

1981

Grass control in pastures.

C W. Thorn

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EXPERIMENTAL SUMMARY

1980-81

GRASS CONTROL IN PASTURES

1. Crop Yields after Pasture Manipulation in 1980
2. Effect of Grass Control on Pasture Production
3. Effect of Grass Control on Animal Production
4. Pasture Density Effects and Composition on Soil Nitrogen.
5. The Effect of Kerb (R) on Rapeseed, Linseed and Barley Grass.

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Research Officer
Plant Research Division
Ext. 291

1. PASTURE MANIPULATION - GRASS CONTROL THE YEAR PRIOR TO CROPPING

- AIM:
1. To measure the effects of various grass control treatments on pasture production and composition in the spraying year.
 2. To measure the effects of grass control on wheat yield in the year following pasture treatment.

TREATMENTS:

Untreated	
Kerb	1.5 kg ha ⁻¹ sprayed in early winter.
Paraquat	550 ml Grammoxone at the clover 6+ leaf stage.
Spraytop	880 ml ha ⁻¹ Sprayseed at 80 to 90% grass head emergence.

TRIAL:	80M041	80M040	80AB2
LOCATION:	M. Nixon "Kallaroo" Moora	D. Lefroy "Coolvin" Moora	AB & RI "Austinlea" Katanning
SOIL TYPE:	Red-sandy loam, hard setting surface, red clayey sub soil neutral in reaction	Undulating with laterite ridges, sandy surface with yellow mottled sub soil - acidic in reaction (8.7% gravel √2 mm at 0-10 cm)	Sandy/loamy soil with patches of salt areas.
HISTORY:	Cropped 1979	Pasture 1979	Pasture 1979
PASTURE:	Medic/barley grass/capeweed	Dwalganup/ barley grass/ capeweed	Dwalganup/ barley grass/ capeweed
CROP:	1981	1981	1981
CROP TREATMENTS:	2 varieties + nitrogen + sprayseed/ direct drilled	4 rates nitrogen + sprayseed/direct drilled	4 rates nitrogen + sprayed/ direct drilled

RESULTS:

80M041 M. NIXON "KALAROO"

Table 1 % total soil nitrogen, organic carbon and pH of soil after pasture manipulation.

	Control	Kerb	Paraquat	Spraytop
% TSN	0.203	0.192	0.209	0.205
% C	2.08	1.95	2.13	2.07
G/N	10.24	10.16	10.19	10.19
pH	8.45	8.53	8.50	8.57

Table 2 Medic seed production (kg ha⁻¹) and grass counts prior to cropping pasture manipulated plots.

	Seed yield (kg ha ⁻¹)	Grass counts (m ²)
Control	45.9	4686
Kerb	78.3	447
Paraquat	67.5	3540
Spraytop	56.1	675

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Table 3 Grass counts in the crop, wheat density and crop yield.

kg ha ⁻¹ N	Direct Drilled				Sprayseed/Direct Drilled			
	Miling		Gamenya		Miling		Gamenya	
	0	60	0	60	0	60	0	60
Control	288	353	288	401	59	99	54	81
Kerb	80	146	164	93	28	28	35	36
Paraquat	405	475	377	542	85	109	73	70
Spraytop	103	74	84	84	44	39	26	21
Wheat Density (m ⁻²)								
Control	205	191	172	180	179	194	208	203
Kerb	222	219	218	244	173	160	216	188
Paraquat	218	268	229	228	196	220	197	212
Spraytop	273	275	251	217	199	202	212	194
Crop Yield (kg ha ⁻¹)								
Control	675	582	688	861	1841	1773	1833	1786
Kerb	1048	905	1249	1040	1786	1562	1865	1718
Paraquat	627	694	563	611	1698	1584	1690	1682
Spraytop	1381	1295	1385	1413	2087	2004	1925	1917

Comments:

1. There was no effect of pasture treatment on % TSN, % organic carbon or pH levels.
2. Medic seed yields were significantly increased on the kerb treated plots.
3. Both Kerb and spraytopping resulted in a low level of barley grass weeds present prior to cropping.
4. Paraquat showed a low level of control of barley grass.
5. Spray misses resulted in a higher level of grass weeds in the Kerb plot than could have been expected.
6. Grass counts in the direct drilled plots were a reflection of the initial grass levels prior to cropping. Cultivation with combine achieved 90% control of the grasses.
7. Sprayseed reduced the grass levels, however, they were still too high.
8. Wheat density was not influenced by previous pasture treatment.

9. Crop yields were significantly correlated to the grass weed levels. Direct drilling straight in is only possible when grass weed levels are reduced by 95 to 100%. These did not appear to be nitrogen nor variety reponse. Sprayseed/direct drilled yields were similar for all pasture treated plots, reflecting the low grass levels achieved with using sprayseed. The sprayseed/direct drilled plots yielded significantly more than the direct drilled plots.

RESULTS:

80M040 D. LEFROY "COLVIN"

Table 1 Dwalganup seed yield on pasture manipulated plots 1980-81 (kg ha⁻¹) and grass counts prior to cropping in 1981.

	Seed Yield (kg ha ⁻¹)	Grass Counts (m ⁻²)
Control	15.1	1570
Kerb	9.0	120
Paraquat	13.4	1520
Spraytop	10.7	1165

Table 2 % total nitrogen, organic carbon and pH of soil prior to (1980) and after pasture manipulation (1981).

	1980	1981			
	Across site	Control	Kerb	Paraquat	Spraytop
% TSN	0.109	0.126	0.149	0.133	0.147
% C	1.212	1.42	1.71	1.44	1.622
C/N	11.12	11.27	11.47	10.83	11.03
pH	5.85	5.87	5.90	5.92	5.87

Table 3 Grass counts in the crop (m⁻²) and wheat density.

