



Now with added Boron

Knowledge grows

Achilles Granular

33% Nitrogen plus 8% water-soluble Calcium with 0,1% Boron

Soluble calcium with urea and/or ammonium nitrogen: A unique and beneficial combination

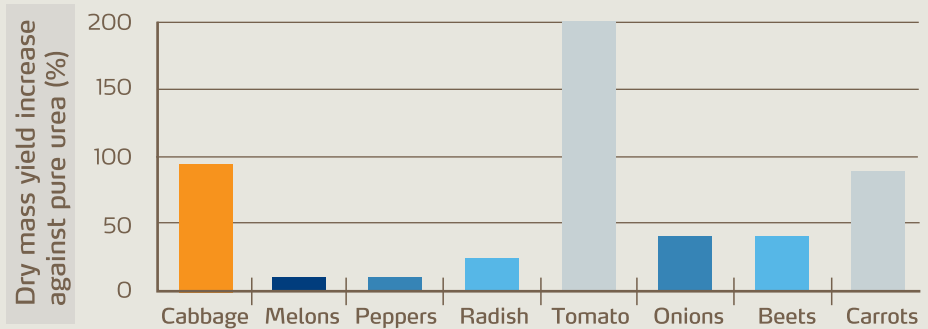
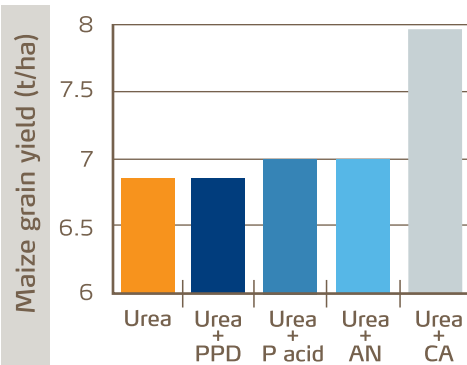
Recently, published research data has shown the following regarding the combination of soluble calcium with ureic nitrogen:

- Improved crop production
- Increased ammonium, potassium and phosphorus absorption as a result of calcium
- Stimulation of photosynthesis
- Increased mass of sellable plant parts
- Reduced urea volatilisation
- Improved economics of production (use of urea)
- Reduced nitrogen contamination of the environment through efficient use of nitrogen.

The points above and the graphs below are taken from the publications of Feagly and Fenn from 1986 to 1994 and show the superior efficiency of Achilles-type products.

How is urea volatilisation inhibited?

As Achilles contains soluble calcium it reacts with ammonium carbonate, a product



from urea hydrolysis, to form calcium carbonate and ammonium nitrate. These are the components of Calcium Ammonium Nitrate also known as CAN or LAN. This significantly reduces the loss of nitrogen associated with urea-based products, which means a 15 to 20% higher N-efficiency from Achilles.

Calcium and Boron for healthy, high-quality, stress-resistant crops

Calcium is a major structural component of cell walls and vital for cell membrane integrity. Boron (B) influences the movement of sugars and besides the translocation of carbohydrates it also enhances the uptake of cations - essential for flowering and fruit development. Furthermore, Boron (B) improves phenol/auxin activity regulation. It also plays a structural role in the synthesis of pectin and lignin and thus fulfils a primary role in the biosynthesis of cell walls, such as cell elongation and structural cell wall development. What is most important is that it enhances the efficiency of calcium. Growers have noted that crops fed with Achilles are stronger, have better developed root systems and are able to survive even in periods of moderate drought.

Achilles rate and timing

As Achilles contains 20% of its nitrogen as nitrate its application timing is quite versatile.

On cereals and grassland, Achilles is commonly applied at the end of the winter season or in early spring at a rate of 150-200 kg/ha. On maize, at the beginning of crop development (5th-7th leaf stage) at a rate of 400-500 kg/ha, it has given excellent results. On vegetables such as potatoes and tomatoes, 250-300 kg/ha applied 2-4 weeks after planting or during the early growth stages is ideal.

Any recommendations are meant as a guide and must be adapted to suit local conditions.

Achilles is made locally from high-quality raw materials such as the unique and exclusive product Nitabor™ from Yara.

Achilles granular is registered under Act 36 of 1947 with K number K8034.

Achilles is also available in water-soluble or liquid form.





