

10 October 2019

Page 1 of 2

## Power up your planting blends



### Rob Dwyer - Technical Agronomist Tropical Systems, Incitec Pivot Fertilisers

Incitec Pivot Fertilisers is introducing a powerful addition to DAP that will help growers keep the nitrogen where it's needed for longer, drive phosphorus uptake and potentially improve crop yields and quality.

Our new product, **eNpower™ 18:20**, is DAP coated with a patented new formulation ammonium stabiliser, DMPG.



**eNpower™**  
18:20

It works just like **ENTEC®**, by inhibiting the nitrifying bacteria in the soil, stopping them from converting the ammonium nitrogen to nitrate nitrogen. If you've had experience with ENTEC, you'll know the advantages this can bring. It can mean better nitrogen efficiency, reduced losses from leaching, runoff and denitrification, better protection in the wet and a nitrogen supply that better matches crop demand.

Incitec Pivot Fertilisers developed the new formulation ammonium stabiliser because DAP and ENTEC were not chemically compatible. DAP is a key planting fertiliser for sugar cane and range of other tropical and temperate crops, so this is an important step towards better outcomes for more growers.

### Matching nitrogen supply with crop demand

The best fertiliser programs match nutrient supply with crop demand to avoid over and under application and to help crop growth progress towards optimum yields and quality. This is easier said than done!

In most vegetable and summer crops, nitrogen demand increases after planting as the crop grows, then peaks at 40-70 days after planting. If most of the nitrogen is applied at planting or within the first month, this can result in a lot of nitrate nitrogen available in the soil that the crop can't yet use. This nitrate nitrogen is vulnerable to losses, particularly in the case of heavy rainfall or unexpected rain following irrigation.

Nitrate leaching occurs when nitrates move down through the soil profile beyond the root zone. Leaching losses can be significant, particularly on lighter soil types with a cation exchange capacity (CEC) of 4 or less. Denitrification occurs where soil oxygen has been depleted in high soil moisture situations, and results in the loss of nitrogen to the atmosphere.

In cane, nitrogen is important for early vigour and successful establishment, so protecting the planting fertiliser by using eNpower 18:20 may help better match nitrogen requirements between planting and the last side dress opportunity prior to out of hand stage.

Using eNpower 18:20 provides an alternative for growers looking to better match nitrogen supply with crop demand by keeping the nitrogen in the soil in the ammonium form until it is needed by the crop. Ammonium nitrogen is not subject to leaching or denitrification losses. Most crops, including sugar cane and maize, prefer ammonium nutrition, so there is no delay in the availability of nitrogen. In fact, eNpower 18:20 could help promote quality and consistency in produce in some crops by reducing the incidence of nitrate flushes.

Using eNpower 18:20 is a good way to set crops up for success, whatever the season. Australia's tropical and sub-tropical cropping regions are subject to unpredictable rainfall, and while good rains can lead to good yields, they can also rob the crop of nitrogen. Using eNpower 18:20 helps protect nutrients for when the crop needs them most.

## Driving phosphorus uptake

Phosphorus is essential for photosynthesis, plant growth and crop development and is the most expensive macro nutrient. Switching from DAP to eNpower 18:20 has the potential to increase the uptake of phosphorus by two mechanisms.

Firstly, phosphorus uptake is strengthened when crops take up ammonium nitrogen rather than nitrate nitrogen. As the plants absorb the positively charged ammonium nitrogen, they naturally compensate by seeking out negatively charged nutrients such as orthophosphate (phosphorus). This effect can give emerging cane crops a better start.

Secondly, the use of ammonium stabilisers promotes rhizosphere acidification, via a process referred to as partial ammonium nutrition. The rhizosphere is the specific zone immediately around each plant root (generally within 1 mm distance). Ammonium stabilisers make only the rhizosphere slightly more acidic while the DMPG is active.

This 'very localised' change to pH improves phosphorus and zinc availability. See Table 1. Rhizosphere influences, of which rhizosphere acidification is one example, can greatly benefit crop production.

**Table 1: Influence of the nitrogen form on uptake of other nutrients**

	pH value			Nutrient uptake (µg/m root length)				
	Root distance	Rhizosphere	P	Fe	Mn	Zn	Cu	K
Nitrate	6.6	6.6	123	55	8	7	1.4	903
Ammonium	5.7	5.6	342	71	20	13	2.0	1127
Ammonium with N inhibitor	6.6	4.5	586	166	35	19	4.6	1080

Source: Adapted from Thomson et al. (1993) *J. Plant Nutr.* 16, 493-506.

## The nitty gritty

As with ENTEC, eNpower 18:20 will only be available from accredited advisers who have proven their understanding of the product by satisfactorily completing a training course and assessment. This helps ensure the best practice use of eNpower 18:20 for the best possible results in crop.

Growers will be able to use eNpower 18:20 as a straight or in blends. As with any fertiliser decision, it should be based on a sound understanding of the soil nutrient status and the requirements of the crop. Always arrange soil testing and analysis through the [Nutrient Advantage](#)® laboratory to determine an appropriate fertiliser strategy.

In Incitec Pivot Fertilisers' incubation trials, the DMPG ammonium stabiliser has been shown to be effective on other nitrogen fertilisers present in blends with eNpower 18:20.

However, to ensure the ammonium stabiliser works effectively in a blend, eNpower 18:20 must provide at least 50% of the total nitrogen in the blend.

Starter fertilisers for cane vary widely depending on soil fertility and the needs of the crop. Some popular planting fertiliser blends such as CK 55, CK 55(Zn), CK 66 and DAP(S) can be made using the new eNpower 18:20 instead of DAP.

Urea blends are not recommended for use at planting in cane. ENTEC urea will continue to be recommended for sidedressing in plant cane situations and in ratoon cane where growers are looking to protect their nitrogen investment against losses.

To find out more about eNpower 18:20, read the [eNpower 18:20 sugar brochure](#) or contact me by calling 0428 111 471 or via email [rob.dwyer@incitecpivot.com.au](mailto:rob.dwyer@incitecpivot.com.au).