

QMIN[®]

The QMIN[®] N-Gain[™] Advantage

Nitrogen is the nutrient required by plants in higher quantities compared to any other nutrient. It is an integral constituent of proteins, nucleic acids, chlorophyll, co-enzymes, phytohormones and secondary metabolites. It is the most abundant nutrient in all crops, and its deficiency can have negative impact on photosynthesis, plant growth, and production. Plants with optimum nitrogen status have improved performance, including better yield and high quality produce. On the other hand, excessive supply of nitrogen can increase vegetative growth and increase plant susceptibility to pest and diseases.

In most crops nitrogen demand is driven by crop yield. Higher yield require more nitrogen and vice versa. Seasonal demand for nitrogen varies between crops. In nut and in fresh fruit crops, most of the nitrogen is partitioned into the fruit. For example, over 90% of the applied nitrogen in almonds is accumulated in the fruit. In vegetables, on the other hand, demand is lower after transplanting and increases as crop canopy cover increases.

Foliar fertilization is important to supply readily available nitrogen to the crop when nitrogen demand is high, and such demand cannot be met by soil uptake alone, or when soil conditions limit nitrogen uptake by plant roots. Soil conditions such as cool and wet soil in spring reduce root growth and hence root nitrogen uptake. Similarly, low moisture in soil reduces nitrogen uptake. Under such conditions, crops can greatly benefit from foliar nitrogen application, which can be used for photosynthesis and other important metabolic processes. Deficiency of nitrogen, even for a short duration of a few days at critical phenological stages of the crop, can significantly reduce fruit set, number of fruit and crop yield.

In many deciduous crops, reproductive growth starts before vegetative growth. Deciduous trees store a significant amount of nitrogen from the past season. Stored nitrogen is utilized by

flowering, fruit set and leaf out. There is a transient stage when nutrient supply from the soil is just starting but not enough to meet the demand of initial fruit development. In almond this occurs when the tree is 50-70% leaf out. At this stage, foliar application of nitrogen can help improve fruit set and retention. Nitrogen demand is highest during fruit development and canopy growth. Foliar application of nitrogen during this stage can improve photosynthesis and fruit retention and growth.

Foliar application of nitrogen is also beneficial when applied during stress periods such as drought. Postharvest nitrogen application can help store nitrogen in the woody tissues, for utilization during flower bud development the next spring. Given that utilization of foliar applied nitrogen is highly efficient, the amount applied foliarly to correct deficiency can be significantly smaller than nitrogen applied via soil.

In a trial conducted by independent researchers in almonds, QMIN N Gain produced numerically higher yield than Amino Acid based product and Foliar Controlled Release nitrogen product (Figure 1).

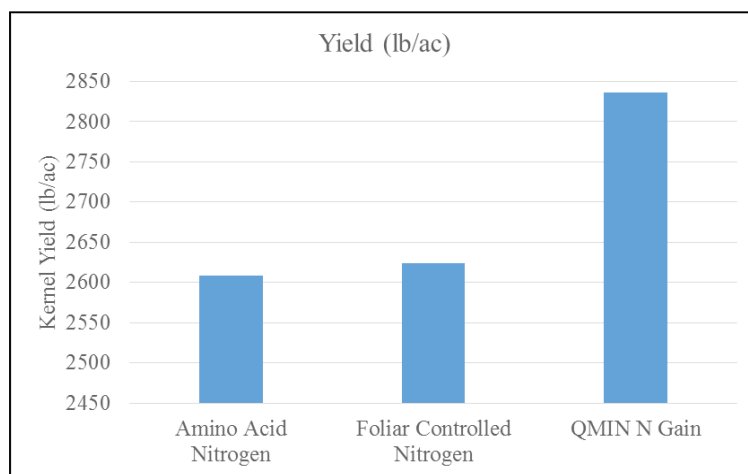


Figure 1. Almond yield under different foliar treatments. QMIN N Gain produced numerically higher yield than other foliar treatments. (Research conducted by Two Bees Ag)

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Together, we make ideas that work.[™]

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QMIN N-Gain polysaccharide complexed nitrogen has been formulated to increase the uptake and assimilation of foliarly applied nitrogen in plants. Nitrogen from QMIN N-Gain readily passes through the leaf cuticle and stomata and is translocated to the site of greatest demand, where it is utilized for important metabolic functions. Additionally, polysaccharides in QMIN N-Gain can be used by plants as an energy source similar to the sugars from photosynthesis.



Suggested Rates and Timing - QMIN[™] N-Gain[™]

Crop	Growth Stage	Application Rate
Almond	70% Leaf Out	1-2 qt/acre
	Tender Leaf	1-2 qt/acre
	May Spray	1-2 qt/acre
	Postharvest	1-2 qt/acre
Pistachio	Bud Retention	2 qt/acre
	Postharvest	1 qt/acre
Citrus	Pre-bloom	2-4 qt/acre
	Post-bloom	2-4 qt/acre
Table Grape	Vine Emergence	1-2 qt/acre
	Post-bloom	2 qt/acre
	Fruit Growth	1-2 qt/acre

Apply in 100 gallon/ac of water for uniform application.

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Key Advantages of QMIN[™] Technology:

Effective. Across a wide variety of crops, QMIN technology has shown consistent nutrient uptake.

Translocates. Because plants naturally store polysaccharides for energy, they readily absorb QMIN's polysaccharide protected nutrients then move them to areas with highest demand.

Compatible. In fertilizers and pesticides, QMIN's unique chemistry and polysaccharide protection are effective in diverse applications.

Safe. Plant derived polysaccharide complexation helps to minimize phytotoxicity.