FERTFACTS

# GRANULOCK
## FACT SHEET

- Sulphur (Granulock® 15) and Zinc (Granulock Supreme Z) enriched ammonium phosphate fertilisers;
- Fully granulated for ease of handling, and providing even distribution of nutrients in the crop row;
- Ideal planting fertilisers for grain, forage and cotton crops;
- Australian made. Granulock 15 is manufactured by Incitec Pivot Fertilisers in Brisbane; Granulock Supreme Z at Phosphate Hill in North West Queensland using locally mined phosphate rock.

| Product | Analysis | | | |
|---|---|---|---|---|
| | % N | % P | % S | % Zn |
| Granulock® 15 | 14.3 | 12 | 10.5 | - |
| Granulock® Supreme Z | 11 | 21.8 | 4 | 1 |

High analysis fertilisers such as Urea, DAP (Diammonium Phosphate) and MAP (Monoammonium Phosphate) have become popular since the 1960s, replacing products such as Sulphate of Ammonia and Superphosphate as the preferred nitrogen and phosphorus fertilisers in cropping. These fertilisers have a high analysis, are free flowing, and are suited to modern application equipment. Their use, however, has led to a renewed focus on other nutrients, such as sulphur (S) and zinc (Zn), and how to best apply them.

## Sulphur (S)

The reduced use of single superphosphate has resulted in an increase in the area in which responses to sulphur can be expected. Higher crop yields and the adoption of reduced tillage practices which conserve soil organic matter and reduce its rate of mineralization have also contributed to the increased need to apply sulphur in fertiliser programs, as too have the use of high sulphur demanding crops such as canola. Grain legumes also remove more sulphur than cereal grain crops.

Sulphur can be applied in two ways, as elemental sulphur, and in the sulphate ($SO_4$) form.

Before elemental sulphur is of use to plants, it must be converted to the sulphate form by soil bacteria. A fine particle size is essential. The microbial process is slowed under cool and dry conditions.

Granulock 15 combines ammonium sulphate and MAP in a fully granulated fertiliser. It provides starter nitrogen, with the phosphorus and sulphur in the balance that crops need. The sulphur is present in the sulphate form, which is immediately available for plant uptake. This is important in annual crops, where any delay in the mineralization of elemental sulphur may result in a deficiency early in the life of the crop. This is most likely to occur in winter crops when soil temperatures at planting are low.

Granulock 15 is an ideal planting fertiliser for grain, forage and cotton crops.

Granulock 15 may also be used for pasture establishment and to oversow pastures. The nitrogen assists in the establishment of grasses and may help legumes in the first few weeks before their roots are properly nodulated, and they become self-sufficient in meeting their own nitrogen requirements.

## Zinc (Zn)

The incidence of zinc deficiency in Australian agriculture has increased in recent decades. There are several reasons for this including:-

- As agriculture has grown, it has expanded on to less fertile land.
- Yields have increased (improved varieties and cultural practices), increasing the demand on the soil for all nutrients, including zinc.
- Soil zinc concentrations have declined, as a result of crop and pasture removal (nutrient depletion).
- Soil pH has increased in some soils and districts. This has occurred as a result of the use of lime; irrigating with alkaline water; and cultivation, land-levelling or erosion exposing or bringing more alkaline sub-soil to the surface in semi-arid regions. Plant-availability of zinc is reduced in alkaline (high pH) soils.
- Fallow management practices have changed, with greater use being made of herbicides for weed control. Bare fallows reduce soil VAM (Vesicular arbuscular mycorrhizae) populations. VAM is a beneficial fungi which infects most crop roots (canola is an exception). The mycelium (fungal threads) acts like fine root hairs, greatly increasing plant uptake of immobile nutrients such as phosphorus and zinc. VAM numbers will decline during bare fallows or if non-host crops are grown.
- Some pre-emergent herbicides also affect VAM and root growth and in turn uptake of zinc.

- Less zinc is being applied as an impurity in phosphorus fertilisers as a result of changes in the source of the phosphate rock from which they are made. Nauru phosphate rock, which was extensively used in the past, is higher in zinc that the phosphate rocks used in the manufacture of phosphorus fertilisers used in Australia at the present time.

Where soil zinc levels are low, it can be applied in many ways. For example, zinc can be applied to the soil in a single high rate does that remains effective for several years. Zinc can also be foliar applied. It is however being more commonly applied in the basal fertiliser each time a crop is planted.

As zinc is a micronutrient (trace element), it is not applied at high rates. Concentrated zinc fertilisers, such as Zinc Sulphate Monohydrate (35% Zn) will not provide a lot of point sources of zinc in the field. They are of use where zinc is applied at high rates (intended to last several years), where crops are planted at wide row spacings, and where plants with a large stature are grown.

As an example, zinc sulphate monohydrate is perfectly suitable for use in plant sugarcane. The plants are large, they are planted in rows about 1.5 metres apart, and zinc is applied at a rate that is intended to last a crop cycle, i.e. the plant crop plus several ratoons.

However, if zinc sulphate monohydrate is used in a blended fertiliser at planting in a cereal crop planted at 18 cm row spacings at a low rate for that crop only, there will be insufficient point sources of zinc in the row to provide access to all seedlings. Uneven responses and crop growth can be expected.

Zinc is combined with monoammonium phosphate during the manufacturing process for Granulock Supreme Z. Some zinc is present in each granule, providing more even distribution of zinc in the crop row than can be achieved with blends.

Granulock Supreme Z is an ideal planting fertiliser for forage, cereal, legume grain and oilseed crops. It is also used in cotton.

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