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## Pasture trials of Esperance

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DEPARTMENT OF AGRICULTURE

WESTERN AUSTRALIA

SUMMARY OF EXPERIMENTAL RESULTS 1983

PASTURE TRIALS OF ESPERANCE

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PLANT RESEARCH DIVISION  
ESPERANCE

82 ES 55      Serradella Co X N trial  
R. Burchell, Myrup

Soil Type:            Grey sand over laterite

History:             New land, cleared April 1982.

Aim:                 To determine whether Co or low winter temperatures limit the growth of serradella in winter months.

Basal Fertilizer:    800 kg/ha superphosphate  
                          100 kg/ha potassium chloride  
                              3 kg/ha sodium borate  
                              10 kg/ha  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$   
                              2 kg/ha ZnO  
                              0.2 kg/ha  $\text{MoO}_3$

The experiment was sown 2/6/1982, using inoculated and lime pelleted seed, a seeding rate of 50 kg/ha Pitman and 100 kg/ha Esperance.

Nitrogen was topdressed at 51 kg/ha (150 kg/ha Agran 34) when the trial was sown, and at 17kg/ha (50 kg/ha Agran 34) mid July and again at mid August.

Co was applied at seeding as  $\text{CoSO}_4 \cdot 7\text{H}_2\text{O}$  (21% Co).

The trial design was a completely randomised block with 3 replicates:

6 rates of Co x + N x 2 species x 3 replicates.

## Results

N	kg Co/ha	Dry weight yield of topgrowth (kg/ha)					Seed Yield (kg/ha)
		26.8.82	14.9.82	6.10.82	2.11.82	3.8.83	
-N	0.00	127	287	2047	4410	740	443
	0.05	143	233	2120	4970	694	553
	0.11	120	253	2377	4190	693	430
	0.21	127	267	2103	4830	683	477
	0.42	137	247	1977	4390	655	487
	0.84	133	287	2093	4665	700	430
<b>Pitman</b>							
<b>Serradella</b>							
+N	0.80	316	640	3150	5190	1115	473
	0.05	347	767	3360	4515	1276	480
	0.11	300	693	3340	4450	1248	477
	0.21	307	820	2780	4735	1245	443
	0.42	313	760	3489	4972	1289	533
	0.84	327	733	3503	5065	1225	443
-N	0.00	407	760	1103	1400	1445	593
	0.05	380	787	1207	1402	1391	717
	0.11	383	760	1103	1249	1526	627
	0.21	370	713	1093	1476	1820	690
	0.42	403	767	1163	1385	1327	697
	0.84	393	733	1250	1367	1499	647
<b>Esperance</b>							
	0.00	443	793	1207	1416	1390	746
	0.05	387	780	1273	1367	1356	623
	0.11	403	800	1110	1449	1408	610
	0.21	453	789	1290	1380	1330	787
	0.42	437	800	1267	1407	1524	747
	0.84	390	807	1097	1367	1338	740

There was no response to cobalt. Serradella responded to fertilizer N in winter indicating the low temperatures limit symbiotic nitrogen fixation. This effect disappeared by spring time. The serradella and subterranean clover were effectively inoculated.

83 ES 46      Serradella N trial  
High School block, Neribup

Soil Type:            Grey sand over yellow-brown clay over gravel

History:             New land, February 1983.

Aim:                 To test whether dry matter production of serradella and subterranean clover are limited by symbiotic nitrogen fixation in mid winter.

Basal Fertilizer:    800 kg/ha superphosphate  
                          100 kg/ha potassium chloride  
                          10 kg/ha CuSO<sub>4</sub> 10H<sub>2</sub>O  
                          2 kg/ha ZnO  
                          0.2 kg/ha MoO<sub>3</sub>  
                          3 kg/ha sodium borate  
                          2 kg/ha CoSO<sub>4</sub> 7H<sub>2</sub>O

The experiment was sown 12/5/1983, using inoculated and lime pelleted seed. Seeding rates were as follows:

Pitman and GM 034, 50 kg/ha; GT 045, 25 kg/ha; subterranean clover 100 kg/ha.

