1970

Pasture species investigations - high rainfall area

D A. Nicholas

PASTURE SPECIES INVESTIGATIONS

HIGH RAINFALL AREA

D.A. NICHOLAS

1970/71

CLOVER CULTIVAR GRAZING TRIAL
GILROS PASTORAL CO., NORTH BANNISTER

Sheep Bodyweights - kg/head
1970/71

		17/4	6/5	21/5	3/6	18/6	10/7	3/8	10/9	13/10	27/11	8/1	10/2
Geraldton	3 sh/ac	47.3	46.1	43.0	41.9	42.7	44.5	51.3	59.1	64.9	67.3	66.0	63.6
"	4 "	42.1	41.3	40.1	38.4	38.1	39.8	45.7	53.0	60.8	64.1	62.9	60.0
Uniwager	3 "	45.3	44.6	43.9	42.9	43.6	45.8	52.5	59.4	66.0	70.6	68.4	65.7
	4 "	36.9	37.2	36.0	34.0	33.9	35.8	41.6	49.4	56.4	63.0	62.6	57.7
Dwalganup	3 "	49.7	50.1	48.3	46.9	47.0	48.7	53.2	62.6	68.6	72.0	71.8	69.3
	4 "	43.8	43.8	42.8	41.4	41.3	42.3	46.0	53.5	60.5	65.1	64.7	63.2
Daliak	3 "	47.4	46.1	46.0	46.5	47.7	50.3	55.7	62.8	69.2	70.0	68.9	66.7
	4 "	40.7	41.2	41.5	40.1	41.2	42.8	47.8	54.9	62.9	67.1	65.4	63.4
Seaton Park	3 "	49.6	48.8	48.0	48.0	48.1	50.4	56.6	63.4	70.4	73.1	75.0	71.1
	4 "	39.6	40.2	39.4	38.5	37.0	41.8	47.4	55.9	62.5	69.9	70.0	66.5
Dinninup	3 "	47.7	46.5	46.0	45.2	45.3	48.6	53.8	59.9	64.9	70.9	71.3	71.1
	4 "	42.6	42.5	41.4	40.3	40.0	43.0	46.6	53.5	60.1	70.0	70.1	68.0
Woogenellup	3 "	55.0	52.7	50.5	49.1	47.2	49.4	53.3	59.8	67.5	69.5	70.3	69.2
	4 "	51.3	49.6	46.9	45.2	43.5	43.5	46.7	54.8	63.7	71.9	73.4	71.8
Mt Barker	3 "	50.6	48.7	46.9	44.2	43.7	43.5	46.1*					
	4 "	44.7	45.0	42.6*									

* Treatments discontinued.

Wool Data

Shorn - 6/4/70 Previous Shearing 23/4/69

		Greasy Wt (kg/hd)	Clean Wt (kg/hd)	Yield (%)	Fibre Diam. (microns)	Staple Length (cms)
Geraldton	3 sh/ac	5.67	4.14		23.9	7.0
	4 "	5.19	3.77		23.1	6.7
Average		5.42	3.95	72.9	23.5	6.9
Uniwager	3 "	5.25	3.59		21.9	6.6
	4 "	4.61	3.41		21.5	6.2
Average		4.93	3.50	71.2	21.7	6.4
Dwalganup	3 "	6.02	4.48		23.8	6.9
	4 "	5.33	4.07		22.6	7.2
Average		5.67	4.27	75.3	23.2	7.1
Daliak	3 "	5.74	4.14		22.9	6.2
	4 "	5.26	3.77		23.6	6.6
Average		5.50	3.95	71.9	23.2	6.4
Seaton Park	3 "	5.97	4.39		24.2	6.6
	4 "	5.23	3.84		22.9	5.5
Average		5.59	4.11	73.5	23.5	6.0
Dinninup	3 "	6.06	4.39		24.0	6.4
	4 "	5.57	3.98		23.5	6.2
Average		5.81	4.18	71.7	23.7	6.3
Woogenellup	3 "	6.29	4.55		24.5	6.6
	4 "	5.90	4.21		23.7	6.5
Average		6.09	4.37	72.0	24.1	6.5
Mt Barker	3 "	6.15	4.48		24.9	6.7
	4 "	5.57	4.09		23.8	6.4
Average		5.86	4.28	73.1	24.3	6.5