	Direct Drilled				Sprayseed/Direct Drilled			
	0	15	30	60	0	15	30	60
kg ha ⁻¹ N	0	15	30	60	0	15	30	60
Control	164	158	168	222	12	10	8	9
Kerb	10	9	6	9	5	3	3	1
Paraquat	120	122	105	112	5	6	8	7
Spraytop	83	116	119	111	7	19	5	7
	Wheat Density (m ⁻²)							
Control	172	199	162	162	186	209	171	187
Kerb	168	142	155	167	148	146	161	184
Paraquat	128	183	152	156	182	210	197	199
Spraytop	166	155	153	125	189	212	219	171

Table 4 Anthesis dry matter production of the crop and % nitrogen in the top at anthesis.

kg ha ⁻¹ N	Anthesis dry matter production (kg ha ⁻¹)							
	Direct Drilled				Sprayseed/Direct Drilled			
	0	15	30	60	0	15	30	60
Control	2366	2758	3635	5942	4241	4319	5415	5280
Kerb	4576	4301	4459	4631	3957	5226	5213	5480
Paraquat	3548	3504	3838	4456	4130	4692	5052	5230
Spraytop	3604	3430	3941	4171	4764	5672	4795	5241

kg ha ⁻¹ N	% Nitrogen in Tops at Anthesis							
	0	15	30	60	0	15	30	60
Control	2.30	1.68	2.27	2.09	2.40	2.55	2.39	2.62
Kerb	2.67	2.07	2.56	2.63	2.70	2.48	2.86	2.34
Paraquat	1.85	1.64	1.81	2.06	2.14	1.91	2.06	2.36
Spraytop	1.83	1.89	2.30	2.18	2.14	2.18	2.11	2.14

Table 5 Head number, grass/head, grain weight, and HI on quadrat cuts.

kg ha ⁻¹ N	Head Number m ⁻²							
	Direct Drilled				Sprayseed/Direct Drilled			
	0	15	30	60	0	15	30	60
Control	206	204	262	247	262	275	275	266
Kerb	272	249	244	304	298	268	247	319
Paraquat	187	208	199	187	281	262	277	296
Spraytop	208	212	212	233	258	316	306	342

kg ha ⁻¹ N	Grains/head							
	0	15	30	60	0	15	30	60
Control	36.7	37.7	38.2	37.6	43.1	42.4	40.9	40.6
Kerb	42.6	45.1	40.6	47.0	43.2	44.4	42.0	42.3
Paraquat	39.1	40.4	40.2	39.3	38.1	38.4	41.0	40.0
Spraytop	40.6	42.8	40.8	39.7	39.8	42.3	43.5	39.6

kg ha ⁻¹ N	Grain Weight (mg)							
	0	15	30	60	0	15	30	60
Control	33.5	32.0	30.0	29.0	32.0	30.0	29.0	28.0
Kerb	32.0	31.0	32.0	29.0	28.0	29.0	30.0	28.0
Paraquat	31.0	30.0	30.0	28.0	31.0	29.0	29.0	26.0
Spraytop	32.0	30.0	30.0	31.0	30.0	30.0	29.0	26.0

kg ha ⁻¹ N	Harvest Index							
	0	15	30	60	0	15	30	60
Control	0.436	0.433	0.425	0.396	0.459	0.432	0.425	0.429
Kerb	0.556	0.447	0.444	0.444	0.422	0.443	0.480	0.421
Paraquat	0.361	0.436	0.441	0.472	0.444	0.435	0.416	0.393
Spraytop	0.441	0.431	0.422	0.435	0.430	0.391	0.433	0.406

Table 6 Grain yield (kg ha⁻¹).

	Direct Drilled				Sprayseed/Direct Drilled			
Control	1389	1813	1667	1970	2433	2456	2571	2612
Kerb	2778	2555	2603	2781	2303	2505	2476	2455
Paraquat	1685	1822	1857	2024	2242	2425	2333	2325
Spraytop	1758	2024	1893	2155	2512	2587	2520	2452

Figure 1 Relationship between grain yield and barley grass numbers in the crop.

$$y = -5.31 x + 2505 \quad r^2 = 0.95$$

Comments:

1. There was a very low clover seed yield due to the extremely dry finish to the season in 1980.
2. There appeared to be a slight increase in the % TSN on the Kerb and spraytop plots.
3. Grass counts prior to cropping reflected the high level of grass control Kerb exhibited in 1980. Paraquat and spraytop treatments carried high grass levels.
4. The in crop grass counts were a reflection of the weed burden prior to cropping in the direct drilled plots. Sprayseeding resulted in a high level of grass control.
5. There was no effect of previous grass control treatments on the crop density.
6. There was a significant nitrogen and nitrogen x sprayseed response in anthesis dry matter production of the direct drilled crop.
7. The % nitrogen in the tops were a reflection of the grass weed levels and nitrogen application.
8. Crop yield components: grass weed competition reduced the head numbers (m⁻²). There was no effect of nitrogen, ± sprayseed, nor pasture treatment on grain weight. The direct drilled/Kerb yields had the highest HI. There did not appear to be a response of HI to nitrogen.
9. There was a significant grain yield response to nitrogen and a nitrogen x sprayseed interaction. With the nitrogen x sprayseed response being attributed to the differing weed levels influencing yield. A higher rate of nitrogen enabled the direct drilled plots with high grass weed levels to be more competitive. There was a significant yield/grass level relationship.

