

## New herbage plant cultivars

### A. Grasses

#### 26. *Danthonia*

##### (b) *Danthonia linkii* Kunth (wallaby grass) cv. **Bunderra**

Reg. No. A-26a-1. Registered on November 9, 1991.

*Originator*: LODGE, G.M.

NSW Agriculture, RMB 944, Tamworth, NSW, 2340, Australia.

*Registrar*: Oram, R.N.

CSIRO Division of Plant Industry, GPO Box 1600, Canberra, ACT 2601, Australia.

*Released by* Head Licensee, Lachlan Valley Seeds Pty Ltd, Forbes, NSW 2871.

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#### Origin

Selected from a single plant of a natural ecotype collected by Dr G.M. Lodge from a grassed laneway near Tamworth (31°09'S, 150°59'E, 434 m elevation, average annual rainfall 670 mm) in northern New South Wales (NSW). The parent plant of Bunderra was 1 of 844 *D. linkii* plants collected throughout NSW in 1985–86. Plants were grown in nursery rows at the Agricultural Research Centre, Tamworth and selected for dry matter production and seed retention and yield over 4 generations.

Bunderra was submitted by NSW Agriculture and recommended for registration in the Standing Committee on Agriculture Scheme by the New South Wales Herbage Plant Liaison Committee. NSW Agriculture will maintain breeders' seed. Pre-basic, basic and certified seed will be produced by growers under contract to the Head Licensee. Bunderra has been granted Plant Variety Rights (Anon. 1992; Application No. 91/099).

#### Morphological description

All *D. linkii* plants have a chromosome number  $2n = 24, 48$  or  $72$  (Brock and Brown 1961) and are self-pollinating. Bunderra is a functional diploid  $n = 24$  (Lodge 1993). It is an erect,

densely caespitose, leafy, sub-glabrous perennial, up to 105 cm tall, but more generally 85 cm. The culms are moderately stout, about 1 mm in diameter and 4-noded. The ligule is shortly ciliate with 0.5 mm hairs, with a few long hairs at the side. Leaf blades are 120–290 mm long by 2.2–5.3 mm wide. The panicle is lanceolate, 4–8 cm long. Spikelets are usually pale green when young and straw coloured when mature, 10–15 mm long and about 6-flowered with the florets slightly shorter than the glumes, except for the very short central awn. The glumes are sub-equal, narrow and boat-shaped. The body of the lemma has abundant hairs scattered over the back with short hairs above the callus gradually lengthening to longer hairs below the sinus. Palea are lanceolate and narrowed acutely in the upper part. Florets of Bunderra have pale yellow to orange anthers about 1–2 mm long. Caryopsis is straw coloured to medium brown, obovate and about 1.7 mm x 0.8 mm, with the embryo up to 1.0 mm. Caryopsis weight averages 4.71 mg (2.12 million seeds per kg).

When grown as spaced plants in comparative growing trials (Lodge and Schipp 1993) Bunderra was morphologically distinguishable from other ecotypes by its wider and longer flag and tiller leaves. It also produced significantly more reproductive tillers than the other ecotypes and so had a higher number of inflorescences.

#### Agronomic characters

Bunderra is a long-lived, frost-tolerant, yearlong green perennial grass native to Australia. *D. linkii* occurs mainly on heavier textured soils in all coastal, tablelands and slopes environments of NSW (Vickery 1956; Jacobs and Pickard 1981; Wheeler *et al.* 1982). It is also commonly found in the north and south western plains (Wheeler *et al.* 1982) areas as well as in Queensland, Victoria and South Australia. They are widely regarded for their drought resistance and their ability to grow and persist in areas of low fertility.

However, unselected *D. linkii* plants have also been shown to be responsive to fertiliser input (Lodge 1979; Scott and Whalley 1982) and to persist under heavy grazing (Scott and Whalley 1982; 1984). Bunderra is moderately tolerant of acid soils (K. Helyar, personal communication).