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CLOVER CULTIVAR GRAZING TRIAL

GILROS PASTORAL CO., NORTH BANNISTER

68NA1/2303 Ex

Pasture Measurements 1970

Cultivar	2.6.70			Yield of top dry matter - Kg/ha - - grazed			
	Density plants/ 10 sq.dm	Yield kg/ha	% Clover (by weight)	15.7.70	31.8.70	16.10.70	
						Yield	% Clover
Geraldton 3 sh/ac	496	855		1,096	2,556	2,207	
4 "	408	900		860	1,970	1,442	
Average	453	877	98	978	2,262	1,824	91
Uniwager 3 "	460	660		722	1,502	1,825	
4 "	356	600		704	1,157	954	
Average	409	630	89	713	1,329	1,389	53
Dwalganup 3 "	482	1,028		1,153	2,807	3,480	
4 "	358	855		922	2,281	3,206	
Average	421	941	95	1,038	2,544	3,343	89
Daliak 3 "	654	976		842	2,055	3,018	
4 "	596	765		723	1,787	2,429	
Average	624	870	95	783	1,921	2,723	85
Seaton Park 3 "	328	569		864	1,662	3,815	
4 "	268	485		719	1,252	3,527	
Average	298	527	92	792	1,457	3,670	94
Dinninup 3 "	444	627		976	2,381	4,436	
4 "	346	527		875	1,940	3,855	
Average	396	577	88	926	2,161	4,145	97
Woogenellup 3 "	67	330		733	1,441	5,132	
4 "	55	289		773	1,189	4,025	
Average	61	309	78	753	1,314	4,578	94
Overall 3 "	379	654		912	2,057	3,416	
4 "	308	623		797	1,654	2,776	
Average	343	639		850	1,856	3,096	
Mt Barker 3 "	26	192					
4 "	22	101					
Average	24	162	36				

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CLOVER CULTIVAR GRAZING TRIAL
GILROS PASTORAL CO., NORTH BANNISTER

68NA1/2303 Ex

Pasture Measurements 1970
Yield - Kilogram/hectare

	19.3.70		16.12.70		
	Total	Seed	Total	Vegetative	% Germination
Geraldton 3 sh/ac	2,034	553	3,476	3,051	
4 "	895	259	2,438	702	
Average	1,465	406	2,957	877	7
Uniwager 3 "	1,220	303	2,837	1,405	
4 "	1,252	306	2,023	914	
Average	1,236	305	2,430	1,159	10
Dwalganup 3 "	1,474	270	4,297	2,049	
4 "	1,297	285	3,290	1,276	
Average	1,385	277	3,794	1,662	21
Daliak 3 "	1,487	318	3,870	1,787	
4 "	845	187	2,680	1,080	
Average	1,166	252	3,275	11433	19
Seaton Park 3 "	1,191	217	3,435	3,170	
4 "	682	124	3,780	1,348	
Average	936	170	3,108	1,759	24
Dinninup 3 "	1,115	230	4,338	3,197	
4 "	985	188	3,297	2,107	
Average	1,050	209	3,817	2,652	22
Woogenellup 3 "	897	94	4,160	3,380	
4 "	651	75	3,594	2,490	
Average	774	84	3,877	2,935	44
Mt Barker 3 "	642	26			
4 "	294	13			
Average	443	20			

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CLOVER CULTIVAR GRAZING TRIAL 68NA1/2303 Ex
GILROS PASTORAL CO., NORTH BANNISTER

