Nitrogen Watch 2010

By Peter Scharf

Excessive rainfall can result in loss of fertilizer and soil nitrogen. This spring, as in 2008 and 2009, large swaths of the U.S. corn belt have received rainfall in sufficient amounts to put nitrogen at risk of loss. This is a serious production and environmental problem that I estimate cost Midwestern corn producers a billion bushels total in 2008 and 2009. Whether N loss occurs in June will be an important component of whether this situation costs producers yield and money again this year, but now is the time to assess your risk level. If your risk level is high, it is the time to plan the logistics for possible rescue applications of N.

I have created a web page that tracks spring precipitation totals and highlights areas that are most at risk. This page is updated weekly and may be found at: http://plantsci.missouri.edu/nutrientmanagement/Nitrogen/Nitrogen%20watch%202010/nitrogen%20watch%202010.htm.

Figure 1 above shows my assessment of high-risk areas for well- and moderately well-drained soils through the end of May. Well-drained soils are vulnerable mainly to nitrogen loss from leaching. This process can start shortly after fertilizer application (with some delay for ammonia). I have used April 1 to represent a preplant N application date. For ammonia or for applications later than April 1, risk is lower; for applications before April 1, risk is higher.

Areas shown in cross-hatch are 'danger areas' that are on track to have 16 or more inches of rainfall from April 1 to June 30. This does not mean that significant loss of N has already happened, just that producers in these areas should be watchful and aware of the potential for N loss and deficiency.

Aerial photos can help to assess the need for additional N on corn between waist-high and tasseling. They can assess large areas quickly, identify fields where rescue N is likely needed, and help to prioritize which fields are most in need of treatment.

Figure 2 shows my assessment of high-risk areas for poorly- and somewhat poorly-drained soils through the end of May. Poorly-drained soils lose N mainly by denitrification, which is very temperature-sensitive. Normally my rule of thumb is that wet conditions in May and June cause denitrification losses, but losses in April are minimal. With warmer soil temperatures in

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Figure 1.

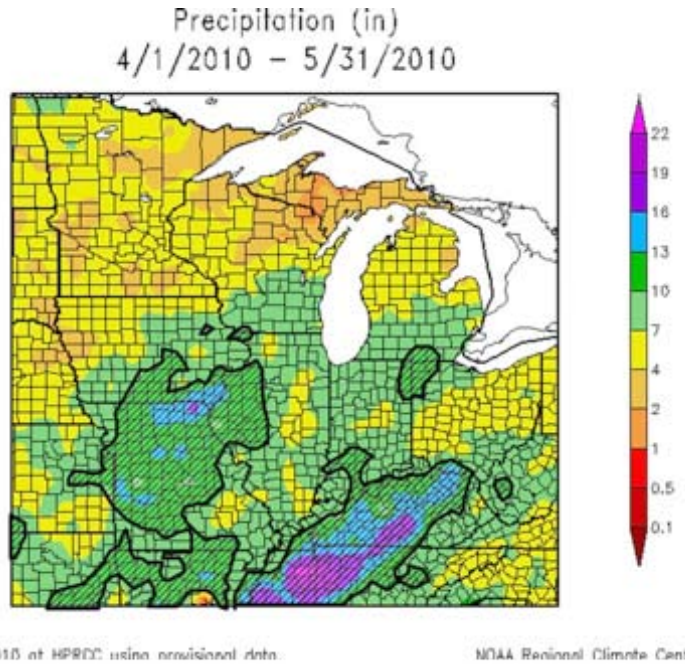
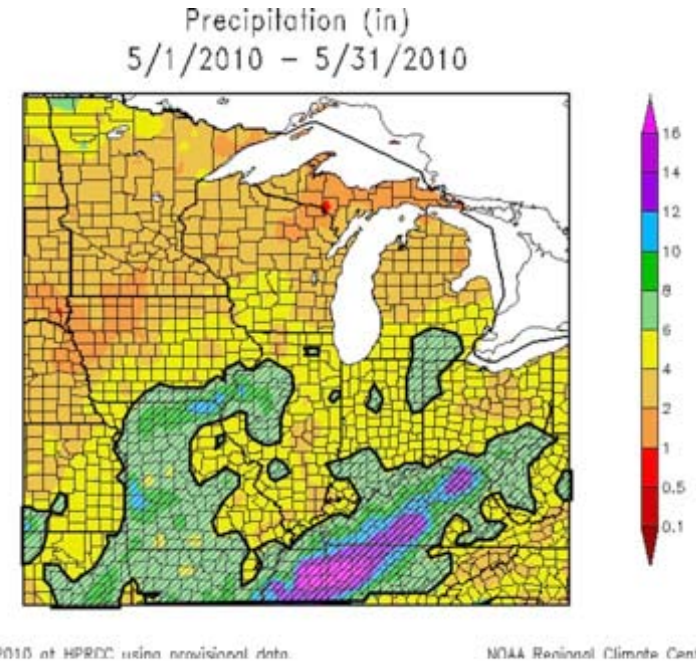


Figure 2.



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April this year, there was some potential for denitrification, but soil temperatures were still well cooler than a normal May. Early May turned out to be much cooler than normal, so denitrification losses may still be slow even in saturated soils. I have decided to still consider precipitation total from May 1 as the best indicator of denitrification loss potential.

Areas shown in cross-hatch are 'danger areas' that are on track to have 12 or more inches of rainfall from May 1 to June 30. This does not mean that significant loss of N has already happened, just that producers in these areas should be watchful and aware of the potential for N loss and deficiency.

Again, aerial photos are the quickest and most accurate way to assess the severity of N loss and deficiency quickly.

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