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## Medic variety evaluation.

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# 1. MEDIC VARIETY EVALUATION

## a) Row Evaluation

TRIAL TITLE: Medic Variety Evaluation - Rows

TRIAL NUMBER: 89M57

LOCATION: Merredin Research Station (Paddock T5)

SOIL TYPE: Red brown sandy loam (pH 0-10 cm, 1:5 CaCl<sub>2</sub>)

SOWING DATE: 29/5/89

FERTILIZER: 100 kg/ha Superphosphate

RESULTS: 89M57A (2 replicates)

Species	Vigour Rating (0-9) 7/8/89	Days to Flower	Aphid Number (0-9) 12/9/89	Seed Yield (g/m row)			
				Aphid Spray		No Spray	
				Rep 1	Rep 2	Rep 1	Rep 2
<u>M. polymorpha</u>							
Serena	6.1	76	7.5	17.0	26.4	19.2	20.9
Santiago	6.8	79	5.1	20.0	29.4	14.3	22.2
Circle Valley	5.8	90	6.3	6.4	19.4	21.1	24.8
N 4980	6.8	80	5.8	28.0	23.1	36.2	24.9
SAD 2649	8.4	79	5.5	13.9	28.0	25.9	20.0
SAD 2702	8.3	83	5.9	18.6	25.8	44.1	10.5
GMJ 50.1	7.9	86	6.3	14.0	31.6	30.9	37.3
Z 497	6.9	82	6.1	12.4	15.5	16.6	16.1
Z 498	6.9	79	7.3	13.2	22.7	11.7	15.1
Z 499	7.5	82	6.9	25.0	20.7	29.2	24.6
Z 500	6.5	84	7.0	6.8	20.0	16.2	17.0
Z 503	7.0	83	5.8	11.5	18.5	20.8	10.3
Z 504	7.0	81	6.0	10.3	27.7	18.1	15.2
Z 505	6.1	85	7.5	10.4	16.2	8.1	13.7
Z 506	6.0	85	7.3	18.3	12.9	9.7	16.4
Z 507	6.4	76	6.4	14.4	19.1	17.1	14.3
Z 508	6.8	76	6.5	8.4	26.4	25.1	24.8
Z 509	6.5	76	5.9	14.0	4.9	9.3	7.5
<u>M. truncatula</u>							
Cyprus	5.9	83	7.4	13.2	13.6	35.1	21.1
Paraggio	4.9	98	5.5	16.4	26.9	15.8	19.7
Parabinga	6.6	88	3.1	22.2	27.5	25.7	32.2
<u>M. murex</u>							
GRC 5658.2	6.1	91	4.0	10.0	19.5	5.9	5.9
GRC 5661	6.4	86	7.8	16.4	16.4	17.8	14.3
GRC 50.3	6.8	88	7.4	7.8	27.3	23.0	18.6
Mean					21.6		18.6
LSD (p < 0.05)	0.8	2	1.6			8.3	

Rating System - Vigour Rating      0 = poor,    9 = good  
    Aphid Number      0 = low,     9 = high

COMMENTS:

Seed yields were extremely variable across the site (particularly Rep 1) making it difficult to quantify the effect of aphid control on seed production. A comparison of treatments within Rep 2 indicates that on average seed production was increased by 3 g/m row (16%) with aphid control.

RESULTS: 89M57B (no replicates)

Species	Vigour Rating	Days	Aphid Number	Seed Yield (g/m row)	
	(0-9) 7/8/89	to Flower	(0-9) 12/9/89	<u>Aphid Spray</u>	<u>No Spray</u>
<u>M. polymorpha</u>					
Z 653	6.0	84	7.0	18.4	13.0
Z 654	6.5	87	7.5	7.1	17.6
Z 655	5.8	87	6.3	17.4	10.4
Z 656	6.5	86	7.5	5.2	11.2
Z 659	6.8	79	6.8	28.6	11.0
Z 660	6.5	85	7.5	13.0	10.8
Z 663	6.5	84	7.8	12.2	16.2
Z 710	7.0	82	7.8	16.6	19.0
Z 713*	8.0	84	7.5	28.9	19.7
Z 714	7.3	79	7.5	16.6	14.6

\* Z 713 mixture of spiny and smooth podded types.

