

### Yara Africa Fertilizer (Pty) Ltd

Lambrecht Street, Huguenot  
Paarl, South Africa

+27 21 877 5300

infos@yara.com

www.yara.co.za



## Knowledge grows



Operations in  
more than  
**50**  
countries



Sales to  
more than  
**150**  
countries

Yara's market presence includes a global network of sales offices in more than 50 countries and sale to more than 150. The company has a strong production and marketing base in Europe and has greatly extended its presence in North and South America, not least taking a strong position in Brazil, as well as in Australia, while expanding in Africa and Asia.

### Market Knowledge

Yara delivers a wide range of solutions for the world's farmers and industrial users, leveraging its experience and knowledge to tailor solutions to local needs. With regard to Agricultural Solutions, Yara offers the market's most complete portfolio of mineral fertilizers and solutions for sustainable agriculture – covering all necessary nutrients for most crops.



### Creating Impact

Yara commits to a sustainable future. Creating impact is our blueprint to create business value in the way we respond to human challenges. Yara creates value by delivering profitable, sustainable growth benefitting customers and shareholders – as well as society at large. By creating value Yara is positioned to create impact, to make a difference. Successful alignment of the company's current and future core business with global challenges will strengthen the company's position and develop a sustainable competitive edge. Yara creates impact by engaging in three focal areas where it is able to make a profound contribution: food security, resource management, and environmental issues. The three areas are intrinsically linked, and Yara is uniquely positioned to develop viable business solutions that address related global challenges.



# Quality Tomatoes

# Timing is everything



Yara works closely with researchers and Farmers all over the world gaining in valuable experience on how best to use our fertilizers.

We know that rate and timing of nutrient application - taking in to account nutrient availability from the soil, crop residues and manures - are essential aspects to ensure growth and that crop quality is not compromised.

Potatoes receive relatively large soil applications of fertilizer. However during periods of rapid growth, under certain conditions, the root system is unable to take up sufficient nutrients from the soil to meet the very high demands of potato plants. Careful focus on the management of nutrient inputs is essential, but success depends on the timely application of foliar sprays based on an understanding of the role and requirement.

## YaraVita™ products

YaraVita™ products are not simply nutrients. They are finished products designed from the start with crop nutrition in mind. When you choose YaraVita™, you can be sure that what you apply will be easy and convenient to use and effective and safe for the crop.



## Major Nutrient Uptake

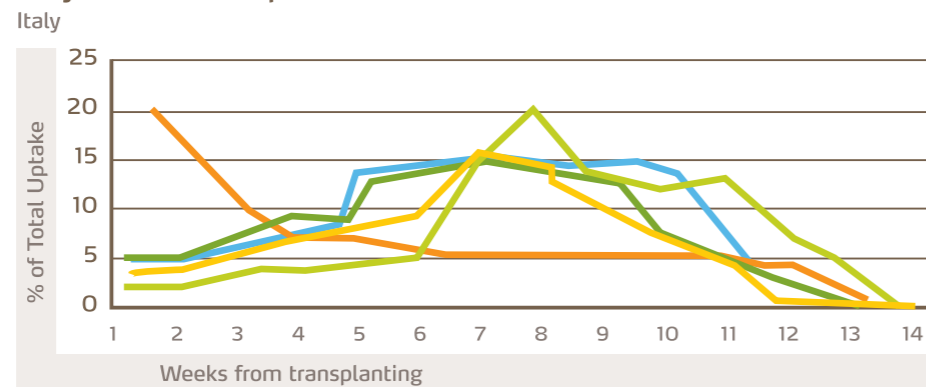


Figure 1

REF: IMPRONTA

## Phenological phases

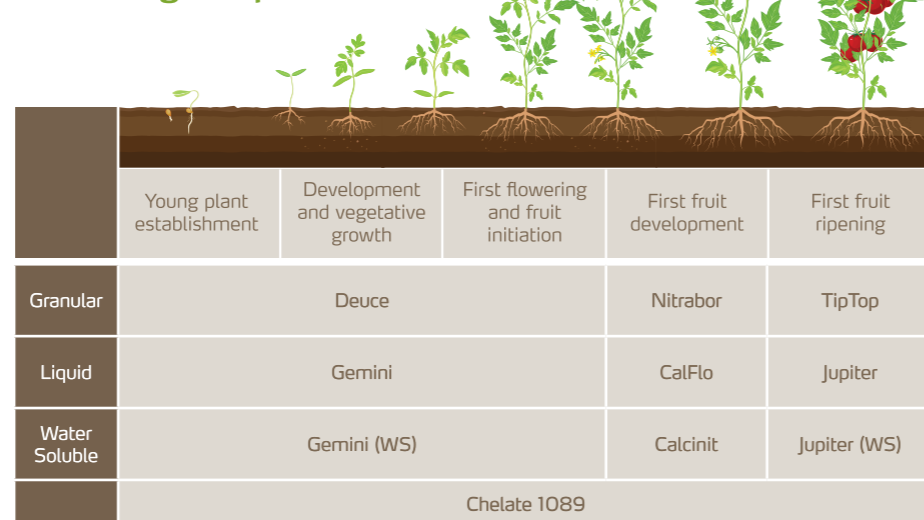


Figure 2

## YaraVita™ foliar sprays play an important role in nutrition

	2-3 weeks after transplant	3th flower truss	
Foliar YaraVita™		Mancozin	This is a complete timing chart, showing all possible sprays. For a custom made foliar spray program, consult your local agronomist
	Mancozin	Seniphos	
	Magtrac	Bortrac 150	

Figure 3

## Important Nutrients

**Nitrogen** is needed at early stages of development to encourage good strong seedling and plant development. Peak requirements is just before flowering.

