

Benefits and uses of plantain (*Plantago lanceolata*) cv. Ceres Tonic in livestock production systems in New South Wales

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Abstract: This paper highlights some key attributes of plantain (*Plantago lanceolata*) as a forage species and outlines the generic benefits of plantain cv. Ceres Tonic. It explores four different ways of using Tonic plantain as a component of perennial pastures, as a companion with either summer-growing brassicas or lucerne and as a monoculture.

Key words: pasture mixes, medicinal herb, lactation feed

Introduction

Narrow-leaved plantain *Plantago lanceolata* has had a long history of use as a forage plant being sown in pasture mixes in the United Kingdom and Europe since the 1700s (Foster 1988). *Plantago lanceolata* is highly valued as a medicinal herb and is known to contain many biologically active-compounds.

As a grazing herb, the species was first introduced as proprietary cultivars into the Australasian seed industry via the AgResearch cv. Grassland Lancelot closely followed by the Agricom cv. Ceres Tonic in the mid to late 1990s. Since this time it has become an important addition to pasture mixes, and more recently has been used as a monoculture.

This paper highlights the generic benefits of Tonic plantain and explores four different ways plantain is being used commercially in livestock production systems.

Key attributes

Plantain has some key attributes as a forage species. These are;

1. Excellent dry matter production, particularly winter activity (Moorhead and Piggot 2009). In many environments, plantain produces similar amounts of forage to perennial ryegrass. A feature of plantain's productivity is its rapid response to moisture in autumn.
2. Rapid rumen degradation rates (Burke *et al.* 2000) for improved dry matter intake (Judson *et al.* 2009).

3. Increased performance of sheep compared with ryegrass during lactation (Judson *et al.* 2009) and post-weaning (Moorhead *et al.* 2002).
4. Increased supply of trace elements to grazing livestock, resulting in increased liver concentrations of particularly copper, cobalt, and selenium (Moorhead *et al.* 2002).
5. Reduced impact of internal parasites. Ewes grazing Tonic plantain had significantly lower faecal egg concentrations than their counterparts grazing ryegrass (Judson *et al.* 2009).

Ways of using plantain

1. Tonic as a component of a perennial pasture

The initial use of Tonic plantain in Australia was as a companion species in pastures mixes. Although pastures benefited from the inclusion of Tonic, the need to spray many perennial pastures for weeds such as capeweed and thistle species, limited the area of adoption because many of the herbicides used were equally effective on plantain. As a companion species, Tonic plantain improves summer quality, autumn recovery and winter activity of perennial pastures.

2. Tonic as a companion with a summer brassica

Tonic has been widely used as spring-sown component of a brassica crop. Jacobs *et al.* (2006) reported that plantain (along with chicory) sown with summer forage brassica crops in the spring can increase forage production in the following autumn, and reduce weed ingress into newly sown pastures in their first year. The presence of

plantain in a brassica crop can also mitigate, to some degree, animal health issues which can arise on brassica monocultures from time to time.

3. Tonic as a mono-culture

The experience gained in summer brassica crop mixes led to the evaluation of Tonic plantain as a monoculture. Initially, this work focussed on summer liveweight gain of weaned lambs. In these studies, Tonic plantain supported greater liveweight gain and a higher stocking rate than those grazing perennial ryegrass and also elevated liver copper and selenium concentrations (Moorhead *et al.* 2002). Although the liveweight gain potential of Tonic in summer is greater than ryegrass, it is generally less than that of summer legumes, summer brassica and chicory.

More recently Judson *et al.* (2009) evaluated Tonic plantain as a lactation feed for twin-bearing ewes lambing in August. The winter and early spring activity of Tonic provided sufficient feed to support twin-bearing lactating ewes in early spring. The ability to consume more plantain, probably as a result of its fast rumen degradation rates, improved the weaning weight of the lambs by between 10 and 34% over the four years of studies. Ewes were also heavier at weaning by up to 14 kg. In a farm system, where the sale of cull ewes or last-lambing ewes is a valuable income stream, using a lactation forage that puts weight on the ewe by weaning is a real asset.

4. Tonic as a companion with lucerne

Lucerne systems are characterised by excellent summer growth, particularly in hotter, drier environments. Although specific genotypes of lucerne have been bred for increases in winter activity, this may come at the cost of persistence. Where lucerne is used in sheep systems in drier environments, winter-active species need to be included in the farming system to fill feed gaps left by inactive lucerne in winter and early spring. Such species have included cereals and short rotation ryegrass. More recently, adding Tonic plantain to lucerne stands has provided valuable feed in early spring and late autumn, which complements the summer production of lucerne.

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