FIG. 1: RELATIONSHIP BETWEEN CROP YIELD AND BARLEY GRASS NUMBERS
(YIELD AND GRASS NUMBERS ARE A MEAN OF EACH NITROGEN
TREATMENT FOR BOTH SPRAYSEED/DIRECT DRILLED AND DIRECT
DRILLED PLOTS)

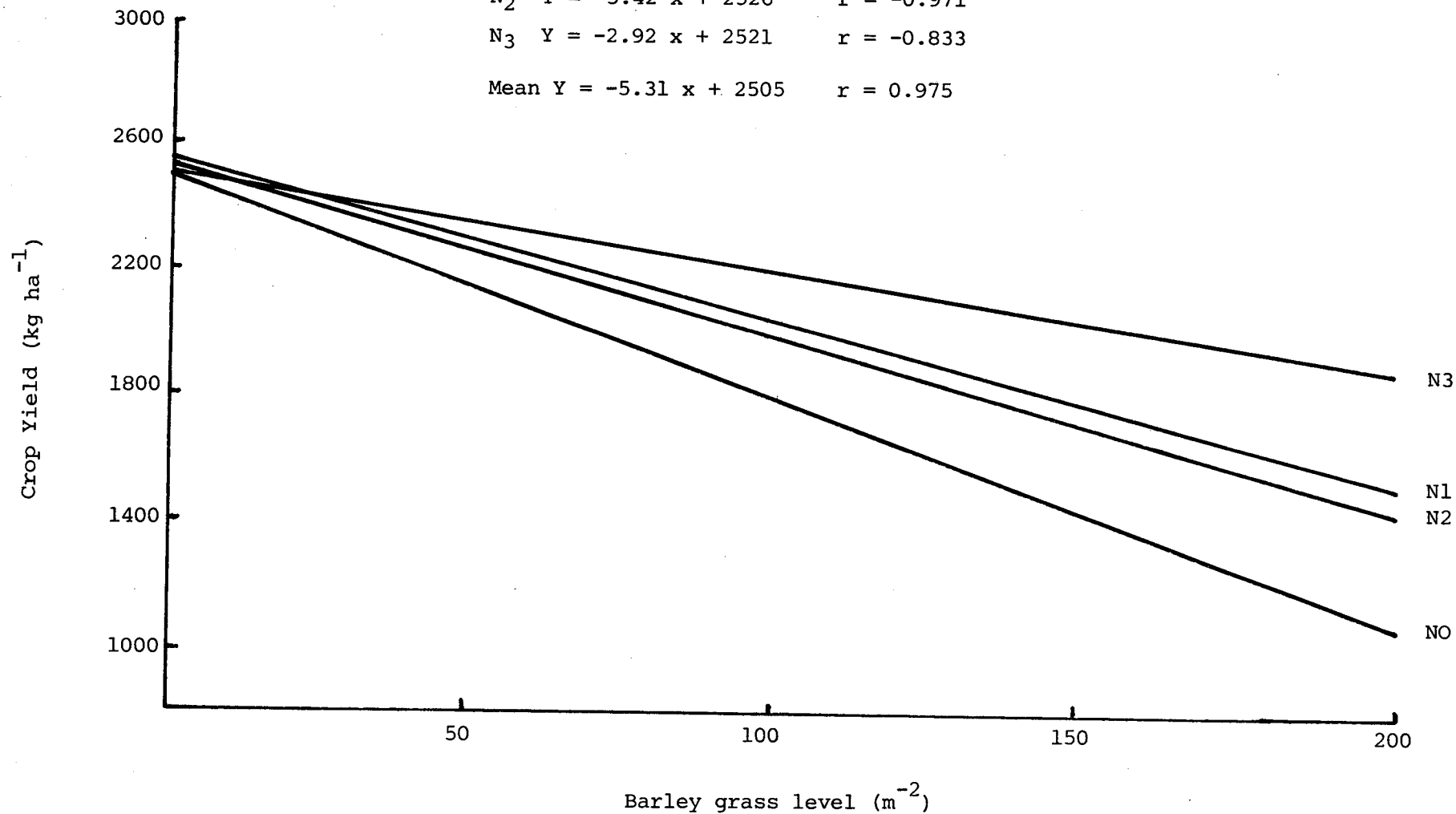
N_0 $Y = -6.97 x + 2491$ $r = -0.925$

N_1 $Y = -4.93 x + 2546$ $r = -0.966$

N_2 $Y = -5.42 x + 2526$ $r = -0.971$

N_3 $Y = -2.92 x + 2521$ $r = -0.833$

Mean $Y = -5.31 x + 2505$ $r = 0.975$



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RESULTS

80AB2 "AUSTINLEA" KATANNING

Table 1 % total soil nitrogen, organic carbon and pH of soil after pasture manipulation.

	Control	Kerb	Paraquat	Spraytop
% TSN	0.163	0.164	0.163	0.165
% C	2.76	2.80	2.77	2.85
C/N	16.93	17.07	16.99	17.27
pH	6.50	6.62	6.52	6.52

Table 2 Subterranean clover seed production and grass counts prior to cropping.

	Seed yield (kg ha ⁻¹)	Grass counts (m ²)
Control	15.8	4090
Kerb	44.7	105
Paraquat	27.9	2030
Spraytop	17.1	335

Table 3 Grass counts in the crop seed, wheat density and crop yield.

kg ha ⁻¹ N	Direct Drilled				Sprayseed/Direct Drilled			
	0	15	30	60	0	15	30	60
Control	366	315	275	320	42	21	36	35
Kerb	4	6	7	4	6	3	3	7
Paraquat	317	317	264	318	35	43	29	27
Spraytop	8 ⁵	62	52	67	3	8	2	8

Wheat Density (m⁻²)

Control	164	168	161	181	148	176	176	158
Kerb	170	170	154	160	161	142	132	161
Paraquat	181	186	188	152	159	152	160	159
Spraytop	184	193	195	187	171	180	182	185

Table 4 Anthesis dry matter production of the crop and % nitrogen in the top, and harvested yield.

kg ha ⁻¹ N	Direct Drilled				Sprayseed/Direct Drilled			
	0	15	30	60	0	15	30	60
Control	477	718	849	1008	811	1117	1306	1470
Kerb	2378	2315	1808	2431	1211	1579	1755	1820
Paraquat	843	826	1034	1485	1225	1014	1619	1780
Spraytop	1737	2618	2580	2661	1468	1770	2152	2365

% Nitrogen in the Tops

Control	2.14	2.14	2.81	2.30	3.17	2.99	3.16	3.02
Kerb	2.95	2.81	2.84	2.69	3.48	3.18	3.60	3.55
Paraquat	2.27	2.15	2.10	2.08	2.99	3.11	2.92	3.15
Spraytop	2.40	2.60	2.28	2.52	3.06	3.01	2.92	3.17

