

Summit Granular and Liquid P comparison

Aim: To evaluate granular and liquid P fertilizer sources on high fixing soils

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Location: Gairdner



Background:

Liquid phosphorus has been shown to be effective on the calcareous soils of the Eyre Peninsula, South Australia. These soils have very high pH and effectively lock up both P and Zinc. This demo aims to evaluate liquid phosphorous as VigourFLO and MAPZFLO with granular compound MAP.

Trial Details:

Plot size and replication	12*50m, 2 reps plus 3 controls		
Soil type	Sandy loam		
Sowing date	30 th May, 2003		
Conditions at sowing	Moist		
Machinery	Ausplow E-Series Multi stream DBS @ 12"		
Seeding rate	Gairdner @ 65kg		
Fertiliser	N Basal to 45kg with Nitroplus		
Herbicides and Insecticides	Roundup	1.5	L/ha
	Trifluralin	2	L/ha
	Chlorpyrifos	1	L/ha
	Triad	800	ml/ha
Paddock History	2002 =Wheat, 2001 = Pasture, 2000= Wheat		

Soil Test results:

Depth (cm)	P (ppm)	K (ppm)	Cu (ppm)	Zn (ppm)	S (ppm)	PRI	pH
0 – 10	45	189	0.3	0.4	32	39	5.2

Results:

