

## NITROGEN ISSUES SO FAR THIS SPRING

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Across the state, generally there has not been excessive precipitation and much of Iowa has been below normal the past 60 days. A few areas have received more than normal precipitation, mostly in Western to Southwestern Iowa, some isolated areas in Central to North Central Iowa, and very eastern Iowa (see maps).

So far this spring there have not been many weather-related issues with nitrogen (N) management, unlike recent years. There have been a few reports of damage to corn seedlings from spring applied anhydrous ammonia. However, precipitation has kept soils moist this spring which reduced damage potential.

This past winter at the ISU Extension and Outreach Crop Advantage Series and ICM Conference I talked about using springtime precipitation to indicate chance of excess wetness that would indicate need for supplemental N application. A summary of long-term N rate research with continuous corn and corn rotated with soybean conducted at seven ISU research and demonstration farms in Iowa from 1999 to 2014 indicated that springtime precipitation (March through June or April through June) could be used to estimate chance for needing a N rate greater than the MRTN rate suggested by the Corn Nitrogen Rate Calculator. The database from the long-term research provided 126 crop rotation/site-years of data. The analysis indicated that the Southeast area of Iowa (Chariton and Crawfordsville research sites) should use March through June precipitation total, and the rest of the state April through June precipitation total. Those precipitation totals were evaluated for each of the 126 site-years against the occurrence of an economic optimum N rate (EONR) more than 20 lb N/acre greater than the MRTN rate (MRTN rate of 137 lb N/acre for corn following soybean and 190 lb N/acre for continuous corn). Why the more than 20 lb N/acre? I assumed would need at least a 20 lb N/acre rate to be worthwhile to apply (ex. cost of application) and to provide some buffer due to uncertainty in the analysis.

For the majority of Iowa, evaluation of the precipitation data showed that a total April-June precipitation amount of at least 16 inches (like a critical level) correctly indicated if the MRTN rate was either adequate or at least 20 lb N/acre short. The percentage of correct determination (adequate or at least 20 lb N/acre short) was 76%. For Southeast Iowa, evaluation of the precipitation data showed that a total March-June precipitation amount of at least 17 inches correctly indicated if the MRTN rate was either adequate or at least 20 lb N/acre short. The percentage of correct determination (adequate or at least 20 lb N/acre short) was 74%. In both cases there was obviously not perfect, but pretty good odds of a correct determination. Many things affect soil N supply and N loss, which is why the evaluation is not perfect. In addition, ponded areas of fields would have more gaseous loss through denitrification, so short-term high precipitation events could cause more rapid N loss than indicated by the springtime total.

If the precipitation total in your area or at your farms to date (until the end of June) is close to or more than 16 inches within the April-June time period (majority of Iowa) or close to or more

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than 17 inches within the March-June (Southeast Iowa), consider an additional N application – if your total N applied by that time is not more than an MRTN rate. Unfortunately, the precipitation totals are not reliable enough to indicate how much additional N would be needed. It is directionally correct (that is, the more precipitation is above the indicated precipitation totals, the more N needed), but could not be calibrated to a specific rate. Somewhat depending on the already applied N rate, a suggestion would be to limit a supplemental N application to no more than 50 lb N/acre. This suggestion is given with the assumption that an N rate was already applied that was close to the MRTN rate. If the rate to date was much less than the MRTN rate, then more than 50 lb N/acre should be considered. If an N rate was well above a CNRC suggested rate, then the chance of being short is less than indicated by this analysis approach.

You may be able to track your own precipitation totals for the springtime. Through May, here are the precipitation totals for each research farm used in the analysis. We'll see what the rest of the season brings.

### April-May (inches)

AEA (Ames): 10.37

Northwest (Sutherland): 6.61

Northern (Kanawha): 8.95

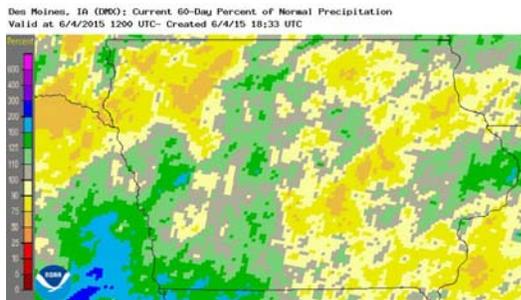
Northeast (Nashua): 7.74

Armstrong (Lewis): 10.97

### March-May (inches)

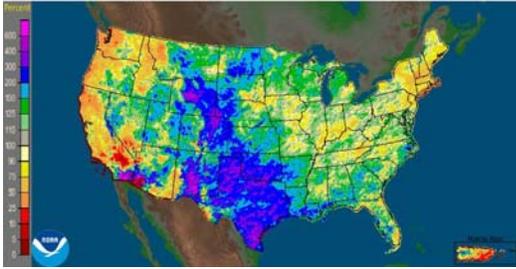
Southeast (Crawfordsville): 7.30

Chariton: 9.15



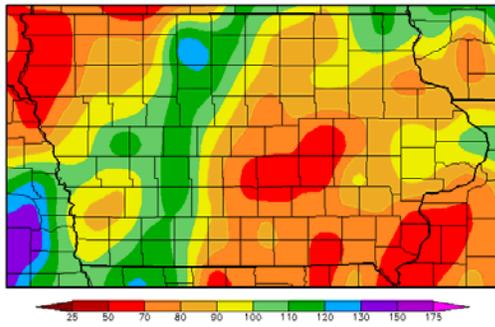
Sixty-day percent of normal (April 1 – May 31).

COMB5 + Puerto Rico: Current 60-Day Percent of Normal Precipitation  
Valid at 6/4/2015 1200 UTC- Created 6/4/15 18:32 UTC



Sixty-day percent of normal (April 1 – May 31).

Percent of Normal Precipitation (%)  
3/1/2015 – 5/31/2015



Generated 6/2/2015 at HPRDC using provisional data. Regional Climate Centers

Three-month percent of normal (March 1 – May 31).