A collection of naturalized annual pasture legumes in the semi-arid cereal-livestock zone of south Australia

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Historically, naturalized ecotypes of annual pasture legumes have been sources of well-adapted commercial cultivars. In many instances, these accidentally introduced ecotypes have had in excess of fifty generations to evolve and adapt to local conditions. To utilise these local genetic resources for pasture improvement programmes. naturalized annual pasture legumes were collected on hard-setting red-brown earths in the semi-arid uplands of the cereal-livestock zone of SA.

Methods

Fifty three collection sites were selected on and around the transition between the southern Flinders Ranges and the Northern Mount Lofty Ranges. Annual rainfall declines from 400 to 250 mm from the southern to the northern boundaries of the collection zone. Altitude varies between 275 to 789m above sea level. The topography consists of north-south ridges with montane plains. This causes rainfall. temperature and soil type to vary considerably over short distances. The collection targeted specific niches rather than a systematic sampling and so does not define the overall distributions of local species.

Results

Fourteen species from four genera were collected. *Trifolium* and *Medicago* were the most common genera. *Lotus* and *Vicia* were found at only one site each. Accessions of *M. minima* and *M. truncatula* were the most numerous species (Table 1). Medics were found over a wider range of pH than the clovers. 67% of *Trifolium* accessions and 41% of *Medicago* accessions occurred in the pH range 6.0-6.5. (69% of all sites). Of these, most species were found on clay loams and sandy clay loams which were the dominant textural classes of the eight soil textural classes encountered. Both genera were distributed across a broad range of rainfall and altitude but the aerial seeding *T. angustifolium, T. arvense, T. campestre, T. glomeratum* and *T. tomentosum,* tended to occur at wetter, higher sites. This trend was also apparent with the smaller seeded medics, *M. minima* and *M. praecox.*

Table I. Environmental characteristics of the collection sites of the most numerous species.

Species	No. of sites at which species occurred	Altitude m.a.s.l[a]		Estimates of annual rainfall mm		pH[c]		No. of sites at which a species occurred on the main soil textural classes	
		Mean	Std[b]	Lower	Upper	Mean	Std	Clay loam	Sandy clay loam
M. minima	31	497	99	250	350	7.1	1.1	9	11
M. polymorpha	10	407	78	290	360	7.8	0.8	4	4
M. praecox	10	523	110	310	350	7.0	1.0	2	5
M. truncatula	39	445	86	250	340	7.5	1.1	16	16
T. glomeratum	11	524	100	320	380	6.9	0.8	6	3

[a]m.a.s.l - metres above sea level; [b]Std - Standard deviation; [c]pH - pH field kit