Grain Yield (kg ha⁻¹)

Control	155	171	306	204	571	649	694	887
Kerb	1049	1065	955	1008	1596	1560	1680	1845
Paraquat	155	167	192	200	771	829	816	1167
Spraytop	759	1085	1008	1163	1375	1604	1706	1555

Comments:

1. There was no effect of previous pasture treatment on % TSN levels, pH nor % carbon.
2. Clover seed yields were low due to the dry finish in 1980, however the Kerby created pasture was the top yielder.
3. Both Kerb and spraytop treated plots had a low barley grass level in the cropping year. Paraquat did not achieve adequate grass control.
4. The in crop grass counts for both direct drilled and sprayseed/direct drilled plots was a reflection of the grass weed levels achieved by pasture manipulation.
5. Wheat density was not affected by pasture treatments.
6. There was a drymatter response to added nitrogen when the grass levels were high (i.e. control and paraquat direct drilled plots).
7. The difference in nitrogen in the tops of the sprayseed/direct drilled crops and the direct drilled indicates the N used by the grasses in the direct drilled crop (= 1%).
8. The crop looked very moisture stressed in October, and some pinched heads were recorded.
9. Grain yield was related to grass levels and there may be a slight N response (needs analysis). The grain yield on the Kerb treated plots were the highest reflecting the low weed levels.

2. GRASS CONTROL IN PASTURES

- AIM:
1. To measure the effects of various grass control treatments on pasture production and composition in the spraying year.
 2. Relate subterranean clover seed production to grass levels.
 3. Measure the effect of grass control on crop yield in the year following the pasture treatment.

TREATMENTS:

- Untreated
T₁ Kerb⁹ (propyzamide) 1.5 kg ha⁻¹ at the break
T₂ Kerb⁹ (propyzamide) 1.5 kg ha⁻¹ at the 6+clover leaf stage
T₃ Paraquat + wetter 500 ml ha⁻¹ at the 6+ clover leaf stage
T₄ Sprayseed 880 ml ha⁻¹ at the 6+ clover leaf stage
T₅ Spraytop 880 ml ha⁻¹ Sprayseed at 80-90% grass head emergence

LOCATION: J.R. Bushell, Katanning, 81 Ka 1

SOIL TYPE: Loamy sand over gravel.

HISTORY: Pasture 1980.

HERBICIDE APPLICATION: T₁ applied 3/6/81 in 86 l of water
T₂)
T₃) 21.8.81
T₄)
T₅) 16.10.81

RESULTS.

Table 1 Dry matter production (23/9/81) and botanical composition, and seed yield.

Treatment	DMP	% of control	Composition			Clover seed yield
			Grass	Clover	Weed	
Control	2716		36.4	56.1	7.5	169.8
Early Kerb	2323	85.3	4.8	75.0	20.2	66.5
Late Kerb	2310	85.0	25.3	6.35	11.2	135.8
Paraquat	2487	91.5	25.7	54.2	20.1	84.1
Sprayseed	2384	87.8	23.7	63.6	12.7	106.8
Spraytop						128.7

PASTURE MANIPULATION

LOCATION: J.B. Griffith, "Woodlands", Gnowangerup 81 Ka2

SOIL TYPE: Loamy sand over clay.

HISTORY: Pasture 1980.

HERBICIDE APPLICATION: T₁ applied 3/6/81 in 86 l ha⁻¹ water
T₂
T₃ 21/8/81
T₄
T₅ 16/10/81

RESULTS:

Table Dry matter production (23/9/81) botanical composition and seed yield.

Treatment	DMP (kg ha ⁻¹)	% of control	Composition (%)			Clover seed yield (kg ha ⁻¹)
			Grass	Clover	Weed	
Control	1613		18.5	53.0	28.5	130
Early Kerb	1645	102.0	0.2	50.9	48.9	109
Late Kerb	1417	87.8	8.7	65.3	26.0	147
Paraquat	1371	85.0	9.1	41.2	49.7	135
Spraysæd	988	61.2	24.3	69.1	6.6	117
Spraytop						103

LOCATION: G. Prowse, "Topend", Williams 81 Na3

SOIL TYPE: Sandy loam over gravel.

HISTORY: Pasture 1980.

HERBICIDE APPLICATION: T₁ 2/7/81
T₂)
T₃) 3/8/81
T₄)
T₅) 22/10/81

RESULTS:

Table Dry matter production (12/10/81) and botanical composition.

Treatment	DMP (kg ha ⁻¹)	% of control		Composition (%)		Clover seed yield (kg ha ⁻¹)
			Grass	Clover	Weed	
Control	1074		39.4	50.8	9.8	
Early Kerb	757	70.5	0.3	86.4	13.3	
Late Kerb	865	80.6	0.0	86.3	13.7	
Paraquat	650	60.5	12.2	77.4	10.7	
Sprayseed	472	44.0	24.8	74.9	0.3	
Spraytop						

LOCATION: D. Sewell, Goomalling 81 NO5

SOIL TYPE: Sandy loam.

HISTORY: Crop 1980.

HERBICIDE APPLICATION: T₁ 25/6/81
T₂
T₃ 15/7/81
T₄
T₅ 15/9/81

RESULTS:

Table Dry matter production (/81) botanical composition and seed yield.

Treatment	DMP (kg ha ⁻¹)	% of control Grass	Composition (%) Clover	Weed	Clover seed yield (kg ha ⁻¹)
Control		No dry matter or composition estimates, due to too late a sampling (pasture had dried off)			118.9
Early Kerb					165.3
Late Kerb					153.2
Paraquat					137.6
Sprayseed					107.5
Spraytor					112.2

LOCATION: Avondale Research Station 81A23

SOIL TYPE: Heavy red clay loam with pH 5.7.

HISTORY: Pasture 1980.

HERBICIDE APPLICATION: T₁ 26/5/81
T₂)
T₃) 30/7/81
T₄)
T₅ 4/10/81

RESULTS:

Table Dry matter production (7/10/81) botanical composition and clover seed yield.

