

# Domestication of Mitchell grass (*Astrebla*) for agricultural use in the semi-arid rangelands of eastern Australia

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*Astrebla lappacea* and *A. pectinata* are both native, warm season, perennial grasses well suited to the grey soil areas throughout the semi-arid areas of eastern Australia. Where these species still exist they provide one of the most stable grasslands of these areas (Orr and Holmes 1984). Declines in Mitchell grass pasture have resulted from increases in areas cropped, inappropriate grazing management and flooding. Seed is not regularly available in commercial quantities. The domestication of these species would provide a regular seed supply of varieties with superior agronomic characteristics. This paper reports the differences in floral and seed production characteristics within and between species as an initial step towards the domestication of these species.

mm (134.8) respectively. There were also large differences between the two species in the length of inflorescence. The mean (s.d.) length of inflorescence for Curly Mitchell was greater than for Barley Mitchell grass, 208 mm (82.5) and 89.5 mm (27.6) respectively. However, the number of spikelets in each inflorescence did not reflect the differences in inflorescence length. Barley Mitchell had a greater number of spikelets than did Curly Mitchell due to a wider spacing of spikelets in the latter. Curly Mitchell accessions displayed a high proportion of multiple seed heads whereas Barley Mitchell tended to have only single heads.

## Conclusions

Both the length of the culm and inflorescence has implications for seed harvesting. Very long culms could result in lodged seed heads or uneven

## Materials and Methods

Between October 1991 and April 1992 a total of 455 whole plants were collected within a sampling area extending throughout Western New South Wales and Central Western Queensland and planted in a nursery at Walgett. Five mature seed heads from each plant were collected in December 1992. From each of these seed heads, mean culm and inflorescence length as well as the number of inflorescences and spikelets for each plant was determined.

## Results

The range in length of culm was large, 48 mm to 988 mm. The mean (s.d.) culm length of Curly and Barley Mitchell was 407.2 mm (143.3) and 449.9

heights of seed heads that would reduce the seed retrieved during harvesting. It was therefore considered desirable to have seed heads positioned evenly above the plant. The observed large variation in inflorescence characteristics within these species has provided useful levels of variation as a basis for the selection of superior lines of Mitchell grass. For example, over a single generation culm length has been reduced by approximately 80%, removing plants with excessively long culms. Performance (high levels of dry matter and leaf production) of the third generation of selections is being evaluated at four locations to determine the final selection of elite lines due for release within the next two years.

## References

- Orr, D.M. and Holmes, W.E. (1984). Mitchell grasslands. In: "Management of Australia's Rangelands". Eds. G.N. Harrington, A.D. Wilson and M.D. Young. CSIRO Australia