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Productivity of grazed legume pastures.

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Trial: 86MT51/5576EX

Title: Productivity of grazed legume pastures

Location: Mount Barker Research Station, Paddock N1E

Aim:

1. To assess the productivity of five legume based pastures in terms of the production of pasture, animal and crop.
2. To quantify factors that contribute to the productivity of those pastures.

Treatment: 6 pastures x 3 stocking rates x 2 replicates.

1. Subclover - cvv. Seaton Park, Woogenellup, Mt Barker.
2. Subclover - cvv. Trikkala, Junee, Green Range.
3. Balansa clover - cv. Paradana.
4. Mixture - T2 + T3 + T6.
5. Mixture - T2 + T3 + T6 using a 1/1 rotation.
6. Murex medic - mixture of three lines, 1/1 rotation.

Stocking Rates.

8, 11, 14 DSE for T1 - T4.

5.7, 7.8, 10.0 for T5, T6, with provision to increase to 8, 11 and 14 DSE.

Plots = 36, area = 19.5 ha, 5 sheep per plot.

Detail: Old land, sown to a mixture of subclover cultivars. Cropped 1984, 1985. Gravelly loamy sand/clay. Legumes sown May 28-29, 1986 with combine after stubble burnt and regenerating pasture sprayed with herbicide. Intermittent grazing in common during 1986, grazing on a plot basis commenced in January 1987, scheduled stocking rates applied from May 14. Supplementary feeding required 28-4 to 3-6-87. Sheep removed from plots to be cropped (T5, T6) on 13-5 and Echidna oats sown 19th May using minimum tillage techniques. Harvested 11-12-87. Sheep weighed monthly, shorn in October.

Results: Legume establishment, plants/sqm, 5/86, 7/87. Pasture yield and composition, 9/87, 10/87. Legume seed yield, kg/ha, 1/87. Crop plant density, no/sqm, 7/87. Crop vegetative yield, kg/ha, 10/87. Grain yield, kg/ha, 12/87. Bodyweights and wool production of sheep, kg/hd.

Table 13. Summary - 86MT51 - plant establishment no/sqm 1986-87

Pasture	Clover 5-86	Parad 5-86	Murex 5-86	Clover 7-87	Parad 7-87	Murex 7-87
Old subs.	299	0	0	1,913	0	0
New subs.	252	0	0	1,468	0	0
Paradana	41	386	0	748	1,724	0
Mixture	99	167	41	1,156	535	5
Mix. 1/1	93	211	42	1,171	722	2
Murex 1/1	29	0	154	846	0	11

Table 14. Summary - 86T51 - Plant establishment no/sqm 1986-87

Pasture	Sheep per ha	Clover 5-86	Parad 5-86	Murex 5-86	Clover 7-87	Parad 7-87	Murex 7-87
	8 SH/HA	367	0	0	2,064	0	0
	11 SH/HA	279	0	0	1,810	0	0
	14 SH/HA	251	0	0	1,866	0	0
Old subs.		299	0	0	1,913	0	0
	8 SH/HA	198	0	0	1,598	0	0
	11 SH/HA	302	0	0	1,362	0	0
	14 SH/HA	256	0	0	1,445	0	0
New subs.		252	0	0	1,468	0	0
	8 SH/HA	34	394	0	803	1,136	0
	11 SH/HA	60	402	0	780	2,420	0
	14 SH/HA	31	364	0	660	1,616	0
Paradana		41	386	0	748	1,724	0
	8 SH/HA	108	178	50	1,210	595	5
	11 SH/HA	105	167	52	1,344	462	9
	14 SH/HA	85	156	23	914	549	0
Mixture		99	167	41	1,156	535	5
	6 SH/HA	89	266	65	1,090	799	5
	8 SH/HA	109	204	41	1,505	951	0
	10 SH/HA	81	165	20	919	15	0
Mix. 1/1		93	211	42	1,171	722	2
	6 SH/HA	23	0	192	766	0	18
	8 SH/HA	29	0	182	743	0	9
	10 SH/HA	35	0	89	1,030	0	5
Murex 1/1		29	0	154	846	0	11

