

## The development of Talish clover (*Trifolium tumens* Steven ex M. Bieb.) as a potential new perennial pasture legume for low rainfall temperate environments

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**Key words:** temperate pasture, perennial legume, drought tolerant, *Trifolium tumens*

**Introduction** *Trifolium tumens* is a long-lived, deep rooting perennial legume from the *Trifolium* Sect. *Vesicaria* Crantz., with a natural distribution across Turkey, Caucasus and Iran (Zohary and Heller 1984). There are a number of described varieties of *T. tumens* (Zohary and Heller 1970), but no commercial cultivars. *T. tumens* can be found growing across a broad range of environments. On a germplasm collecting mission to Azerbaijan by the senior author in 2004, *T. tumens* was collected from altitudes ranging from 11 to 1591 metres above sea level, in soils ranging from pH(1.5 H<sub>2</sub>O) 5.0 to 9.0 and rainfall zones of 300 to 1300 mm per annum. In Azerbaijan *T. tumens* can be found growing in heavily grazed lowland pastures with companion species *Medicago sativa* subsp. *caerulea*, *Trifolium fragiferum*, *Lotus corniculatus*, *Trifolium diffusum*, *Trifolium lappaceum*, *Medicago polymorpha* and *Chicorium intybus* or in lightly grazed alpine meadows with companion species *Lolium perenne*, *Dactylis glomerata*, *Trifolium repens*, *Trifolium pratense* and *Trifolium ambiguum*. In many areas it was seen as an important legume component in the pasture and at low rainfall sites (<400 mm) was the only perennial *Trifolium* species present.

**Methods** A collection of 63 accessions of *T. tumens*, sourced from Genetic Resource Centres, or collected in Azerbaijan in 2004 (Table 1) were assembled at the Tasmanian Institute of Agricultural Research Plant Materials Centre. This germplasm represents around 90% of the available germplasm held in world ex situ collections.

**Table 1** Source of germplasm.

Genetic Resource Centre	Country of origin	Number of accessions
New Zealand, Margot Forde Germplasm Centre	Armenia	4
	Georgia	2
	Russia (Dagestan)	2
USDA, ARS National Temperate Forage Legume Germplasm Resources Unit	Azerbaijan	7
	USSR	1
Australian Trifolium Genetic Resource Centre	Uzbekistan	1
	Iran	4
Tasmanian Institute of Agricultural Research	Azerbaijan	38
	unknown	4

20 plants from each accession were grown as spaced plants at Launceston, Tasmania, Australia, 41°45' S, 147°17' E. Plants were characterised for a range of morphological and phenological features including growth habit, rhizome and stolon production, flowering time, seed production, seed size and leaf markings.

**Results and discussion** The germplasm characterised was highly variable both within and between accessions. The number of previously described varieties within the species could explain the variability recorded between accessions. *T. tumensis* described as rhizomatous (Zohary, M. and Heller, D. 1984), however, none of the accessions produced rhizomes. A number of accessions were shortly stoloniferous in habit, rooting at the nodes, in particular those originating from the Talish Mountain region around Lerik in Azerbaijan. The range in time to flowering was between 116 and 204 days from May 1<sup>st</sup>. Seed production ranged between 0.7 and 31 grams per plant. Seed size ranged between 0.691 and 1.341 gms. *T. tumens* has a wide range of leaf markers with over 20 different markings observed.

**Conclusions** Grazing systems in low rainfall temperate regions of Australia currently rely heavily on annual legume based pastures. Perennial legumes such as *Trifolium repens* and *Trifolium pratense* are not well adapted to areas receiving below 700 mm rainfall per annum and *Medicago sativa* is not well adapted to heavy grazing pressure. This preliminary work has identified *T. tumens* germplasm with the potential to be developed as a drought tolerant, deep rooted perennial forage plant suitable for growing in low rainfall temperate regions.

### References

- Zohary, M. and Heller, D., 1984. The Genus *Trifolium*. *The Israel Academy of Sciences and Humanities*, 296-298.  
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