Nitrogen was topdressed at sowing at 51 kg N/ha (150 kg/ha Agran 34), and at 17 kg N/ha (50 kg/ha Agran 34) mid June, mid July, mid August and mid September.

The trial design was a completely randomised block with 4 replicates:

5 species x + N x 4 replicates.

Results:

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	Dry weight yield of tops (kg/ha)			
	2/8/1983		26/9/1983	
	-N	+N	-N	+N
<u>O. compressus</u> Pitman	52	148	2044	2015
<u>O. pinnatus</u> GT 045	9	71	1706	1686
<u>O. perpusillus</u> GM 034	52	168	1937	1913
<u>T. subterraneum</u> Daliak	159	175	1639	1600
<u>T. subterraneum</u> Seaton Park	205	243	1753	1763

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Seed yields yet to be determined.

Again serradella was limited by symbiotic N fixation in mid winter.

82 ES 46      T. brachycalycinum burr burial trial  
J. Royle, Condingup

Soil Type:              Grey sand over gravel

History:                New land 1980.

Aim:                    To determine the importance of burr burial for T. brachycalycinum for the formation of burrs and seed.

Basal Fertilizer:      800 kg/ha superphosphate  
                             100 kg/ha potassium chloride  
                             10 kg/ha CuSO<sub>4</sub> 10H<sub>2</sub>O  
                             2 kg/ha ZnO  
                             0.2 kg/ha MoO<sub>3</sub>

The trial was sown on 10/6/1982 using inoculated and lime pelleted seed. Seed was sown in 2 parallel 2 m rows which were 0.3 m apart. Burr burial was prevented in half the plots by using a sheet of asbestos. In the other half developing burrs were lightly covered in sand to ensure burial.

Method used was similar to that described by: Collins, W.J., Francis, C.M. and Quinlivan, B.J. (1976). Aust. J. Agric. Res. 27: 787-797.

Results:

	Total burrs/m <sup>2</sup>		Seeds/burr		Individual seed weight (mg)		Seed yield (g/m <sup>2</sup> )	
	Unburied	Buried	Unburied	Buried	Unburied	Buried	Unburied	Buried
<u>T. subterraneum</u>								
Esperance	4800	6965	3.4	3.6	5.2	6.6	96.8	140.0
<u>T. yanninicum</u>								
Trikkala	592	2684	2.8	2.9	5.1	9.5	4.8	81.2
<u>T. brachycalycinum</u>								
Clare	1943	4095	2.9	3.5	5.3	9.1	41.2	118.4
CPI 19451	3081	6314	3.0	3.4	8.7	10.7	78.4	199.6
CPI 25308B	1539	4320	2.8	2.9	7.3	11.6	51.6	126.0
CPI 28096	935	4580	2.9	3.1	5.0	9.8	13.6	104.5
CPI 33245	1732	4808	2.7	3.2	7.4	12.7	20.4	150.8
CPI 69976	884	8964	2.5	3.4	5.7	9.9	7.6	70.9
CPI 69988	332	6436	2.8	3.0	5.4	10.6	4.8	173.3
CPI 70082A	1952	5848	2.7	2.9	5.5	10.0	19.6	187.3
CPI 70100	1220	3751	2.7	3.0	5.1	9.2	24.4	81.2
CPI 70124B	1268	7924	2.6	3.2	5.6	12.0	42.1	210.4
<u>T. globosum</u>								
CPI 45768A	2372	2716	6.0	6.4	4.6	4.7	56.1	64.0
CPI 46304	2452	2596	3.6	3.9	3.9	3.9	36.0	34.0
<u>T. isrealitium</u>								
CPI 18448	1168	2664	2.1	2.6	7.9	13.1	38.4	65.6
Q 080A	1724	3204	2.4	2.7	6.4	9.3	37.6	95.6

T. brachycalycinum is a passive burr burier. If its burrs can not bury, there is a large reduction in number of burrs, individual seed weight and seed yield.