Chemical Analyses of Pasture

15.8.69

(Sampled after pasture sprayed with 2 oz cobalt sulphate/ac on 23.7.69)

	Percentage			p.p.m.					Invitro digestibility - %		
	P	N	S	Cu	Zn	Co	Mo	Mn	7/69	10/69	12/69
Geraldton	0.29	4.48	.23	5.45	34	1.49	.47	45	81	63	38
Uniwager	0.32	4.81	.28	5.65	29	.83	.46	37	78	66	39
Dwalganup	0.24	3.92	.26	5.50	32	1.67	.59	43	75	60	45
Daliak	0.31	4.79	.25	6.32	30	1.34	.36	51	77	66	43
Seaton Park	0.31	4.50	.25	5.32	29	1.37	.47	43	79	64	39
Dinninup	0.28	4.31	.25	4.20	26	1.47	.49	36	75	66	42
Woogenellup	0.29	4.39	.24	4.70	25	1.09	.45	42	81	72	42
Mt Barker	0.31	4.46	.24	5.37	30	1.79	.44	34	79	71	44

16.7.70

	Percentage			p.p.m.				
	P	N	S	Cu	Zn	Co	Mo	Se
Geraldton	.45	5.69	.29	8.3	39	.16	1.10	.02
Uniwager	.45	5.15	.30	8.0	35	.15	.93	.02
Dwalganup	.41	5.15	.30	8.7	38	.12	.56	.02
Daliak	.47	5.67	.31	8.8	36	.09	.96	.01
Seaton Park	.45	5.13	.25	7.7	36	.19	.90	.02
Dinninup	.44	5.31	.26	6.2	28	.10	.64	.02
Woogenellup	.40	4.95	.27	7.1	31	.09	.61	.02
Barker	.40	4.50	.26	7.1	27	n.s.s.	.66	.02

The difference in bodyweight of sheep that were established over the first summer of the trial were maintained up to shearing of 1970. These differences were reflected in the wool production of the various groups. Sheep grazing Woogenellup, Mt Barker and Dwalganup produced more clean wool than those grazing Daliak or Geraldton. Sheep grazing Uniwager produced less clean wool than all other groups.

The effect of stocking rate was also marked, although wool production per acre clearly was greater with the increased stocking rate.

Stocking Rate	Clean Wool per Head	Clean Wool per Acre
3 sheep/acre	4.27 kg (9.4 lb)	12.82 kg (28.2 lb)
4 sheep/acre	3.89 kg (8.6 lb)	15.64 kg (34.4 lb)

Following the opening rains in April 1970 large differences in clover plant density due to the influence of cultivar were obtained. These differences were directly related to the seed production of the various cultivars in the previous year. The very low plant density recorded for Woogenellup and Mt Barker reflected the poor season for seed production that was experienced in 1969.

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The differences in plant density and seed size resulted in the early winter production of the various cultivars varying greatly with Daliak, Geraldton and Dwalganup producing the most and Woogenellup and Mt Barker the least.

With reasonable growing conditions in 1970 the later maturing cultivars Woogenellup, Dinninup and Seaton Park made their normal excellent spring growth and thus by October had produced more top growth than the four earlier cultivars.

As had been postulated the differences in plant density between cultivars after germination were reflected in the sheep bodyweight changes. Thus sheep grazing Woogenellup and Mt Barker lost most weight and over a longer period following germination than all other groups. Sheep grazing Daliak began significantly gaining weight two weeks earlier than all other cultivars. Therefore by mid-July sheep on Daliak were the heaviest on the trial whereas only three months previously they had been the second lightest. With the availability of adequate feed, all sheep gained weight at similar rates from mid-July to October.

The Mt Barker treatment had to be discontinued from August 1970. Because of the very low density after germination in 1970 the sheep continued to loose weight through until July. In August the sheep were still in very poor condition and it was decided to delete the treatment. The two main reasons behind the decision were -

(a) one of the four Mt Barker groups was in such poor condition that hand feeding would have been necessary;

(b) because of the season in the previous year, very little seed had been set by the Mt Barker cultivar, but contaminant cultivar (e.g. mainly Dwalganup) had: therefore over 80 per cent. of the plants present in 1970 were cultivars other than Mt Barker.

