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# Pasture species investigations - high rainfall area 1976

D A. Nicholas

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## Recommended Citation

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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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N. Bannister.
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Esperance

TITLE : Perennial versus Annual Grass Grazing Trial

LOCATION : Manjimup Research Station

AIM : To compare the productivity of a perennial grass based pasture and an annual pasture.

SITE : Loam changing to sandy quartz at southern end carrying karri, redgum, jarrah vegetation.

TREATMENTS : 1. Wimmera ryegrass and annual clover.  
2. Currie cocksfoot and Wimmera ryegrass and annual clover.

Replications - 2  
Animals/plot - 6  
Stocking rate - 2.30 steers/ha

EXPERIMENTAL : Cocksfoot and Wimmera ryegrass sown in September 1972. Whole area oversown in May 1973 with Wimmera ryegrass and clover. Some grazing from 1/8/73. Trials animals allocated annually end of each year commencing 1973.

RESULTS : see Tables - Pasture dry matter yield.  
Pasture botanical composition.  
Steer body-weight graph.  
Steer carcass measurements.

#### Comments

1. A poor start to the season resulted in very low winter pasture yields. Hay was fed to animals from 15/6/77 to 17/8/77 at 10 kg/6 animals/day.
2. In contrast to previous years available pasture was not consistently greater on perennial plots. However in October when one third of area closed up, the perennial plots made much better growth on closed area 4648 kg/ha cocksfoot 2800 kg/ha after a 6 week closing period. In terms of number of bales cut the difference was even greater. Pasture aftermath also greater on the cocksfoot. On grazed two thirds little difference between treatments.
3. Pastures continue to differ markedly with annual pasture containing much capeweed; perennial pastures contain little.

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4. Cocksfoot plant density remains stable at 24 plants/m<sup>2</sup>.
5. An advantage in favour of the cocksfoot treatment was shown in animal bodyweight. During the June-September period there was a difference of 30 kg/hd - approximately a 20% increase. The difference decreased during spring and at slaughter the advantage was 20 kg/hd.
6. At slaughter each carcass was individually valued and on that basis the carcasses from the cocksfoot plots averaged over \$6/head more (\$14=60/ha).
7. There were two groups of animals for each treatment. The two cocksfoot groups performed similarly. However, the two annual groups reacted differently. One group (No. III) performed well below average in terms of bodyweight - over summer pasture residues were very low. However, once hayfeeding commenced good gains were recorded and in fact the group ended up having the thickest backfat of any group on the trial.

Note - the trial is carried out jointly with J. Giumelli, Manjimup.

#### PLANT ASSESSMENTS - 1977

Dry matter yield = kg/ha

	7/7	31/8	8/11	Bales/ ha
Annual	72	786	2458	114
Cocksfoot	104	487	3204	286

Botanical composition = %

	7/7				31/8				8/11			
	CL	WE	AG	Dg	CL	WE	AG	Dg	CL	WE	AG	Dg
Annual	35	52	13		44	41	15		45	32	23	
Cocksfoot	16	3	15	66	41	1	38	20	49	2	26	23

CL = clover + lotus  
WE = weed, mainly capeweed

AG = annual grass  
Dg = cocksfoot

3.

