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Yellow Corn, Wet Soils, and N Loss – Part 2

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Abstract
Last week (June 19) I provided some observations on corn growth and response to nitrogen (N) applied in an anhydrous ammonia study being conducted at the ISU research farm between Ames and Boone. Following are some observations one week later (June 26, 2008).

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Last week (June 19) I provided some observations on corn growth and response to nitrogen (N) applied in an anhydrous ammonia study being conducted at the ISU research farm between Ames and Boone. Following are some observations one week later (June 26, 2008).

Response to Anhydrous Ammonia Timing – More Observations
In this study, anhydrous ammonia is applied in late fall (Oct. 31, 2007), spring preplant (April 30, 2008) and sidedressed (June 18, 2008) at different depths of injection and application rates. Corn was planted May 15. The study is "low" on the landscape, and like many fields this year part of the study area was wetter than the rest, with a small part where the corn is dead due to standing water.

Plant growth has progressed a growth stage or two since last week. As of Thursday, June 26, the corn on the "higher" ground continues to grow better and respond more to applied N than plants on the "lower" ground or where plants were severely impacted by wet conditions. However, plants on the lower ground are now responding to the fall and spring applied N, where they did not show this response a week ago.

Looking at the plant coloration and growth, I generally still see a better response to the spring applied ammonia compared to the fall applied ammonia, especially at lower N rates. It is still too early to tell what amount of N may have been lost this spring, but the corn coloration is beginning to show the classic response to N rate (with more differentiation between rates where corn is growing the best). In this study there are two depths of injection. In the lower part of the landscape, the N response appears better with the shallow ammonia placement. This is likely due to the N being placed closer to the root system, especially where the root growth into the soil was restricted by wet soil.

As the corn continues growth I would expect to see more differentiation between N rates. Also, experience with N rate studies would tell me that the low N rate (80 lb N/acre) would not be an adequate rate even in a "normal rainfall" year. And, in this wet year, experience would indicate that the N response will be greater than normal and to a higher required N rate. Over time, as the plants grow and demand more N, this will become more clear.

The corn has not responded yet to the sidedressed ammonia. There was no rain from the time of sidedress application to the time I evaluated the corn this week. While I was evaluating the corn I got rained out of the field. Following that precipitation and with additional root growth, I would expect the corn to now begin accessing the sidedressed N.

Figure 1. The middle orange stake is in the border between two four row plots. The plot on the right (stake is in the middle of the plot) had no N applied and the plot on the left (stake is in the middle of the plot) had 80 lb N/acre applied last fall. (J.E. Sawyer, June 26, 2008)

Figure 2. The middle orange stake is in the border between two four row plots. The plot on the left had no N applied and the plot on the right had 160 lb N/acre applied last fall. (J.E. Sawyer, June 26, 2008)

Figure 3. The middle orange stake is in the border between two four row plots. The plot on the right (stake is in the middle of the plot) had no N applied and the plot on the left (stake is in the middle of the plot) had 80 lb N/acre applied last fall. The plot to the extreme left had 160 lb N/acre applied last fall. These plots are in the area with best corn growth. (J.E. Sawyer, June 26, 2008)

John Sawyer is a professor of agronomy with research and extension responsibilities in soil fertility and nutrient management.