

Nitrogen and Potassium Applications for Wheat

Aim: Compare N x K applications and in-furrow fungicides for wheat.

Research Officer: Stephen Loss, Luigi Moreschi

Company: CSBP Ltd.

Farmer: Liam Carter

Location: Main Trial Site, West Buntine



Grow to your full potential.

Background: The occurrence of potassium (K) deficiency is expanding rapidly in WA. This problem is usually corrected by topdressing with Muriate of Potash (MoP) but recent trial work has shown banded K is more efficient. A number of liquid (Flexi-NK, Flexi-NPK) and solid fertilisers (K-Till and MacroPro) containing K are now available. Responses to K and nitrogen (N) are often closely linked. There is also increasing interest in banding in-furrow fungicides in liquid fertilisers as a flexible and cost effective method of early disease control.

Trial Details:

Plot size and replication	2 x 20m, 3 reps
Sowing	3 rd June into soil moisture with knifepoints + press wheels.
Seeding rate	75 kg/ha Arrino
Herbicides and Insecticides	3 rd June; 1.5L Roundup PowerMax + 2L trifluralin + 35g trisulfuron+1Lchlorpyrifos. 13 th July: 900mL Giant
Paddock History	2003 = Lupins

Soil Analysis	Description	pH	Salt	OC	N(Nit)	N (Amm)	P	Fe	K	S
0-10cm	Brown grey loamy sand (over gravel)	5.1	0.1	1.1	13	4	30	384	45	7.7

	Treatments Banded at sowing kg/ha	Sowing (TD/ boom) kg or L/ha	4WAS L/ha	Total kg/ha		
				N	P	K
1	71 AgstarExtra + Impact*	45L Flexi-N	-	31	10	0
2	81 KTill Plus + Impact + 4 Urea	20 Potash + 45L Flexi-N	-	31	10	20
3	81 KTill Plus + Impact + 4 Urea	80 Potash + 45L Flexi-N	-	31	10	50
4	71 AgstarExtra + Impact	45L Flexi-N	100 Flexi-N	73	10	0
5	81 KTill Plus + Impact + 4 Urea	20 Potash + 45L Flexi-N	100 Flexi-N	73	10	20
6	81 KTill Plus + Impact + 4 Urea	80 Potash + 45L Flexi-N	100 Flexi-N	73	10	50
7	71 AgstarExtra + Impact	20 Potash + 45L Flexi-N	100 Flexi-N	73	10	10
8	81 KTill Plus + Impact + 4 Urea	45L Flexi-N	100 Flexi-N	73	10	10
9	(71 AgstarExtra + Imp) + 104L Flexi-NK		100 Flexi-N	73	10	10
10	71 AgstarExtra (no Imp) + 104L Flexi-NK	80 Potash	100 Flexi-N	73	10	50
11	(71 AgstarExtra+Imp) + 104L Flexi-NK	80 Potash	100 Flexi-N	73	10	50

12	71 AgstarExtra + (104L Flexi-NK+Imp)	80 Potash	100 Flexi-N	73	10	50
13	(88 MacroPro+Imp) + 4 Urea	45L Flexi-N	100 Flexi-N	73	10	10

Results:

The trial was sown into good soil moisture conditions in early June following useful rainfall in mid-May. June rainfall was good and establishment was 41- 45 plants per m row in all treatments at the end of the month.

Plant analysis at this stage showed no significant difference in K concentrations and levels were adequate even where K was not applied. There was a trend of greater K in the 20 and 50kg K/ha treatments, compared to lower K applications. No other nutrients seemed to be limiting growth at this stage. Plant weight was not measured at this time. Winter and spring rainfall was below average and there was no significant disease detected in the trial, hence there was no response to the application of Impact whether on the Agstar Extra or Flexi-N banded.

Grain yields at the end of the season averaged 1.7t/ha at 31kg N/ha, and about 2.0 t/ha with 73kg N/ha. There was no clear K response at either N rate (Table 1). In general there was no significant difference between K sources, with K-Till, MacroPro, Flexi-NK banded and MoP topdressed producing similar yields at 10kg K/ha.

Grain protein and screenings data were not available at the time of writing this report.

Key measurements taken on the trial.

Trt	Treatment	N	K	Jun-30 Plants/m row	Jun-30 Total N %	Jun-30 P %	Jun-30 K %	Nov-16 Yield t/ha
1	0K, 31N	31	0	41.400	4.470	0.682	3.908	1.703
2	20K, 31N	31	20	40.867	4.373	0.749	4.621	1.682
3	50K, 31N	31	50	43.567	4.473	0.683	4.532	1.692
4	0K, 73N	73	0	42.533	4.473	0.692	3.927	1.945
5	20K, 73N	73	20	43.167	4.500	0.674	4.453	2.011
6	50K, 73N	73	50	41.600	4.403	0.621	4.236	1.944
7	MoP 10K	73	10	43.400	4.523	0.631	3.867	2.022
8	KTill 10K	73	10	42.467	4.947	0.633	4.015	2.109
9	F-NK 10K	73	10	44.800	4.580	0.655	3.965	2.228
13	MacroPro 10K	73	10	41.467	4.690	0.636	4.143	2.021
10	AgstEx(No Imp)+FNK	73	50	42.067	4.037	0.652	4.095	2.135
11	(AgstEx+Imp)+FNK	73	50	41.167	4.760	0.648	3.954	2.123
12	AgstEx+(FNK+Imp)	73	50	45.100	4.337	0.638	3.797	1.939
	LSD			1.75	nsd	nsd	0.506	0.2348

Prob	0.038	0.376	0.589	0.034	<0.001
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Summary:

- Following drier than average seasonal rainfall, yields averaged 1.7 t/ha at 31kg N/ha, and about 2.0 t/ha with 73kg N/ha.
- There was no clear K response at either N level and there was no significant difference between K sources, with K-till, MacroPro, Flexi-NK banded and MoP topdressed producing similar yields at 10kg K/ha.
- Earlier plant testing suggested no response to K application was likely.

Technically reviewed by: Eddy Pol