

Project No.: YP1/ 02

Project Title: Liquid Fertiliser Evaluation in Medium Rainfall Alkaline Soils

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Executive Summary

Project Aims

1. To quantify the effectiveness of liquid fertilisers in medium rainfall alkaline soils.
2. To evaluate and demonstrate available equipment for liquid fertiliser application & to conduct a cost benefit analysis of adoption of liquid fertilisers in the farming system.

Trials conducted in 2003 and 2002 now represent a small database of fluid P fertiliser performance on Yorke Peninsula. Although our experience is still pretty limited, some patterns are emerging.

The performance of fluid fertilisers when compared to granular fertilisers is very site specific with soil type, rainfall and crop choice impacting on comparative grain yield and grain quality.

Fluid P fertilisers have shown little promise with cereals on the calcareous brown loams around Minlaton as their performance has been no better than granular products.

On the highly calcareous sands South of Warooka in medium rainfall fluid P fertilisers are slightly more effective but with current pricing structures, the economic returns from shifting to fluids appear to be marginal. The performance of fluids with beans in 2003 suggest that the pulses may benefit more from fluids than cereals. A small reduction in the cost gap between fluid and granular P products would quickly make fluid P fertilisers more attractive in this environment.

In the drier environments along the west coast of YP and on those highly calcareous sands, fluids would seem to have a clear advantage. The results in barley in 2003 closely matched the performance of fluid P fertilisers in similar situations on Eyre Peninsula, so it is reasonable to expect that the good performance of fluids at West of Minlaton in 2003 are reliable and could be expected to be frequently repeated. This site was strongly responsive to P with Keel barley yields increasing by 50% with high rates of P fertiliser. Under these conditions, fluid fertilisers were much more effective than granular 18:20 at supplying P to the crop and producing high grain yields. For example, yields achieved with 15 kg P/ha as granular 18:20 were realised with only 2.5 kg P/ha as fluid APP. The phosphoric acid based products were more efficient again than APP. At 5 kg P/ha, the phosphoric acid products produced 400 kg/ha more grain than 15 kg P/ha of granular 18:20 and 300 kg/ha more than APP. One feature of the phosphoric acid products, which was present in several trials this year, was that doubling the rate of product, from 5 to 10 kg P/ha caused little

improvement in crop performance and sometimes made it a bit worse. We have not yet been able to explain this behaviour but it may be worthy of further investigation. With the current pricings for fluid fertilisers (2-3 times more expensive per kg P than granulars), fluids would have easily produced a better financial outcome in this paddock if conditions had been similar right across the paddock.

Fluid P and Legumes

Despite problems with blockages in seeding boots due to the large Fiesta beans, at the trial south of Warooka fluid P fertilisers were agronomically superior to granular triple super on beans on calcareous sands. There was little difference in the yield of beans with either fluid fertiliser type but, on average, APP resulted in nearly 200 kg/ha more grain at the same rate of P/ha as triple super. This yield increase would be worth \$50/ha, which would pay for the extra purchase cost of fluid P fertiliser. The response to P was moderate in this trial with a maximum increase in yield of 25% at the highest rate of APP.