Animal assessments

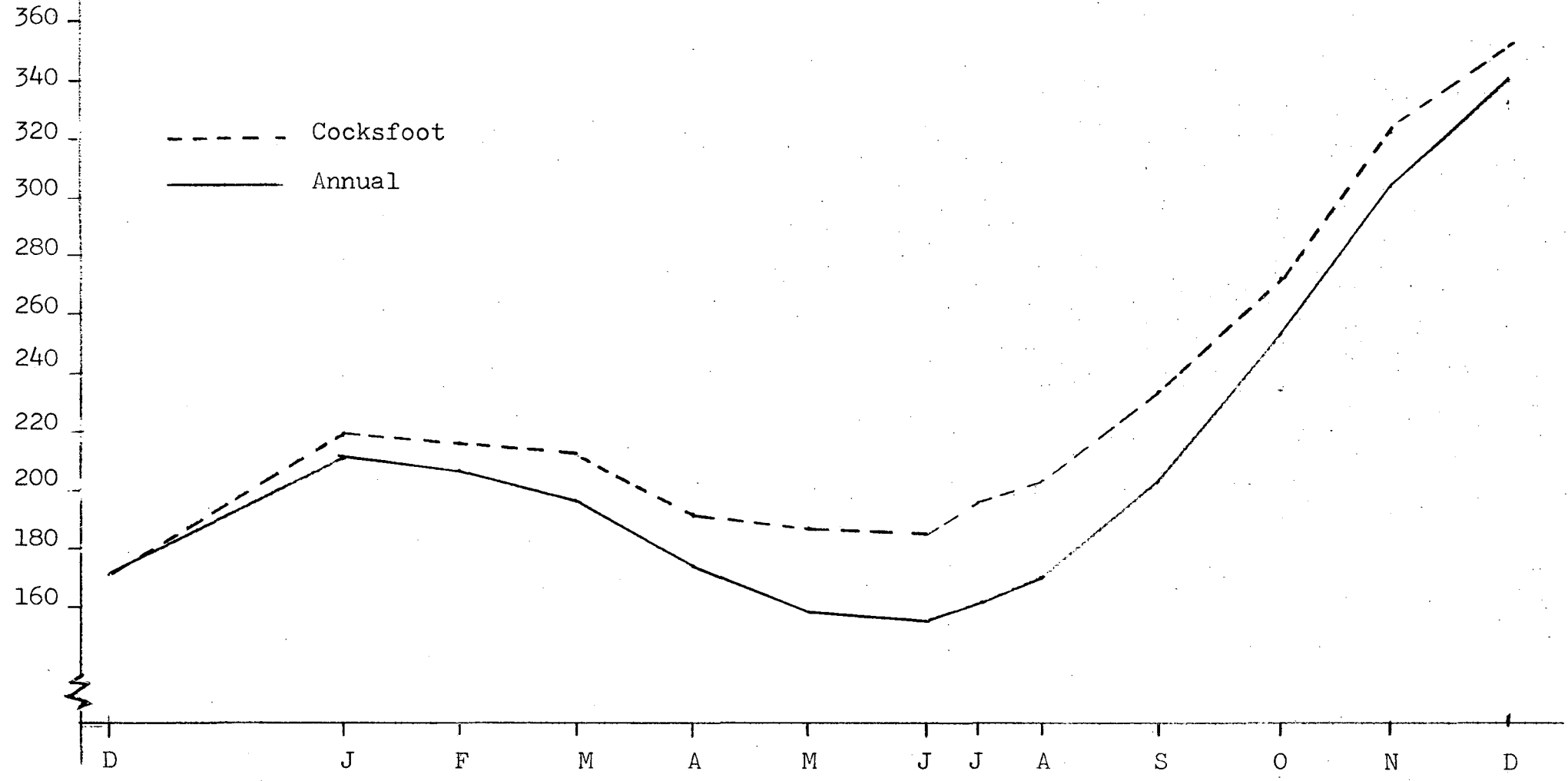
		<u>Annual</u>	<u>Cocksfoot</u>
Liveweight gain	kg/hd	146	168
15/12/76 to /12/77			
Carcass weight	kg/hd	165	174
Backfat thickness	mm	10.4	10.8
Carcass value	\$ hd	87.14	93.50

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PERENNIAL VERSUS ANNUAL GRASS GRAZING TRIAL

STEER BODYWEIGHTS - kg/hd

1977



1976

1977

4.



TITLE : Pasture Types x Stocking Rate Trial

LOCATION : Denmark Agricultural High School

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 two stocking rates. Steers changed annually.

SITE : Mainly Plantagenet peaty sand, winter waterlogged.

RESULTS : Steer body weight.  
Pasture assessment.

#### Comments

1. Once again steers of very mixed quality ex Wokalup Research Station grazed the plots during 1977 - 5 steers/plot.
2. With the late start to the season (early May) pasture growth was again very slow during winter. Animals had to be removed from the Woogenellup plus Yarloop treatments for two months from 27/6/77 to 26/8/77.
3. Animal performance was again reasonable on the Larisa treatments - particularly at the high rate of stocking. Performance on the Woogenellup plus Yarloop plus kikuyu was better than that on Woogenellup plus Yarloop - there was a higher clover content (including some perennial clover) on the kikuyu treatment.
4. Clover root rot again was evident on Woogenellup and Yarloop. Clover scorch was also more damaging on those two cultivars. Consequently annual lotus made up the bulk of the pasture on those treatments.
5. Larisa plots continued to maintain a high clover content. Grass content now averages 30-35% in spring on the Larisa plots.
6. The perennial clover has persisted but has not contributed greatly to production, except in late spring - early summer.
7. If sufficient seed can be obtained, one of the deteriorated plots (No. 2) will be sown to a promising Yanninicum selection 39327YB in 1978.

