JumpStart Trial

Adam Hancock, Elders Rural Services 0427 475 254 adam.hancock@elders.com.au

Key Outcomes:

- JumpStart is phosphate inoculant containing naturally occurring soil fungi
- Trial showed no significant difference in JumpStart treatments
- Significant yield increases achieved with increasing phosphorus rates
- DGT test results suggest JumpStart increases plant available P residual for following crop

Trial Objectives: This trial was used to determine the efficacy and yield response of JumpStart as a seed coat on spring sown barley and to measure any residual plant available phosphorus for the following crop.

Trial Duration: 2012 Season
Location: Conmurra
Soil Type: Black clays over lime stone
Paddock History: 2011 Beans, 2010 Permanent pasture
Crop Type/Variety: Barley – Gairdner
Sowing Date: 10/9/12 **Harvest Date:** 10/1/2013

Monthly Rainfall:

Rain	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	April-Oct	Total
Conmurra (NRM)	9	7	34	39	51	151	71	121	42	39	29	11	514	604

Yield Limiting Factors: Plots were sown 14 days after ideal sowing date, below average spring rain.
Type of Trial: Strip plot design with 3 replicates
Trial Design: 8m Long plots x 8 rows x 15cm Spacing's, Randomised block Design with 3 replicates

Treatments:

All trials were sown with small plot equipment and managed as per usual agronomic treatment. Barley variety chosen was Gairdner sown at 80kg/ha equilivent on the 10th of September. Seed was inoculated with the JumpStart according to the application

instructions, see Appendix 1. All plots were sown with 61g of Urea, the 10 Units of P was 59g/plot Triple Super and 119g/plot Triple Super to achieve 20 units.

Trial Layout:-

	Buffer(Bolac)		Buffer		Buffer
1	Nil 10P	7	Nil 0P	13	Nil 10P
2	Jumpstart 10P	8	Jumpstart 0P	14	Jumpstart 10P
3	Jumpstart 0P	9	Jumpstart 20P	15	Jumpstart 20P
4	Nil 0P	10	Nil 20P	16	Nil 20P
5	Jumpstart 20P	11	Jumpstart 10P	17	Jumpstart 0P
6	Nil 20P	12	Nil 10P	18	Nil 0P
	Buffer		Buffer		Buffer

The trial site was soil tested before sowing using the APAL soil test to measure soil P using several methods including DGT, Colwell-P and Total P, this was to compare with a soil test taken after harvest on the Nil Jumpstart 10P and Jumpstart 10P with sample taken in the seed row.

Evlauations where made by measuring yield from a small plot harvester.

