Response to Pr-70 in Wheat

Aim: To determine whether the seed inoculant, Pr-70, is economical on acid sands at Jibberding. The inoculant will be used in conjunction with increasing rates of phosphorus to determine the most profitable return for farmers in the region.

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Company: Elders Limited

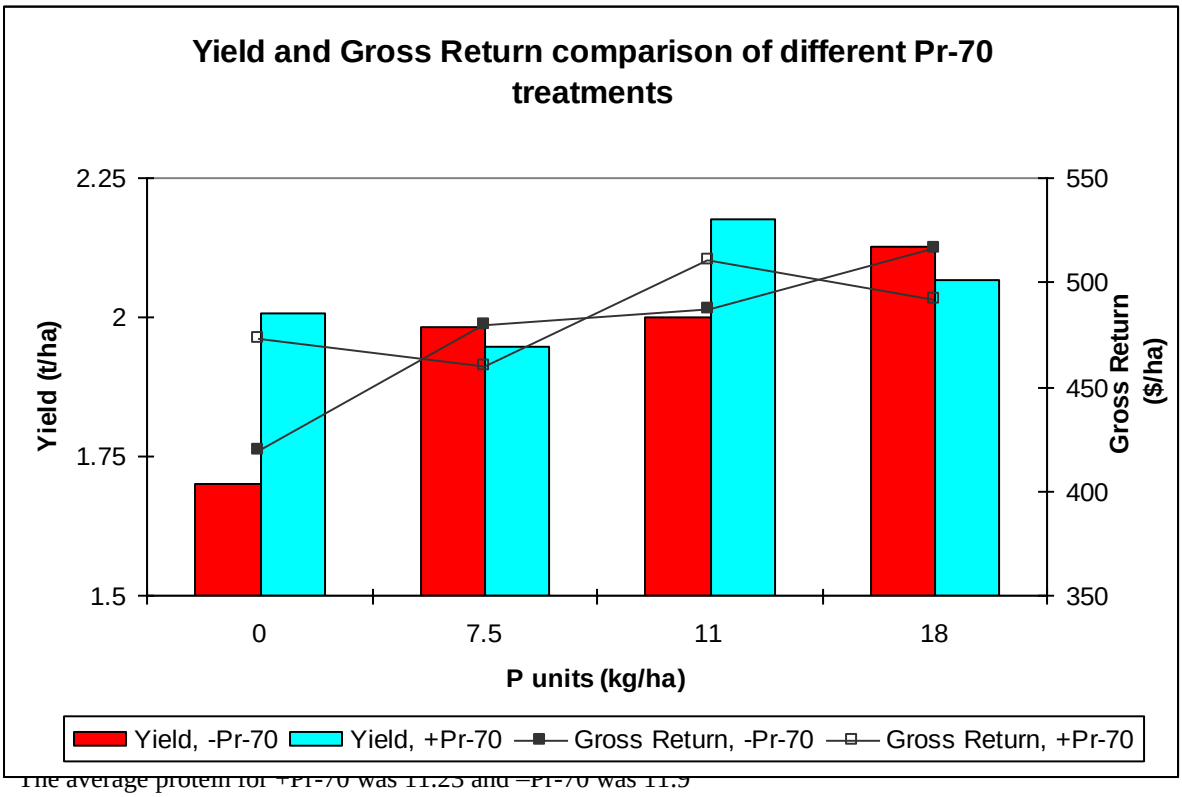
Farmer: Keith Carter
Location: Liebe Group Main Trial Site, Jibberding Hall Rd, Wubin

Background: Past research has shown that only 20-30% of applied P in any given year is actually accessible and taken up by wheat plants. What happens to the rest? The majority of this is locked up by Ca, Mg, Al and Fe ions, and availability depends on the pH and reactive iron status of the soil. Considering it is quite time-consuming and slightly expensive to treat soils with products such as lime, dolomite and gypsum, there have been a number of other options presented to the industry over the past few years. The inoculant Pr-70 is one of these. It is a P-solubilising fungi applied to the seed and claims to "unlock, locked-up P" and hence make it available to wheat plants. Found in Wagga Wagga, NSW, it has shown considerable yield increases in trials across Australia. WA trials have shown less improvement with results variable from site to site. This trial attempts to test the effectiveness of Pr-70 in a Jibberding soil in the 2003 season.

Trial Details:

Plot size and replication	1.6 x 20m with 2m centres, 4 reps in a Randomised Complete Block Design
Soil type	Light acid sand with a percentage of gravel
Sowing date	29th May, 2003
Conditions at sowing	Poor, into a drying seedbed
Machinery	Min-till small plot cone seeder – Knife points on chisel tynes at 20cm row spacing with press wheels
Seeding rate	Wyalkatchem wheat @ 80 kg/ha
Fertiliser	Double Phos at varying rates
Herbicides and Insecticides	May 21st 2003: Knockdown 1– Roundup dry (680gai) 1.3 kg/ha, Ester 80 300 mL/ha, Hammer 40 g/ha Hasten 1% May 29th 2003: Knockdown 2– Roundup Max 2 L/ha, Ester 80 300 mL/ha, Hasten 0.5% July 23rd 2003: PO1 – Hoegrass 1.5L, Barracuda 750mL, BS1000 0.2% August 26th 2003: PO2- Hoegrass 350mL, Achieve 250g, 0.75% Supercharge
Paddock History	2002 = Failed lupins, 2001 = Wheat, 2000 = Pasture

Results:



The average protein for +Pr-70 was 11.25 and –Pr-70 was 11.9

These were used to generate the above Gross Returns. Values were based on the APW golden rewards matrix and assuming $8/ha of Pr-70.

Summary:

- The Jibberding site showed a positive and linear response to increasing P with no Pr-70. Yield increased from 1.7 to 2.1 t/ha.
- There was a positive response with Pr-70 when using less than 11 units applied P.
- Pr-70 improved yield by 0.3 t/ha under 0 units of added P. This yield was equivalent to 7.5 and 11 added units of P without Pr-70.
- Similar responses to Pr-70 have been shown in other trials in WA in 2003.
- Local Pr-70 trials in the last few years have indicated no response to the inoculant, however this may have been due to the extreme drought conditions experienced in those years.
- Improved grain quality characteristics are an added bonus especially for noodles.
- There was no gross return improvement with Pr-70 at higher P application rates.
- Improving extraction of soil P at low rates using Pr-70 may have long term effects on soil fertility if not monitored carefully.

Technically reviewed by: Bevan Addison