Excessive use of nitrogen can however produce a crop that is too vigorous, has poor flowering and excessively large fruit.

Around 2.2 - 2.4kg of nitrogen is removed for every tonne of crop produced (Figures 4 and 5)

Some nitrogen is normally broadcast pre-planting or at transplanting, unless rainfall patterns are likely to lead to leaching. This is followed by side dressing prior to flowering.

## Major Nutrient Uptake (kg/t of fruit)

Greenhouse Tomato - Yield 400 t/ha Netherlands

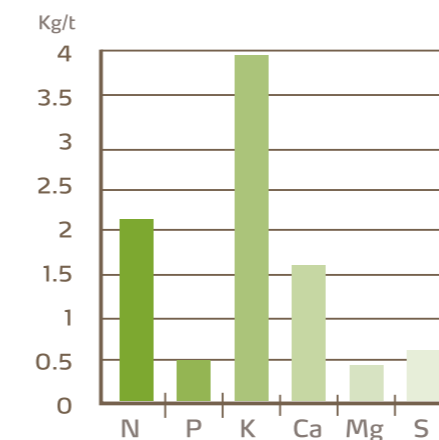


Figure 4

REF: VOOGT - 1993



Most **Phosphorus** is required early on in the plant's development to ensure good root growth and flowering (Figure 6). Crops need 0.2 - 0.4 kg P/t of fruit (Figures 4 and 5).

**Potassium** is needed in greater quantities than Nitrogen. Plant uptake is around 2.6 - 3.6 kg K/t of fruit with the highest demand during fruit bulking (Figures 4, 5 and 6).

Base applications of Potassium are usually followed by regular applications throughout the season.

## Major Nutrient Removal (kg/t of fruit)

Processing Tomato - Yield 121 t/ha Greece

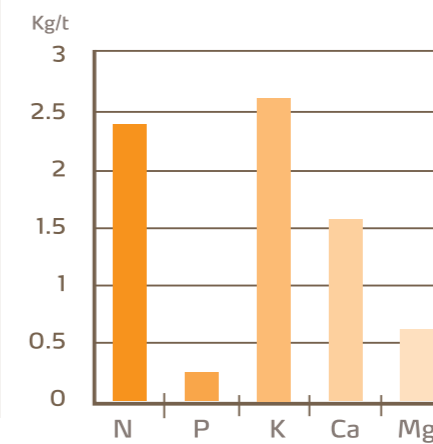


Figure 5

REF: CHRISTOU ET AL - 1999

**Calcium** is also needed in relatively large quantities at around 1.7 kg Ca/t (Figures 4 and 5). In many situations, it is equally as important as nitrogen.

## Nutrient Distribution (% Total)

Netherlands

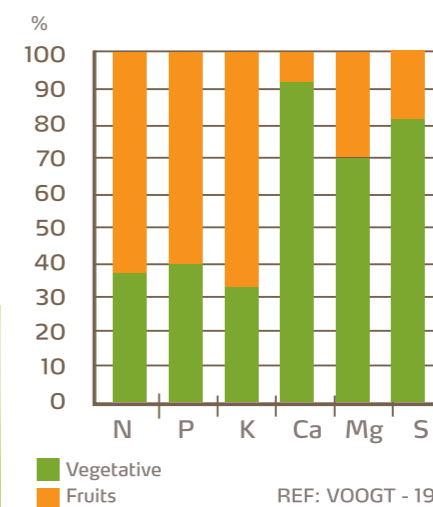


Figure 6

REF: VOOGT - 1993

Peak calcium needs are from flowering, through fruit development and up to harvest (Figure 6). Since only 5% of Ca is found in fruit and 95% in the vegetative parts of the plant, the need for Ca is also high during vegetative growth. Therefore a steady supply of calcium is needed throughout the season.

Only small - but highly significant - amounts of calcium are used by the fruit to ensure high quality production.

## Micronutrients

While much lower levels of micronutrients are needed to satisfy yield and quality tomato crop production, the correct balance of these trace elements is essential.

## Micronutrient Removal in Fruit (mg/kg as dry weight)

Boron	10 - 50
Copper	1 - 10
Iron	30 - 100
Manganese	10 - 50
Molybdenum	0.1 - 1
Zinc	10 - 50

Figure 7

Leaf tissue analysis to assess micronutrient need, will enable deficiencies to be correctly diagnosed and treated.

The key micronutrients are **boron** and **zinc**, which has a significant effect on fruit ripening characteristics.

## How to avoid blossom-end rot (BER) in greenhouses

- Optimise yield and Ca supply to the fruit:
  - Maintain Ca above 150 ppm in the substrate
  - Reduce CO<sub>2</sub> to reduce plant growth
  - Increase humidity to reduce transpiration
  - Maintain a 18-20°C night root temperature to enhance Ca uptake & allocation to the fruits.
  - Spray Ca directly on young fruits
  - Reduce the leaf/fruit ratio in warm summer days
- Avoid high ammonium supply (<10% of total N)
- Balance the K/Ca ration - K in excess over compete Ca uptake (> 500ppm)
- Avoid excess of Magnesium (> 150 ppm)

