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DEPARTMENT OF AGRICULTURE

WESTERN AUSTRALIA

SUMMARY OF RESULTS
PASTURE SPECIES INVESTIGATIONS
HIGH RAINFALL AREA
1976

D.A. NICHOLAS

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1. Clover cultivar grazing trial - North Bannister.
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Manjimup Research Station.
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Title Clover Cultivar Grazing Trial
Location Culford - North Bannister
Aim To investigate the performance under grazing of eight cultivars of subterranean clover.

Experimental

8 Cultivars x 2 stocking rates (7.4, 9.9 sh/ha) x 2 replications.

Site

Gravelly sandy loam, Redgum - jarrah vegetation. Cropped 1967, pastures sown 1968. Midland replaced Mt. Barker in 1971. Grazing commenced November 1968. Total super 2900 kg/ha. Current application (1976) 220 kg/ha.

The plots cropped to oats in 1975 were stocked at 20 sheep/ha from 10/1 to 22/3/76. Sheep were then removed and grazed outside trial until 21/4/76 when original stocking rates were again imposed. During period off plots sheep lost a lot of weight - more probably than if they had been left on plots. Pasture plots were continuously grazed.

A partial germination occurred in early April but conditions then remained dry until May.

Results Pasture assessments
 Wool production
 Sheep bodyweight changes.

Comments

1. Wool production from continuously grazed sheep at February 1976 was reasonable. Best performance again from Seaton Park, Unwager, Daliak, Midland and Woogenellup.
 2. Cropping had an affect on botanical composition of the pastures early in the season. During May - June cropped plots contained more grass and sometimes more capeweed. By Spring, there was no consistent trend other than a tendency for the clover content of Midland to increase with cropping.
 3. Pasture yield was markedly affected by cropping. At the low stocking rate yield on cropped plots were 75% of continuous pasture plots during winter - early spring. By October there was no difference. At the high rate of stocking yield on cropped plots were as low as 35% that of continuous pasture plots rising to 70% by October.
- Only Daliak and Seaton Park at low stocking rate went against the trend early in the season.

4. The lowered yield was a result of fewer seedlings although seedlings on cropped plots were larger. It was quite noticeable that root growth was more prolific on cropped plots where water penetration appeared much better and more even.
5. Despite the differences in yield animal weight changes were similar on continuous pasture and cropped plots. From May to December the overall difference in average weight was only 1- 2 kg/hd. The result highlights the importance of feed presentation i.e. the regenerating pasture on cropped plots was more upright and accessible. Clover plants were larger, there was some self sown oats available at beginning of season and growth of associated species initially at least appeared more upright.
6. No handfeeding was carried out.
7. The Dwalgarup plots have been largely taken over by Dinninup.
8. Plots which have been continuously grazed since 1968 are to be cropped in 1977 to complete cropping of the whole area.

Pasture Assessments - 1976 (Continuously grazed plots)

68NA1/2303 EX

Density - Plants/10 sq.dm

Yield - kg/ha

Cultivar	Density		mgm/plant		Yield - kg/ha					% Clover					
	4/5	2/6	4/5	2/6	4/5	2/6	10/8	12/9	7/10	4/5	2/6	10/8	12/9	7/10	
Geraldton	7.4	351	472	4.4	9.6	173	695	802	1285	1875	90	66	48	60	24
	9.9	250	380	6.2	7.6	158	380	240	792	1278	98	76	59	61	31
		300	426	5.3	8.7	166	537	521	1039	1576					
Unwageri	7.4	355	407	4.0	8.9	220	655	808	1532	2098	65	55	25	26	7
	9.9	346	418	5.1	8.2	250	566	328	868	1635	71	60	32	49	24
		350	413	4.6	8.5	235	611	568	1200	1866					
Dwalgarup	7.4	291	469	7.2	13.1	211	640	558	1425	1868	100	84	82	92	87
	9.9	214	382	7.3	10.9	156	147	408	665	975	100	90	74	89	94
		253	425	7.3	12.0	183	393	482	1045	1421					
Daliak	7.4	416	460	4.6	8.8	191	539	480	1170	1752	100	75	82	84	72
	9.9	414	381	4.9	7.0	295	557	958	1882	3552	69	48	18	42	30
		415	421	4.8	7.9	243	548	719	1526	2652					
Seaton Park	7.4	239	210	6.2	10.2	173	378	570	1858	3318	86	57	45	74	83
	9.9	303	266	4.4	10.9	132	484	275	702	1552	100	60	38	62	50
		271	238	5.3	10.6	152	431	422	1280	2435					
Dinninup	7.4	583	506	5.7	9.0	330	489	995	2175	3652	100	92	97	100	100
	9.9	232	376	6.5	13.3	151	501	702	1702	2502	100	100	100	100	100
		408	441	6.1	11.1	241	495	849	1939	3078					
Woogenellup	7.4	244	162	9.1	18.4	261	516	642	1572	3242	85	58	46	52	43
	9.9	297	207	6.3	15.0	206	422	670	2030	3942	91	75	43	60	82
		270	184	7.7	16.7	233	469	656	1801	3592					
Midland	7.4	647	594	4.4	8.3	294	667	788	1890	3450	97	74	39	48	47
	9.9	626	525	4.4	7.2	304	590	358	975	1502	90	64	33	46	40
		636	560	4.4	7.8	299	629	572	1432	2476					
Average	7.4	391	410	5.7	10.8	232	572	705	1613	2657	90	70	58	67	58
	9.9	335	367	5.7	10.0	206	456	492	1202	2118	90	72	50	64	56
		363	388	5.7	10.4	219	514	599	1408	2387	90	71	54	65	57

