

## Broadacre nutrition trials

Incitec Pivot's manages more 60 trial sites across eastern Australia. The 2008 trials included investigating the timing and placement of fertiliser applications, economic rates of nitrogen and phosphorus as well as the efficiency gains made by various products.

Incitec Pivot's Market Development Agronomists provide the following R&D overviews into key research and development activities during 2008.

### Jim Laycock, Cowra, NSW

In 2008 the long term phosphorus and nitrogen nutrition field trial located at Grenfell to investigate the long-term effects of nitrogen and phosphorus use on productivity and soil health showed significant grain yield responses to phosphorus up to 20 kg P per hectare, compared with nil phosphorus.



Jim Laycock.

There were no significant responses in grain yield to rates of 30 kg P per hectare and 40 kg P above the 20 kg P per hectare rate. All phosphorus treatments were sown over the top of the same phosphorus rate treatments used in 2007 with a starting Colwell P of 29 mg per kg in 2007.

Applications of phosphorus up to 20 kg P per hectare applied as triple superphosphate also increased water use efficiency by up to 40 per cent over the nil phosphorus control. But growers must also be aware when growing wheat on wheat, yellow leaf spot may reduce yield potential.

An enhanced nitrogen field trial at Spring Ridge held last year has shown that current techniques for nitrogen budgeting and assessment may be inadequate for sorghum/fallow/durum wheat rotations on the Liverpool Plains.

The trial investigated canopy management and ways to maximise returns from enhanced nitrogen products. There was a significant grain yield response to both urea and EASY N fertiliser at planting when applied at 140 kg N per hectare.

A late harvest and rainfall at harvest affected quality and protein levels. To achieve target yields and proteins, and depending on soil nitrogen levels, more than 200 kg N per hectare of applied nitrogen may be required under favourable seasonal conditions on the Liverpool Plains.

A Granulock phosphorus field trial at Werris Creek held during 2008, which investigated the economic benefits of Granulock products compared with a range of other starter fertilisers, has shown a significant grain yield response to 20 kg P per hectare, compared with nil phosphorus.

The 2009 trial program in New South Wales will continue to investigate liquid fertilisers and build on the liquids response curve data with trial sites located at Gulgandra, Canowindra, Grenfell and Mullaaley

### Bruce Ramsey, Wagga Wagga, NSW

Field fertiliser trials at Griffith and Grogan in New South Wales held in 2008 during the winter crop season continue to support the argument for increasing critical soil Colwell P values in southern New South Wales.

Starter fertilisers used in the trial included triple superphosphate, MAP, DAP, AirSeeder SuPerfect, Granulock SuPreme Z and EASY NPK 27 fertilisers.

ENTEC was also applied to MAP, DAP and Granulock SuPreme Z to test the crop's response to the nitrification inhibitor.

The trials at Grogan showed significant response to the application of phosphorus up to 20 kg P per hectare at Grogan (Colwell P 37 ppm).

But on the high phosphorus soils at Griffith (Colwell P 104 mg per kg), there was no response to phosphorus.



**Bruce Ramsey**

Time of sowing trials also held at Grogan showed that yield increased by 20 per cent when phosphorus was applied at the end of May rather than the end of June.

**Rob Christie, Horsham, Victoria**

Phosphorus and nitrogen trials across the cropping regions of Victoria in 2008 continue to show that applications of these nutrients can still provide good yield responses.

The 2008 results from Incitec Pivot's long-term field trial site at Dahlen continue to show that 9 kg per hectare of phosphorus and 20 kg per hectare of nitrogen are the top returning strategies for maintaining phosphorus levels and providing adequate nutrition in the Wimmera region.

Soil test results from the site also show that applications of 9 kg per hectare of phosphorus maintain and even slightly increase phosphorus levels in the soil.

A similar trial held at Bordertown during last year's winter crop (in conjunction with Jolpac Rural Supplies) also assessed responses to phosphorus applied at rates of 0, 8, 16 and 24 kg per hectare, and nitrogen applied at rates of 0, 20, 20 + 20 split, 40 and 80 kg per hectare.

There was a significant yield response to phosphorus applications at rates of 16 and 24 kg per hectare at harvest. But there was no yield response to the application of 8 kg P per hectare, compared with the control of 0 kg P per hectare, and no response to nitrogen application rates was apparent.

These were very encouraging phosphorus responses, particularly in the face of such dry spring conditions.



**Rob Christie.**

Another field trial at Clunes conducted by the Central Highlands Farming Systems group during 2008 also highlighted the importance of phosphorus fertiliser placement.

Placement of phosphorus near the seed at sowing is important to achieve yield potential.

The optimum economic rate was 10 kg P per hectare in a season characterised by low rainfall and low yields. The highest yields on average were achieved when phosphorus was applied at 20 kg P per hectare.

Grain protein responses occurred only when phosphorus application rates were adequate.

Specialty phosphorus product trials held at the Southern Farming Systems' trial site at Mininera (Victoria's Western District) during 2008 also indicated that there is a significant yield response to the application of phosphorus.

In a region where the acidic soils tend to be phosphorus responsive, data indicated that there was a significant yield response to the application of 20 kg P per hectare.

Findings from solid versus liquid fertiliser trials held in conjunction with Incitec Pivot and the Birchip Cropping Group, Agritech Rural, Jolpac Rural Supplies and the Victorian Department of Primary Industries and Agriculture at Sea Lake, Waitchie, Hopetoun, Walpeup, Bordertown and Horsham sites have shown that liquid fertilisers, such as EASY NP+Zn and EASY NPK 27, perform as well as solid fertilisers.

**For more information on any Incitec Pivot trial, contact your local distributor agronomist.** ■