# Nitrogen Loss Scoresheet 08

*By Peter C. Scharf*

I've had a lot of questions coming in about nitrogen loss from corn fields that either went under water or just received excessive rainfall this spring. These questions are difficult to answer because the N loss process is complicated. However, producers need to be able to make decisions about applying additional N that are at least in the ballpark. And they need to be able to correctly prioritize which of their fields need the largest additional applications of N fertilizer.

Need for additional N is probably the same regardless of whether a field was replanted or not.

Ideally, producers would be able to conduct a diagnostic test to determine whether to apply additional N and how much. However, most producers who may be dealing with N loss are also so pressed for time that this may not be a realistic option. Wet conditions have delayed planting and other field operations and people are running as hard as they can to get back on top of things.

A lot is known about the effects of N fertilizer source and date, soil type, and degree of wetness on nitrogen loss. I have put my knowledge and opinions about these factors into a simple scoring tool. My goal is to give producers and service providers an easy-to-use way to identify those fields that are likely to respond to additional N, and to identify the fields that need the largest additional N applications.

I've put this scoring system together quickly and have not been bounced it off of many people yet. Consider this a first stab at creating a useful tool, but do not take the results as gospel. Use your own knowledge and opinions to modify what may be suggested by this scoring tool.

The scoring system consists of three factors: a fertilizer management factor, a soil factor, and a wetness factor.

The fertilizer management factor mainly aims at ranking how much of the fertilizer N is likely to be in either the nitrate form or the urea form. Both of these forms are vulnerable to loss by leaching or being carried away in flood waters. Nitrate can also be lost due to denitrification, which is temperature-sensitive and probably has been important in some fields since soil temperatures have been 65 or higher during some of the wet periods.

The soil factor recognizes that sandy soils are especially vulnerable to N loss by leaching, and that clayey soils are more prone to denitrification than are loamy soils.

To quickly assess potential N loss and response to additional N for a field, score each factor using the following three tables, then multiply the three numbers together to get a nitrogen loss score.

Nitrogen loss score = fertilizer management factor x soil factor x wetness factor

### Fertilizer management factor

| Nitrogen source | Date applied | Score |
|---|---|---|
| Anhydrous ammonia | before November 1 | 5 |
| Anhydrous ammonia | Nov. 1 - Dec. 31 | 4 |
| Anhydrous ammonia | Jan. 1 - Feb. 28 | 3 |
| Anhydrous ammonia | March 1 - 31 | 2 |
| Anhydrous ammonia | April 1 - 30 | 1 |
| Anhydrous ammonia | May 1 or later | 0 |
| Urea | < 4 days before excess water | 4 |
| Urea | 4-14 days before excess water | 3 |
| Urea | > 14 days before excess water | 5 |
| Ammonium nitrate or UAN solution | before April 1 | 5 |
| Ammonium nitrate or UAN solution | April 1 - 30 | 4 |
| Ammonium nitrate or UAN solution | May 1 or later | 3 |

*This table has been modified slightly from the 2007 version to fit this year's conditions.*

### Soil factor

| Surface soil texture | Score |
|---|---|
| Loamy | 2 |
| Clayey | 3 |
| Sandy | 5 |

### Wetness factor

| Water situation | Score |
|---|---|
| Flooded 6 or more days | 5 |
| Flooded 3 to 5 days | 4 |
| Flooded 1 to 2 days | 3 |
| Never flooded but saturated 3 or more days | 2 |
| Never flooded but saturated 1 to 2 days | 1 |
| Never saturated but sandy and excess rainfall | 1 |
| Never saturated and not sandy | 0 |

My suggestions for application of additional nitrogen are:

**Nitrogen loss score 0 - 10:** No additional N needed.
**Nitrogen loss score 11-24:** Don't apply additional N now but watch for possible development of N deficiency symptoms.
**Nitrogen loss score 25-49:** Apply 40 to 60 lbs. N now.
**Nitrogen loss score 50 or more:** Apply 60 to 120 lbs. N now.

No matter what decision is made, the most important measure of whether enough nitrogen was applied is the response of the crop. Keeping an eye on the corn (or milo) as it develops will pay dividends. For fields with additional N applied, I would recommend having one double-applied strip in each field. Then if you can see the doubled strip, it probably means that the crop does not have enough N and more should be applied. Putting a small high-N area in fields where no N is applied now would also be good insurance. That way, if it was the wrong decision, it can be seen and corrected.

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