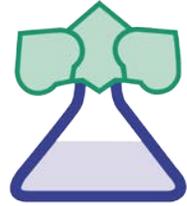


# American Agricultural Laboratory, Inc.

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*"Analysis You Can Grow With"®*



## Nitrogen Fertilization Guidelines

American Agricultural Laboratory (AAL) is proud to currently provide calculated nitrogen (N) fertilizer recommendations for 151 crops. Within these recommended rates, there are best management practices that depend on crop, environment, producer capabilities, and many other factors that ensure the greatest yield with the least amount of inputs.

Factors associated with our N recommendations include:

- Proper Sampling Protocol
- Application Timing (Including Multiple Applications)
- Placement of Fertilizer
- Fertilizer N Source
- Individual Crop Factors

### Proper Sampling Protocol

Collection of a representative and uncontaminated soil sample is crucial to ensuring accurate analysis and fertilizer recommendations. This includes making sure the sample contains a sufficient number of cores (10-15), over a uniform area of no more than 60 acres, at the proper depth (0-8" and 8-24" for most crops). Following these guidelines will ensure the most accurate fertilizer recommendation is given.

For more information on proper soil sampling please refer to our sampling protocol:

[American Agricultural Laboratory Soil Sampling Protocol](#)

### Application Timing

Applying N fertilizer at the proper time is critical to achieve the highest N recovery and minimize loss to the environment. Determining the proper timing of application is highly crop and location dependent and is much too diverse to properly cover all aspects in this document. AAL does make some general assumptions about application timing when giving a fertilizer recommendation including:

- Nitrogen applications to wheat are almost always more efficient when split applied with a lower percentage of the total recommendation applied in the fall and a higher percentage applied in the spring.
- High N recommendations typical for high yield situations in crops such as corn will also almost always be more efficient when split applied.
- Nitrogen applications that occur greatly in advance of critical crop N use time periods are more susceptible to N loss.

## Placement and Source of Nitrogen Fertilizer

Proper placement and source of N fertilizer is critical to minimizing N loss through various pathways such as volatilization (gaseous loss of N in the form of ammonia) and leaching (movement of N in the form of nitrate out of the bottom of the soil profile). These factors are also important to avoid plant damage and yield reduction that can occur from salt or ammonia “burns.”

- Never apply urea directly in contact with the seed. Doing so carries a high probability of creating a zone of ammonia toxicity within the seed furrow, reducing stand establishment and yield.
- Do not broadcast urea, without incorporation, onto high pH soils. This creates a very high chance for N loss due to ammonia volatilization.
- Volatilization of surface broadcasted urea can be minimized with at least 0.5 inches of precipitation within 48 hours of application.
- Surface broadcasting N with heavy residue can lead to immobilization of N, causing N deficiency symptoms. Precipitation of at least 0.5 inches after application can help reduce the amount of N immobilization.
- Anhydrous ammonia applications near the seed are more likely to cause burn in dry, tilled situations or in coarse textured soils.
- Nitrogen in the nitrate form is leached from coarser textured soils more rapidly than fine textured soils.

## Individual Crop Factors

### *Soybeans*

- Nitrogen recommendations given for high yielding situations are for application at pod filling. Earlier applications can promote excessive vegetative growth and decreased nodulation, both which lead to decreased yield.

### *Sugar beets*

- Nitrogen recommendations are based on a residual nitrate profile of 48” depth. This is based on the crops ability to produce a deep taproot gaining access to nitrate that has moved deeper in the profile. If a 48” sample depth is not taken, an adjustment factor will be used to predict the nitrate available at the 48” depth.

**If there is ever any confusion or further explanation needed regarding any of the topics discussed or other areas of crop production feel free to give us a call at: 308-345-3670**

## References

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