1977

Potassium trials

W. J. Cox

SUMMARY OF RESULTS

1977

W.J. COX

1. Potassium Trials

77M01/1616EX

The pattern of accumulation of potassium by plants and movement in the soil was examined on a number of treatments. Results from the time of application study indicated the rapid movement of it and a low residual value.

0.1N HCl extractable K (ppm) 0.20 cm

Date sampled	Nil	150 at Seeding	150 at 4 weeks	150 at 8 weeks
20 May	6	58	6	6
26 May	6	48	6	6
7 June	4	57	4	4
14 June	6	23	6	6
22 June	8	29	60	8
5 July	5	20	43	5
12 July	4	19	39	4
18 July	4	19	22	56
27 July	4	17	25	46
2 August	4	19	19	26
16 August	4	19	19	23
23 August	4	18	21	22
30 August	4	16	20	19
20 September	3	10	20	17
3 October	6	11	16	16
10 November				

77M01/1616EX Rates and Times of Potassium Application on Lupins

Location: C. Mills Perron Place Badgingarra

Soil Type: 0-10 cm grey sand, 10-60 cm white sand 60-100 cm pale yellow sand.

Seeding: Spray seeded 18 May sown 88 kg ha^{-1} unicrop 19 May : Basal 206 kg ha^{-1} super manganese.

Harvest: 14 November 1977

Results: Grain yield kg ha^{-1}

Time of application	KCl kg ha^{-1}							
	0	25	50	75	100	150	200	300
At seeding	162	357	474	410	613	913	966	1087
At 4 weeks	66	484	784	701	1032	1120	1156	1341
At 8 weeks	123	319	620	649	657	781	805	933

Comment: Results confirm those in previous trials which indicated that application at 4 weeks results in higher yields than application at seeding. 8 weeks is comparable to at seeding application.

Soil Properties: 40 cores February 1977

Depth cm	pH	silt + clay %	C %	N %	CEC	Ca	Mg M eq %	K	Na	K Total 0.1NHcl ppm	
0-10 bulk profile	5.4	1	1.19	.03	3.1	1.8	0.2	<.05	.1	87	6
0-10	5.4	1.5	1.06	.03	2.6	1.7	0.2	<.05	.1	96	7
10-30	5.4	1	.32	.01	0.6	0.4	0.1	<.05	.1	85	<5
30-60	5.4	1	.11	.005	0.2	0.1	<0.1	<.05	.1	56	<5
60-100	5.5	1	.08	.004	0.2	0.1	<0.1	<.05	.1	50	<5

..2

76M01 Comparative potassium requirement of unicrop, uniharvest and CB49 - wheat in 1978

Location: P. Beer Mogumber Pastoral Company Red Gully via Gingin

Soil type: 40-60 cm grey sand overlying yellow sand and gravel

Seeding: Sown to Bokal @ 60 kg ha^{-1} 21 June with 215 kg ha^{-1} plain super.

Harvest: December 11 1977

Results: Grain Yield

	Kg Kcl ha^{-1}								
	0	30	60	90	120	180	240	360	720
CB49	333	531	472	486	538	586	378	480	476
Uniharvest	913	1128	1024	934	1225	1190	1156	1003	1187
Unicrop	969	1059	1052	1025	1118	1055	1205	1055	1093

Comment: Wheat yields closely follow the pattern of 1976 lupin dry matter and grain yield sand appear to be due to nitrogen effects rather than pottassium directly.

Soil properties:

0.1 NHcl extractable K (1:5 soil - solution ratio)

	Kg K ha^{-1}		
Depth	Nil	120	360
(cm)			
0-10	30	73	89
10-30	9	31	33
30-60	5	16	14
60-100	5	11	11

† soil sampled 25 March, 1977

77M02 Comparative potassium requirement of Unicrop, Main and CB349 lupins

Location: M. Hurst & Sons Walyer Walyer

Soil type: 0-10 cm pale yellow sand on dark yellow sand

Seeding: 23 May unicrop and main 100 kg ha^{-1}; CB49 140 kg ha^{-1} 205 kg ha^{-1} Super no topdressed before seeding and 153 kg ha^{-1} Mu super drilled with seed.

Harvest: December 7 1977

Results: Grain Yield kg ha^{-1}

	Kg Kcl ha^{-1}								
	0	30	60	90	120	180	240	360	720
CB49	629	708	708	830	844	902	857	941	864
Marri	326	371	611	854	650	764	839	968	740
Unicrop	156	256	430	507	479	458	548	597	510

Comment: Confirms initial observations made last year that yields of CB49 are higher at the low levels of applied potassium.