RESULTS: 89M57C (no replicates)

Species	Vigour Rating	Days	Aphid Number	Seed Yield
	(0-9) 7/8/89	to Flower	(0-9) 12/9/89	(g/m row)
<u>M. polymorpha</u>				
Z 657	7.0	82	5.5	22.2
Z 658	7.0	85	7.0	18.1
Z 661	4.5	91	7.0	8.5
Z 662	8.0	83	7.0	29.8
Z 664	2.5	92	5.0	13.6
Z 665	7.5	83	7.5	26.4
Z 666	3.5	87	8.0	16.1
Z 705	5.0	84	7.5	17.9
Z 706	1.5	76	8.5	8.5
Z 708	7.5	84	7.0	14.1
Z 709	6.0	83	9.5	16.6
Z 711	7.0	82	8.0	15.0
Z 712	7.5	82	8.0	19.9
Z 715	6.0	85	7.0	10.0
Z 716*	-	-	-	-

\* No plants.

COMMENTS:

All accessions of M. polymorpha evaluated in 1989 showed moderate levels of aphid number and damage, however none of the new hybrid lines appeared significantly better than the newly released variety, Santiago. Even though some accessions may have moderate resistance to the blue-green aphid, the damage associated with the cowpea aphid may mask this effect. Although further improvements in aphid tolerance of M. polymorpha are desirable, the current benchmark for future comparisons is likely to be Santiago.

Within M. polymorpha none of the new hybrid accessions produced significantly more seed than current commercial varieties either in the presence or absence of aphids.

b) Large Machine Sown Plots - New Sowings

TRIAL TITLE: Selection of early maturing *M. murex*.

TRIAL NUMBER: 89ME71

LOCATION: Nokanning (R. Gray)

SOIL TYPE: Loamy sand (pH 0 - 10 cm 4.65, 1:5 CaCl<sub>2</sub>)

SOWING DATE: 19/5/89 Seeding Rate: 10 kg/ha

FERTILIZER: 116 kg/ha Superphosphate

RESULTS: Pasture establishment

Species	Plant Counts (sq m ) 11/7/89	Vigour Rating 8/8/89	Aphid No Rating 12/9/89	Days to Flower	Dry Matter (t/ha) 13/9/89	Seed Yield (kg/ha)
<u><i>M. murex</i></u>						
87FO1-F3	102	5.2	7	101	0.64	100.3
87FB2+5-F3	100	6.3	6.7	99	0.67	127.9
SAR 3462.1	103	3.2	6.3	103	0.52	59.6
SAR 3490	111	6.2	6	103	0.81	76.8
GRC 5658.2	82	5.8	6.5	93	0.86	134.9
GRC 5661	57	6.2	6.2	93	0.78	113.9
GRC 50	96	7.2	7.3	90	0.67	223.8
GRC 63.5	76	3.5	6.5	100	0.51	86.8
GRC 69	81	3.7	6.8	93	0.78	155.5
GRC 78	98	5.7	6.5	108	0.66	52.2
GRC 87.1	108	4.3	6.5	105	0.58	82.4
SEP 26.2.1	89	7.3	7.2	100	0.70	124.3
SEP 26.2.7	92	7.8	7.7	100	1.11	179.4
SEP 26.3.2	109	7.8	6.5	105	0.76	105.9
SEP 27.1.6	102	5.0	6.7	108	0.69	148.7
SEP 28.1	87	7.5	7.5	107	0.77	103.9
SEP 28.2	87	6.8	7.7	105	0.96	143
SEP 29.1	108	6.7	6.7	101	0.93	149.9
SEP 29.2	93	6.8	6.8	104	0.84	150.9
SEP 30.3	84	5.8	6.3	101	0.64	130.8
SEP 30.6.1	91	6.2	6	106	0.80	78.2
5320	57	2.3	7	108	0.39	31
<u><i>M. polymorpha</i></u>						
Santiago	171	6.2	2.5	81	0.87	340.9
Circle Valley	132	7.2	5.3	93	0.77	211.6
L.S.D (p<0.05)	19	1.1	1	1	0.33	63.9

COMMENTS:

Pasture ungrazed. Site sprayed for insects at seedling stage and again in mid-June. Grasses were removed with Fusilade 350 ml/ha on 4/7/89.