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Pasture type			Yield Nov. 1977			Steer growth rate kg/hd/day		
			kg/ha	% CL	% LO	23/12 to 16/3	16/3 to 27/6	27/6 to 30/9
1.	Woog. + Yarloop	LSR	3035	2	61	0.25	0.49	* -
2.	" "	HSR	2155	5	33	0.06	0.44	* -
3.	Larisa	LSR	3044	63	5	0.32	0.78	0.80
4.	"	HSR	2252	34	42	0.52	0.38	1.04
5.	Woog. + Yarloop + kikuyu	LSR	1799	26	60	0.44	0.31	0.84
6.	" " " "	HSR	2057	12	52	0.38	0.50	0.42
7.	Perennial clover	LSR	2795	8	22	0.52	0.40	1.10
8.	" "	HSR	2555	18	30	0.31	0.61	0.86

\* Animals removed because of low bodyweight and absence of feed.

LSR = 2.06 steers/ha

HSR = 2.69 steers/ha

TITLE : Clover Cultivar Evaluation Trial

LOCATION : Denmark Research Station

AIM : To measure the vegetative growth and seed production of a number of clover cultivars when exposed to clover scorch disease.

EXPERIMENTAL : Eight cultivars x 6 replications. Trial handsown in 1977. Topdressed with fertiliser in autumn 1977 (super 370 kg/ha, muriate of potash 90 kg/ha) and late winter (250 kg/ha of 3:2 super/potash).

RESULTS : Clover plant density and seed parameters. Dry matter yields. Botanical composition and clover scorch rating.

#### Comments

1. No significant rainfall received over summer. Opening rains received late April 1977.
2. Germination as measured in laboratory on field samples lower than expected, particularly for 39327YB. However the 6.4 plants/sq. dm. of 39327YB was equivalent to 50 kg/ha of germinable seed. (Seed yield x % germination = 61 kg/ha).  
Perhaps the laboratory test does not reflect accurately the field germination for all cultures.
3. Losses in plant density was recorded for the high density stands and the disease prone Woogenellup.
4. Some clover scorch disease became evident in spring. Yields of Yarloop were reduced. Larisa and Trikkala both showed greater signs of attack than did 39327YB.
5. Trikkala yielded very well in the second year of the trial - particularly at the early part of the season. Low plant densities reduced yields of 39327YB early in the season but by late July it was producing well.
6. Larisa produced well throughout the year. However its prostrate habit of growth resulted in low yields above 7 mm when sampled in June. Visually Larisa was not as impressive as 39327YB in spring.
7. The clover content of the plots was generally above 80% until late August when grasses and the annual lotus became evident. The most clover dominant stand was maintained by 39327YB.

8.

8. The final yield sampling in December was not obtained through cattle having broken into the area.

	Seed Yield Summer kg/ha	% germ- ination 13/4/77	Seed Size mgm/seed	Clover Plant Density		
				17/5/77	13/7/77	14/9/77
1. Daliak	433	21	3.24	58.3	29.3	21.8
2. Esperance	914	12	4.40	40.9	28.2	26.0
3. Trikkala	779	30	7.60	51.6	27.2	21.7
4. Yarloop	407	38	7.77	34.4	15.7	13.0
5. 39327YB	759	8	7.56	6.4	6.7	6.2
6. Larisa	542	25	7.16	20.8	21.0	12.0
7. Woogenellup	581	32	6.22	35.9	16.4	8.7
8. Mt. Barker	489	12	4.65	14.8	13.5	9.8

HERBAGE PRODUCTION

kg/ha of dry matter

1977

A. By rotary mower

	16/6	12/7	10/8	7/9	6/10
1. Daliak	323	186	493	507	684
2. Esperance	270	300	490	630	974
3. Trikkala	709	609	704	674	894
4. Yarloop	636	414	519	586	509
5. 39327YB	90	224	655	740	1356
6. Larisa	194	443	450	654	1017
7. Woogenellup	260	230	412	520	796
8. Mt. Barker	110	194	416	564	815

16/6 to 7/9 - cutting height 7 mm. On 6/10 increased to 60 mm, not cut on 2/11.

