

## Developments in the use of plantain (*Plantago lanceolata*) cultivars in New Zealand pastures

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**Introduction** The use of pasture herbs, such as chicory, is commonplace in New Zealand in recent years. This has stimulated interest in other herb species such as plantain (*Plantago lanceolata*) that often occurs as a ubiquitous weed in temperate pastures throughout the world. In the last decade 2 improved commercial cultivars, Grasslands Lancelot (Rumball *et al.*, 1997) and the erect, winter active Ceres Tonic (Stewart, 1996), have been bred in New Zealand for use in pastures. These cultivars have useful agronomic features that make them valuable for grazing. They are productive in mixtures, palatable to grazing animals, and tolerate a wide range of soils and dryland conditions (Stewart, 1996; Stewart & Charlton, 2003).

**Plantain in New Zealand pastures** Plantain, often with added chicory and red clover, is used widely with perennial ryegrass and white clover in pasture mixtures. Autumn establishment and winter activity of Tonic Plantain compare well with those of perennial ryegrass. Thus, plantain has few limitations to establishment and use in mixed pastures. It usually persists longer than red clover or chicory in pastures under common grazing practices and many 5-year-old pastures still contain up to 5-10% plantain in the sward as a tertiary component. Plantain's superior heat tolerance often allows it to exceed 10% of the sward in the north of New Zealand.

**Plantain and minerals** Plantain herbage contains a higher concentration of Ca, Mg, Na, Cl, S, P, Zn, Cu and Co than pastures based on perennial ryegrass-white clover. Lambs grazing pure plantain swards have higher liver concentration of Cu (2250 vs 716  $\mu\text{mol/kg}$  FW) and Se (671 vs 380  $\text{nmol/kg}$  FW) than those grazing perennial ryegrass (Moorhead *et al.*, 2002). Animals grazing plantain also retain more Ca, Mg and Na than those grazing perennial ryegrass (Wilman & Derrick, 1994).

**Plantain and enhanced animal performance** With appropriate management, plantain supported summer growth rates in young lambs of 222 g/day. Increased intake at a common allowance (Moorhead *et al.* 2002) and a faster rumen degradation rate of plantain than perennial ryegrass (24.6 vs. 11.7%; Burke *et al.* 2000) may explain enhanced animal performance. Older and stemmier herbage has a reduced animal performance (51g/day, Robertson *et al.*, 1995, 84-141g/day, Fraser & Rowarth, 1996) due to a much reduced digestibility. As herbage quality depends on the stage of plant development, grazing management should aim to keep plantain at a relatively leafy stage and utilise seed-head before lignification.

**Conclusion** The useful features of these productive bred plantain cultivars make them a valued component of pasture mixtures for sheep, cattle and deer in New Zealand. However, like chicory, the lack of suitable herbicidal controls for serious broadleaved weeds can limit plantain use in some situations.

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