

Incidence and agronomic significance of endophyte in perennial ryegrass seed lines

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The endophyte, *Acremonium lolii*, found in perennial ryegrass, *Lolium perenne*, has a significant effect on the growth and persistence of perennial ryegrass in New Zealand. Since the endophyte confers protection to the plant from the Argentine stem weevil, *Listronotus bonariensis*, most perennial ryegrass seed sown in New Zealand contains a high level of infection with endophyte. The importance of endophyte in perennial ryegrass grown in the climatic and biotic environment in mainland Australia, where the Argentine stem weevil is considered a minor pest in pastures, is largely unknown. The aim of this experiment was to determine the incidence and agronomic significance of endophyte in seed of perennial ryegrass cultivars available commercially in Australia.

Methods

One hundred and fifty two samples of perennial ryegrass seed lines were collected from seed certification laboratories and seed companies in Victoria, New South Wales and Tasmania and examined for the level of infection with endophyte. Ten lines of perennial ryegrass cv. Victorian and 5 lines of cv. Ellett were sown in May 1991 in replicated plots at Flaxley (800mm annual rainfall), under dryland and irrigated managements, and at Springton (550mm annual rainfall) under dryland management. Endophyte infection in the sown cultivars ranged from 0 to 87% of seeds infected. Three Ellett lines with endophyte levels of 0, 66 and 87% were also sown in mixtures with subterranean clover in the dryland plots and white clover in the irrigated plots.

Results and discussion

The mean and range of the level of endophyte infection in the perennial ryegrass cultivars is shown in Table I. In the first year of growth at all sites, endophyte level had no effect on dry matter yield of either the pure ryegrass or mixed ryegrass/clover swards. A significantly ($P < 0.05$) higher proportion of Ellett perennial ryegrass was recorded in mixed ryegrass/clover plots sown with endophyte infected ryegrass compared to that in mixed plots sown with endophyte free ryegrass at the irrigated Flaxley site (0.55 v.0.49) and at Springton (0.67 v 0.51). A reduction in the clover content of mixed pasture will be detrimental to its nutritional value for livestock (1).

Table I. Level of endophyte infection in perennial ryegrass seed lines.

Cultivar	No. of lines	No. of seeds infected with endophyte(%)	
		Mean	Range
Victorian	58	64	9-85
Ellett	33	71	47-87
Martlett	25	37	5-68
Nui	12	16	0-51
Brumby	7	40	31-46
Kangaroo Valley	7	38	0-86
Yatsyn	5	61	28-95
SuperNui	2	25	1-49

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Reference

1. Rogers, G.L., Robinson. 1.B. and Moate. P.J. 1986. Proc. Aust. Soc. Anim. Prod. 16. 427.