## B. Amount below rotary mower (cut with handpiece)

	16/6	12/7	10/8	7/9	6/10
1. Daliak	500	658	669	512	776
2. Esperance	275	704	641	362	1023
3. Trikkala	275	370	534	317	931
4. Yarloop	212	433	528	483	971
5. 39327YB	138	475	538	408	692
6. Larisa	512	646	497	454	824
7. Woogenellup	338	596	508	492	740
8. Mt. Barker	225	379	440	529	1004

## C. Total above ground growth for period ending -

	16/6	12/7	10/8	7/9	6/10	2/11
1. Daliak	823	344	504	350	948	1266
2. Esperance	545	729	427	351	1635	1585
3. Trikkala	984	704	868	457	1508	1102
4. Yarloop	848	635	614	541	997	1046
5. 39327YB	228	561	718	610	1640	1983
6. Larisa	706	577	301	611	1387	1834
7. Woogenellup	598	488	324	504	1044	1818
8. Mt. Barker	335	348	477	653	1290	1921

% CLOVER AND CLOVER SCORCH RATING - 1977

	% Clover			Scorch	
	7/9	6/12	2/11	7/9	6/10
1. Daliak	54	63	23	0	0
2. Esperance	63	67	68	0	0
3. Trikkala	85	86	64	3.5	2.5
4. Yarloop	64	56	18	5.0	5.7
5. 39327YB	86	97	81	0.7	1.0
6. Larisa	71	69	59	2.0	2.3
7. Woogenellup	47	42	35	3.0	3.7
8. Mt. Barker	43	56	44	0.5	1.8

Scorch Rating:  
 0 = None  
 3 = Some turned leaves easily seen  
 5 = Many turned leaves

.../10

TITLE : Clover cultivar evaluation trials

LOCATION : P. McDonald, Karridale

AIM : To measure the vegetative growth and seed production of a number of clover cultivars sown on old land.

EXPERIMENTAL : 12 cultivars x 4 replications.  
 Trial hand sown on 10/5/77 at seeding rate of 75 kg/ha viable seed following normal cultivation. Area cropped previous year and had a history of clover scorch and root rot. Fertiliser was 3:2 super potash at 300 kg/ha.

RESULTS : Herbage dry matter yields

#### Comments

1. Heavy rain following seeding resulted in some erosion of plots despite effort by farmer to prevent if happening. However, all plots made good growth by mid spring and only a few plots had winter yield depressed due to the erosion.
2. Some oats were evident at first sampling but they failed to recover from a mowing. Thereafter all plots consisted of 100% clover. Grazing was undertaken for a short period in August.
3. Neither clover scorch nor root rot had a major effect on production.
4. Mt. Barker performed well throughout the season. Two of the new selections, MND7 and DMN5 also showed promise.
5. Unexpectedly Larisa out produced 39327YB, particularly in the late spring period. The 39327YB was taller in November and collapsed faster than Larisa with the onset of hot weather in late November.

77BU10/3423 EX

P. McDonald  
Karridale.DRY MATTER YIELD OF CLOVER

kg/ha - 1977

Cultivar	18/7	29/9	27/10	24/11	Total
1. Guildford D	436	1104	2262	4462	6002
2. Esperance	280	911	2212	4762	5953
3. Woogenellup	240	993	2438	5000	6233
4. HND2.3	286	1263	2638	4050	5599
5. HND7.1	257	1114	2638	3300	4671
6. MND7	312	976	2662	5000	6288
7. MND9	276	984	3062	4550	5870
8. Mt. Barker	460	1318	2838	5062	6840
9. Larisa	297	1035	3250	4938	6270
10. 39327YB	297	894	2800	4425	5616
11. DMN4	246	910	2888	4738	5894
12. DMN5	253	1226	2962	4962	6441
	304	1061	2721	4604	5969

Yield - Cut at 7 mm on 18/7,  
10-15 mm on 29/9,  
ground level on 27/10 and 24/11 but not  
trimmed after sampling.