Granular & Liquid P comparison, Gairdner 2003

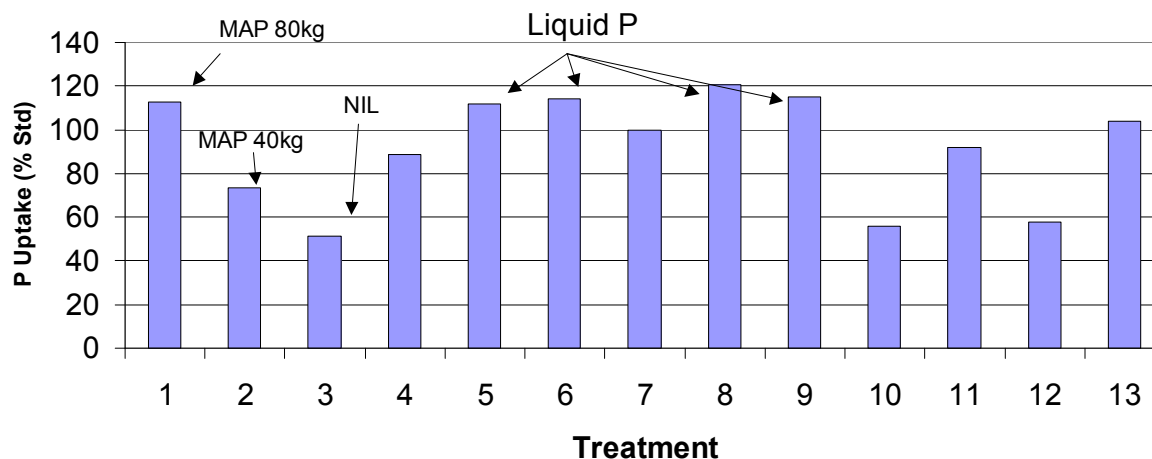


Figure 1. Gairdner Barley P uptake from various phosphorus P sources

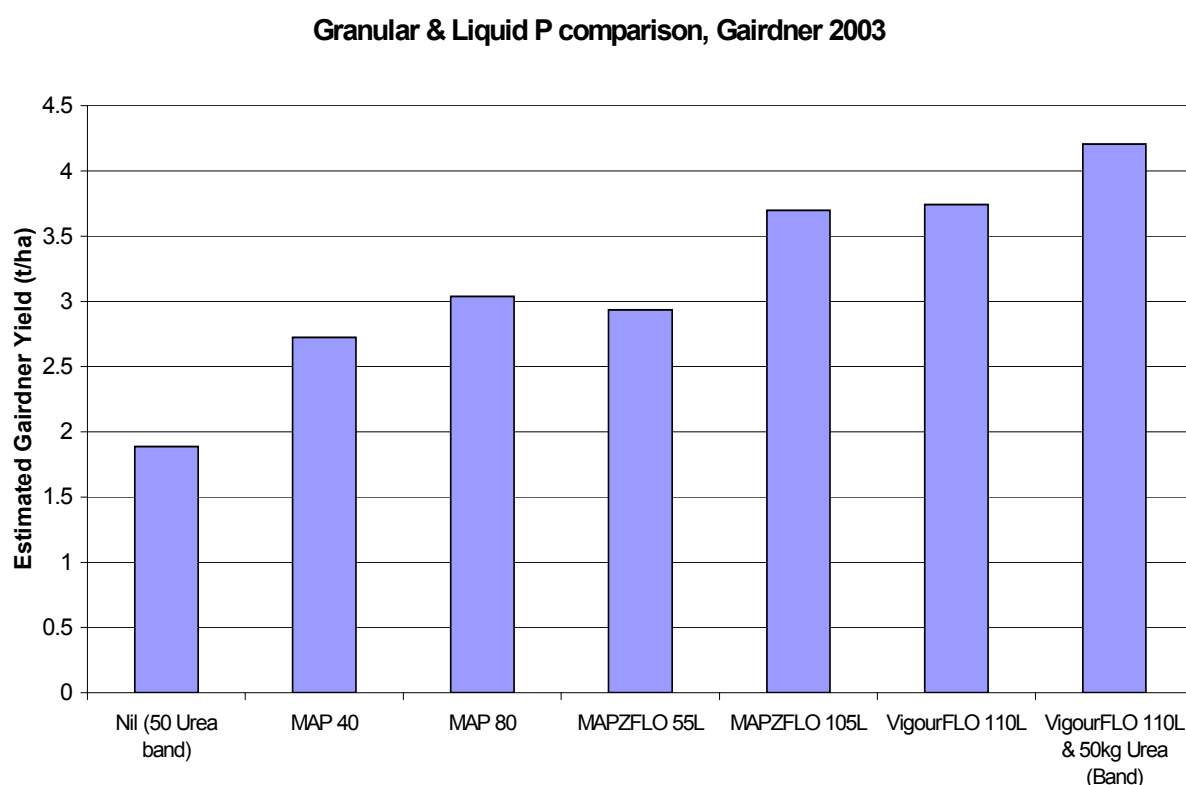


Figure 2. Estimated Gairdner grain yield (after accounting for lost heads) (t/ha) with various phosphorus treatments.

This trial suffered enormous grain loss from poor Gairdner head retention (up to 180 heads/m²). Plots were harvested and heads were then counted using 4x1m squares per plot. Estimated grain loss was then added to the harvested plot weights.

At equivalent rates of phosphorus, the liquid fertilizer treatments produced more grain yield than their granular comparisons. In this instance, 55L and 105L of MAPZFLO produced more grain yield than 40kg and 80kg of MAP respectively. This may have been due to improved P uptake from the Liquid P treatments (Figure 1). Liquid phosphorous fertilizers have been shown to be effective on the calcareous soils of the Eyre Peninsula. These soils have very high pH and effectively lock up both P and Zinc mainly due to their calcareous mineralogy. Zinc and phosphorous deficiencies are common on high pH soils in Western Australia, however this is mainly due to iron oxides and not calcium. Little research has been conducted on liquid P fertilizers in Western Australia. The better grain yield responses of the liquid fertilizers have been a source of much conjecture. Many researchers now believe it is due to less soil sorption of P in the liquid phosphorous fertilizer compared to the granular. These liquid P fertilizers are also thought to help release 'fixed P' from the soil.

All treatments were feed grade as screenings were all above 40%. The highest protein came from the 110L VigourFLO + 50kg Urea treatment (12.4%).

There also appeared to be a potassium response at this site. VigourFLO applied at 110L was equally effective as 105L MAPZFLO, even though it supplied 6kg P less. At 110L, VigourFLO supplies 10kg potassium. This result was unexpected as the soil test result suggests an unlikely potassium response. VigourFLO applied at 110L with 50kg Urea banded below was the highest yielding treatment showing the better efficacy of nitrogen when it is placed in the seed row, away from germinating seed.

Summary:

- Liquid P fertilizer increased grain yield above granular at equivalent P rates