



Why potassium nitrate is the preferred K and N source for plant growth

Potassium nitrate from natural resources: efficient plant growth

Nitric Nitrogen

Nitrate:

Nitrate is the preferred nitrogen source:

Non-volatile

Unlike ammonium, nitrate is non-volatile and does not require soil incorporation when applied by top or side dressing.

Readily available

Direct uptake by the plant, highest efficiency.

Nitrate promotes the uptake of valuable cations

Whereas ammonium competes for the uptake of K, Ca and Mg.

Nitrate can be readily absorbed by the plant

Urea and ammonium N must first undergo chemical conversions in the soil before becoming available to plants.

No acidification of the soil

Ammonium must go through nitrification to become available, a process which increases soil acidity.

Nitrate limits the uptake of chloride

Ammonium can lead to increased chloride uptake.

The conversion of nitrate to amino acids occurs in the leaf

Ammonium has to be converted into organic N compounds in the roots, stealing carbohydrates from processes that promote plant growth and fruit fill.

Potassium



Essential roles of potassium

Potassium promotes photosynthesis, the transport of sugars to fruits and plays an essential role in the production and accumulation of oils.

Potassium sustains season-long leaf function to increase yields and deliver a higher content of soluble solids (more sugars) in fruits at harvest time.

Main Roles:

Promotes the production of proteins

Faster conversion of inorganic N to proteins.

Promotes photosynthesis

More CO₂ assimilation, which results in more sugar production.

Intensifies the transport and storage of carbohydrates

More energy flows from leaf to fruit for better yields (Figure 1).



Figure 1.

Improves the efficiency of N fertilizers

Higher nitrogen use efficiency (NUE) leads to higher yields and prevents unwanted N-losses to the environment.

Improves water use efficiency

Regulates the opening and closure of stomata, resulting in less water needed per kg of plant biomass.

Synthesizes lycopene

The synthesis of lycopene creates deep red color in fruit.