To make use of the plots which became available, it has been decided to seed them to a new selection of clover in 1971 - Midland B. Sufficient seed of the cultivar is on hand to use a heavy seeding rate (in excess of 100 lb/ac) and grazing should commence in July 1971.

The trial has already provided some valuable data. However, the information which will be gained over the next two to three years from the trial will be of great value in assessing the relative value of the agronomic features of the various cultivars for the grazing animal.

The chemical analyses of pasture have shown that Dinninup clover in particular has lower levels of both copper and zinc than the other cultivars. This level, particularly of copper, could be detrimental to the performance of the cultivar. It may also explain the relatively poor performance of sheep on Dinninup during the green period and their subsequent improvement during the dry period - copper deficiency can disappear when the feed dries off. The whole area is to be treated with extra copper and zinc in 1971 as a precautionary measure.

8th March, 1971.
DAN:LMM.

CLOVER CULTIVAR GRAZING TRIAL

70BR15/2836 Ex

TONE RIVER PASTORAL COMPANY, CHOWERUP

Trial sown 5-7th May, 1970.

Sheep began grazing plots on 8.10.70

Plant Assessments

	Plant Density 6.8.70 No./10 sq. dm.	Herbage Yield - Kilogm/hectare		
		29.9.70	11.1.71	
			Total	Top
Seaton Park	27.6	3,190	3,448	2,213
Dinninup	33.8	3,840	4,032	2,707
Midland B	33.6	3,430	3,944	2,351
Woogenellup	28.8	3,620	3,048	2,290
Mixture	30.4	3,080	3,507	2,264

Isoflavone Analysis % d. wt. - 29.10.70

	Formononetin	Genistein	Biochanin A
Seaton Park	0.15	0.88	1.24
Dinninup	1.17	1.00	1.16
Midland B	0.28	2.45	0.56
Woogenellup	0.47	1.99	0.36
Mixture	0.45	1.06	0.65

Sheep Bodyweights

	8.10.70	20.10.70	25.11.70	12.1.71
Seaton Park	36.3	44.4	50.8	51.7
Dinninup	36.3	43.3	49.6	52.6
Midland B	36.0	44.6	51.5	52.6
Woogenellup	35.9	43.5	50.0	53.9
Mixture	36.0	44.0	50.3	51.5

Comment

The aim of the trial is to investigate the performance under continuous grazing of four clover cultivars (Seaton Park, Dinninup, Midland B and Woogenellup) and a mixture of the four cultivars. The trial will give the first full scale comparison under grazing of Midland B and its competitors.

Seeding of the trial was carried out in May and stocking at 4 sheep/acre commenced in October of the same year. Three stocking rates (3, 4 and 5 sheep/acre) will be imposed from the beginning of April 1971.

Herbage production of the four cultivars was much as expected, except for the relatively low spring yield of vegetative material (as measured in January) of Woogenellup.

The isoflavone levels for Midland B were higher than previously measured for the cultivar.

Due to the relatively short period of grazing there are no significant differences in sheep bodyweight to date.

LOW OESTROGEN CLOVER CULTIVAR TRIAL

R. HUGHES, MOBRUP

68BR27/2564 Ex

Herbage Production - 13.3.70
(Kg/ha)

	Total	Seed
Daliak	2,510	527
Woogenellup	2,380	248
Dinninup	3,280	478
Seaton Park	3,520	770

Sheep Bodyweights - 1970-71
(Kilogram/head)

	14/5	25/6	28/7	14/10	19/10	13/1
Daliak	22.5	33.8	37.1	49.0	3.76	44.6
Woogenellup	22.7	33.9	38.0	49.4	3.76	49.0
Dinninup	22.9	34.0	38.2	46.7	3.78	46.6
Seaton Park	22.9	35.6	39.6	48.7	3.82	46.6

The pasture recovered sufficiently in the spring of 1969 for there to be reasonable quantities of seed produced. In 1970 Dinninup produced the most feed. Grazing of the plots which had been discontinued in August 1969 was recommenced for the summer period. All sheep have been mated. Stocking rate is four ewes/acre on all plots.

