

Nitrogen Uptake and Application Timing

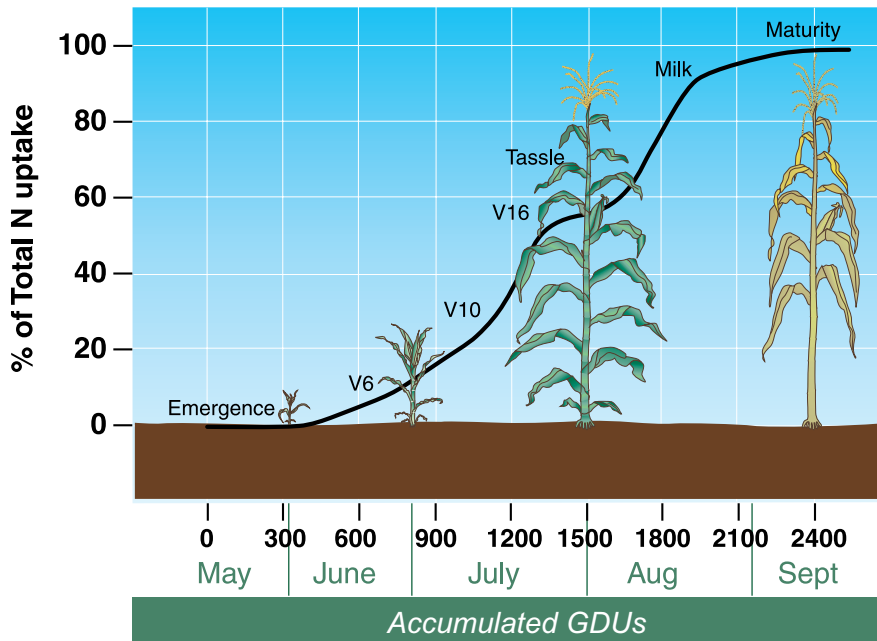


Figure 18. Generalized nitrogen uptake pattern in corn.

Data source: Soil and Water Conservation Unit, USDA, ARS and Univ. of Neb.

Since N is not stable in soil and becomes less available for crop uptake over time, application timing is important. As Figure 18 shows, much of the N uptake occurs in a relatively short time period. If N is insufficient during this period, yield loss will occur. Apply nitrogen immediately before or during this period to result in higher uptake by the crop and less nitrate lost to leaching or transformations to unavailable forms.

An application schedule that applies a small amount of N early in the season (preplant or starter) followed by later, in-season applications of higher amounts of N is ideal. This schedule takes care of the small, but important, early season N needs and maximizes uptake by applying N during the rapid growth and N requirement period.

Table 10. Timing of application affects nitrogen use efficiency. Delayed or split application results in higher return per unit of fertilizer applied.

Nitrogen use efficiency according to timing of application	
Highest	Sprinkler applied during rapid growth
↓	Sidedress just before rapid growth
	Post-plant incorporated
	Pre-plant incorporated
Lowest	Fall application for next year's crop

- Corn absorbs the majority of its N during rapid growth between 8-leaf and dough (R3) growth stages.
- N uptake period is rapid between 8-leaf and tassel and sidedress N should be applied just before this period for maximum efficiency.
- Corn yield potential is determined as early as V4, when ears begin forming. Therefore, any nutrient deficiency at this time can reduce yield potential.
- Corn hybrids vary slightly in N accumulation patterns.

BMP

Use sidedress or in-season fertilizer application for at least 40% of the total N applied to irrigated crops on fields with sandy soils.

Use fall planted cover crops such as rye or triticale to scavenge excess N left in the soil after a poor crop.

Mix and store N fertilizers at least 100 feet away from wells or any water supply.