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**Effect of A Novel Endophyte on the Productivity of Perennial Ryegrass  
(*Lolium perenne*) in New Zealand**

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**Abstract**

As part of the national evaluations of selected endophytes in New Zealand, herbage yields were measured for the same cultivar of perennial ryegrass infected with each of 7 selected endophytes and the same cultivar infected with its endemic 'wild-type' endophyte and endophyte-free. In total, 11 trials were sown in six locations over 2 years. Small plots were measured for dry matter yields for up to 4 years from sowing. During summer and autumn, endophyte AR37 was the highest yielding treatment in 58% (summer) and 74% (autumn) of the comparisons (n=38 in each season) (P<0.05). It was higher yielding than endophyte AR1 and wild-type for 45% and 18% (respectively) of the comparisons in summer and 63% and 42% in autumn (respectively) (P<0.05). AR37 was never lower yielding than these other treatments during these seasons. In other field trials, tiller numbers per m<sup>2</sup> were significantly greater for endophyte AR37 compared with wild-type (P<0.05). Further small plot trials of AR37 inoculated into another ryegrass cultivar show this enhancement in yields is transferable to other cultivars. The high summer/autumn yields of ryegrass infected with AR37 is likely to be due to this endophyte imparting greater pest protection to the plant than does the wild-type endophyte (Popay et al., 2004) through the production of novel compounds (Tapper and Lane, 2004). Endophyte AR37 offers the potential to increase ryegrass yields and enhance persistence compared with the endemic wild-type endophytes that infect New Zealand cultivars.

**Literature Citations**

- Popay, A.J., Silvester, W.B., Gerard, P.J. 2004. Effect of Different Endophyte Isolates in Perennial Ryegrass on a Root Aphid, *Aploneura lentisci*. In Proceedings 5th International Symposium on *Neotyphodium*/Grass Interactions: this volume.
- Tapper, B.A., Lane G.A. 2004. Janthitrems found in a *Neotyphodium* endophyte of perennial ryegrass. In Proceedings 5th International Symposium on *Neotyphodium*/Grass Interactions: this volume.