Grazed by cattle for two weeks prior to 31/8.

Some plots eroded after seeding - lowered yields of Esperance,  
Woogenellup at 18/7 sampling.

TITLE : Clover cultivar evaluation trial

LOCATION : Denmark Research Station

AIM : To measure the vegetative growth and seed production of a number of clover cultivars sown on old land.

EXPERIMENTAL : 12 cultivars z 4 replications.  
 Trial handsown on 2/5/77 at a seeding rate of 75 kg/ha viable seed. Area used was a degenerated pasture with a history of clover scorch and root rot. Normal cultivation techniques used to prepare seed bed. Fertiliser used was 300 kg/ha of 3:2 super potash at seeding with a further 250 kg/ha in September.  
 Soil type - Plantagenet peaty sand.

RESULTS : Plant establishment.  
 Total yields and clover yields.  
 Botanical composition.

#### Comments

1. The season commenced late (30/4/77) and growth was very slow in winter. RLEM were a problem until sprayed.
2. Establishment was satisfactory with 40-60% of viable seeds emerging. Best establishment by larger seeded cultivars. Following plant count on 25/5 heavy mortality of plants in Woogenellup and Mt. Barker treatments was observed (root rot).
3. A low germination of old pasture measured = 0.6 plants/dm<sup>2</sup>.
4. Clover generally made up at least 50% of total production until November. Two notable exceptions were Woogenellup and Mt. Barker which suffered from root rot disease. During November grasses and lotus grew rapidly and clover scorch disease affected some cultivars (notably MND9 and DMN4). Mt. Barker also was affected by clover scorch due to the Mt. Barker seed source being impure.
5. Despite some scorch being evident on Larisa and 39327YB best late spring growth made by those cultivars. On visual appearances 39327YB was more showy than Larisa.



CLOVER CULTIVAR TRIAL

Denmark Research Station (1977)

	Density No./dm <sup>2</sup>	Scorch Rating 6/10	Clover yield only - kg/ha			
			7/9	6/10	2/11	1/12
1. Guildford D	5.3	0.3	166	404	525	375
2. Esperance	5.2	0.0	220	553	778	438
3. Woogenellup	4.4	4.0	64	159	362	262
4. HND 2.3	5.3	0.0	179	582	791	388
5. HND 7.1	4.4	0.0	199	638	959	538
6. MND 7	4.6	0.0	139	466	909	1088
7. MND 9	5.1	1.5	189	390	751	475
8. Mt. Barker	5.4	2.0	100	176	315	588
9. Larisa	6.3	1.3	271	782	1145	1450
10. 39327YB	5.5	0.8	260	721	1302	1425
11. DMN 4	4.8	2.0	299	620	939	500
12. DMN 5	5.2	0.3	239	690	1049	975
AVERAGE	5.1		194	515	819	708

Cutting regimeSample AreaWhole plot

10/8

7 mm

7 mm

7/9

7 mm

7 m

6/10

50 mm

50 mm

2/11

ground

not trimmed

1/12

ground

not trimmed

CLOVER CULTIVAR TRIAL

Denmark Research Station - (1977)

Total yield (kg/ha) and % clover

Cultivar	10/8	7/9		6/10		2/11		1/12	
	Tot	Tot	% C	Tot	% C	Tot	% C	Tot	% C
1. Guildford D	389	272	57	682	61	1612	33	3050	12
2. Esperance	374	363	62	806	69	1588	47	2875	15
3. Woogenellup	139	168	38	488	32	1650	22	3600	7
4. HND 2.3	202	286	62	924	63	1688	47	3050	14
5. HND 7.1	186	316	64	943	67	1688	58	2950	19
6. MND 7	243	262	54	729	63	1888	48	3212	35
7. MND 9	310	295	60	773	49	1812	41	3288	14
8. Mt. Barker	252	183	53	476	37	1825	17	3100	19
9. Larisa	242	413	66	1045	74	1875	62	2962	49
10. 39327YB	336	361	71	938	76	2075	63	3050	41
11. DMN 4	356	446	66	922	67	1712	55	3000	18
12. DMN 5	361	368	64	930	74	1888	56	3012	33
AVERAGE	282	311	60	804	61	1775	46	3096	23

Tot = Total dry matter yield. Other components - grasses, sorrel, flatweed, lotus.

