A comparison of herbage production of a range of *Danthonia* spp.

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The genus *Danthonia* has become widely recognised as offering species potentially useful to pastoral agriculture on the Tablelands and Western Slopes of NSW (Munnich *et al.* 1991). *Danthonia* spp are dominant or co-dominant in much of the large area of native pastures on the Southern Tablelands and Monaro. Domestication programs have concentrated effort on a small number of species common in other regions, but little attention has been directed to many of the species which are most prominent in pastures of this region. This study investigates the dry matter (DM) production of the most prominent *Danthonia* spp in the southern Tablelands and the recently released domesticated cultivars from other regions.

Methods

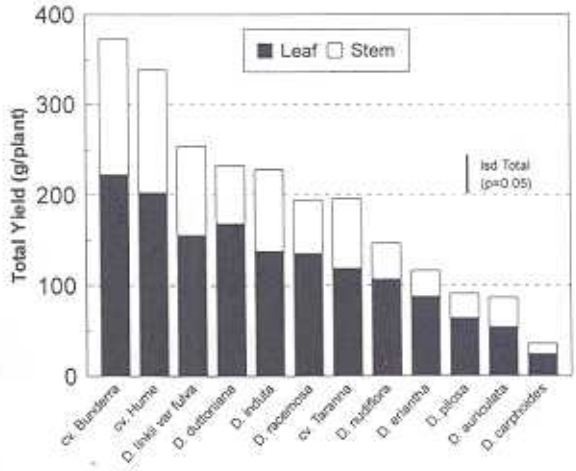
2 blocks of 5 replicates of 12 species of *Danthonia*, spaced in a 1m grid, were established at the CSIRO "Ginninderra" Experiment Station near Canberra. The experiment used spaced plants because the lack of seed of many species would prohibit their inclusion if swards were established in plots. The trial area was sprayed with glyphosate and rotary-hoed before sowing. Lime was applied at 6 t/ha to one block before cultivation, to test the pH sensitivity of each species.

Plants were germinated and established in plastic tubes (90 x 200 mm), and transplanted into the field in summer 1992. A small amount of a granulated slow release fertiliser was placed at the bottom of each hole before planting to assist establishment. No further fertilising occurred. Inter-plant spaces were kept free of volunteer plants throughout the study.

Plants were sampled 10 times, between March 1993 and January 1995 at approximately seasonal intervals. At each sampling, plants were harvested, sorted into leaf and stem, oven dried and weighed.

Results and discussion

Cumulative DM production of all species is shown in Figure 1. Two of the recently domesti-



cated cultivars, *D. linkii var. linkii* cv. Bunderra and *D. richardsonii* cv. Hume, produced significantly more total DM than the next highest species but the difference in leaf DM was not significant. Other statistically significant differences were found only between species more widely separated in Figure 1. However, broadly the species could be divided into 3 groups, on total and leaf DM production: *D. linkii* var. *linkii* cv. Bunderra and *D. richardsonii* cv. Hume; *D. linkii* var. *fulva*, *D. duttoniana*, *D. induta*, *D. racemosa* and *D. richardsonii* cv. Taranna; and *D. nudiflora*, *D. eriantha*, *D. pilosa*, *D. auriculata* and *D. carphoides*.

Soil pH tests ($CaCl_2$) in June 1994 indicated: unlimed; 0-10 cm (4.9), 10-20 cm (4.2); limed; 0-10 cm (6.3), 10-20 cm (5.8). These results suggest that the area had previously been limed, but soil pH was still low deeper in the profile. The lime treatment showed a significant depression of both leaf and total DM production, by about 15% across all species. However the species responded differently. *D. linkii* var. *linkii* cv. Bunderra and *D. richardsonii* cv. Hume were significantly depressed by liming. Production appeared to be depressed by liming in *D. duttoniana*, *D. induta* and *D. pilosa* but differences were not significant. Production by *D. richardsonii* cv. Taranna appeared to be increased by liming but the effect was also not significant.

These results show a considerable range in DM

productivity of *Danthonia* spp. The data is broadly consistent with field observations. It suggests that several species prominent in this region (*D. linkii* var. *fulva*, *D. duttoniana* and *D. racemosa*) are worthy of consideration for domestication. The results also show that *Danthonia* spp. are generally tolerant of low soil pH. This further supports their retention and development for pastoral and other landscape uses.

Acknowledgments

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Reference

Munnich, D.J., Simpson, P.C. and Nicol, H.I. (1991). A survey of native grasses in the Goulburn district and factors influencing their abundance. *Rangeland Journal* **13:** 118-29.