
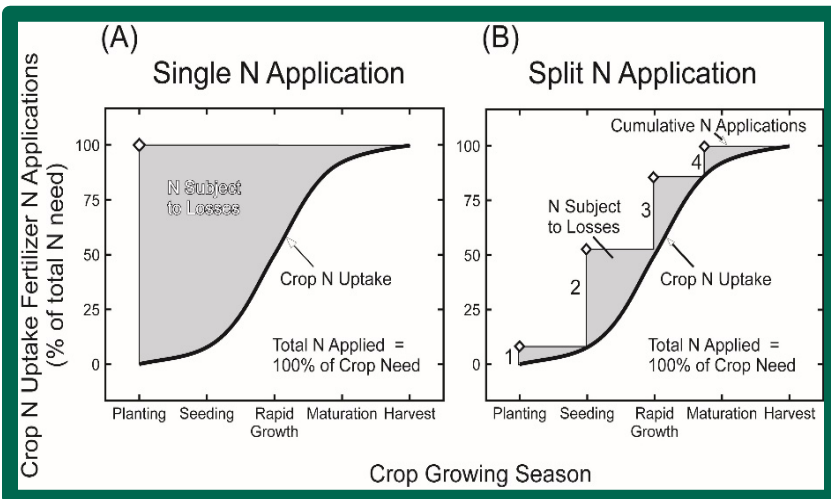


TIMING OF NUTRIENTS

Nitrogen Use Efficiency According to Timing of Application	
Highest  Lowest	Sidedress + multiple fertigations during rapid growth
	Sidedress/topdress applied just before rapid growth
	Post-plant incorporated
	Pre-plant incorporated
	Fall application for next year's crop



DESCRIPTION

Crops uptake and utilize nutrients at roughly the same rate as they accumulate biomass. Early uptake is low and increase rapidly during the middle to late vegetative growth period. While some post reproductive uptake occurs, most of the nutrients are being relocated from vegetative tissue to grain. Timing of nutrient application just prior to or during this rapid uptake period maximizes plant uptake and minimizes loss to the environment. This BMP improves uptake efficiency, potentially increasing crop yield and is more cost effective for the producer.

In-season application combined with tools that assess crop nutrient status such as tissue testing, crop sensors or soil testing maximizes nutrient uptake and economic return. Timing of nutrient application combines knowledge of the crop variety, stage of plant growth, crop rotation, plus the current soil and weather conditions.

BEST MANAGEMENT PRACTICES

- Application timing is the *Right Time* in 4R nutrient management.
- Splitting nutrients into at least two applications better matches plant growth and nutrient uptake rates.
- Timing of nutrient application close to or within the growing season increases uptake efficiency.
- Delayed application of N can allow for rate adjustment based upon growing season conditions and yield projections.
- Avoid application before precipitation and irrigation events.
- Split application of N is most suitable on loamy sands, sandy loams and situations with shallow groundwater.

IMPLEMENTATION REQUIREMENTS

Cost= Medium
 Operation and Maintenance= MEDIUM
 Training= LOW

EFFECTIVENESS

Split application of N and P has been shown to increase uptake efficiency and reduce leaching losses over a single pre-plant application in many cropping systems.