4/5 12/6 = Cores

10/8 - 7/10 - shearing handpiece

Pasture Assessments - 1976 (1975 Cropped plots)

68NA1/2303 EX

Density - No. clover plants/10 sq.dm

Yield - kg/ha

Cultivar		Density		mgm/plant		Yield - kg/ha					45% Clover 7/10				
		4/5	2/6	4/5	2/6	4/5	2/6	10/8	12/9	7/10	4/5	2/6	10/8	12/9	7/10
Geraldton	7.4	25	130	5.8	20.8	60	458	418	1055	2072	24	37	27	45	20
	9.9	99	104	6.0	23.2	68	305	78	218	432	87	79	64	90	95
		62	117	5.9	22.0	64	382	248	636	1252					
Unwager	7.4	117	188	7.8	12.6	288	563	545	2195	3700	31	41	40	56	53
	9.9	118	118	6.7	16.6	134	378	242	372	878	59	52	36	26	29
		118	153	7.2	14.6	211	470	394	1284	2289					
Dwalganup	7.4	44	60	12.2	23.8	95	465	362	582	1145	64	96	37	45	65
	9.9	68	92	10.0	27.7	116	331	170	450	1725	59	75	48	56	62
		56	76	11.1	25.7	105	398	266	516	1435					
Daliak	7.4	180	157	6.1	13.0	197	446	600	1822	3352	56	46	29	56	47
	9.9	42	43	9.3	9.8	124	276	78	108	122	31	30	23	21	53
		111	96	7.7	16.2	161	361	483	965	1738					
Seaton Park	7.4	104	106	10.8	27.5	234	550	705	1170	2825	48	53	41	45	61
	9.9	43	38	7.5	19.7	63	206	262	485	1698	51	36	30	54	45
		73	72	9.1	23.6	148	378	484	828	2261					
Dinninup	7.4	165	142	8.8	27.2	164	418	918	1200	2252	89	93	99	100	100
	9.9	114	125	9.8	19.3	148	268	238	840	2345	76	90	98	99	98
		140	134	9.3	23.3	156	343	577	1020	2299					
Woogenellup	7.4	72	61	13.5	32.2	171	411	355	1535	4112	57	48	60	82	92
	9.9	88	103	12.6	27.2	214	460	160	968	2875	52	61	77	62	81
		80	82	13.1	29.7	193	435	258	1251	3494					
Midland	7.4	166	183	7.4	16.6	170	433	288	920	2838	73	70	46	74	86
	9.9	171	140	6.5	14.4	195	336	160	412	1725	57	56	51	62	68
		168	161	7.0	16.0	182	384	224	666	2281					
Average	7.4	109	112	9.0	21.7	172	468	524	1310	2787	55	60	47	63	65
	9.9	93	95	8.6	21.0	133	320	173	482	1475	59	60	53	59	66
		101	112	8.8	21.3	153	394	348	896	2131	57	60	50	61	66