Lorsban used in June caused chlorosis of leaves on most varieties of M. murex however plants eventually grew away from this damage.

M. murex appears very sensitive to relegged earth-mite and cowpea aphid attack and warrants special attention. Only one variety under test flowered earlier than Circle Valley and none of the varieties produced more seed than Santiago. Lines GRC 50, GRC 69 and SEP 26.2.7 were amongst the best of the group.

c) Large Machine Sown Plots - Regeneration

TRIAL TITLE: Evaluation of Santiago in Low Rainfall areas.

TRIAL NUMBER: 88ME86

LOCATION: Mukinbudin (A. Shadbolt)

SOIL TYPE: Red loam (pH 0 - 10 cm 5.8, 1:5 CaCl<sub>2</sub>)

FERTILIZER: Nil

RESULTS: Pasture regeneration - second year

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Species	Medic Counts (sq m) 29/6/89	Seed Reserve (kg/ha)	Medic Counts (sq m) 9/2/90
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<u>M. polymorpha</u>			
Serena	2932	690	115
Santiago	1037	479	163
Circle Valley	910	118	124
Ser/Sant/CV mix	1615	427	138
 <u>M. truncatula</u>			
Cyprus	570	171	477
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LSD (p<0.05)	430	107	102

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COMMENTS:

Pasture paddock grazed.

Medic regeneration in 1989 highlighted the extra hardseededness of Santiago relative to Serena. Despite an adequate level of regeneration, however, seed reserves of all pasture treatments were dramatically reduced by the end of the second pasture year.

This decline ranged from 35 - 50% of the first years seed production and emphasises the need for high seed production in the establishment year as well as carefull grazing management over the following summer and autumn. Seed production in the second pasture year is unlikely to fully compensate for grazing and germination losses.

Germination from summer rains in February 1990 highlighted the higher levels of hardseed in burr medic relative to barrel medic. Approximately 5.7 kg/ha of Santiago (1.2% of the seed reserve) germinated compared to 24 kg/ha of Cyprus (14% of the seed reserve).

TRIAL TITLE: Medic Variety Evaluation - large plots  
 TRIAL NUMBER: 87M73  
 LOCATION: Merredin Research Station (5CE)  
 SOIL TYPE: Red-brown sandy loam (pH 0 - 10 cm 6.1, 1:5 CaCl<sub>2</sub>)  
 FERTILIZER: Nil  
 RESULTS: Pasture regeneration after crop

Species	Medic Counts (sq m) 26/7/89	Lucerne Flea Damage Rating 23/8/89	Medic Seed Yield (kg/ha)
<u>M. polymorpha</u>			
Serena	697	6.5	103
Circle Valley	438	6.7	18
N 3146	493	5.7	63
N 4970	722	5.7	75
N 4980	727	6.2	53
N 4991	803	6.2	30
SA 5527	400	5.3	8
SA 5552	366	7.0	44
SA 5563	561	6.0	20
SA 5665	366	5.7	29
SA 5666	502	6.0	13
SA 9615	574	6.0	39
SA 10693	502	6.0	11
<u>M. truncatula</u>			
Cyprus	391	4.0	26
Natural Pasture	-	-	-
L.S.D (P<0.05)	235	1.3	21

COMMENTS:

Pastures were paddock grazed during the growing season. All plots were severely affected by lucerne flea in late winter. They were rated for damage and then sprayed. None of the burr medic lines showed any strong resistance to lucerne flea.

Rating system for Lucerne Flea damage: 0 - nil, 9 - totally dead.

Seed production was extremely low and would have been influenced by the high level of lucerne flea damage and poor growing conditions during spring. Serena and Santiago (N3146) were amongst the best performers.



