2010 Demonstration Report

THE LEARNING CENTER

at Monmouth, Illinois

Nitrogen Rate and Timing of Application in Corn

One of the most costly and important inputs in corn production is nitrogen fertilizer. Research was conducted at the Monmouth Learning Center to evaluate the yield response of corn to application timing and nitrogen use rates.

Study Guidelines

Data was collected in 2008, 2009, and 2010 from non-replicated trials at the Monsanto Learning Center near Monmouth, Illinois to evaluate the effect of nitrogen rate and timing of application in corn. The same four hybrids were used in 2008 and 2009. New hybrids were used in 2010. Nitrogen rates were established using the Illinois Agronomy Handbook recommendations.

Five Rate of Nitrogen Used

Rate 1	**Full rate preplant**	
	2008	200 lbs N/Acre
	2009-2010	240 lbs N/Acre
Rate 2	**Half rate preplant**	
	2008	100 lbs N/Acre
	2009-2010	120 lbs N/Acre
Rate 3	**Half rate Preplant followed by side-dress**	
	2008	50 lbs N/Acre followed by 50 lbs N/Acre at V6 stage
	2009-2010	60 lbs N/Acre followed by 60 lbs N/Acre at V6 stage
Rate 4	**Full rate Preplant followed by side-dress**	
	2008	167 lbs N/Acre followed by 33 lbs N/Acre at V6 stage
	2009-2010	180 lbs N/Acre followed by 60 lbs N/Acre at V6 stage
Rate 5	**Untreated Check**	
	2008	0 lbs N/Acre
	2009-2010	0 lbs N/Acre

Weed control for the trial consisted of 2 qt/Acre Harness® Xtra preemergence followed by 22 oz/Acre Roundup PowerMAX® when weeds were 4 inches tall or less. The preplant nitrogen was applied with a ground application rig and incorporated. Side-dress nitrogen was applied with a hand boom at the V6 growth stage. All nitrogen was applied as 32% urea ammonium-nitrate (UAN) solution. In 2008, the crop rotation was corn following soybean and in 2009 and 2010 corn followed corn.

An extremely wet spring and summer led to nitrogen leaching and lower yields in 2010. 2009 was also an extremely wet year. High organic matter soils with excellent nitrogen mineralization make it difficult in some years to control the availability of nitrogen to the plant.

Results and Conclusions

Overall response to the timing of nitrogen application in 2008 and 2009 was limited. Yields from 2009 showed a slight positive response to the split application of nitrogen. Yields from 2010 showed a greater response to nitrogen rate and timing compared to results from 2008 and 2009.

Splitting nitrogen applications can have significant benefits if environmental conditions lead to poor nitrogen availability later in the growing season. Soil type and rainfall can have a major effect on the availability of nitrogen at key periods during the growing season. High organic matter soils are able to mineralize large amounts of nitrogen quickly and make it available to the plant if needed. However, this process is not sustainable over time.

Later maturing hybrids showed a more positive response to split applications of nitrogen compared to the earlier hybrids in 2008 and 2009. However, in 2010, the earlier hybrids showed a better response. This was likely due to differences in genetics and their response to the overall variability in the growing seasons.

Figure 1 shows a summary of all five treatment rates averaged over four hybrids for three years.

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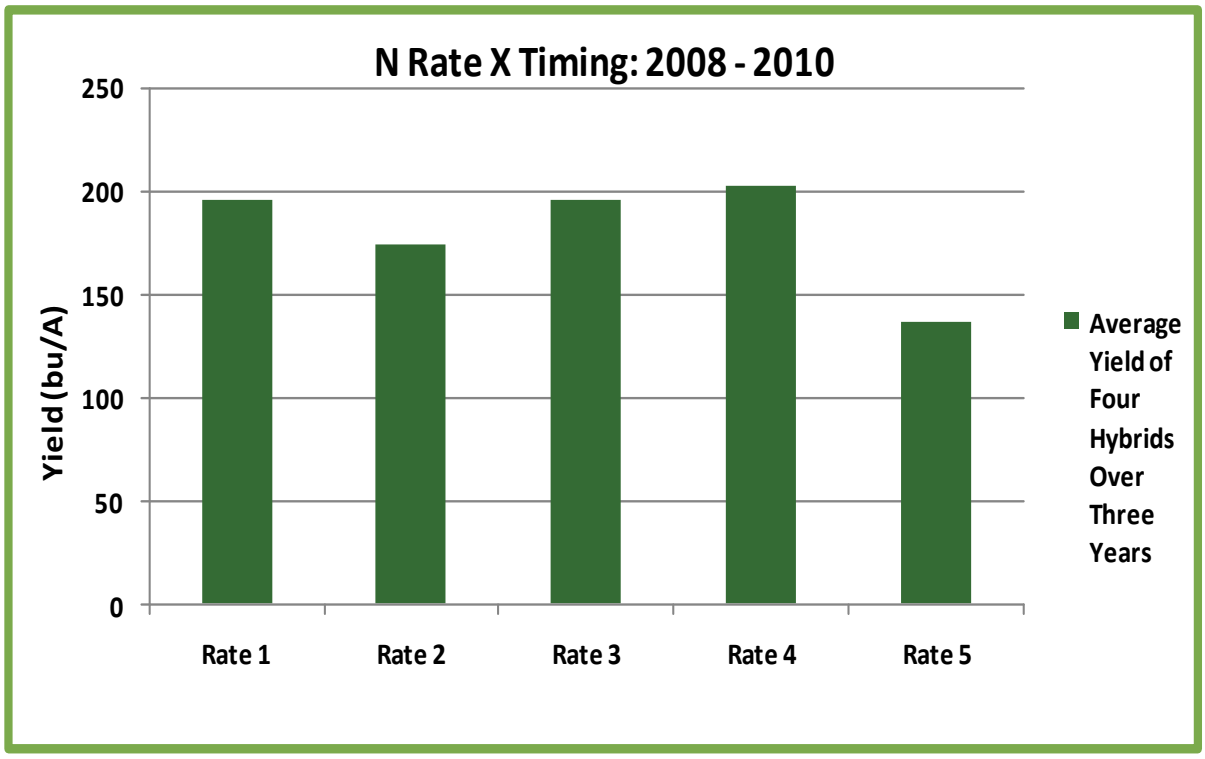

Figure 1. Average corn yields across nitrogen rates and application timing.

The information discussed in this report is from a single site, non-replicated, three-year demonstration. This informational piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.

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