Table 15. Summary - 86MT51 - seed yields 1-87 kg/ha

Pasture	Clover black	Clover white	Clover BL + WH	Murex	Paradana	Total
Old subs.	513	91	604	0	0	604
New subs.	498	195	693	0	0	693
Paradana	86	41	127	0	260	387
Mixture	305	148	452	29	97	578
Mix. 1/1	315	121	437	37	85	558
Murex 1/1	119	69	187	162	0	349

Table 16. Summary - 86MT51 - seed yields 1-87 kg/ha

Pasture	Sheep per ha	Clover black	Clover white	Clover BL + WH	Murex	Paradana	Total
	8 SH/HA	481	68	549	0	0	549
	11 SH/HA	557	102	659	0	0	659
	14 SH/HA	502	102	603	0	0	603
Old subs.		513	91	604	0	0	604
	8 SH/HA	524	188	711	0	0	711
	11 SH/HA	447	172	620	0	0	620
	14 SH/HA	523	224	747	0	0	747
New subs.		498	195	693	0	0	693
	8 SH/HA	80	55	136	0	255	390
	11 SH/HA	110	38	148	0	302	449
	14 SH/HA	67	31	99	0	223	322
Paradana		86	41	127	0	260	387
	8 SH/HA	260	148	408	36	94	539
	11 SH/HA	336	146	482	27	100	609
	14 SH/HA	318	149	467	23	96	585
Mixture		305	148	452	29	97	578
	6 SH/HA	275	115	390	26	61	476
	8 SH/HA	404	137	541	58	129	728
	10 SH/HA	267	112	378	26	65	470
Mix. 1/1		315	121	437	37	85	558
	6 SH/HA	125	65	190	142	0	332
	8 SH/HA	126	81	207	160	0	368
	10 SH/HA	105	60	165	184	0	349
Murex 1/1		119	69	187	162	0	349

Table 17. 86MT51- Pasture assessments - 9.9.87 - grazed

Pasture	Clover %	Paradan %	Yield kg/ha
Old subs.	78	0	1,718
New subs.	78	0	1,840
Paradana	41	31	1,471
Mixture	51	21	1,796

Table 18. 86MT51 - Pasture assessments - 9.9.87 - grazed

Pasture	Sheep per ha	Clover %	Paradan %	Yield kg/ha
	8 SH/HA	79	0	2,150
	11 SH/HA	79	0	1,690
	14 SH/HA	77	0	1,315
Old subs.		78	0	1,718
	8 SH/HA	76	0	1,940
	11 SH/HA	81	0	1,870
	14 SH/HA	78	0	1,410
New subs.		78	0	1,740
	8 SH/HA	36	39	1,840
	11 SH/HA	41	33	1,445
	14 SH/HA	46	21	1,130
Paradana		41	31	1,471
	8 SH/HA	56	18	2,200
	11 SH/HA	49	18	1,710
	14 SH/HA	48	27	1,480
Mixture		51	21	1,796

Table 19. 86MT51 - Pasture assessments - 28.10.87 - grazed

Pasture	Plot	Cl-Gr %	Par-Gr %	Gr-Gr %	We-Gr %	Yld-Gr kg/ha	G. rate kg/ha day
Old subs.		65	0	25	10	3,229	44
New subs.		69	0	19	12	3,232	44
Paradana		40	26	23	11	2,913	49
Mixture		45	17	20	17	3,372	47

Table 20. 86MT51 - Pasture assessments - 28.10.87 - grazed

Pasture	Sheep per ha	Plot	Cl-Gr %	Par-Gr %	Gr-Gr %	We-Gr %	Yld-Gr kg/ha	G. rate kg/ha day
	8 SH/HA		57	0	29	15	3,554	39
	11 SH/HA		63	0	32	5	3,434	48
	14 SH/HA		75	0	16	10	2,700	44
Old subs.			65	0	25	10	3,229	44
	8 SH/HA		63	0	21	17	3,663	46
	11 SH/HA		72	0	16	13	3,226	40
	14 SH/HA		72	0	21	7	2,807	44
New subs.			69	0	19	12	3,232	44
	8 SH/HA		33	31	19	18	3,274	44
	11 SH/HA		41	28	25	7	3,317	54
	14 SH/HA		47	20	26	8	2,150	47
Paradana			40	26	23	11	2,913	49
	8 SH/HA		37	13	25	21	3,856	43
	11 SH/HA		43	18	21	18	3,203	49
	14 SH/HA		54	19	16	11	3,058	50
Mixture			45	17	20	17	3,372	47

