

## Persistence of perennial grass cultivars on the Northern Tablelands

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The major perennial grass species in use on the Northern Tablelands are *Festuca arundinacea* (tall fescue), *Dactylis glomerata* (cocksfoot), *Phalaris aquatica* (phalaris) and *Lolium perenne* (perennial ryegrass) (Lowien *et al.* 1997). A large number of either recommended or newly-released cultivars of these species is available commercially. However, little is known of long-term persistence, particularly of the new cultivars. Persistence of introduced species is critical for an economic return on investment in pasture development (Vere *et al.* 1997). This paper reports the long-term (*ca.* 10 years) persistence of 23 cultivars of these four perennial grass species.

### Methods

The yield performance of the 23 cultivars was assessed at Glen Innes from 1990 to 1995 (FitzGerald *et al.* 1992). The cultivars were established in autumn 1990 using the recommended seeding rate for the species, maintained in monocultures in 5.5 x 1.2 m plots with two replicates, and fertilised annually with 250 kg superphosphate/ha and 125 kg N/ha. Annual average rainfall at Glen Innes is 853 mm with summer dominance, but during the experimental period there was a severe and protracted drought (1993-1995). From 1990 to 1995, plots were grazed monthly with sheep to a height of 2 cm. From 1996 to 1999 the plots were grazed with sheep to a height of 2 cm once each season. Plant frequency was measured in 1992 to 1995 and 1999 by recording presence of the sown cultivar in each cell of a 0.5 m x 1 m quadrat (200 cells each 5 cm x 5 cm).

### Results and discussion

In 1992 and 1993 there were no significant differences in plant frequency between the four species. In 1994, 1995 and 1999, frequency of cocksfoot was significantly ( $P < 0.05$ ) higher than the other species. There was little difference between the other three species until 1999, when frequency of perennial ryegrass was significantly ( $P < 0.05$ ) lower than phalaris and tall fescue. Of the cocksfoot cultivars, Porto had the greatest persistence, with a presence of at least 30% in any year (Table 1). Demeter and Au Triumph fescue both persisted well, and Holdfast was the most persistent phalaris. No perennial ryegrass cultivar persisted satisfactorily.

**Table 1. Plant Frequency (% incidence) of 23 cultivars of four perennial grass species on the Northern Tablelands of NSW, 1992-1999.**

Species/Cultivar	1992	1993	1994	1995	1999
<b>Cocksfoot</b>					
Kara	41	47	28	13	32
Wana	54	77	38	28	56
Porto	57	80	52	32	91
Currie	54	76	42	23	50
<b>Tall fescue</b>					
Demeter	44	71	18	12	45
Roa	43	71	11	3	31
Cajun	52	73	15	2	17
Au Triumph	47	71	16	4	57
<b>Phalaris</b>					
Holdfast	61	52	25	8	40
Uneta	81	80	26	6	26
Sirosa	54	60	35	8	21
<b>Ryegrass</b>					
Yatsyn	39	68	22	11	9
Nui	32	49	0	0	1
Javelin	20	11	0	0	1
Supernui	34	64	10	1	1
Brumby	40	80	9	2	3
Endeavour	47	72	16	3	2
Victorian	49	89	29	5	2
KV Early	42	77	24	5	2
Ellett	38	74	20	7	14
Kangaroo Valley (KV)	45	72	10	3	3
Roper	25	89	30	2	16
Pacific	35	57	11	3	2

The drought recovery and long-term persistence of the approved (NSW Pasture Variety Committee) cultivars of cocksfoot (cv. Porto), tall fescue (cvs. Au Triumph and Demeter) and Phalaris (cv. Holdfast) provide evidence for the robustness of introduced grasses in this environment. Monitoring of long-term persistence of new perennial grass cultivars will be continued at Glen Innes, and plant improvement work has commenced to develop new cultivars of tall fescue (based on cv. Demeter) with better persistence, grazing value and winter activity.

### References

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