

FERTFACTS

GRAN-AM

FACT SHEET

- **20.2% Nitrogen (N);**
- **24% Sulphur (S)**
- **Fully granulated ammonium sulphate fertiliser. Gran-am[®] stores and handles better and is easier to apply than crystalline by-product grades of Sulphate of Ammonia;**

MANUFACTURE

Gran-am is a granulated ammonium sulphate [(NH₄)₂SO₄] fertiliser with an analysis of 20.2% nitrogen (N) and 24% sulphur (S). It is manufactured by Incitec Pivot in Brisbane by reacting ammonia with sulphuric acid. The process, which was developed by Incitec Pivot in the 1970s, involves the use of a specially designed pipe reactor and mixing tee. The process proved superior to the previously used neutraliser based techniques as the corrosive ammonium sulphate slurry is confined to the reactor. The manufacturing process is used under license by several overseas manufacturers.

Up to the 1960s, by-product Sulphate of Ammonia from industry, including the coking of coal, was the most commonly used nitrogen fertiliser in Australia and the rest of the world.

Since then, synthesised nitrogen fertilisers including anhydrous ammonia, urea, ammonium nitrate and urea ammonium nitrate (UAN) solutions have been produced and used in greater quantity in response to the rapidly escalating demand for nitrogen fertilisers as the world's population grew.

By-product Sulphate of Ammonia continues to be used, but is not available in sufficient quantity to meet demand.

Urea (46% N) is now the most commonly used nitrogen fertiliser in the world. Urea has a higher analysis than by-product Sulphate of Ammonia (21% N), meaning there is less product to store, handle and apply. It also handles better.



By-product Sulphate of Ammonia is a fine crystalline material. It does not flow freely through fertiliser boxes making it unsuitable for use through much of today's modern application equipment, or for use in blends with other fully granulated fertilisers.

These limitations led Incitec Pivot to develop Gran-am.

While Gran-am is used as a nitrogen fertiliser, it is commonly incorporated into fertiliser programs as a sulphur fertiliser. The sulphur it contains is in the sulphate form, which is readily available for plant uptake as this is the form in which plants take up sulphur from the soil.

USE

As a Dry Fertiliser

By-product Sulphate of Ammonia has been used as a nitrogen fertiliser since the advent of the Industrial Revolution. It continues to be used as such.

The widespread use of ammonium sulphate as a nitrogen fertiliser and single superphosphate as a phosphorus fertiliser [SuPerfect has an analysis of 8.8% phosphorus (P) and 11% sulphur (S)] up to the 1960s meant that little value or importance was placed on the sulphur content of these products. More than enough sulphur was being applied and sulphur deficiency was almost unheard of.

Nowadays, the popularity of urea and the ammonium phosphate fertilisers means that often little or no sulphur is being applied. Sulphur deficiency has emerged and with it a need to incorporate sulphur in fertiliser programs. This has been exacerbated by higher crop yields, the inclusion of high sulphur-demanding crops such as canola in crop rotations, and the adoption of reduced tillage practices meaning that less sulphur is mineralised from the soil organic matter.

Where sulphur is required, it is not necessary to go back to using ammonium sulphate exclusively as a nitrogen source as it supplies sulphur in excess of crop requirements. Plants take up ten or more times as much nitrogen as sulphur, whereas ammonium sulphate contains approximately equal amounts of nitrogen and sulphur.

Gran-am costs more per kg of nitrogen than other nitrogen fertilisers such as urea, if no value is placed on its sulphur content. As a nitrogen fertiliser there are more economical alternatives such as urea.

If value is placed on both the nutrients that it contains, Gran-am becomes an economical source of nitrogen and sulphur. Hence, while Gran-am may be used to supply a crop's complete nitrogen requirements, this is normally not the way the product is used. Gran-am is more commonly applied in combination with other nitrogen-containing fertilisers such as urea. It can be alternated with these products in topdressing programs, or used in blends with other granulated fertilisers to achieve the desired nutrient balance. Gran-am is compatible with many other fertilisers in dry blends including urea, DAP, MAP, dried granulated grades of superphosphate and Muriate of Potash.

The sulphur in Gran-am is present in the sulphate form that is immediately available for plant uptake once the fertiliser dissolves in soil moisture.



In Solution

While Gran-am is granulated with the intent that it be used as a free-flowing dry fertiliser for direct application to the soil on its own or in blends, some use is made of Gran-am in solution, in fertigation programs and in the preparation of mineral supplements for livestock (ruminants).

As in plants and fertiliser programs, about ten times as much nitrogen as sulphur is required in dietary supplements. This ratio can be achieved by adding one part Gran-am for every five parts urea in the mix.

It is recommended that Gran-am be trialled in small quantities before fully committing to its use in solutions. A coating agent is added to Gran-am during the manufacturing process. This may cause a scum to form on the surface of fertiliser solutions and the walls of mixing tanks, and cause blockages in fine filters and nozzles, e.g. emitters in micro-irrigation systems.

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