Treatment	DMP (kg ha ⁻¹)	% of control		Composition (%)		Clover seed yield (kg ha ⁻¹)
			Grass	Clover	Weed	
Control	1318		70.6	17.7	11.7	52.2
Early Kerb	1209	91.7	0.6	87.7	11.7	44.3
Late Kerb	1033	78.4	0.4	75.2	24.4	27.5
Paraquat	811	61.6	25.7	52.6	21.7	41.6
Sprayseed	1390	105.4	58.6	32.6	8.6	42.0
Spraytop	1261	95.7	46.9	42.2	10.9	43.2

LOCATION: D. Jasper "Pannoo" 81 A188

SOIL TYPE: Sand over clay.

HISTORY: Pasture 1980.

HERBICIDE APPLICATION: T₁ 30/7
T₃ 30/7
T₅ 28/10

RESULTS:

Table Dry matter production (21/10/81) botanical composition and seed yield.

Treatment	DMP (kg ha ⁻¹)	% of control		Composition (%)		Clover seed yield (kg ha ⁻¹)
			Grass	Clover	Weed	
Control	1889		51.7	48.0	0.3	45.2
Late Kerb	1453	77.9	8.7	89.5	1.8	66.4
Paraquat	1665	88.2	59.6	39.3	1.1	57.4
Sprayseed						44.1

LOCATION: Badgingarra Research Station 81Ba2

SOIL TYPE: Deep sand

HISTORY: Pasture 1980.

HERBICIDE APPLICATION: T₁ 12/6/81
T₂
T₃ 7/7/81
T₄
T₅

RESULTS:

Table Dry matter production (29/10/81) botanical composition and seed yield.

Treatment	DMP (kg ha ⁻¹)	% of control	Composition (%)			Clover seed yield (kg ha ⁻¹)
			Grass	Clover	Weed	
Control	935		65.7	31.4	2.9	39.6
Early Kerb	797	85.3	10.3	83.9	5.8	26.8
Late Kerb	950	101.6	59.7	38.5	1.8	37.0
Paraquat	829	88.7	19.7	80.3	0.0	18.6
Sprayseed	933	99.8	47.7	50.8	1.5	44.6
Spraytop						29.6

LOCATION: Newdegate Research Station 81 N3

SOIL TYPE: Sandy loam.

HISTORY: Pasture 1980 (= 15% clover)

HERBICIDE APPLICATION: T₁ 10/6/81
T₂ 18/8/81
T₃ 18/8/81
T₄ 18/8/81
T₅ 28/9/81

RESULTS:

Table Dry matter production (29/9/81) botanical composition and seed yield.

Treatment	DMP (kg ha ⁻¹)	% of control	Composition (%)			Clover seed yield (kg ha ⁻¹)
			Grass	Clover	Weed	
Control	1266	93.4	54.8	30.9	14.3	90.3
Early Kerb	1183	70.4	2.6	89.4	8.0	74.9
Late Kerb	892	60.2	47.2	42.8	10.0	81.7
Paraquat	763	69.3	26.4	65.6	8.0	91.4
Sprayseed	878		16.8	79.0	4.2	78.2
Spraytop						57.5

LOCATION: Newdegate Research Station 81 N2

SOIL TYPE: Sandy gravelly loam.

HISTORY: Pasture 1980 (= 8% clover site)

HERBICIDE APPLICATION: T₁ 10/6/81
T₂ 18/8/81
T₃ 18/8/81
T₄ 18/8/81
T₅ 28/9/81

RESULTS:

Table Dry matter production (29/9/81) botanical composition and seed yield.

Treatment	DMP (kg ha ⁻¹)	% of control		Composition (%)		Clover seed yield (kg ha ⁻¹)
			Grass	Clover	Weed	
Control	542	142.4	23.4	17.6	59.0	9.5
Early Kerb	772	81.4	0.4	25.8	73.8	8.0
Late Kerb	441	52.2	15.2	18.5	66.3	6.2
Paraquat	283	61.4	8.7	62.4	28.9	4.5
Sprayseed	333		5.5	77.1	17.4	5.5
Spraytop						

LOCATION: J. Sandilands, Kendenup 81 All

SOIL TYPE: Sandy loam.

HISTORY:

HERBICIDE APPLICATION: T₁ 7/5/81
T₂ 9/7/81
T₃ 9/7/81
T₄ 9/7/81
T₅ 21/10/81

RESULTS:

Table Dry matter production (/81) botanical composition and seed yield.

Treatment	DMP (kg ha ⁻¹)	% of control	Grass	Composition (%) Clover	Weed	Clover seed yield (kg ha ⁻¹)
Control	3600.8		70.0	30.0	0.0	-
Early Kerb	3515.0	97.6	26.6	73.4	0.0	260.6
Late Kerb	3257.0	90.5	27.8	72.2	0.0	373.6
Paraquat						
Sprayseed						
Spraytop						

LOCATION: Newdegate Research Station 81N21

SOIL TYPE: Sandy loam.

HISTORY: Pasture 1980.

HERBICIDE APPLICATION: T₁ 10/6/81
T₂ 18/8/81
T₃ 18/8/81
T₄ 18/8/81
T₅ 28/9/81

RESULTS:

Table Dry matter production (29/9/81) botanical composition and seed yield.

Treatment	DMP (kg ha ⁻¹)	% of control	Composition (%)		Clover seed yield (kg ha ⁻¹)
			Grass	Clover	Weed

Control		Not measured			
Early Kerb					
Late Kerb					
Paraquat		- too heavily grazed			
Sprayseed		pasture to even			
Spraytop		assess differences.			