4/5, 12/6 = Cores

10/8, 12/9, 7/10 - Shearing handpiece

374

68NA1/2303 EX

Greasy Wool Production
kg/ha

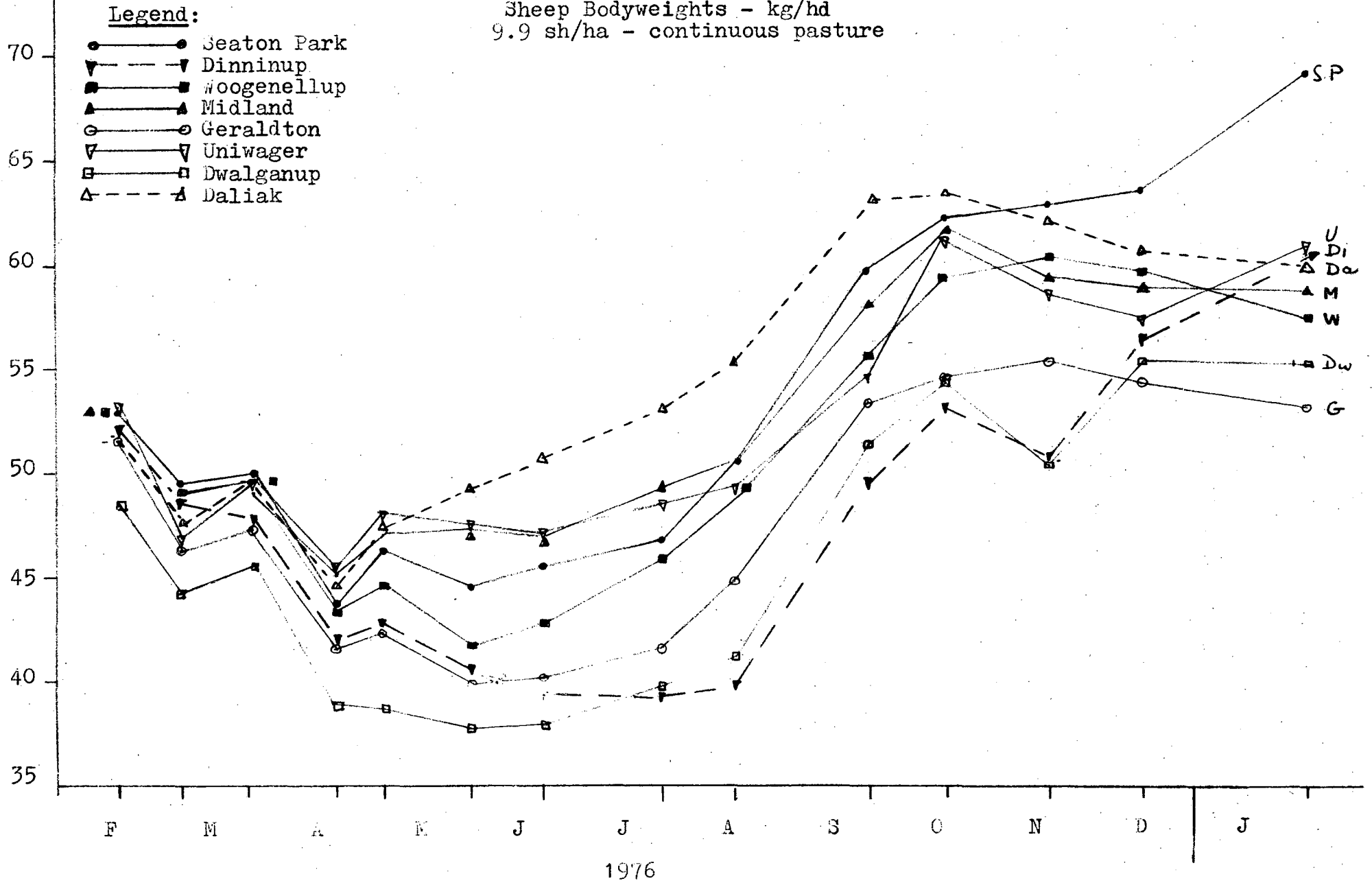
Shorn 18/2/76

Previous shearing 3/3/75

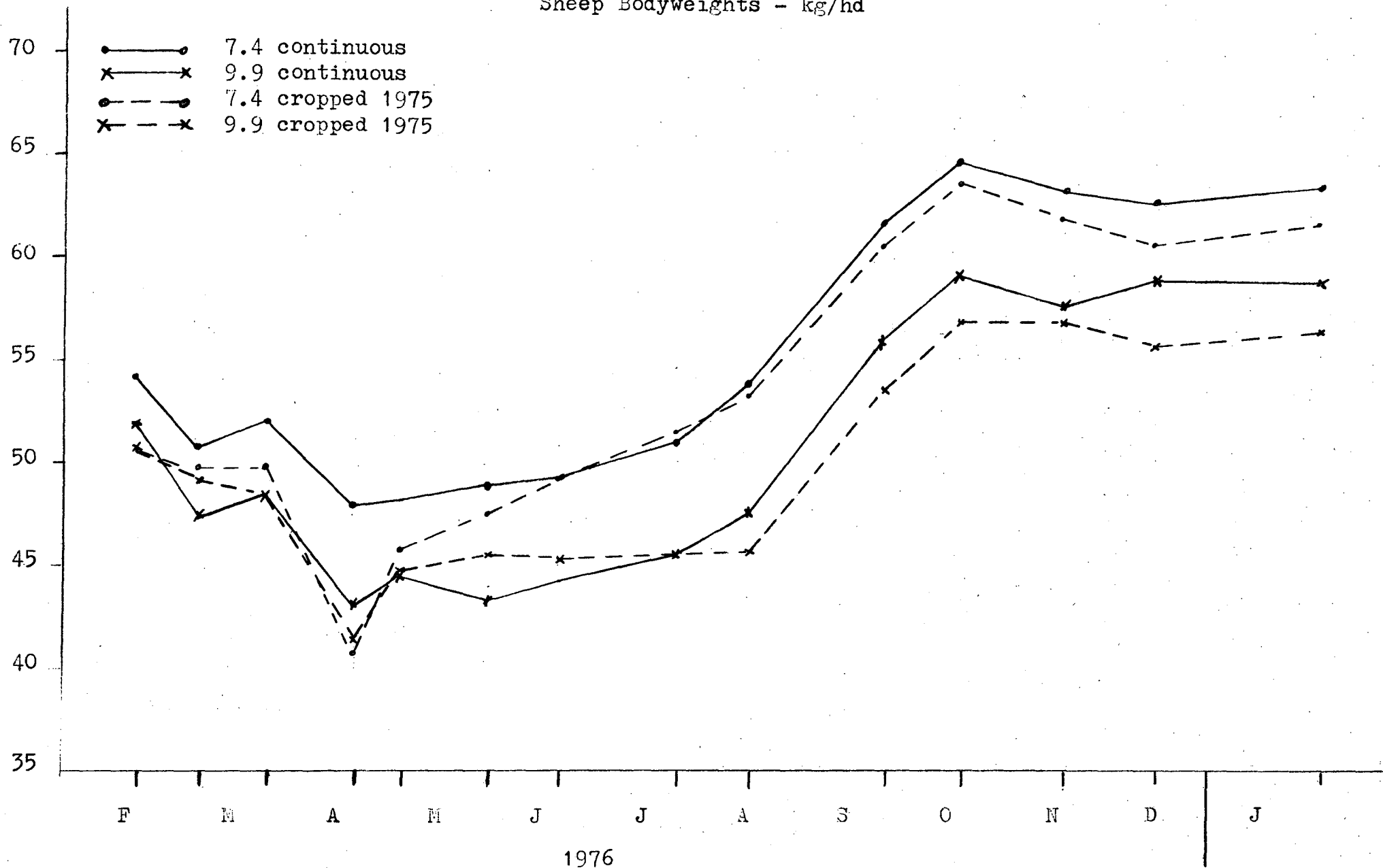
Animals from continuously grazed treatments only.
Remaining sheep grazed in common for most of year during
cropping phase.

<u>Cultivar</u>	<u>7.4 sh/ha</u>	<u>9.9 sh/ha</u>	<u>Average</u>
Geraldton	5.23	4.78	5.00
Unwager	5.65	5.06	5.36
Dwalgarup	4.99	4.52	4.76
Daliak	5.36	5.14	5.25
Seaton Park	5.70	5.18	5.44
Dinninup	5.30	4.90	5.10
Woogenellup	5.48	5.01	5.24
Midland	5.20	5.28	5.24
<u>Average</u>	<u>5.36</u>	<u>4.98</u>	<u>5.17</u>

Clover Cultivar Grazing Trial -
 North Bannister - 1976
 Sheep Bodyweights - kg/hd
 9.9 sh/ha - continuous pasture



Clover Cultivar Grazing Trial -
 North Bannister - 1976
 Sheep Bodyweights - kg/hd



72MN5/3104 EX

Title Perennial Versus Annual Grass Grazing Trial

Location Manjimup Research Station

Aim To compare the productivity of a perennial pasture and an annual pasture.

Site Karri - redgum - jarrah vegetation. Loam changing to sandy quartz at lower southern end.

Treatments 1. Wimmera ryegrass + annual clover.
2. Currie cocksfoot + W.R.G. + annual clover.
Replications - 2
Animals/plot - 6
Stocking rate 2.30 steers/ha.