8th March, 1971.
DAN:LMM.

LEGUME SPECIES GRAZING DEMONSTRATION

67M016/2320 Ex

J.B. WOOD - LANCELIN

	Plant Density No./10 sq. dm. 15.5.70		Herbage Production Kg/ha			
			17.3.70		3.12.70	
	Legume	Grass*	Total	Seed	Total	Seed
Geraldton	236	43	1,640	232	4,930	601
Woogenellup	37	43	1,172	24	2,260	282
Yellow serradella	206	221	2,400	n.a	4,740	n.a
Daliak	235	26	1,610	200	4,490	574
Harbinger medic	358	87	3,780	736	6,380	669
Kondinin rose clover	163	23			3,490	288
Lucerne	0.4					

* Grass was mainly silvergrass.

Sheep Bodyweights 1970 - Kilograms/head

	24/3	16/4	30/4	15/5	14/7	29/7	11/9	15/9	27/10	2/12
Geraldton	40.7	39.2	38.2	38.6	43.6	43.9	51.0	3.14	51.2	52.5
Woogenellup	44.3	40.3	41.4	41.6	42.0	41.5	46.6	2.86	52.4	53.4
Serradella	40.9	39.1	40.9	39.5	44.9	43.7	48.4	3.31	54.3	56.6
Daliak	48.2	47.1	46.2	42.4	47.8	47.6	54.1	3.52	55.0	54.9
Harbinger medic	46.7	46.8	45.8	45.3	55.2	54.8	61.9	3.68	61.7	61.4
Kondinin rose		48.7		44.9	54.0*	54.3	58.0	4.32	56.2	57.2
Lucerne		52.8		48.7	48.8	48.3	51.6	4.04 G.W.W.	55.2	54.5

* Sheep returned to plot on 5/6/70 (Removed on 11/2/70)

	Wool Data - 1970		Lambing Data	
	G.W.W. (Kg/hd)	C.W.W. (Kg/hd)	Total born (25 ewes/plot)	No. marked
Geraldton	3.14	2.17	19	18
Woogenellup	2.86	2.14	19	15
Serradella	3.31	2.42	23	22
Daliak	3.52	2.20	20	19
Harbinger medic	3.68	2.54	21	16
Kondinin rose	4.32	2.84	22	21
Lucerne	4.04	2.68	19	18
				74%

Shearing - 15/9/70
Previous shearing - 19/9/69

Lambing commenced early June
Lambs marked - 29/7/70

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The ranking of pasture species for animal productivity altered markedly during 1969/70. Because of the poor dry matter production by Kondinin rose clover in 1969 sheep had to be removed from the plot in February 1970. At that stage the sheep were eight kilograms/head lighter than those on yellow serradella, the second lightest group, and 19 kilograms lighter than those on Daliak clover. Grazing of the plot did not recommence until 5/6/70.

Harbinger medic performed better than Daliak clover in 1970, the reverse of the 1969 situation. This was due to better winter production by the medic in 1970. The medic pasture has shown marked improvement since 1968, the year after seeding.

The bodyweight of sheep grazing Hunter River lucerne overtook all other groups following heavy rain in February 1969. Weights fell back again in winter. The lucerne stand now after two years of rotational grazing appears to be losing vigour. Probably the stand would benefit from a longer recovery period in spring than is possible under the strict rotation being used (one week grazing in four).

Yellow serradella gave a satisfactory pasture in 1970 after being ravaged by insects in 1969. Production by Geraldton and particularly Woogenellup clover has been below the other species.