Comments:

1. Early Kerb proved to be the most effective herbicide at controlling grasses.
2. Sprayseed gave some control of capeweed.
3. In general both sprayseed, paraquat and in some cases a late application of Kerb failed to give adequate grass control.
4. Pasture production was reduced with the removal of grasses. Paraquat and sprayseed were in general more severe on pasture production than either an early or late application of Kerb.
5. Early application of Kerb results in increased clover seed production.
6. The lower the initial clover content the more severe is the reduced pasture production when grasses are removed.
7. Pasture manipulation is not recommended on pasture with less than 30% clover content.
8. Capeweed increased in the Kerb treated plots due to reduced grass competition.
9. Grass levels prior to and after cropping, soil N levels, and crop yield will be measured on the trial in 1982.

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3. THE EFFECT OF GRASS CONTROL ON ANIMAL PRODUCTION

AIM: A preliminary study to measure the effects of chemical grass control the year prior to cropping a legume-grass by an:-

1. Animal production at 2 stock rates
2. Pasture production and composition
3. Crop production
4. Pasture regeneration following the crop.

LOCATION: Ranfurly Park, Mr P. Isbister, South Moora. 81M01

HISTORY:

1. Cropped in 1979.
2. Main pasture species, Dwalganup, barley grass and capeweed; minor components, rose clover, brome grass and rye grass.
3. Soil type; sandy loam over clay laterite.
4. Top dressed 1981 at 90 kg ha⁻¹ of super.
5. Sandy loam over gravel, pH 5.5, 12 ppm p, 230 ppm K.

TREATMENTS:

1. Stocking rate - 4 ha⁻¹
- 8 ha⁻¹
2. Grass control - no control
- total control with 1.5 kg Kerb applied at 11/6/81.

RESULTS:

FIG. 2:

SHEEP LIVWEIGHT ON A GRASSY AND GRASS FREE PASTURE
AT 2 STOCKING RATES

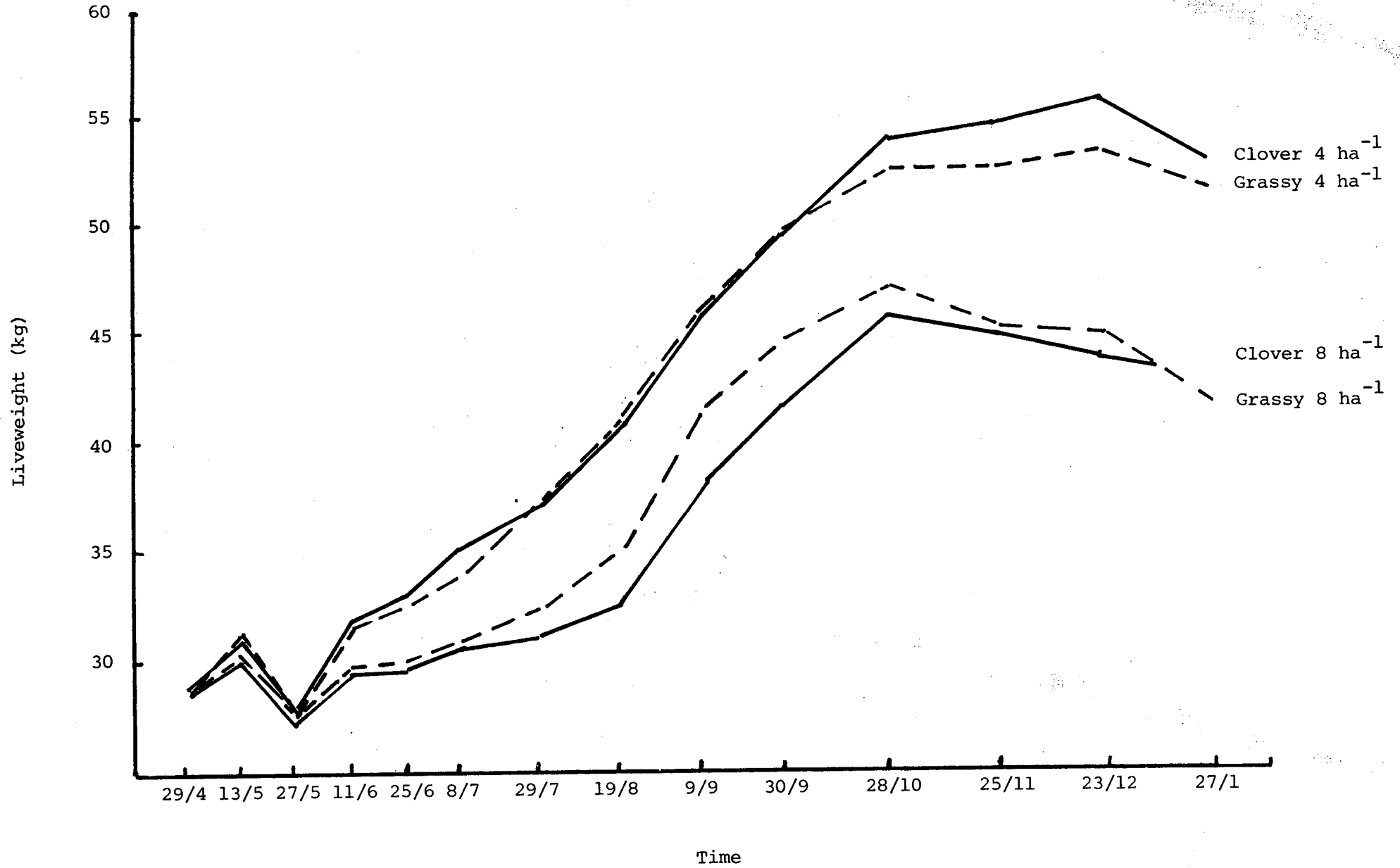


FIG. 3: Δ IN SHEEP LIVWEIGHT FOR GROWING GRASSY AND GRASS FREE PASTURE AT 2 STOCKING RATES.

