Yara Africa Fertilizer (Pty) Ltd
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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

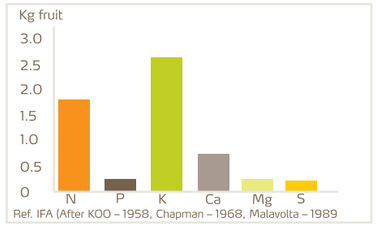
Yara commits to a sustainable future. Creating impact is our blueprint to create business value in the way we respond to human challenges. Yara creates value by delivering profitable, sustainable growth benefitting customers and shareholders – as well as society at large. By creating value Yara is positioned 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 Citrus

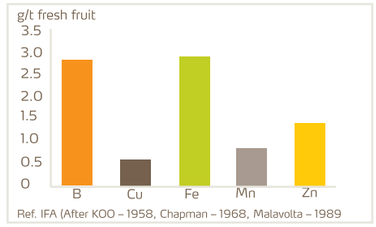
Timing is everything

Yara works closely with researchers and farmers from all over the world to gather valuable information that allows us to make the best possible recommendations regarding fertilisers, application times and application methods. This ensures the optimal use of our fertilisers. We therefore know how crucial it is to apply the correct amount of fertiliser at the right time while also taking into account the availability of nutrients in the soil.

Fruit removal figures show that more nitrogen (N) and potassium (K) are removed than any other nutrient, followed by calcium (Ca). Much lower levels of micro-nutrients are required to ensure the yield and quality of crop production. However, the correct balance of these elements is essential. To deliver optimal yield and quality, it is critical to follow a balanced nutritional programme during the entire season. Leaf quality impacts sugar production which in turn impacts fruit size and fruit quality. Leaf yellowing, which is caused by a deficiency of nutrients such as manganese, magnesium and zinc can be cost-effectively be treated by applications of YaraVita™ Mantrac 500, YaraVita™ Zintrac 700 or YaraVita™ Foliamag 300. The YaraVita™ products have been custom-designed for plant nutrition and are relatively easy to apply. The safety and effectiveness of the products for citrus crops is underpinned by proper research.

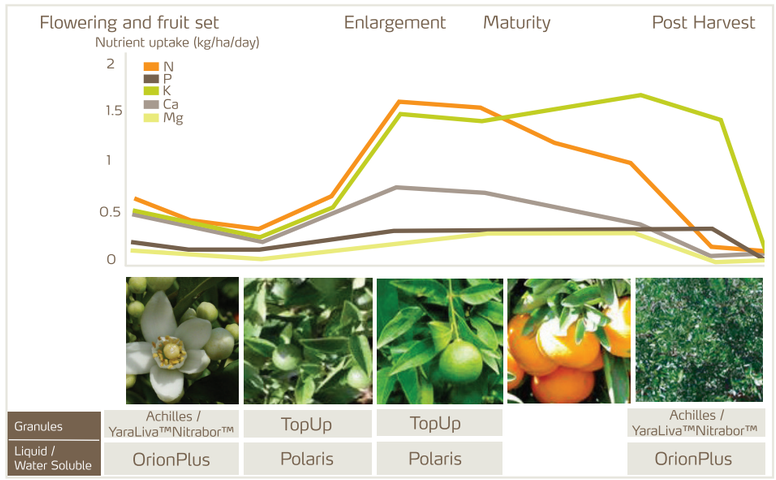


Fruit macro-element removal



Fruit micro-element removal

Application times of nutrients



Granules	Achilles / YaraLiva™Nitrabor™	TopUp	TopUp	Achilles / YaraLiva™Nitrabor™
Liquid / Water Soluble	OrionPlus	Polaris	Polaris	OrionPlus

The crucial role of YaraVita™ in leaf nutrition

Leaf nutrition YaraVita™	Spring	50% foliar drop	White nodules	Please contact your local agriculturist for a customised foliar nutrition programme
	YaraVita™ Zintrac	YaraVita™ Mantrac	YaraVita™ Bortrac	

Essential nutrients

Nitrogen is a key component of enzymes, vitamins, chlorophyll and other cell compositions required for crop development and yield. Nitrate N is the preferred form of the nitrogen application. Citrus uses most of the nitrogen in nitrate form although some ammonium is also taken up. Maximum nitrogen take-up happens during the active growth phases. When urea is applied to cultivated soil, 15% to 50% of nitrogen is lost as a result of evaporation depending on soil pH and climate conditions.

Potassium is essential for enzyme activation, cell division, photosynthesis, photosynthetic transport and osmotic regulation. Citrus takes up more potassium than any other nutrient. Also, the juice contains high amounts of potassium. Potassium plays a crucial role in foliar size and the general health condition of the tree. It is also important for internal and external fruit quality, including fruit size, peel thickness and colour. Most of the potassium is taken up during the late fruit growth stage. Application should therefore be scheduled accordingly.

Phosphate is taken up during the post-flowering and late fruit-ripening growth phases. Availability is crucial during active root growth phases.

Calcium is a key component of cell walls. It directly impacts the regulation of enzyme systems, photosynthesis and the take-up of nutrients. The element influences pollen tube elongation and seed formation. It is also required for flowering and fruit development.

Citrus fruit set programme

The average number of flowers per tree during flowering varies between 50 and 200 000. Only a small percentage of flowers turn into fruit. Also, large numbers of flowers do not ensure large quantities of fruit. Understanding the critical issues and following the right management practices during these phases will lead to optimal fruit size and crop yield for the producer.

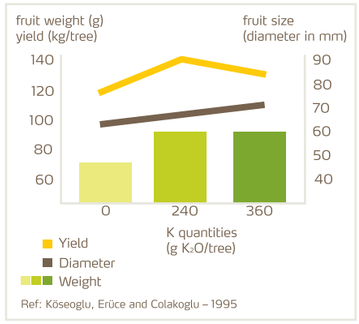
Important issues

- Flowering takes place during the cooler and dryer spring months. These conditions delay chemical reactions and microbiological activities.
- It is crucial to ensure that sufficient amounts of nutrients are available as each flower takes up nutrients regardless of whether it develops into fruit.
- Growing flower buds require a low respiration / transpiration environment.
- Calcium impacts pollen tube elongation (fruit set), mitosis (cell division) and ablactating.

Key management practices

- Take into account that sufficient irrigation is crucial during the flowering and early fruit-development stages.
- Prevent competition for nutrients in the soil and promote calcium take- up.
- Apply calcium in soluble form.
- Take into account that ablactation will increase when calcium is less than 30 mg per fruit during the five-week growth phase.

Better roots due to Nitrabor (left) compared with ammonium nitrate (right)



Fruit should at least have 30 mg calcium to prevent ablactation.

Fruit splitting

Yara North America Inc