Results

Figure 1: Results of Jumpstart treated and untreated

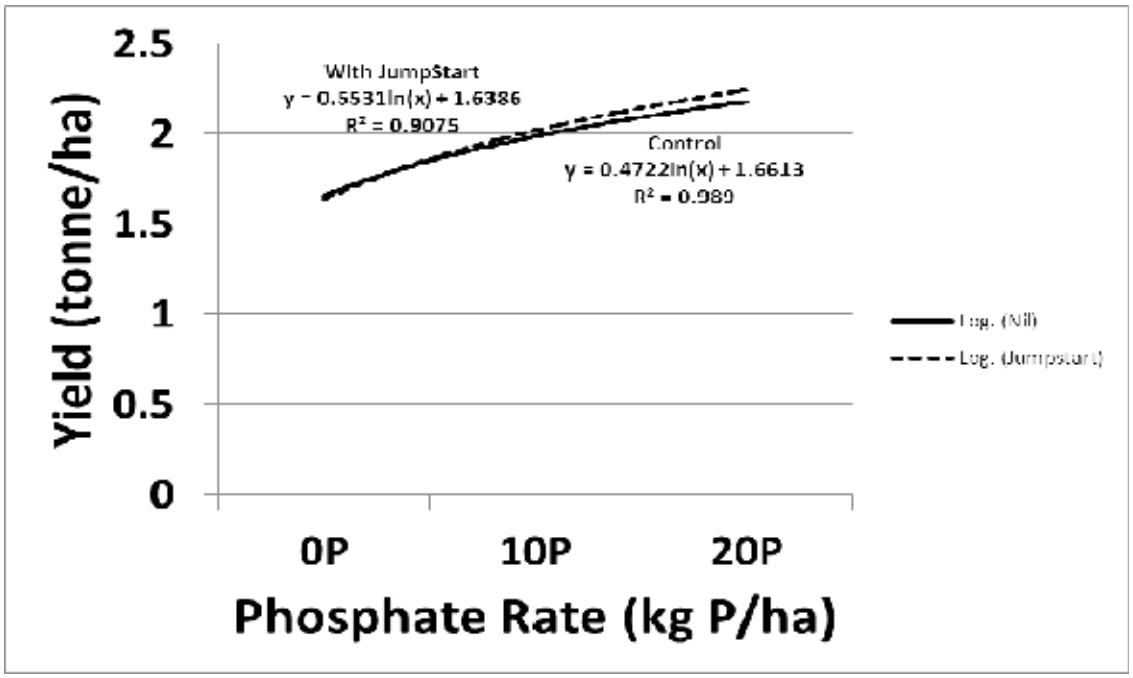


Figure 2: Barley Yield across Phosphorous treatments

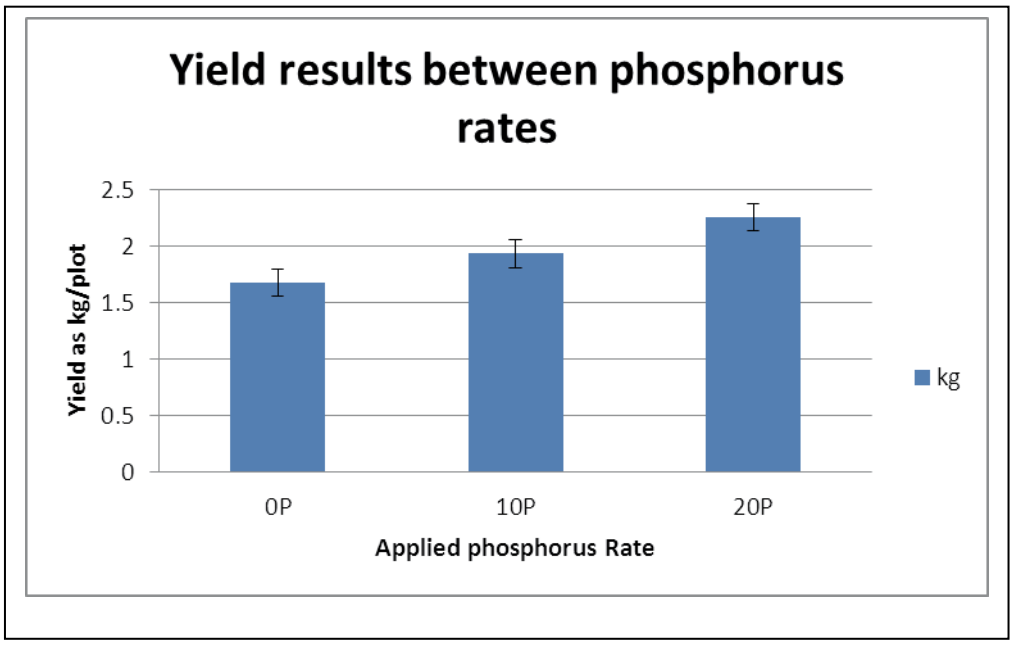
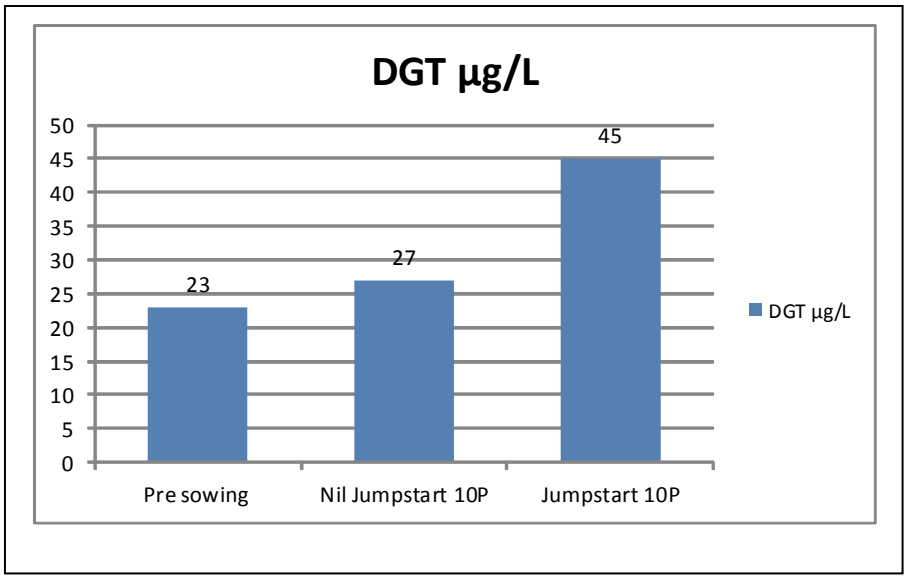