Experimental Cocksfoot and W.R.G. sown in September 1972. Whole area oversown in May 1973 with W.R.G. and clover. Some grazing from 1/8/73. Trial animals first allocated 29/11/73. Second allocation on 16/12/74, third allocation on 12/12/75.

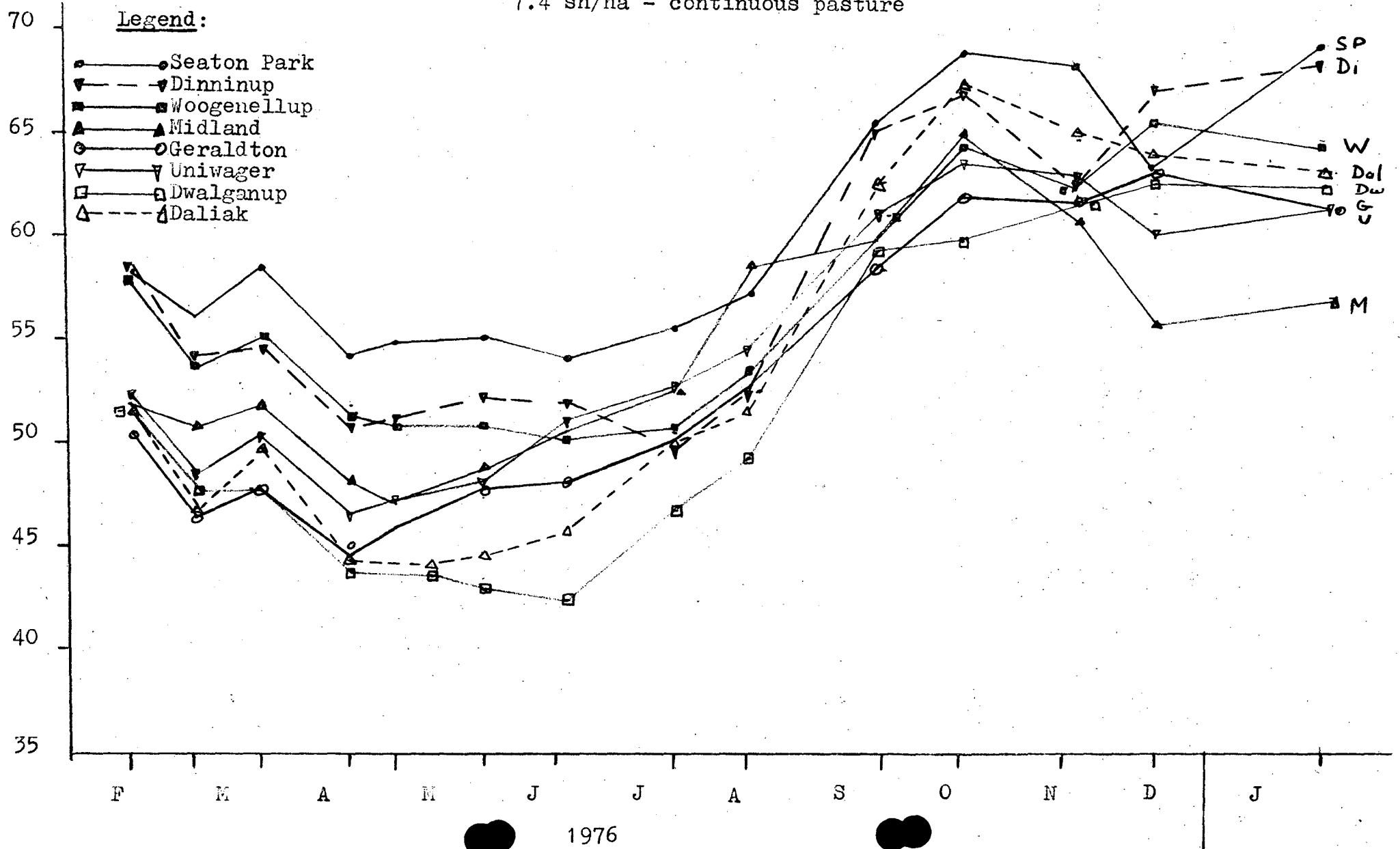
Results See tables - Pasture dry matter yield
Pasture Botanical composition
Steer bodyweight graph.

