

Persistence under grazing by introduced temperate perennial grasses in New South Wales and Victoria

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Introduction

The successful use of productive introduced temperate perennial grasses depends critically on their persistence in the face of climatic, soil, and grazing stresses.

Climatic zones where temperate grasses are used in southeastern Australia range from Mediterranean areas in the southwest to hotter and more summer-rainfall-dominant areas in the northern inland where all

introduced temperate perennial grasses struggle to survive. The more summer-dormant species phalaris is widely used in inland areas where moisture stress limits the survival of perennial ryegrass. Summer-dormant tall fescues may play a similar role.

Cultivars of phalaris and other commercial temperate grasses were sown in autumn 1999 at Bulart, southwest Victoria; at Rye Park, Southern Tablelands of New

South Wales; and at Tamworth, North-West Slopes of New South Wales, with three replicates at each site. All sites were grazed by sheep, with continuous stocking at Bulart and Rye Park. Bulart had high soil phosphorus (P) and high stocking rate, Rye Park had low to moderate soil P and moderate stocking rate, and Tamworth had moderate soil P and low stocking rate. Plant basal frequency was measured annually.

Results and discussion

Climatic stress appeared to dominate at Tamworth and grazing stress at Bulart. Persistence in year 4 calculated as the ratio of basal frequency in 2002 relative to maximum levels in 2000 is presented in Table 1.

Australian phalaris and its seed-retaining form, Australian II, were highly persistent under heavy grazing at the two southern sites but less persistent than more winter-active cultivars at Tamworth, where Landmaster and the more summer-dormant Atlas PG had the highest means. Phalaris in general persisted

better than other species at Tamworth, with the exception of the Mediterranean-type tall fescue Fraydo, which persisted better than the summer-active AU Triumph tall fescue in all environments. Porto and Currie cocksfoot were highly persistent at the two southern sites but were poor at Tamworth, possibly because of their shallow rooting depth and higher summer activity. A more summer-dormant perennial ryegrass, AVH4, was markedly more persistent than the more summer-active Yatsyn 1 at Rye Park but was similar to Yatsyn 1 at the other sites. The low persistence of Landmaster at Bulart was unexpected and needs confirmation. The results suggest that summer dormancy promotes survival of temperate grasses in southeastern Australia but that there are strong interactions with climatic zones.

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Table 1. Persistence (%) of sown perennial grasses in Year 4.

Cultivar	Phalaris			Cultivar	Other species		
	Bulart	Rye Park	Tamworth		Bulart	Rye Park	Tamworth
Sirosa	60	71	66	Perennial ryegrass			
Holdfast	53	74	69	cv. Yatsyn 1	52	35	42
Landmaster	25	81	79	AVH4	57	79	32
Sirolan	43	63	72	Tall fescue			
Atlas PG	31	71	80	cv. AU Triumph	7	25	24
Australian	93	93	62	cv. Fraydo	36	46	80
Australian II	82	90	40	Cocksfoot			
				cv. Porto	80	88	50
Isd (P=0.05)	34	15	25	cv. Currie	77	89	35