Figure 3: Soil DGT Phosphorous levels after treatments



Conclusion & Comments

JumpStart is a granular product which contains the fungus *penicillium bilaii*, discovered by the DPI's in Canada, this fungus colonises plants roots growing outwards extending the root system reach whilst releasing organic compounds to release bound phosphorus into the soil solution in a plant available form. This extension of the root system is an advantage to the plant as the fungus can explore much more soil per unit of

carbohydrate used than a plants root system.

JumpStart has recently and successfully been used to increase plant available phosphorus to main season cereal and canola crops in soils that lock up phosphate. In this particular trial there was no significant increase in yield results achieved on any JumpStart treated plots despite the low DGT-P levels at the beginning of the season. Possible causes for this may be a combination of the lower than average rainfall for September, October and November lowering the soils overall biological activity including soil fungi, coupled with the later than ideal sowing date for spring sown Gairdner limiting the plants opportunity to take advantage of the extra Phosphorus.

The trial results suggest that using Jumpstart increases the plant available phosphorus for the following year; this is consistent with Novozymes North American experience. Further long term study is required into this residual plant available P caused by JumpStart in a commercial environment.

Table 2 shows that JumpStart is not a replacement for phosphorus fertiliser and must be applied in conjunction with minimal required upfront P.

Table 2 showing economics based on recommended retail price

Phosphate Applied (kg/ha P)	Control Yield (kg/ha)	JumpStart Yield (kg/ha)	Gross Margin[1] ($/ha)		Extra Gross Margin[2] $/ha	
			Control	JumpStart	Control	JumpStart
0	1673	1680	$418.25	$410.80	0	-$7.45
10	1957	1910	$452.75	$431.80	$34.50	$13.55
20	2200	2317	$477.00	$497.05	$58.75	$78.80

Acknowledgements

Elders Naracoorte would like to achknowledge and thank the following People and Organisations

- Lachie Seears and Family for providing the location and site.
- SARDI for there cooperation and professionalism in conducting the trial on Elders behalf
- Robert Velthuis for technical and Product Support and Treatments.
- Felicity Turner, Krysteen McElroy and the Mackillop Farm Management Group for a platform to communicate important agronomic issues to growers.

Appendix 1: Inoculant Application Instructions

Inoculant Performance Trials: JumpStart

Apply the JumpStart to seed when transferring seed from the bin to the truck, or from the truck to the seed tank or cart.

- Mix the JumpStart with cool, clean de-chlorinated water and apply to seed at the rates listed in the table below.

JumpStart Application Rates for Cereal, Canola, Grain Legumes and Sorghum:

Crop	Seed Inoculated by one 80 gram container of JumpStart	Approximate Water Volume	Planting Window (Bare Seed)
Cereal	1,630 kg	10.0 litres (5-6 litres/tonne)	30 days
Canola	90 kg	2.0 litres	60 days
Sorghum	200 kg	4.0 litres	45 days
Pea	2720 kg	8.0 litres (3 litres/tonne)	15 days
Chickpea	2180 kg	6.0 litres (3 litres/tonne)	15 days
Lentil	1630 kg	5.0 litres (3 litres/tonne)	15 days
Lupin	2720 kg	8.0 litres (3 litres/tonne)	15 days
Faba bean	1630 kg	5.0 litres (3 litres/tonne)	15 days
Clover	100 kg	2 litres	15 days
Lucerne	100 kg	2 litres	15 days
Medic	100 kg	2 litres	15 days

JumpStart Seed Treatment Compatibility

- Application with seed-applied pesticides is possible but will reduce planting windows in some cases. Limited compatibilities are provided on the label.

	Planting Window	
Crop and Seed Treatment	Sequential Application	Simultaneous Application
Canola		
Jockey	60 days	60 days
Wheat		
Dividend	30 days	30 days
Hombre	28 days	28 days
Jockey	30 days	30 days
Premis Protect	30 days	30 days
Raxil T	30 days	30 days
Real 200C	30 days	30 days
Vincit C	30 days	30 days

- The JumpStart can be applied sequentially or simultaneously with seed-applied pesticides. Sequential application means the seed treatment must be applied and allowed to dry before the inoculant is applied. Simultaneous application means the seed treatment can be applied at the same time as the inoculant but separate applicators must be used.