Dactylis glomerata ssp. *Hispanica* (Roth) Nyman, Cultivars Uplands and Sendace, Drought Tolerant Forage Grasses for Temperate Environments

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Introduction The extent and severity of dry summers across temperate Australia has resulted in a need to develop perennial grasses with increased ability to survive long dry periods . Kemp and Culvenor (1994) state that for environments which suffer regular droughts the prime strategy in cultivar development should be the plants ability to survive dry summers followed by high regrowth rates after autumn rains . *Dactylis glomerata* ssp . *hispanica* represents the Mediterranean form of *Dactylis glomerata* , with a winter active/summer dormant growth pattern and includes genotypes with very high summer drought tolerance (Knight R . 1973) . This paper details the development of two cultivars of *D . glomerata* ssp . *hispanica* , Uplands and Sendace with specific application for use in Tasmania and other temperate climates .

Methods Between 1995 and 2001 , 24 genotypes of *D . glomerata* ssp . *hispanica* of Spanish , Portuguese and Tunisian origin were evaluated at 7 sites across Tasmania , Australia . The sites were selected to represent a wide range of environmental and soil conditions across Tasmania's low rainfall (<600 mm per annum) regions (Table 1) .

Table 1 *Co-ordinates , soil and rainfall data for evaluation sites .*

Site	Co-ordinates	Soil type	Soil pH 1 :5 water	Colwell P (mg/kg)	Colwell K (mg/kg)	Mean rainfall (mm)
Cranbrook	41°02′ S 148°03′ E	gravelly clay loam	5 .9	8	120	547
Swansea	42°11′ S 148°03′ E	heavy clay loam	6 .4	23	372	532
Triabunna	42°28′ S 147°56′ E	sandy loam	5 .8	59	306	559
Cambridge	42°48′ S 147°26′ E	sandy clay loam	5 .8	18	151	507
Hamilton	42°33′ S 146°46′ E	clay loam	6 .2	37	463	411
Jericho	42°22′ S 147°18′ E	clay loam	5 .6	16	212	470
Ross	41°58′ S 147°28′ E	sandy clay loam	5 .5	15	150	550

The genotypes were characterised for growth habit , herbage production , palatability , grazing tolerance , pest and disease resistance , cold tolerance , drought tolerance and persistence . As a result , 2 populations were selected from the best-performed genotypes for cultivar development . Population 1 underwent 4 cycles of recurrent phenotypic selection for seedling vigour , summer activity , and upright growth habit , and Population 2 underwent 5 cycles of recurrent phenotypic selection for seedling vigour , dense tillering and prostrate growth habit .

Results and discussion The two resulting cultivars Uplands (Population 1) and Sendace (Population 2) are highly persistent , fine leaved and densely tillered grasses , with high levels of drought and cold tolerance . Uplands and Sendace are both strongly summer dormant , however , Uplands is more responsive to summer rainfall events than Sendace . Both respond rapidly to autumn rains producing high-energy forage (Seasonal means of 22 .5 % CP , 11 .3 MJ ME/kg and 76 .9 % DMD) through to late spring . Sendace has a very compact and semi prostrate growth habit and can tolerate extended periods of close grazing by sheep . Uplands has a more erect growth habit than Sendace and a higher level of annual herbage production .

Conclusions Uplands and Sendace have the potential to play an important role in grazing systems across Australia's temperate low rainfall , drought prone region . This role will become more important if the changesin climatic patterns and the below average annual rainfall experienced over the past decade continues across the region . With the successful development and release of these two cultivars along with the success of *Festuca arundinacea* varieties of Mediterranean origin in Australia's temperate environment , an increase in the breeding of perennial grasses with a Mediterranean growth pattern should become a priority for the development of persistent temperate pasture grasses .

References

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