Table 21. 86MT51 - Crop density, vegetative yield and grain yield - 1987

Pasture	Sheep per ha	Oat plants 7/87	Oat tops 28/10/87	Oat grain 11/12/87
	6 SH/HA	102	7,233	2,765
	8 SH/HA	103	9,235	3,110
	10 SH/HA	102	9,301	3,175
Mix. 1/1		102	8,589	3,017
	6 SH/HA	98	9,950	3,205
	8 SH/HA	103	9,540	2,740
	10 SH/HA	101	7,971	3,485
Murex 1/1		101	9,153	3,143
Grand average		101	8,871	3,080

Table 22. Productivity of legume pastures - 86MT51, 1987 - sheep body weights

Pasture	W1 14-4	W2 29-5	W3 2-7	W4 4-8	W5 4-9	W6 6/10	GWW 6/10	W9 3-11	W10 3-12
Old subs.	44.6	48.7	51.7	55.7	64.4	71.5	4.8	68.2	69.1
New subs.	44.6	47.6	49.3	52.2	62.0	69.3	4.7	66.5	68.0
Paradana	44.7	47.0	47.9	51.8	59.8	67.8	4.5	65.8	66.4
Mixture	44.6	46.8	48.9	52.8	62.4	69.6	4.7	66.5	68.5
Grand average	44.6	47.5	49.4	53.1	62.1	69.6	4.7	66.8	68.0

Table 23. Productivity of legume pastures - 86MT51, 1987 - sheep body weights

Pasture	SR SH-HA	W1 14-4	W2 29-5	W3 2-7	W4 4-8	W5 4-9	W5 6/10	GWW 6/10	W9 3-11	W10 3-12
	8 SH/HA	44.6	50.9	56.8	59.7	67.0	71.1	5.1	67.0	66.8
	11 SH/HA	44.6	48.3	51.3	56.3	65.7	74.7	4.9	70.5	71.6
	14 SH/HA	44.7	47.1	46.9	51.2	60.5	68.6	4.4	67.2	69.0
Old subs.		44.6	48.7	51.7	55.7	64.4	71.5	4.8	68.2	69.1
	8 SH/HA	44.7	49.5	53.0	57.6	66.6	73.7	5.2	70.0	71.6
	11 SH/HA	44.5	46.7	48.1	50.6	60.7	67.6	4.5	65.4	67.0
	14 SH/HA	44.6	46.8	47.0	48.6	58.7	66.7	4.5	64.3	65.5
New subs.		44.6	47.6	49.3	52.2	62.0	69.3	4.7	66.5	68.0
	8 SH/HA	44.6	47.5	49.3	54.0	64.2	72.2	4.4	66.9	68.3
	11 SH/HA	44.9	47.7	49.5	53.9	60.5	68.2	4.8	66.1	66.3
	14 SH/HA	44.6	45.7	45.0	47.6	54.9	63.1	4.2	64.4	64.7
Paradana		44.7	47.0	47.9	51.8	59.8	67.8	4.5	65.8	66.4
	8 SH/HA	44.6	48.1	53.2	58.2	66.7	73.7	4.7	70.3	72.0
	11 SH/HA	44.6	46.6	47.6	51.6	61.9	69.3	4.8	64.8	66.2
	14 SH/HA	44.6	45.7	45.8	48.8	58.6	65.9	4.4	64.5	67.4
Mixture		44.6	46.8	48.9	52.8	62.4	69.6	4.7	66.5	68.5
Grand average		44.6	47.5	49.4	53.1	62.1	69.6	4.7	66.8	68.0