

# FORAGER



*Agronomics with livestock in mind!*

## APPLYING NITROGEN TO CORN

With this year's low milk prices and high nitrogen prices, efficiently managing nitrogen can have a significant impact on a farm's feed production costs, without hurting yield.

Nitrogen (N) is a complex nutrient that changes forms and availability throughout the year due to chemical and biological processes. Nitrogen sources, present in soil (even N from fertilizer), can leach away, volatilize into the air as ammonia, be tied up in organic matter, or be broken down by bacteria. All these processes are dependent on environmental conditions and can result in substantial N loss. More than 98% of soil N is unavailable to plants, because it is tied up in soil organic matter. This organic nitrogen (some in manure) can be mineralized as microbes break down organic matter, adding usable N to the soil. Legumes can fix gaseous nitrogen, adding N to the soil. Because of all these processes soil tests used for phosphorus and potassium are not used for nitrogen. Nitrogen recommendations are usually based on crop needs, such as 1 lb/acre N for each expected bushel of corn yield.

With the recent advent of Nutrient Management Planning, N recommendations have become more complex. Now we give credit to legume nitrogen and manure nitrogen when making N recommendations. The pre-sidedress Soil Nitrate Test (PSNT) was developed to determine the nitrate-N available to corn during the growing season, on fields where N may be available from previous manure or legume contributions. Sidedressing N and using the PSNT test can help to ensure nitrogen fertilizer is not wasted, and that yield is not lost from lack of N.

Applying N to corn through sidedressing is often more efficient than applying all the nitrogen fertilizer before planting. Sidedressing applies N at a time when corn has its greatest N need, which is 20 to 45 days after emergence (can improve yield), and because it is after the spring wet period when N losses are at their highest. High N prices, this spring, and the potential for the price to drop before sidedressing time, has many corn growers waiting to apply nitrogen through sidedressing.

Before deciding to apply nitrogen through sidedressing, producers need to be sure they have the capability or can hire someone to sidedress their corn crop, this is best done when the corn is 10 to 20 inches tall. It is important to make certain you can sidedress before delaying spring N applications you do not lose yield because of N deficiency.

### Keys to Successful Sidedressing:

1. Equipment Available – Do you or can you hire someone with sidedressing equipment to accurately apply nitrogen?
2. Time – Sidedressing corn often coincides with hay harvesting for many dairy farms, stretching labor. If corn gets too tall you may not be able to sidedress at all.
3. Testing for N – It is imperative to have the time and tools to take a soil sample prior to sidedressing in order to determine the application rate, or even if it is needed.

These factors should be considered before planting to determine if an operation is able to sidedress N. To be accurate, soil samples should be taken using the following procedures.

### Nitrogen Soil Test Sampling Procedures:

*(from the Penn State Agronomy Facts 17)*

1. Apply only a minimum of fertilizer N in the spring (starter fertilizer and/or N used as an herbicide carrier).
2. Apply manure based on the history of the field, a manure analysis, how the manure will be handled, and on crop requirements for N estimated from the expected yield and crop history.
3. Take soil samples when the corn is 12 inches tall or at least a week before planned sidedressing.
4. Sample the fields by taking 10 to 20 cores to a 12-inch depth if possible. If that depth is not possible, sample as deeply as you can. Avoid starter bands and other atypical areas. Because of sampling problems, this test cannot be used on fields that received injected fertilizer or manure.
5. Combine, crumble, and dry the cores as quickly as possible. Spread and dry the samples in the sun, or under a heat lamp in a well-ventilated area.
6. Send the sample to a reputable soil-testing lab for soil nitrate-N analysis, or use a reliable field test kit for soil nitrate-N to determine the nitrate-N level in the sample.
7. Calculate the adjusted N recommendation from the lab's formulas.

A chlorophyll meter test can also be used to measure the N status of a growing crop. If using a chlorophyll meter, it is important to follow the test instructions closely, establishing the high N check area to calibrate the meter ahead of time. Testing for available nitrogen can help efficiently use N, however, under-applying nitrogen can reduce yields significantly. Take the steps needed to apply the optimum amount of N this spring.