



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 CO<sub>2</sub> 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).

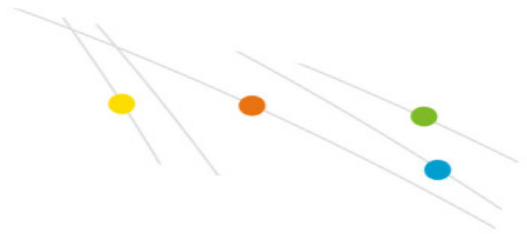


Figure 1.

### **Improves the efficiency of N fertilizers**

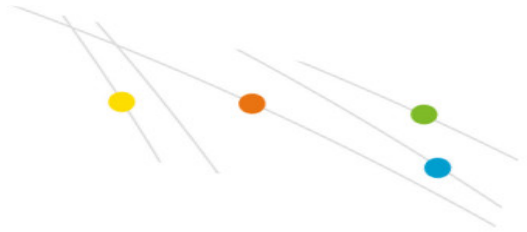
Higher nitrogen use efficiency (NUE) leads to higher yields and prevents unwanted N-losses to the environment.

### **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.



**Enhances organoleptic features and colouring**  
**Maximizes yield and quality**

**Non-volatile nitrate-N:**  
Easy handling, no need for incorporation in the soil.

**Nitrate relieves salinity stress**  
Nitrate counteracts the uptake of chloride.

**Increasing  $\text{NO}_3 : \text{NH}_4$  ratio positively affects plant performance**  
**Readily available**  
Direct uptake by the plant, highest efficiency.

**Increased water use efficiency**

**Energy efficient**  
Conversion of nitrate to amino-acids occurs in the leaf which is energy efficient.

**Nitrate promotes the uptake of valuable cations (K, Ca, Mg)**

**Combats soil salinity**