

Productivity of conventional and new pea phenotypes in Victoria

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The area sown to field peas in Victoria has increased markedly in the last five years but there has been little attempt to improve the suitability of phenotypes available for the dryland environments until the recent development of semi-leafless cultivars. The relative performance of a selection of newly developed lines is being assessed against that of conventional cultivars in the Victorian Wimmera and Mallee.

Methods

Seven cultivars were sown at a rate of 150 kg ha⁻¹ in randomised block experiments located in the Wimmera (Dooen, clay soil Ug 5.2, average rainfall 450 mm p.a.) and Southern Mallee (Woomelang, Mallee soil Gc 2.12, average rainfall 345 mm p.a.) during 1986. The experiments were sown on pea-cereal rotations already established for two complete cycles. Both phases of the wheat-pea rotation were included and phenotypes were replicated five times.

Results and Discussion

Production results from conventional (C), semi-leafless semi-dwarf (SLSD) and leafless cultivars (L) are given below.

Cultivar	Type	Yield (t/ha)		Total dry matter (t/ha)		Harvest index (%)		Grain weight (g/1,000)	
		WG ^a	DN ^b	WG	DN	WG	DN	WG	DN
Dundale	C	2.06	2.94	4.78	8.57	43.1	34.3	220.9	179.8
Dun	C	2.06	2.70	5.65	9.49	36.6	28.2	169.6	151.2
WUE 1	SLSD	1.33	3.37	3.21	8.40	42.6	40.1	266.2	203.1
WUE 2	SLSD	1.78	3.52	3.73	8.46	47.7	41.5	284.4	212.5
WUE 3	SLSD	1.77	3.33	3.63	8.14	48.6	40.8	199.5	173.3
WUE 6	SLSD	1.03	2.80	2.41	6.82	42.6	41.2	271.5	237.8
Filby	L	0.73	2.68	1.61	6.05	46.2	44.5	174.6	195.5
LSD ^c (P=0.05)		0.51		1.21		4.9		6.7	

^aWG = Woomelang; ^bDN = Dooen; ^cLSD = cultivar x site

The SLSD selection WUE2 had the highest yield at the Dooen site and similar dry matter production to that of Dundale. The harvest indices and grain weights of SLSD types were generally higher and more stable across the two environments than Dundale and Dun. Filby was included in the experiment as a contrasting plant type which should maintain low water use rates late in the season, but the sowing rate was insufficient to achieve its production potential at either site. Total dry matter and seed yield of the SLSD types was limited at the Woomelang site by slow initial establishment in conditions of high evaporative demand in the four weeks after sowing. Seasonal conditions in the Wimmera were excellent and SLSD types out yielded Dundale and Dun.

The results indicate the potential of new SLSD phenotypes to produce higher yields than C types depending on environmental conditions and thus the need to select them to match particular environments.