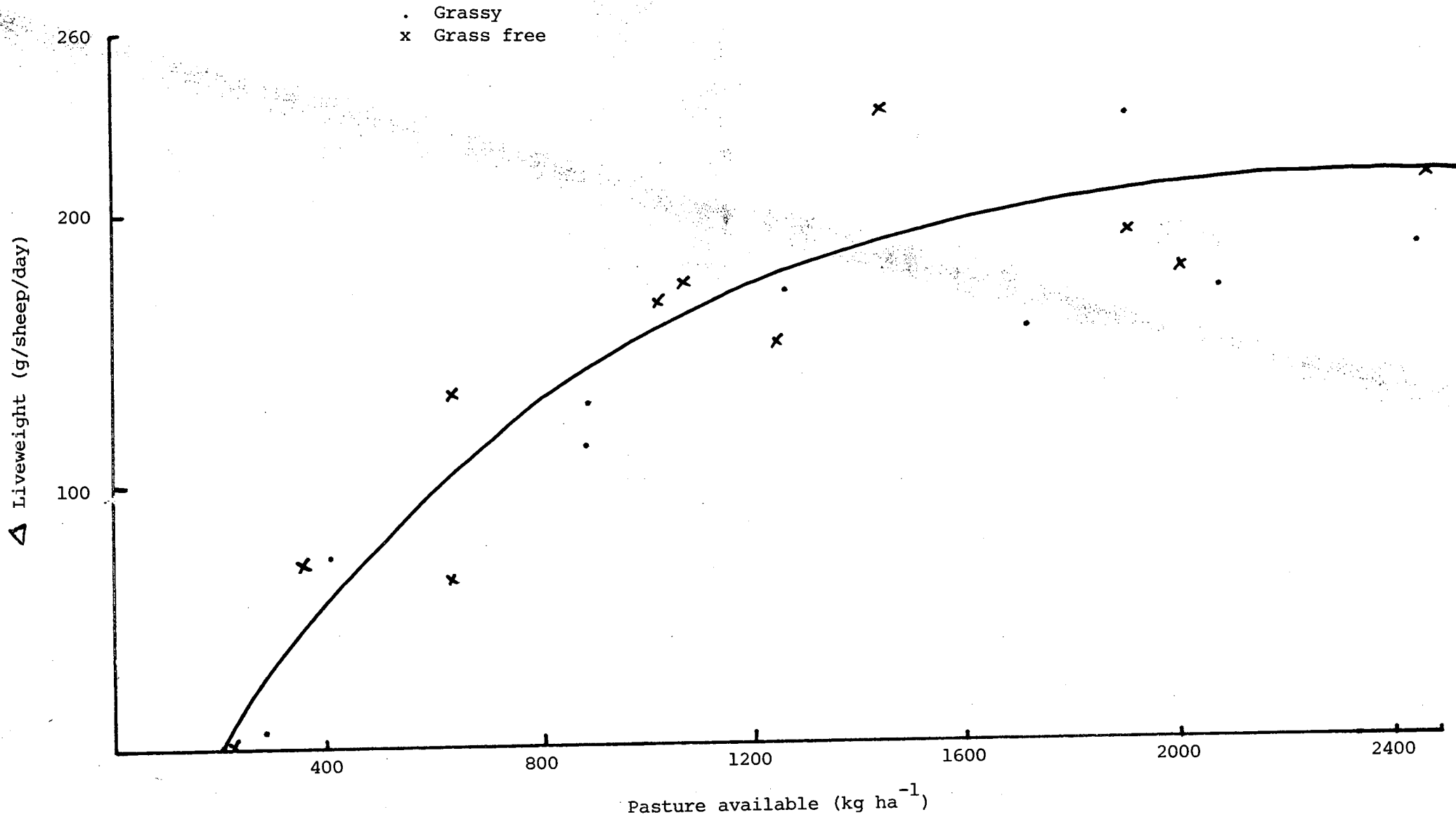


Table 1 Pasture available and composition at the 30/9/81 and clover seed production.

	Pasture available (kg ha ⁻¹)		Composition %			
			Seed production (kg ha ⁻¹)	Grass	Clover	Capeweed
Control	4 ha ⁻¹	2056	151.2	13.5	55.0	31.5
	8 ha ⁻¹	1720	94.7	26.1	41.1	32.8
Kerb	4 ha ⁻¹	1894	190.7	0.3	61.5	41.1
	8 ha ⁻¹	1048	102.9	0.0	72.5	27.5

Comments:

1. Up until pasture senescence 28/10/81 there was little difference between the liveweight of sheep on the grassy and grass free plots, at 4 sheep ha⁻¹. After the 28/10/81 to 23/12/81 sheep on the grass free plots had a higher rate of weight gain, most probably associated with the better quality pasture.
2. At 8 sheep ha⁻¹ the sheep on the grassy plots had a greater liveweight gain than the sheep on the grass free plots during early winter and spring. After pasture senescence the sheep on the grass free plots showed a lower liveweight loss up till 14/1/81 when they were taken off with a body condition score 1. The sheep on the grassy plots were removed on the 27/1/81 when their body condition score was also 1.
3. Although we first thought that grassless pasture would be severely disadvantageous in the autumn and early winter, due to a lower pasture availability, the magnitude of the effect was not very large in this trial and in this year. It should be noted that the site had excellent clover cover. In this trial at least pasture quality appeared to have a marked effect on animal performance.
4. During the growing season there appeared to be a strong relationship between animal liveweight change and pasture availability regardless of the pasture composition. Therefore I see no real problems with grass free pastures, as long as the clover content and density is there to produce as much as a mixed pasture. It is important to maintain the clover seed bank at a high level.
5. There was a significant effect of stocking rate and pasture treatment on clover seed production. Removal of grass competition increased seed production while heavy grazing (8 ha⁻¹) reduced seed production.

4. PASTURE DENSITY EFFECTS AND COMPOSITION ON SOIL NITROGEN

AIM: To examine the effect of legume composition and density in the pasture phase on soil N and relate this to fertiliser N in the cropping year.

LOCATION: Avondale Research Station.