Soil properties:

Depth cm	pH	Silt + clay %	C %	N	CEC	Ca Me	Mg q%	K	Na	0.1 NHcl K ppm
0-10 bulk profile	5.5	1.5	1.11	.03	2.9	1.7	.3	< .05	.10	10
0-10	5.4	1.5	1.00	.03	2.7	1.5	.3	< .05	.10	14
10-30	5.2	1.5	.49	.02	1.2	.5	.1	< .05	<.05	11
30-60	5.3	1.5	.16	.01	.5	.2	<.1	< .05	<.05	< 5
60-100	5.6	4	.29	.01	1.1	.3	.1	< .05	.1	11

77M027

Comparative potassium requirement of L. angustifolius cv unicrop, T. aestivum cu bokal and T. subterraneum cv Mungarin.

Location: S. Perron, Perron Place Badgingarra

Soil Type: 0-10 cm grey sand, 10-60 cm white sand and 60-100 cm pale yellow sand.

Seeding: Bokal at 45 kg ha $^{-1}$. Nitrogen at 50 kg ha $^{-1}$ 4 and 8 weeks after seeding. Lupins as for 77M01.

Harvest: 14 November, 1977

Results:

Seed Yield Kg ha $^{-1}$

Species	Kg KCl ha $^{-1}$							
	0	25	50	75	100	150	200	300
L. angustifolius	131	191	526	621	548	862	638	1025
T. subterraneum	6	46	89	77	107	138	130	110
T. aestiuum	126	184	271	432	397	366	386	447

Comment: A part from differences in total seed yields there is a marked difference in the ability of the different species to set seed at low potassium levels.

Soil Properties: 40 cores collected February 1977

Depth cm	pH	% silt + clay	C %	N %	CEC	Ca	Mg	K	Na	K Total ppm	K 0.1NHcl ppm
						M eq %					
0-10	5.4	1	1.2	.03	2.6	1.8	.2	<.05	.1	96	9
10-30	5.3	1.5	0.9	.03	2.4	1.4	.3	<.05	.1	85	5
30-60	5.2	1	.2	.01	0.3	.2	.1	<.05	.05	56	<5
60-100	5.3	1	.2	.005	0.3	.2	.1	<.05	.05	50	<5

76M03 Sources of potassium - muriate vs Langbeinite

Location: P. Beer Mogumber pastoral Co., Red Gully Road

Soil type: 40-60 cm grey sand over yellow sand and gravel

Seeding: Seeded 21 June 60 kg ha $^{-1}$ Bokal with 215 kg ha $^{-1}$ plain super

Harvest: December 1977

Results: Mean grain yields Kg ha $^{-1}$

	Kg Kcl ha $^{-1}$							
	0	25	50	75	100	150	200	300
Kcl	1141	1194	1153	1319	1254	1257	1303	1268
longbeinite	1100	1127	1250	1217	1255	1146	1264	1240

Comment: Wheat yields closely follow the pattern of 1976 lupin dry matter and grain yields. There is no difference between sources.

77MO27

The movement of potassium in the soil and accumulation in plants during the season was examined on a number of treatments.

The changes in 0.1 NHcl extractable K on the 0, 75 and 150 kg ha^{-1} K treatments for each species are tabulated below for the 0-20 cm soil depth.

Date	L. angustifolius			T. subterraneum			T. aestiuum		
	0	75	150	0	75	150	0	75	150
13 April									
20 May	6	6	6	6	6	6	6	6	6
27 May	6	6	6	6	6	6	6	6	6
7 June	7	36	60	6	30	60	5	30	56
14 June	9	26	39	7	42	38	5	24	38
22 June	6	20	40	9	25	22	7	16	21
5 July	5	16	45	5	12	12	4	12	15
12 July	5	24	20	4	14	27	5	15	24
18 July	4	15	17	7	34	18	4	16	17
27 July	4	18	29	4	34	18	4	7	13
2 August	7	11	24	5	20	18	4	9	9
16 August	4	13	14	4	13	16	4	8	8
23 August	4	9	19	4	9	15	4	7	10
30 August	4	12	18	4	12	14	4	6	10
20 Sept.	3	10	13	3	10	16	3	4	9
30 October	6	10	21	6	10	8	6	5	-
10 Nov.									

Lost due to drought effects

77GE4

77GE5

77GE6

77TS1

77TS2

77TS4

77TS11