BIODIVERSITY AND POTENTIAL UTILISATION OF BLOWN-GRASSES (*AGROSTIS SPP.*) IN LOWLAND VICTORIA

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Abstract

The distribution and habitats of Australian native blown-grasses (*Agrostis spp.*) in the Western District of Victoria were observed over a number of seasons. Growth habit and flowering pattern were noted for each species. A survey of surface soil salinity, indicates that native *Agrostis* species, growing in lowland environments, have decreasing salt tolerance in the order; *A. billardierei* var*. robusta* = *A. adamsonii* > *A. avenacea* = *A. billardierei* var*. filifolia* > *A. aemula* = *A. venusta*. *A. adamsonii* and *A. billardieri var. robusta* can grow in soils with total soluble salt contents of at least 2 % and have potential for use in reclamation of saline discharge sites.

Key Words: Agrostis spp., native grasses, grassland, soil salinity, biodiversity

Agrostis forms a genus of about 200 species worldwide, with 22 species occurring in Australia and 14 species in Victoria (1). Three species are naturalised introductions *viz. A. capillaris* (brown-top bent), *A. stolonifera* (creeping bent) and *A. gigantea* (red-top bent), of which the former two are important grasses in the turf industry, but can be serious weeds of pastures and crops. Of the native Victorian species, six are largely confined to cool forests and alpine regions, three are found in both highland and lowland situations and the remaining two are only found in lowland situations. All species appear to prefer moist or at least seasonally wet soil conditions.

Species and varieties recorded for the plains of western Victoria, are *A. avenacea* (common blown-grass), *A. aemula* var. *aemula* (blown-grass), *A. aemula* var*. setifolia*, *A. venusta* (misty bent), *A. billardierei* var*. robusta*, *A. billardierei* var*. filifolia* (varieties of coastal blown-grass*)* and *A. adamsonii* (Adamson's bent). Of these, only *A. avenacea* is regarded as widely spread and common in the region. Despite some of their common names, all these species have similar growth habit and overall appearance and are collectively referred to here as Blown-grasses.

In the course of recent work with *A. adamsonii* by the senior author, it became apparent that the status and distribution of other native *Agrostis* spp*.* required review. These species are often overlooked in native grasslands, taking second place to *Themeda*, *Stipa* and *Danthonia* spp*.* This paper reports a survey of 616 sites (mainly roadsides) examined as potential habitats for *Agrostis* spp*.* (*ie.* flats, swamps, depressions, gullies and drains) from 1993-97.

Results and discussion

Distribution and habitat

Table 1 shows the percentage of examined sites that contained each *Agrostis spp.* under study, a description of the main habitat and some of the other plant genera (both native and introduced) present. In addition, soil moisture and EC were determined for 28 selected sites during early November 1997.

Table 1. Occurrence, habitat, associated genera and mean and range of soil moisture and EC for each *Agrostis* spp*.* under study.

?	Occurrence,?? % of 616	Habitat description	Other common genera in	Mean and (range) soil	Mean and (range)

Species	sites?		plant community	moisture, %	soil EC, dS/m
A. avenacea	18	Wetter grasslands and roadsides (often extensive) and margins of swamps	Numerous because of wide range of habitats (eg. *Phalaris*, *Lolium*, *Danthonia*, *Poa*, *Critesion*, *Trifolium*, *Cotula*, *Plantago*)	38 (18-68)	0.46 (0.06-1.2)
A. aemula	7	Moist slopes and depressions of open grasslands?	*Themeda, Stipa, Danthonia, Poa, Pentapogon, Calotis, Eryngium, Wahlenbergia, Chrysocephalum*	27 (21-34)	0.07 (0.06-0.09)
A. venusta	3	As above	As above	29 (26-34)	0.07 (0.06-0.09)
A. adamsonii	9	Confined to saline flats and marshes?	*Cotula, Plantago, Triglochin, Juncus, Critesion, Polypogon, Puccinellia, Samolus, Sarcocornia*	61? (31-116)	2.4 (1.2-3.8)
A. billardieri var. robusta	6	As above	As above	68 (46-87)	2.9 (1.5-5.7)
A. billardieri var. filifolia?	3	Moist slopes and depressions of open grasslands and flats	As for *A. aemula and A. adamsonii*	35 (15-52)	0.39 (0.07-1.6)

Growth habit and utilisation

A. avenacea is regarded as a minor nuisance to local farmers. After shedding its seed, the plants' dried inflorescences break off from their culms during summer and are blown by the wind for considerable distances to accumulate against bushes, fences and buildings. The species main flowering period is from November to January but sometimes will have a second flowering with late summer rains. It mainly acts as an annual but some perennial forms have been observed. It does provide some green feed on swamps during the summer.

A. aemula and *A. venusta* are annual species, flower mainly during October and November and would be expected to contribute little to a grazing enterprise. However, *A. aemula* can form small tussocks (up to 15 cm diameter) under favourable site conditions and may have some feed potential in low input grazing systems that utilise native vegetation.

A. adamsonii appears to be a short-term perennial while *A. billardierei* var. *robusta* mainly acts as an annual. Main flowering periods are from November to January for *A. adamsonii* and from January to February for *A. billardierei* var. *robusta* although both species will persist longer, given favourable soil moisture conditions. *A. adamsonii*, in particular, tends to grow larger and more vigorously near or on the edge of permanent water. Both species can grow in soils with total soluble salt contents of 2 % or more and have potential for use in reclamation of saline discharge sites. They have been observed to colonise bare sites that have been fenced off from stock. Although these species appear to persist only under very light grazing, they may provide a short-term green pick. For many sites (*eg.* reclaimed gullies, highly saline flats), where soil protection is of primary importance, no other grazing management is warranted.

A. billardierei var. *filifolia* has been found in plant communities with *A. aemula*/*A. venusta* and with *A. adamsonii* on lesser saline flats. It flowers from October to December and appears to be a short-term perennial or annual. It, like *A. venusta*, has little feed value due to its small leaf bulk.

Conclusion

As components of wet grasslands, native *Agrostis* spp. are an integral part of the biodiversity of such sites and need to be maintained. In particular, consideration needs to be given to the preservation of the salt dependent, *A. adamsonii* and *A. billardierei*, as drainage and land reclamation continues to reduce their habitat.

References

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