In field studies, unselected *D. linkii* plants (Lodge and Whalley 1983; Robinson and Archer 1988) had more green leaf than other native grasses, but lower dry matter production than fescue and phalaris (Robinson and Archer 1988). For green leaf, crude proteins of 12–18% were recorded (Lodge and Whalley 1983; Archer and Robinson 1988), with digestibilities ranging from 60–70%. Similar crude protein data were recorded for the early generation selections of Bunderra (Lodge 1992). Bunderra exhibits a high number of vegetative and flowering tillers and produces green leaf throughout the year. Compared with unselected native ecotypes of *D. linkii*, Bunderra has superior herbage production and seed yield (Lodge and Schipp 1993).

*D. linkii* is encouraged by soil disturbance and cultivation (Scott and Whalley 1982) and Bunderra has high emergence on the soil surface (Lodge, unpublished data), indicating it may also have a role in the restoration of degraded cropping lands. It should be suitable for surface sowing and aerial establishment and may have some potential as an amenity grass. There are presently no other cultivars of this species commercially available.

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### References

- ANON. (1992) Wallaby grass (*Danthonia linkii*) variety 'Bunderra'. *Plant Varieties Journal, Australia*, 5(1), 20–21.
- ARCHER, K.A. and ROBINSON, G.G. (1988) Agronomic potential of native grass species on the Northern Tablelands of New South Wales 2. Nutritive value. *Australian Journal of Agricultural Research*, 39, 425–436.
- BROCK, R.D. and BROWN, J.A.M. (1961) Cytotaxonomy of Australian *Danthonia*. *Australian Journal of Botany*, 9, 62–91.
- JACOBS, S.W.L. and PICKARD, J. (1981) Plants of New South Wales. *A Census of the Cycads, Conifers and Angiosperms*. (Government Printer: Sydney).
- LODGE, G.M. (1979) Effect of fertility on the yield of some native perennial grasses on the north-west slopes, New South Wales. *Australian Rangeland Journal*, 1, 327–333.
- LODGE, G.M. (1992) The domestication of native grasses for pastoral use. *Proceedings of the 6th Australian Agronomy Conference, Armidale*, pp. 456–459.
- LODGE, G.M. (1993) The domestication of the native grasses *Danthonia richardsonii* Cashmore and *Danthonia linkii* Kunth for agricultural use. I Selecting for inflorescence seed yield. *Australian Journal of Agricultural Research*, 44 (in press).
- LODGE, G.M. and WHALLEY, R.D.B. (1983) Seasonal variations in the herbage mass, crude protein and *in vitro* digestibility of native perennial grasses on the north-west slopes of New South Wales. *Australian Rangeland Journal*, 5, 20–27.
- LODGE, G.M. and SCHIPP, A.J. (1993) The domestication of the native grasses *Danthonia richardsonii* Cashmore and *Danthonia linkii* Kunth for agricultural use. II Agronomic/morphologic variation. *Australian Journal of Agricultural Research*, 44 (in press).
- ROBINSON, G.G. and ARCHER, K.A. (1988) Agronomic potential of native grass species on the Northern Tablelands of New South Wales 1. Growth and herbage production. *Australian Journal of Agricultural Research*, 39, 415–423.
- SCOTT, A.W. and WHALLEY, R.D.B. (1982) The distribution and abundance of species of *Danthonia* DC on the New England Tablelands (Australia). *Australian Journal of Ecology*, 7, 239–248.
- SCOTT, A.W. and WHALLEY, R.D.D. (1984) The influence of intensive sheep grazing on genotypic differentiation in *Danthonia linkii*, *D. richardsonii* and *D. racemosa* on the New England Tablelands. *Australian Journal of Ecology*, 9, 419–429.
- VICKERY, JOYCE, W. (1956) A revision of the Australian species of *Danthonia* DC. Contributions from the New South Wales National Herbarium. (NSW Department of Agriculture: Sydney).
- WHEELER, D.J.B., JACOBS, S.W.L. and NORTON, B.E. (1982) *Grasses of New South Wales*. (University of New England Publishing Unit: Armidale).