TRIAL TITLE: M. polymorpha Variety Evaluation - large plots  
 TRIAL NUMBER: 86M65  
 LOCATION: Merredin Research Station (9A1)  
 SOIL TYPE: Red-brown sandy loam (pH 0 - 10 cm 5.0, 1:5 CaCl<sub>2</sub>)  
 FERTILIZER: Nil  
 RESULTS: Pasture regeneration

Treatment	Medic plant counts (sq/m) 27/6/89	Medic Seed Reserve (kg/ha)
<u>M. polymorpha</u>		
Serena	650	0.5
Circle Valley	557	1.9
N 3146	729	3.3
N 4970	812	9.6
N 4980	567	1.1
N 4991	529	2.0
<u>M. truncatula</u>		
Cyprus	83	1.5
Natural Pasture	-	-
L.S.D. (p<0.05)	225	6.5

COMMENTS:

All burr medic varieties regenerated well but failed to be productive during the growing season. Plants suffered redlegged earth-mite damage early in the season and in addition failed to nodulate. Larvae of the Sitona weevil were evident in mid-July which could have accounted for some loss of nodules. A question which needs further investigation however is the effect of the cropping phase on nodulation of regenerating medics when grown on mildly acidic soils. Tillage in the cropping phase may influence survival of the rhizobia and their subsequent position in the surface soil.

c) Large Machine Sown Plots - Cereal Grain Yields

TRIAL TITLE: Evaluation of burr medics on Morrel soils.

TRIAL NUMBER: 88ME84

LOCATION: Nokanning (M. Giles)

SOIL TYPE: Morrel (pH 0 - 10cm 8.3, 1:5 CaCl<sub>2</sub>)

CEREAL: Yagan barley Seeding Rate: 50 kg/ha

SOWING DATE: 19/5/89 Sprayseed/Direct drill

FERTILIZER: 116 kg/ha Superphosphate

RESULTS: Cereal grain yields

Species	Barley grain yields (t/ha)
<u>M. polymorpha</u>	
Serena	1.43
Santiago	1.65
Circle Valley	1.48
SA 5552	1.51
SA 9615	1.53
SA 5665	1.62
SAD 2649	1.54
SAD 2702	1.65
<u>M. truncatula</u>	
Cyprus	1.84
Parabinga	1.48
Paraggio	1.71
<u>M. rugosa</u>	
GRC 5685.2/ 5683.8/5683.7	1.44
<u>T. subterraneum</u>	
Nungarin	1.61
L.S.D. (p<0.05)	0.24

COMMENTS:

Grain yields variable across the site as a result of differences in salt content of the soil. No fertilizer nitrogen was applied to any of the crop treatments. Considerable M. rugosa plants germinated under the crop. Crops were sprayed with 1.0L/ha Brominil M + 1.0 L/ha Hoegrass on 6/7/89.

TRIAL TITLE: Selection of early maturing M. murex.  
 TRIAL NUMBER: 88SC30  
 LOCATION: Merredin (A. Crook)  
 SOIL TYPE: Sandy loam (pH 0 - 10 cm 5.9, 1:5 CaCl<sub>2</sub>)  
 CEREAL: Wheat                      Seeding Rate: 45 kg/ha  
 SOWING DATE: 19/5/89              Sprayseed/Direct drill  
 FERTILIZER: 116 kg/ha Superphosphate  
 RESULTS: Cereal grain yields

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Species	Wheat grain yields (t/ha)
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M. murex

Zodiac	2.14
GRC 50	1.35
GRC 5658.2	1.74
GRC 5661	1.55
SAD 10070	1.78
DZA 3180.4	1.63

M. polymorpha

Santiago	1.47
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T. subterraneum

Dalkeith	1.26
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L.S.D (p<0.05)	0.43
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COMMENTS:

Site sprayed with 1.0 L/ha Brominil M + 1.0 L/ha Hoegrass on 21/7/89. No fertilizer nitrogen was applied to any of the crop treatments. Grain yields were variable but tended to be higher where crops followed pasture treatments which produced relatively smaller amounts of seed in 1988.