160 lb N/acre). Since the data that helped develop the current N rate formula is over thirty-years old and farming practices have changed considerably, it is not known if current N rates are too high or too low, and what adjustments might be applied in more modern tillage systems. Savings due to lower N requirements or higher yields due to more efficient N rates will result in millions of dollars in profitability for the state's corn growers.

The objective is to develop a modern N-rate dataset for corn in order to reevaluate and develop more effective N recommendations and adjustments.

As part of the statewide effort to recalibrate nitrogen rates for corn, two sites in 2010 and four sites in 2012 were selected in southwest North Dakota. In 2010 all of the west-river sites were prevented plant as excessive rainfall at seeding kept producers out of the field. In 2013 five sites west-river will be included in the study. Other sites (over 150 site years to date) have been located in the other regions of North Dakota.

Each site is soil sampled for residual nitrate-N to a depth of 2 feet prior to fertilizer application. The study consists of a randomized complete block design with four replications and six treatments, consisting of a check, and then graduate N rates of 40 lbs N/acre, 80 lbs N/acre, 120 lbs N/acre, 160 lbs N/acre and 200 lbs N/acre applied as either ammonium nitrate, calcium nitrate, or urea broadcast.

The cooperators apply herbicide, seeds the area, and apply other normal farming operations within the plot area as with the rest of the field except nitrogen. The study is monitored throughout the growing season, and the middle two rows of each plot were hand-harvested and shelled before the cooperators harvested the field.

2013 will be the last year data is collected for this study. Late fall 2013 or early spring 2014 new nitrogen recommendations based on these data, corn grain and nitrogen prices will be available for use in the 2014 crop year. This project is partially supported by the North Dakota Corn Council.

West-river corn N Data, 2010 & 2012.