Knowledge grows

Material safety data sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Identification of the substance or preparation

Product name: Urea and low-biuret urea (Agrotain-treated urea)

Number: 111

Synonyms: AMIPLUS™ (containing 600 ppm N- (n-butyl) thiophosphoric triamide)

Material uses: Fertiliser

Supplier address: Yara South Africa (Pty) Ltd
1st Floor Selborne Building
Fourways Golf Park
1016 Roos Street
Fourways
Telephone: 011 317 2000

2. COMPOSITION / INFORMATION ON INGREDIENTS

Composition: A stable substance containing Ca. 100% Urea. Low biuret-containing urea contains less than 0.5% biuret. Methylenediurea < 2.42.

Appearance: White, green or blue solid prills or granules

3. HAZARDS IDENTIFICATION

Effects and symptoms:

- Heating under confinement may lead to violent reaction or explosion.
- Dust may cause irritation or coughing.
- CAS NO: 57-13-6

4. FIRST AID MEASURES

Inhalation: Remove patient from exposure, keep warm and at rest. Get medical attention.

Ingestion: Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Give plenty of water to drink. Get medical attention if symptoms appear.

Skin contact: In case of contact, immediately flush skin with plenty of water. Get medical attention if symptoms appear.

Eye contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Check for and remove any contact lenses. Get medical attention if symptoms appear.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Special fire-fighting procedures:

- Extinguishing media should be determined by surrounding materials.
- Thermal decomposition may evolve ammonia.

Protection of fire-fighters: Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: As a minimum use rubber gloves and a dust mask.

Environmental precautions and clean-up methods: Shovel into well-labelled containers for disposal. Thereafter wash the spillage area with water to drain.

Note: See section 8 for personal protective equipment and section 13 for waste disposal.

7. HANDLING AND STORAGE

Handling: Control dust formation. Avoid contact with eyes. Avoid prolonged contact with skin.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Store and use away from strong bases.

Packaging materials: Use original container.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures: Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Hygiene measures: Wash hands after handling compounds and before eating, smoking, using lavatory, and at the end of the day.

Skin and body protection: Overalls, dust mask.

Hand protection: Gloves (impervious)

Eye protection: Use dust goggles if high dust concentration is generated.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: White/green/blue solid prills/granules

Melting point: 133°C

Solubility: Highly soluble, hygroscopic

Density: 0,76 g/ml

10. STABILITY AND REACTIVITY

Stability: Stable under recommended storage and handling conditions.

Hazardous reaction: Contact with reducing agents and some flammable substances may cause violent reaction and combustion.

Decomposition products: Decomposition may evolve the oxides of nitrogen and ammonia.

11. TOXICOLOGICAL INFORMATION

Eyes: Hazardous in case of eye contact.

Skin: May cause irritation from abrasion.

Inhalation: Dust may irritate nose, throat and the respiratory tract and may cause coughing.

Ingestion: Swallowing large amounts may cause irritation and gastrointestinal disorders and in extreme cases methemoglobinemia and cyanosis.

12. ECOLOGICAL INFORMATION

Users should ensure that they comply with local, provincial and national environmental legislation.

Environmental effects, behaviour and fate:

Toxic to aquatic organisms in low concentrations.

13. DISPOSAL CONSIDERATIONS

Method of disposal: Waste must be disposed of in accordance with state and local environmental control regulations.

14. TRANSPORT INFORMATION

International regulations: Not regulated.

15. REGULATORY INFORMATION

Risk phrases: Contact with combustible material may cause fire. Explosive when mixed with combustible material.

Safety phrases: Keep away from combustible material. This material and its container must be disposed of as hazardous waste.

Users should ensure that they comply with any relevant local, state or national legislation.

16. OTHER INFORMATION

This MSDS summarises at the date of issue and to the best of our knowledge the health, safety and environmental hazard information related to the product, and in particular how to safely handle, use, store and transport the product. Since Yara South Africa (Pty) Ltd cannot anticipate or control the conditions under which the product may be handled, used, stored or transported, each user must, prior to usage, review this MSDS in the context of how the user intends to handle, use, store or transport the product and beyond, and communicate such information to all relevant parties.

Yara South Africa (Pty) Ltd shall not assume any liability for the accuracy or completeness of the information contained herein or any advice given unless there has been gross negligence on our part.

For further information please contact:

Yara Africa Fertilizer (PTY) LTD
PO Box 59, Huguénot 7645
Lambrecht Street, Paarl 7646
Tel: +27 (0)21 877 5300
Fax: +27 (0)21 862 6604
www.yara.co.za

