Residual Nitrogen and Phosphorus

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Purpose: To determine the residual value of nitrogen (N) and phosphorus (P) applied in 2011

Location: Badginagarra (John Scotney's farm)

Soil Type: Red loamy sand

Soil Test Results (2011):

Depth (cm)	pH	EC	OC	Nit N	Amm N	P	PBI	K	S	Ex Ca	Ex Mg	ECEC	Ex Al%	Al
0-10	4.8	0.10	1.1	40	4	14	31	128	5	2.9	0.31	4	2	1
10-20	4.5	0.05	0.4	15	2	8	17	47	3	1.3	0.13	2	11	3
20-30	4.2	0.03	0.2	7	4	4	17	41	5	0.6	0.08	1	25	5
40-50	4.2	0.02	0.1	1	1	3	37	46	12	0.6	0.09	1	6	

Rotation: 2009 and 2010: pasture; 2011: canola

Growing Season Rainfall (April- October 2012): 337mm

BACKGROUND SUMMARY

To determine the residual value of nitrogen (N) and phosphorus (P) applied to canola in 2011.

Soil tests indicated that this site should be very responsive to P.

There was a 0.4 t/ha response to P in 2011 canola but no response to N.

TRIAL DESIGN

Please insert methodology and any design details which could include:

Plot size: 20 * 2.5m

Machinery use: Primary Sales Seeder

Repetitions: 3

Crop type and varieties used: Mace wheat

Seeding rates and dates: 79 kg/ha

Fertiliser rates and dates: Various. NS41 top ups 19 Jul and 14 Aug

RESULTS/STATISTICS

	2012					2011		Harvest
	Banded	Z13	Z30					Yield
Trt	(kg/ha)	(kg/ha)	(kg/ha)	N	P	N	P	(t/ha)
1	-	-	-	0	0	0	0	3.41
2	136 Double Phos	-	-	0	24	0	24	3.83
3	136 Double Phos	-	-	0	24	40	24	4.02
4	136 Double Phos	-	-	0	24	60	24	4.00
5	136 Double Phos	114 NS41	114 NS41	80	24	80	24	4.48
6	-	114 NS41	114 NS41	80	0	80	0	3.76
7	-	114 NS41	114 NS41	80	0	80	8	3.83
8	-	114 NS41	114 NS41	80	0	80	16	3.83
9	90 Double Phos	114 NS41	114 NS41	80	16	40	16	4.01
10	136 Double Phos	114 NS41	114 NS41	80	24	80	24	4.41

	Prob	<0.001
	Lsd	0.33

FINANCIAL ANALYSIS OF RESULTS

2012 Wheat						2011 Canola						2 Year
Trt		Yield	Returns	Cost	Profit	Trt		Yield	Returns	Cost	Profit	Profit
N	P	(t/ha)	($/ha)	($/ha)	($/ha)	N	P	(t/ha)	($/ha)	($/ha)	($/ha)	($/ha)
0	0	3.41	-	-	-	0	0	2.10	-	-	-	-
0	24	3.83	116	92	23	0	24	2.63	265	91	174	197
0	24	4.02	168	92	75	40	24	2.39	146	155	-9	66
0	24	4.00	162	92	70	60	24	2.64	270	189	81	151
80	24	4.48	294	226	68	80	24	2.64	271	219	52	120
80	0	3.76	96	134	-38	80	0	2.25	73	128	-54	-92
80	0	3.83	116	134	-19	80	8	2.30	99	158	-59	-78
80	0	3.83	116	134	-19	80	16	2.31	106	189	-83	-101
80	16	4.01	165	195	-30	40	16	2.30	99	125	-25	-55
80	24	4.41	275	226	49	80	24	2.77	336	219	117	165
	Prob	<0.001					**Prob**	0.007				
	Lsd	0.33					**Lsd**	0.319				

Assumptions: 2012 wheat $275/t; 2011 canola $500/t; March 2011 and 2012 fertiliser prices + freight + application costs. Economics based on returns from fertiliser.

OBSERVATION/ DISCUSSION/ MEASUREMENTS

This trial yielded 3.4 t/ha without fertiliser but there were still good responses to nitrogen (N) and phosphorus (P). The application of both nutrients increased yields up to 4.5 t/ha.

There was a 0.6 t/ha response to 80 kg N/ha and a 0.7 t/ha response to 24 kg P/ha.

24 kg P/ha applied in both years produced 0.4 to 0.5 t/ha more than where 16 kg P/ha applied both years.

Residual responses to N and P applied in 2011 were not significant.

NS 41 applications increased protein from about 12.3% to 13.3%. Hectolitre weights were about 77 kg/hl and screenings averaged 1%.

The most profitable treatment over the two years of the trial was 24 kg/ha (136 kg/ha Double Phos) applied both years.

PEER REVIEW/REVIEW

Owen Langley

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