Comments

1. Amount of pasture on offer consistently favoured the cocksfoot plots (approx. 15%). Difference was least in winter - period of greatest stress.
2. Botanical composition of cocksfoot plots remained similar to 1975. Composition of annual plots continued to change with weed fraction (capeweed mainly) increasing and grass falling. The annual grasses were less vigorous on annual plots as compared with cocksfoot.
3. The cocksfoot pastures visually appear more vigorous and productive than the yield figures indicate - appearances can be deceptive.
4. As in previous years steer bodyweights were maintained better over summer on cocksfoot. Also in 1976 rate of gain was slightly better on average on cocksfoot from August onwards. Heavy late rains in November would have favoured the cocksfoot.
5. No hay was made in 1976. Instead 1/3 of each treatment was closed in mid October. The standing feed will be fed back in mid summer.

68NA1/2303EX

Clover Cultivar Grazing Trial -
North Bannister - 1976
Sheep Bodyweights - kg/hd
7.4 sh/ha - continuous pasture



6. The trend present in previous years of higher bodyweight gains on cocksfoot became more evident in 1976 - 214 kg/hd c.f. 180 kg/hd for the twelve months. Also the heavier weight was accompanied by a greater degree of finish - 7.8 mm c.f. 5.8 mm of backfat cover.

72MN5/3104 EX

Plant Assessments - 1976

Dry Matter Yield - kg/ha

	1/7	12/8	21/9	11/11
Annual	892	622	1567	3072
Cocksfoot	925	712	1814	3566

Botanical composition - % - using dry weights of hand separated samples.

	1/7			12/8			21/9			11/11		
	CL	WE	GR	CL	WE	GR	CL	WE	GR	CL	WE	GR
Annual	50	44	6	31	59	10	30	62	8	59	31	10
Cocksfoot	53	18	6	42	18	14	48	23	11	48	13	18
			*23			26			18			21

