Cal-Am

FACT SHEET

April 2017

- 27% nitrogen (N) as ammonium nitrate,
    - 50% in the ammonium form (13.5% NH_4-N),
    - 50% as nitrate (13.5% NO_3-N).
- The nitrate component can provide a quick response in short season annual crops and in cold weather.
- Cal-Am is less subject to volatilization loss to the atmosphere when surface applied without incorporation than urea and other fertilisers containing all their nitrogen in the ammonium form.
- Cal-Am is not classified as being a Dangerous Good, but is classified as Security Sensitive. It can only be sold to and used by those farmers licensed to receive it.
- Cal-Am is mostly used in blends at concentrations up to 55% (equivalent to 45% ammonium nitrate). Below this concentration, blends in which Cal-Am is used are not classified as Security Sensitive.
- The main uses of Cal-Am are:
    - To side-dress vegetable crops;
    - Topdress raingrown pasture, forage and grain crops;
    - As a ratooning fertiliser in sugarcane where fertiliser is applied over the top of a green cane trash blanket without incorporation.

THE PRODUCT

Cal-Am is Incitec Pivot's name for Calcium Ammonium Nitrate (CAN), an imported granular fertiliser comprised of 80% ammonium nitrate and 20% calcium carbonate.

The calcium carbonate is added during the manufacturing process. It dilutes the product and reduces the sensitivity of the ammonium nitrate to detonation. Ammonium nitrate products that are capable of detonation are classified as being a Dangerous Good (Class 5.1 Oxidising Agent).

While Cal-Am is not classified as a Dangerous Good, it is classified as a Security Sensitive. This applies to any solid product containing more than 45% Ammonium Nitrate (55% Cal-Am).

Security Sensitive Ammonium Nitrate (SSAN) products must be kept secure at all times. A License is required to transport, sell or use Cal-Am on the Australian mainland. SSAN fertilisers have been banned in Tasmania.

Recognizing that it is inconvenient for many growers to seek a SSAN Licence and maintain an appropriate level of on-farm security, Incitec Pivot has formulated a range of blends with other ingredients, including Gran-am (granulated ammonium sulfate), that contain less than the threshold amount of ammonium nitrate above which the security arrangements apply. A SSAN license is not required in order to buy and use them.

Cal-Am is not used as a nitrogen fertiliser as commonly as Urea (46% N), which is more concentrated, stores and handles better, costs less per kilogram of nitrogen, and has no legislative restrictions placed on its use.

Nitrate Nitrogen

Cal-Am is used where the presence of half its nitrogen as nitrate may provide an agronomic advantage.

Plants roots take up nitrogen as ammonium and nitrate, but it is mostly taken up as nitrate. The nitrate nitrogen in Cal-Am is immediately available for plant uptake once it dissolves in the soil. The ammonium nitrogen is converted to nitrate by soil bacteria. This process is usually complete within a few weeks of application. Being a biological process the conversion occurs more slowly under cold temperatures and if the soil is dry.

Cal-Am is less subject to volatilisation (gaseous loss of ammonia to the atmosphere following surface application) than fertilisers that form ammonium, e.g. urea, or fertilisers containing all their nitrogen in the ammonium form, e.g. ammonium sulfate. Half the nitrogen in Cal-Am is present as nitrate, and therefore not subject to volatilisation. Only that nitrogen present as ammonium is subject to volatilisation.

Volatilisation losses can be minimised or eliminated by applying the fertiliser into the soil, applying it with irrigation water (fertigation), irrigating it in immediately after application, or top-dressing shortly before rain is forecast. If reliant on irrigation or rain, it is best that this occurs on the same day that the fertiliser is applied. Overnight dew can dissolve the fertiliser and start the volatilization process from as early as the following morning. Losses typically occur over several days, becoming cumulatively greater with time.

Cal-Am (and blends in which it us used) may be used:

- Where a quick response to nitrogen is required, e.g.:
  - When side-dressing short season vegetable crops;
  - In winter, when the bacterial conversion of ammonium nitrogen to nitrate is slowed by low soil temperatures
- When topdressing rain-grown crops and pastures, particularly at those times of the year when rainfall is variable and none is predicted in the coming days.
- In ratoon sugarcane where nitrogen fertiliser is surface-applied over a green cane trash blanket, and it cannot be placed through the trash into the soil or watered in by a travelling irrigator, and rain is not forecast.

Calcium

Cal-Am contains 7% calcium (Ca) as calcium carbonate, which is insoluble and reacts slowly in the soil. This calcium will only be of nutritional value on acid soils and will not provide a quick response when used to side-dress high value horticultural crops. Soluble calcium fertilisers such as calcium nitrate should be used in these situations. Calcium nitrate can be applied in fertigation programs and as foliar sprays. Cal-Am cannot be applied in solution.

In the longer term, the calcium in Cal-Am is of nutritional value in acid soils. Its use will help maintain soil calcium levels and help meet crop demands for this nutrient. Cal-Am is less acidifying per kilogram of nitrogen than straight nitrogen fertilisers such as urea due to the neutralising value of the calcium carbonate. Cal-Am, however, does not contain sufficient calcium carbonate to totally prevent soil acidification or to correct soil acidity. Where acid soil infertility exists, lime will still need to be applied.

The calcium carbonate in Cal-Am is of little or no value on alkaline soils.

Cal-Gran

Cal-Gran is the most commonly used Cal-Am blend. It contains 55% Cal-Am and 45% Gran-am (granulated ammonium sulfate), and has an analysis of:

Ammonium Nitrogen	16.5% N
Nitrate Nitrogen	7.4% N
Total Nitrogen	23.9% N
Sulfate Sulfur	10.8% Ca