8th March, 1971.
DAN:LMM.

AUTUMN DEFERMENT OF ANNUAL PASTURES
ESPERANCE DOWNS RESEARCH STATION

70E26/2874 Ex

Treatment		14.10.70		20.1.71	
		Rating - Max = 15		Yield - Kg/ha	
		Growth	% Clover	Total	Seed
1. No deferment	3½ sh/ac	9 +	70	3,152	135
2. 10 days deferment	3½ "	11	80	3,525	150
3. 20 " "	3½ "	11	75	3,560	162
4. No deferment	4½ "	9 -	55	3,165	154
5. 10 days deferment	4½ "	11	80	3,155	131
6. 20 days "	4½ "	11 +	90	4,004	167

The aim of the trial is to determine whether 10 or 20 days of non-grazing while annual pastures are germinating and seedlings are becoming established will help establish a fully productive sward earlier than one which is grazed continuously.

The trial area was grazed as a whole during 1970. Fencing was completed in February 1971 and stocking commenced.

9th March, 1971.
DAN:LMM.

LUCERNE ESTABLISHMENT ON OLD LAND
ESPERANCE DOWNS RESEARCH STATION

70E17/2943 Ex

(Trial sown 18.9.70)

A. Seed and fertiliser mixed.

Fertiliser	Uninoculated			Inoculated		
	Growth Rating 11/11/70	Yield Kg/ha 19/1/71	Density No./10 sq. dm 19/1/71	Growth Rating 11/11/70	Yield Kg/ha 19/1/71	Density No./10 sq. dm 19/1/71
1. Nil (Sand at 80 lb/ac)	2.55	137	5.5	2.93	113	5.8
2. Superphosphate 60 lb/ac	3.61	185	10.6	3.39	166	7.3
3. " 157 "	3.67	232	7.4	3.67	233	11.2
4. Limestone 54 lb/ac	2.72	111	5.9	2.78	108	5.0
5. " 158 "	2.55	131	7.0	2.67	139	5.1
6. 50/50 lime/super 105 lb/ac	3.39	207	8.5	4.00	160	7.7
7. " " 295 "	4.17	244	10.1	4.11	212	9.9

B. Seed sown through small seeds box
(Superphosphate topdressed prior to seeding)

	Super (lb/ac)	Lime (lb/ac)				
15.	0	0		3.28	154	8.5
16.	60	0		3.56	143	10.6
17.	157	0		4.39	235	10.5
18.	0	54		3.59	165	8.8
19.	60	54		3.28	145	8.1
20.	157	54		3.29	169	10.7
21.	0	100		3.23	124	9.7
22.	60	100		3.59	187	9.9
23.	157	100		3.89	148	9.8
24.	0	158		3.23	137	8.4
25.	60	158		3.67	194	10.8
26.	157	158		4.17	205	8.1
27.	50/50 lime/super 56 lb/ac			4.44	211	8.1
28.	" " 100 "			4.11	215	10.6
29.	" " 200 "			3.83	177	9.0
30.	" " 295 "			4.27	173	9.4
31.	" " 105 "		+ super 100 lb/ac topdressed	3.94	180	11.3

Comment:

1. No response in yield to inoculation.

2. A response in yield to super where super topdressed prior to seeding or where only super applied with seed.

3. No response to lime.

4. Where lime/super used no response in yield to increasing rates over the range 56-295 lb/ac of 50/50 lime super! The yield figures agree with a visual rating taken earlier.

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5. There appeared to be a difference in yield due to seed placement from the ratings. However, this was not supported by the yield data. Growth appeared better due to plots sown by using the small seeds box consisting of 6 rows, rather than 12 - the tubes were not tied to the boots.

6. Wind blast severely damaged part of one block - it reduced density by 50 per cent. However, it had no effect on the measured yield.

7. For information on nodulation see results by Dr Chatel.

16th March, 1971.
DAN:LMM.