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SUMMIT FERTILIZERS
A Quality Choice

Urea

Summary of placement and timing trials

Studies of nitrogen in WA have been carried out extensively over the past forty years.

There are several common sources of nitrogen used, of which Urea is the most common as it is freely available as a traded commodity around the world and is also the cheapest Nitrogen source at the present time.

Other sources include:

Sulphate of Ammonia (either as a powdered/fine crystal product, or a granulated form—either way it contains about 21% N).

CAN (Calcium Ammonium Nitrate) which is an Ammonium Nitrate, coated with a calcium Oxide powder.

Liquid Nitrogen.

Coated nitrogens. Coatings of a polymer resin or with nitrification inhibitors are designed to slow nitrogen release and make it safer to place N in close proximity to the seed.

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This article summarises the nitrogen work carried out by Summit Fertilizers, with respect to application of Urea, placement in relation to the seed and timing of application.

Urea contains 46% Nitrogen.

As a commonly traded commodity, Urea is usually the cheapest source of nitrogen available and therefore the most commonly used.

Usual rates applied depend on potential crop yield, soil type, crop type and rainfall expected.

Application rates vary from 30kg/ha to 150kg/ha. In cereal crops in WA's wheatbelt nitrogen has become the most limiting nutrient in crop yield.

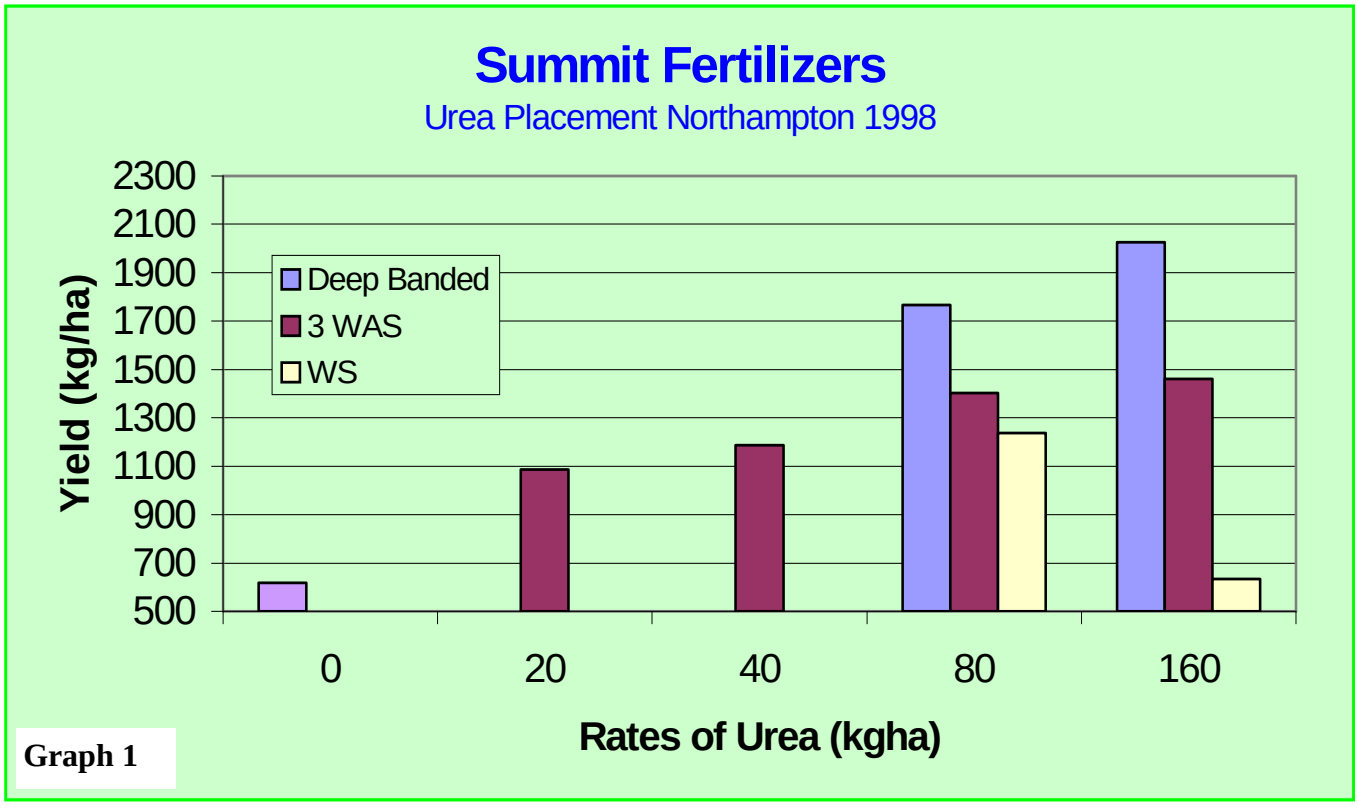
Continuous cropping, shorter pasture rotations, higher crop yields and less Nitrogen from legume crops all mean that many yields are restricted by lack of nitrogen.

Farmers are often reluctant to apply adequate nitrogen for fear of "burning" the crop, increased screenings and volatilisation of the applied product. Experience from trials would show that applied N, early in the crops life, in the case of cereals, will almost always increase yield and quality, particularly where all other nutrients are in adequate supply.

This article will look at nitrogen as Applied Urea.

