

BETWEEN THE ROWS[®]

Sidedress Nitrogen in Corn

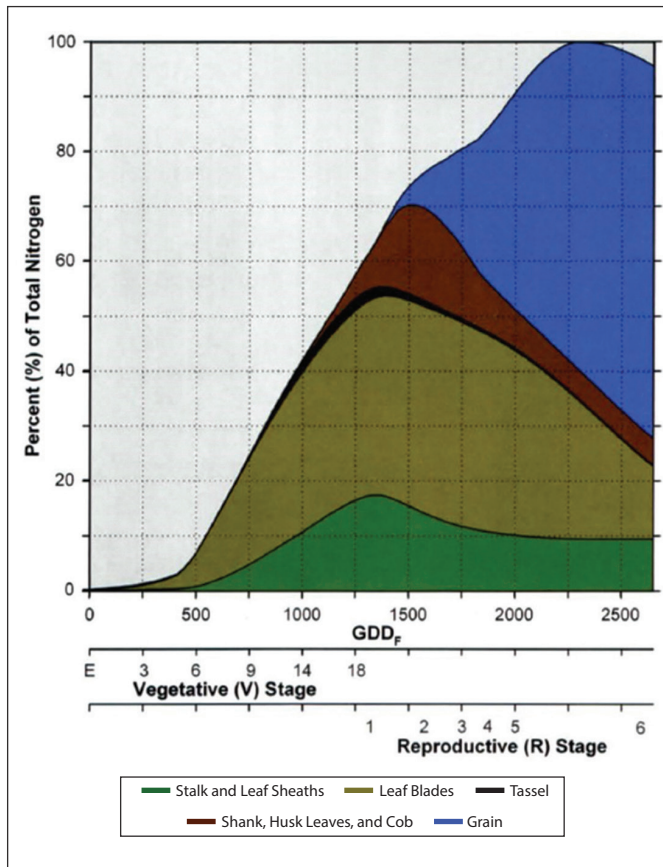
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Nitrogen (N) is an essential nutrient for successful corn production and there is never a good time to be short of N. The chart below illustrates how much N is accumulated by a corn plant during the growing season.

Cumulative N accumulation in above ground components



Approximately 60% of the total amount of N needed by the plant is accumulated from V4 to pollination, making that an especially important time to be mindful of the N available in your fields. N deficiency after V6, when the plant is relying solely on soil supplied nutrients, can have severe impacts on yield. The rate of N uptake diminishes after pollination as a high percentage of the N used during grain fill is supplied via remobilization from leaf and stalk tissue.

Various application methods can be used to ensure N availability to the crop all season long. Pre-plant applications of N are common, as it's typically easier to

find time to do the application. Pre-plant applications have a higher risk of N loss because of the amount of time between application and plant uptake. The application method that poses the least risk of N loss is applying after corn emergence, commonly referred to as sidedressing.

Sidedress N determination

Sidedressing N is essential if little or no N was applied before planting and applications should be made by the V3 growth stage. Sidedressing is often a planned part of N application programs where part of the N is applied before planting and the remainder is applied after emergence. In other cases, sidedressing is used to supplement or replace N lost from pre-plant applications due to weather. This is often the case in wet springs, especially in June, where a significant amount of N can be lost due to leaching or denitrification in warm, saturated soils.

There are various soil and tissue testing methods available to determine if supplemental N is needed after crop emergence. All these methods have their pros and cons and should be studied before using. A popular method of predicting post emergence N applications recently is the use of internet-based N modeling tools. These e-based tools use algorithms that account for current N availability, crop growth stage, weather, and soil parameters. While these aren't perfect, they do help provide some general guidelines on the effect of weather on N loss and availability.

A simple method for determining N need is observing the plant's growth and color. This method is best if N check strips were set up for comparative purposes. Regardless of method, if the crop is expressing N deficiency symptoms at any point from the V4 stage through pollination, a sidedress application of N is usually a wise investment.



N deficiency symptom

Late season N uptake can differ among hybrids, but no hybrid will yield well in N deficient conditions. To ensure maximum yield, regardless of hybrid, use a N management program that supplies a readily available amount of N to the crop throughout the growing season. Rather than choosing which hybrid to sidedress for supplemental N, choose which field is more likely to respond.

The best response to sidedress will come from fields with:

- Little or no pre-plant applied N. In these fields, apply N before V3.
- Saturated soils in warm conditions, especially in poorly drained fields.
- Coarse (sandy) soils that received heavy rainfall after planting.
- High pre-plant N losses due to weather.
- Plants showing N deficiency symptoms from the V4 growth stage through pollination.
- High stand counts, uniform growth and yield expectations that are higher than the current planned N rate.

Fertigation – Applying N through sprinkler irrigation systems is a common and efficient practice. Proper equipment to avoid backflow into the water source is required when using this method. Fertigation should begin with the first irrigation and be complete by the R1 to R2 growth stages. Application rates of 20-30 lb N/acre per irrigation event are recommended, but higher rates of up to 50 lb N/acre per irrigation are unlikely to cause crop damage because the fertilizer is diluted in water. It is important that water is applied uniformly, without runoff, to ensure even distribution of N.



Late season N application

Conclusion

There is never a good time for a corn crop to be short of nitrogen. Pre-plant N applications have an increased risk of N loss, leading many corn growers to use sidedressing as part of their nitrogen plan. For others, it’s a way to add supplemental N in fields that have sustained high N loss. In either case, there are factors to consider to ensure the best return on your investment.

From the desk of



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