% C = % clover in total yield.

TITLE : Clover Cultivar Evaluation Trial

LOCATION : P. Healy, Wellstead

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

EXPERIMENTAL : 10 cultivars x 4 replications. Trial handsown on 16/5/77 onto new land - 15 cm sand over gravel. Fertiliser used - 400 kg/ha of Mix A + 60 kg/ha of muriate of potash at seeding plus 250 kg/ha of 3:2 super/potash in September. Seeding rate was 100 kg/ha viable seed.

RESULTS : Plant establishment.  
Dry matter yield.

Comment

1. Establishment normal. Daliak and Esperance early on and Yarloop later had a number of reddened plants.
2. Conditions dry during most of the year. Only one yield sampling obtained. No clover scorch observed.
3. Yield of Daliak low due to plants beginning to senesce at time of cutting and height of cutting (50 mm). In absence of scorch Woogenellup yielded well. Others to yield well were Trikkala, DMN 25 and HND 7.4.

CLOVER CULTIVAR TRIAL

P. Healy, Wellstead

1977

Cultivar	Density - 17/6 No./dm <sup>2</sup>	Yield - kg/ha 5/10
1. Yarloop	7.6	696
2. Daliak	14.7	496
3. Trikkala	9.0	1227
4. Seaton Park	9.4	1024
5. Dinninup	18.2	976
6. Esperance	10.3	1031
7. Woogenellup	8.3	1467
8. DMN 25	14.2	1362
9. HND 7.4	11.6	1359
10. Mt. Barker	10.0	1002
	11.3	1064

TITLE : Clover Cultivar Evaluation Trials

LOCATION : Esperance District.  
 77ES27 - R.L. Stead, Dalgup  
 77ES28 - E.L.D., Coomalbedgup  
 77ES29 - R. Overheau, Mt. Howick

AIM : To measure the vegetative growth and seed production of a number of clover cultivars sown onto old land of the Esperance plain.

EXPERIMENTAL : 8 cultivars x 6 replications.  
 All trials sown dry into paddocks cropped in 1976. Trials hand sown in late April prior to start of season - a late break. Clover seeding rate was 120 kg/ha. Fertiliser used was 400 kg/ha of Mix B.

RESULTS : Establishment density.  
 Pasture yield.

#### Comments

1. Because season had not commenced by late April and because of location of trials, seeding was carried out prior to any substantial germination of pastures. Capeweed growth in particular provided severe competition for the clover seedings in late May-June. Some spraying with Sprayseed helped to reduce the competition.
2. Establishment was satisfactory at two sites but at Coomalbedgup an unplanned grazing by cattle damaged pastures and made an establishment count too difficult to make. Best establishment was obtained at Dalgup with 66% of germinable results. At Mr. Howick where capeweed competition was greatest emergence was reduced to 45%. Dinninup, Seaton Park and Trikkila gave best establishment while the small seeded Daliak the poorest (% germinable seed basis).
3. Growth of clovers generally was poor at all sites. A very dry period experienced in early October resulted in most cultivars senescing before a spring sampling could be taken. The seasonal conditions should also result in reduced seed yields although Esperance and Woogenellup may have benefited from mid October rains.
4. Seed yield and germination densities in 1978 will be important measures of the success of the cultivars.
5. The conduct of trials at remote locations is difficult.

CLOVER CULTIVAR TRIALS - ESPERANCE

1977

	Density 31/5/77 No./dm <sup>2</sup>		Yield-77ES29-16/8/77		
	77ES27	77ES29	Total kg/ha	% clover	clover kg/ha
Yarloop	7.0	5.1	1420	28	398
Daliak	11.2	5.4	1250	20	258
Trikkala	9.4	4.9	1691	20	341
Guildford D	11.9	7.5	1517	47	715
Seaton Park	10.2	8.6	1554	45	677
Dinninup	14.0	10.8	1540	60	927
Esperance	11.4	8.4	1287	32	410
Woogenellup	7.3	4.4	1431	38	559
AVERAGE	10.3	6.9	1462	36	536