The other forms of nitrogen used in Western Australia are discussed in other articles.

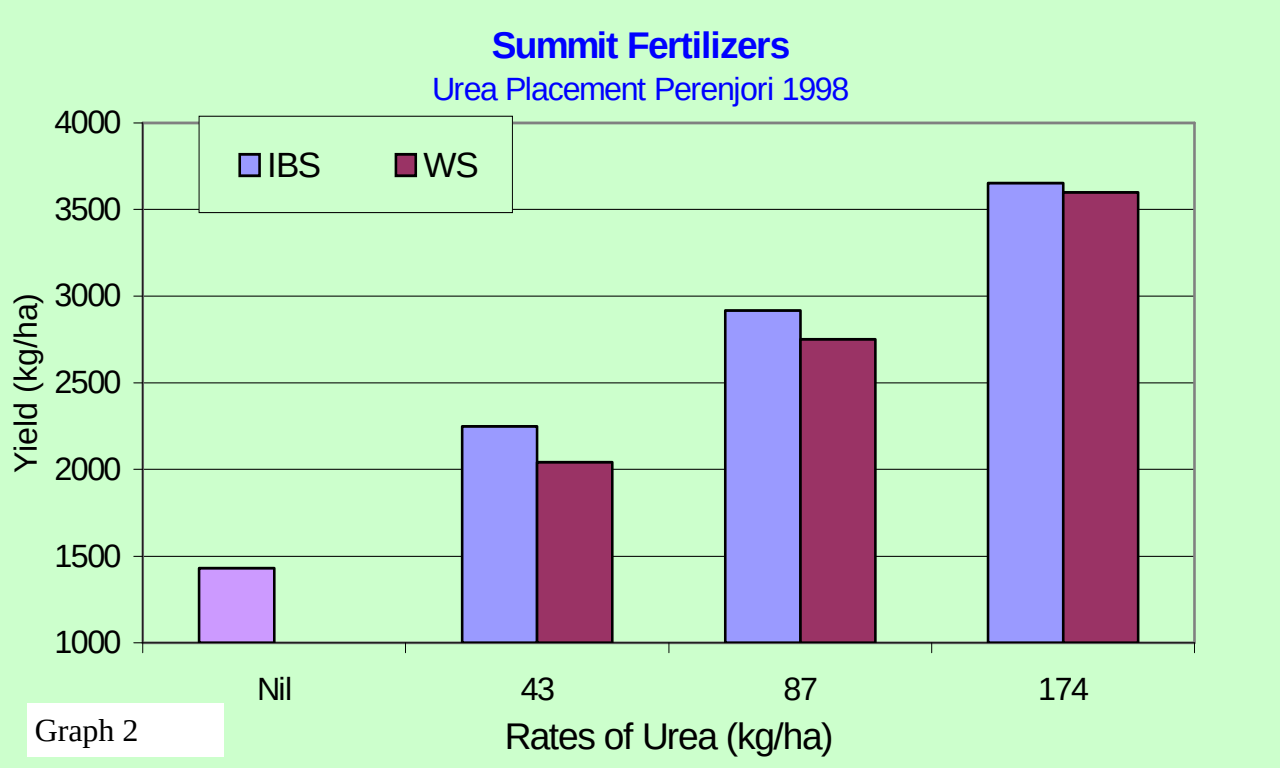
Timing of nitrogen is a much debated subject. In WA, the consistently best method and source of N is to apply Urea just before sowing or just after sowing (1 to 2 leaf stage).
Applying Urea next to the seed may cause damage to the seedling if the Urea passes through the gaseous Ammonia stage.
As with all cases, there may be exceptions—see the trial from Perenjori (below) , where 174kg/ha of Urea applied next to the seed was equal best treatment, because of a 50mm rainfall event the night we sowed the trial.
In areas where leaching may be a problem, delaying or splitting the Urea application may be more cost effective.
With cereals, maximum yield potential is set around the six weeks stage of the crop. So whilst sometimes a response is possible later, ***more yield is lost by delaying the N application than by applying early and possibly getting some volatilisation or leaching.***
Application by around 3 to 4 weeks after germination (4 to 5 leaf stage) will allow the nitrogen to get into the plant and convert from the nitrate form to the protein form within that 6 week time frame.
In 2003 some farmers have delayed Urea application driven by their experiences in the very dry season of 2002. With early sowing and a dry June 2003, many of these crops received late Nitrogen applications and may well suffer yield penalties at harvest.



Graph 1

Graph 1: Discussion.

In this case the at seeding treatment was to deep band below the seed by about 5 cm. Application after sowing produced a 500kg/ha yield penalty—potentially $100.00/ha lost income from a 3 week delay of application of Nitrogen.
The other treatment was to apply the Urea next to the seed which has caused massive damage to the emerging seedling due to the release of ammonia gas (Volatilisation) next to the seed. This practise is not recommended.



Graph 2

Graph 2: Discussion.

This is one of the trials that contradicts the rules. An application of 174 kg/ha of Urea, in a marginal rainfall area, next to the seed, should have reduced germination to almost nothing. Instead, the yield penalty was not significant.

The clue is in the high yield. (for the area). There was a 50mm rainfall event the night we sowed the trial which means that the fertilizer was washed away from the seed, and reduced the formation of Ammonia gas.