

Nitrogen Watch 2013 Launches



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On New Year's Day we likely had a lot of N left by last year's droughted corn still in our fields in Missouri. Most or all of that N is gone now – a few deep soil samples taken in early April did not show as much N as expected. Things have only

gotten worse since then, with an additional 6 inches of rain over eastern and southwestern Missouri flushing out even more N.

Nitrogen fertilizer that has been applied may be soon to follow. How much fertilizer is lost depends on the weather, the soil, and the source and date of the N application.

Nitrate is the main form of N that is vulnerable to loss, but all fertilizer eventually will convert to nitrate in the soil. Urea, ammonium nitrate, and urea-ammonium nitrate solution are all probably more than half nitrate within two weeks of application, while anhydrous ammonia probably takes six weeks or even longer when soil temperatures are cool. This is why anhydrous ammonia is sometimes applied much earlier than other forms of N.

Between fertilizer application and crop N uptake, which for corn is mainly in June and July, more time and more rain increase the risk that the N won't be there when the crop needs it. Earlier applications are more vulnerable to loss.

Nitrogen Watch is a web-based tool to help you track rainfall and risk of N loss during spring for areas where you farm or do business. It is based on cumulative precipitation maps (Missouri and Midwest) and is updated weekly. On those maps we identify 'danger areas' that are on track to have widespread problems with N loss and deficiency in corn. 'Danger areas' have not necessarily lost enough N to cause se-

rious N deficiency at this point, but if rains keep coming at the same rate in these areas then I expect lots of fields to have N deficiency and yield limitation. This is a serious production and environmental problem that I estimate cost Midwestern corn producers 2 billion bushels total from 2008 to 2011.

Producers and ag service providers in the 'danger areas' should prepare for rescue nitrogen fertilizer applications in the case that nitrogen deficiencies develop.

There are separate maps of 'danger areas' for well-drained and for poorly-drained soils. In well-drained soils, nitrate leaching is the main mechanism of loss. This can start whenever the N fertilizer has converted to the nitrate form. I use April 1 as a typical date to have N applied and some converted to nitrate. The eastern half of Missouri is, along with some of southwest Missouri, currently in the 'danger zone' for well-drained soils that had N applied by April 1.

In poorly-drained soils, denitrification is the main mechanism of loss. This process is fastest when soils are warm and near or at saturation. I use May 1 as a day representing when soils have warmed enough for this process to be significant, although soils were cooler on that date this year than they normally would be. Only a smattering of areas along the eastern side of the state are currently on track to have major N problems on poorly-drained soils.

Many people have not yet applied N fertilizer this year. That's good because the N is safe in the bin or the tank. It's bad because there is going to be a lot to get done in a short time.

We are now at or near planting conditions over much of the state, and my bets are on the producers who plant when conditions are right and apply N (or finish applying N) later. This may require a shift in equipment or N source. Δ

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