- TREATMENTS:
1. Pasture with grass and broad leaf plants removed (Kerb, 1.0 kg ha + Tribunil, 850 g ha).
 2. Pasture with broadleaf plants removed (Tribunil, 850 g ha⁻¹).
 3. Pasture with grass removed (Kerb, 1.5 kg ha⁻¹).
 4. Northam drilled into normal pasture at 10 kg ha⁻¹.
 5. Northam drilled into normal pasture at 90 kg ha⁻¹.
 6. Northam drilled into Kerb treated pasture at 10 kg ha⁻¹.
 7. Northam drilled into Kerb treated pasture at 90 kg ha⁻¹.
 8. Lupins (Illyarrie at 80 kg ha⁻¹).
 9. Wheat (Miling at 50 kg ha⁻¹).
 10.) 0 kg ha⁻¹ Agran
 11. Pasture buffers) 40 " " "
 12. till 1982 when) 80 " " "
 13. rates of N) 160 " " "
 14. applied) 320 " " "
 15.) 480 " " "

- PROCEDURE:
1. All clovers were sown with 60 kg ha⁻¹ of super and pasture top dressed at 60 kg ha⁻¹.
 2. Lupins: 3/6/81 sprayed Simazine 1.5 l ha⁻¹ + Yield 1.1 l ha⁻¹. Due to sheep eating out lupins they were resown on the 1/7/81. Lupins were sown with 60 kg ha⁻¹ super.
 3. Wheat: 14/6/81, 2 l ha⁻¹ sprayseed and sown on 15/6/81 at 50 kg ha⁻¹ + 60 kg ha⁻¹ super.
 4. On 30/6/81 treatments 1,2,3,4,5,6,7 were sprayed

SITE: The site had a very poor clover content and there was a low amount of broadleaf weeds of which doublegee and capeweed were the components.

RESULTS:

Table 1 Initial % TSN, organic carbon and pH of the 3 replicates.

Depth	TSN	Rep 1		Rep 2			Rep 3			Mean		
		C	pH	TSN	C	pH	TSN	C	pH	TSN	C	pH
0-10	0.079	0.83	5.5	0.09	1.02	5.7	0.073	0.80	5.9	0.081	0.88	5.6
10-20	0.062	0.68	6.2	0.046	0.55	6.4	0.058	0.57	6.7	0.055	0.60	6.4
20-30	0.031	0.26	6.5	0.037	0.36	6.8	0.057	0.53	7.0	0.042	0.38	6.8
30-40	0.028	0.18	6.7	0.038	0.30	7.2	0.052	0.46	6.9	0.039	0.31	6.9
40-60	0.023	0.17	7.0	0.042	0.34	7.4	0.039	0.32	7.6	0.035	0.28	7.3

Table 2 Clover density and composition on 6/7/81.

	Density (M ⁻²)	Grass	Composition	
			Clover	Broadleaf
T ₁	27	86.3	11.3	2.4
T ₂	36	76.3	22.0	1.7
T ₃	26	84.0	13.3	2.7
T ₄	99	66.0	27.1	6.9
T ₅	282	31.7	66.0	2.3
T ₆	90	64.0	33.3	2.7
T ₇	289	50.0	48.7	1.3
T ₈)			
T ₉)			
T ₁₀₋₁₅	47	77.3	19.0	3.7

Table 3 Dry matter production, composition and clover seed yield at 7/10/81.

	Dry matter (kg ha ⁻¹)	Grass	Composition		Clover seed yield (ka ha ⁻¹)
			Clover	Weed	
T ₁	1492	5.5	94.4	0.1	75.9
T ₂	1795	78.2	21.8	0.0	30.7
T ₃	2001	0.2	98.9	0.9	66.9
T ₄	2543	70.7	26.2	3.1	76.4
T ₅	2750	46.0	40.6	13.4	174.3
T ₆	2209	1.1	98.6	0.3	101.7
T ₇	2460	0.6	99.3	0.1	165.4
T ₁₀₋₁₅	2706	76.5	18.0	5.5	88.9

Table 4 Lupin and wheat yield (kg ha⁻¹).

	<u>Yield</u>
Lupin	712.9
wheat	1470.4

Dry matter production of the lupin and wheat was determined and nitrogen analysis of the top was submitted to Government Chemical Laboratories.

Comments:

1. The site had a very poor clover content.
2. Resown Northam plots looked very good.
3. Kerb controlled the grasses and had some activity on doublegee.
4. Kerb + Tribunil had a marked effect on pasture production as did Tribunil on its own.
5. There were few broadleaf weeds for Tribunil to control, however, its activity against doublegee was good, it also appeared to have some activity against the clovers in terms of seed production.
6. Resowing Northam clover at 10 kg ha⁻¹ resulted in both good dry matter production and seed yield.
7. Soil nitrogen samples will be taken this summer and the site cropped in 1982.

5. THE EFFECT OF KERB⁷ ON RAPESEED, LINSEED AND BARLEY GRASS

AIM: To examine the effect of a post emergence application of propyzamide Kerb⁷ on rapeseed, linseed and barley grass.

LOCATION: Glasshouse, South Perth.

TREATMENTS: 4 rates of Kerb 0, 1, 2, 4 kg ha⁻¹
3 species, Rapeseed, Linseed and Barley grass.
Kerb was sprayed on and the pots harvested on

Table 1 Effect of Kerb on Rapeseed, Linseed and Barley grass tops and roots dry matter after days from application.

Rate	Tops weight (g/pot)			
	0	1	2	4
Rapeseed (Varoona)	6.351	6.876	6.897	5.662
Linseed (Glenelg)	0.107	0.079	0.075	0.050
Barley grass	1.071	0.391	0.276	0.051
	Root weight (g/pot)			
Rapeseed	3.65	3.34	3.72	3.67
Linseed	0.30	0.16	0.15	0.11
Barley grass	0.39	0.33	0.20	0.13

Comments:

1. Kerb markedly reduced barley grass top yield at 1.0 kg ha⁻¹ with some root pruning.
2. Linseed roots were inhibited by Kerb at 1.0 kg ha⁻¹.
3. Kerb appeared to have little effect on rapeseed up to 4 kg ha⁻¹.