CL = clover + lotus

WE = mainly capeweed, some sorrel

GR = Annual grass

* = Cocksfoot fraction only

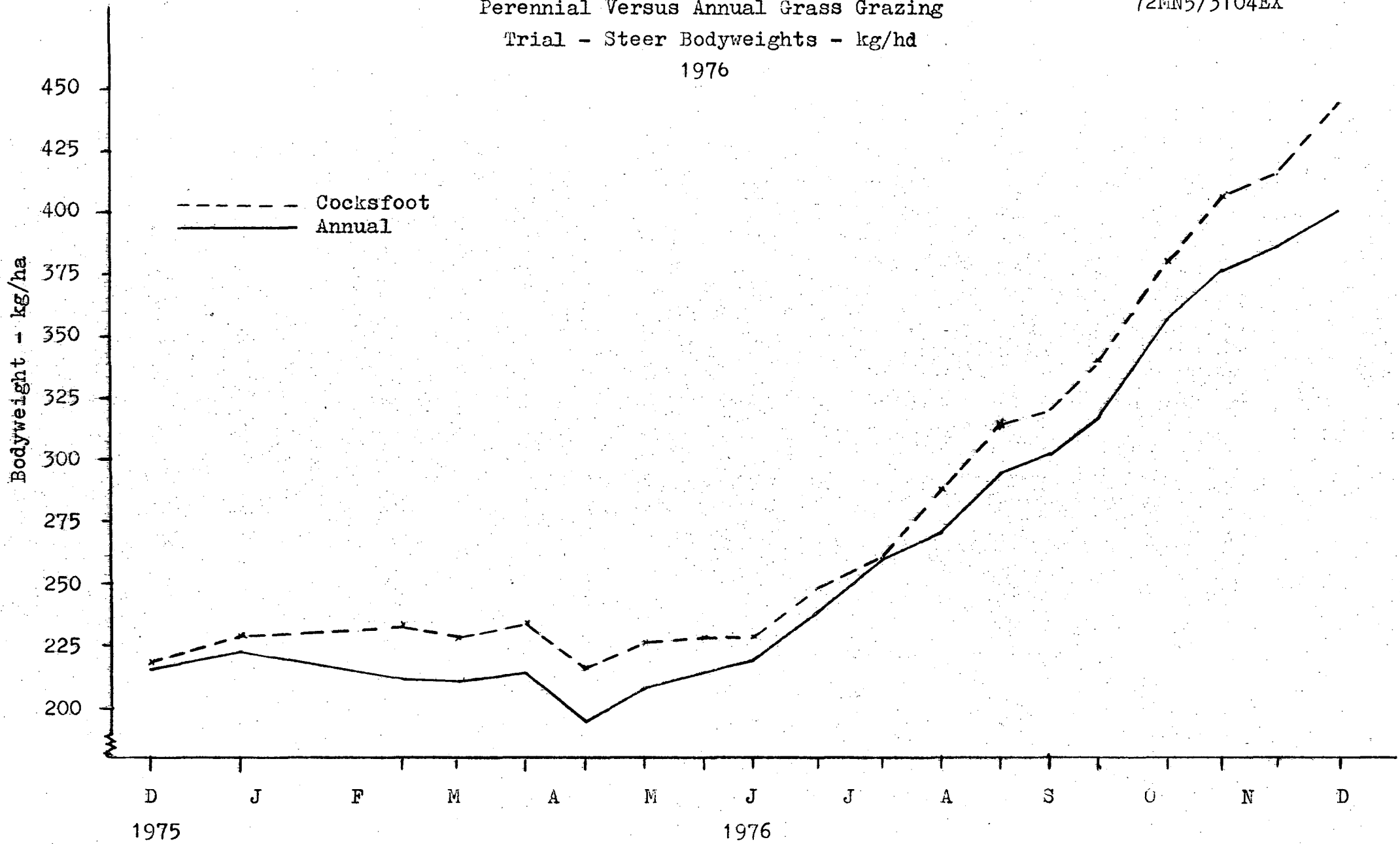
72MN5/3104 EX

Animal Assessments - 1976

		<u>Annual</u>	<u>Cocksfoot</u>
Liveweight gain (2/12/75 - 14/12/76)	kg/hd	180	214
Carcass weight	kg/hd	220	237
Backfat thickness	mm	5.8	7.8

Perennial Versus Annual Grass Grazing
Trial - Steer Bodyweights - kg/hd
1976

72MN5/3104EX



- Title - Pasture Types x Stocking Rate Trial
- Location - Denmark
- Aim - To compare steer beef production at two levels of stocking on four pasture types in a long growing season environment.
- Experimental - Four pasture types x 2 stocking rates x 2 replications (one replication sown on DRS in 1973, one on D.A.H.S. in 1974.
- Site - Mainly plantagenet peaty sand, winter waterlogged.
- Results - Pasture and steer growth rates - D.R.S., D.A.H.S.
- Comments A. Denmark Research Station
1. During February 1976 the whole area was renovated, relimed and then reseeded on 9 - 10/3/76. Following a successful establishment the area was first grazed by sheep (12/4 to 3/6) and then five steers per plot were allocated on 9/6/76.
 2. Kikuyu was satisfactorily established, but as usual, contributed little during the first year.
 3. Steers were maintained on the plots until 6/1/77 when the trial was terminated.
 4. Pasture growth on the poorer plots showed a marked improvement over previous years. However clover scorch and root rot again affected Woogenellup and Yarloop.
 5. The whole area became very waterlogged following heavy rainfall in September - October. Pugging resulted on the short pasture plots (treatments 2,4,6). The Larisa (T 6) failed to make any spring growth. The lack of feed did not markedly affect the animals because they kept breaking into adjoining plots.
 6. Despite the above the Larisa persisted very well throughout the trial - certainly much better than Woogenellup or Yarloop.
 7. At the low stocking rate good bodyweight gains were made on Larisa with performance in late spring being better than on perennial clover.
 8. Poor gains were recorded on T3 - 4. In the case of T 4 lack of a sufficient feed was the reason it having consistently being the poorest plot. For T3 however ample feed was available but the animals did not respond. No satisfactory explanation is available - drenching for worms was carried out.

9. Overall steer bodyweight gains in spring were slightly below expectation as visually there appeared ample feed on all but T 4 and T 6.
10. Despite the trials obvious shortcomings it did show that Larisa clover was much better adapted to the winter waterlogged conditions of the area than Woogenellup or Yarloop. Also Larisa showed capacity to persist well and promote good bodyweight gains in steers.

Treatment	Pasture - 29.10 kg/ha		Steer growth - kg/hd/day		kg/hd 8.12.76
		%CI	9.6-1.9	1.9-8.12	
1. Annual pasture + kikuyu LSR	1800	55	0.63	.87	415
2. " " + " HSR	1500	30	.78	.66	407
3. Perennial pasture + kikuyu LSR	4500	50	.57	.44	368
4. " " + " HSR	400	25	.58	.52	376
5. Larisa LSR	2500	70	1.04	.76	438
6. " HSR	500	80	.88	.56	405
7. Perennial pasture LSR	3500	40	1.04	.48	415
8. " " HSR	3000	30	.65	.89	419

LSR = 2.06 steers/ha

HSR = 2.69 steers/ha

B. Denmark Agricultural High School

72D1/3088 EX

Steers of very mixed quality grazed the plots during 1976 - five steers/plot. Pasture growth was very slow in winter and consequently all animals were removed for one month (28/7 - 26/8/76) to allow recovery.

Clover scorch disease again had a more noticeable effect on Woogenellup and Yarloop than Larisa. Annual lotus became prominent on all plots in late spring.

As had been apparent at the Research Station site the Larisa plots gave good body weight gains in spring - early summer. Once again gains were better than on the perennial clover plots despite a similar legume content and less feed being present.

Treatment			28.7.76		29.10.76		2.12.76		
			kg/ha	%CL	kg/ha	%CL	kg/ha	%CL	%Lot
1.	Woog. + Yarloop	LSR	680	47	2400	30	2900	8	19
2.	" "	HSR	690	53	1200	40	1760	12	25
3.	Iarisa	LSR	930	54	4000	60	3380	35	33
4.	"	HSR	730	54	2000	60	2950	20	28
5.	Woog. + Yarl. + Kikuyu	LSR	640	47	2700	60	3620	5	64
6.	" " "	HSR	630	36	2000	30	2480	5	22
7.	Perennial clover	LSR	1140	41	4000	60	4320	28	30
8.	" "	HSR	1000	52	2500	30	4050	31	14

LSR = 2.06 steers/ha

HSR = 2.69 steers/ha

Steer growth rates - kg/hd/day

Treatment			10.11	25.3 -	26.8 -	Empty Wt.
			25 - 3	28.7	16.12	
			136 days	125 days	112 days	17.12(kg/hd)
1.	Woog. + Yarloop	LSR	.30	-.39	.89	282
2.	" "	HSR	.20	-.38	1.27	324
3.	Iarisa	LSR	.33	-.33	1.55	380
4.	"	HSR	.30	-.19	1.35	354
5.	Woog. + Yarl. + kikuyu	LSR	.33	-.15	.83	303
6.	" " "	HSR	.29	-.24	1.21	324
7.	Perennial clover	LSR	.25	-.01	.90	304
8.	" "	HSR	.29	-.28	1.04	304

Note - all animals grazed off plots from 28/7 to 26/8/76.

Title Clover Cultivar Evaluation Trial

Aim To measure the vegetative growth and seed production of a number of clover cultivars for high rainfall areas.

Experimental 8 cultivars x 6 replications. Plots 4m x 1m, handsown at 100 kg/ha, trimmed after each sampling, except November, to 5 cm. Sampled to ground level.

Site Koorrabup sand, new land, sown 25/3/76. Infected (scorch) clover spread over plots in August and September.

Results Establishment data
seasonal yield - kg/ha

Comments

1. Density of Yarloop below planned level - poor seed quality. Other differences in density mainly due to effects of seed size.
2. Two yield samplings not obtained (May, July) - because of grazing by vermin.
3. Clover scorch worst on Yarloop and Woogenellup. No scorch noted on 26.1. and only light infection on Daliak, Mt. Barker and 39327YB. Scorch worse on Larisa and Trikkala than 39327YB.
4. By December the two earlier maturing cultivars had senesced. Annual lotus swamped plots of Daliak, Trikkala and Yarloop by early December.
5. Up to early November 39327YB, Larisa and Mt. Barker had produced most herbage. Only 39327YB and Mt. Barker took advantage of later rains.
6. Cultivars Trikkala, 26.1 appeared to early maturing for environment with no growth after mid November. Despite better scorch tolerance herbage production no better than Woogenellup.
7. Yield will be determined in 1977 following regeneration,

Pasture assessments - 1976

	Density*	Clover herbage yield -kg/ha				
	No/sq.dm.	4/8	8/9	5/10	5/11	8/12
Daliak	6.63	2258	1708	1125	2250	460
Yarloop	1.78	1550	1683	1367	2625	335
Trikkala	3.09	2141	1550	1283	2633	550
210.10.26.1	3.93	1808	1875	2117	2217	1445
Woogenellup	5.87	2108	1925	1617	2650	1540
39327YB	6.42	1933	2117	2258	2892	3480
Mt. Barker	7.82	2341	1508	2167	2708	3850
Larisa	4.39	2091	1816	2125	3258	3020

* 29/4/76

Note - plots not trimmed after 5/11 cut.

76ES11/3423 EX

Title Clover Cultivar Evaluation Trial

Aim To measure the vegetative growth and seed production of a number of clover cultivars.

Experimental- 6 clover cultivars x 6 replications. Plots 4m x 1m, handsown at 100 kg/ha.

Site New land, sand. Sown 14/4/76

Comments A satisfactory germination but area subject to intense sand blast. Growth very slow. Trial abandoned.