Plantain establishment (1-78a)

Introduction

This farm fact is based on NZ trials and experiences growing the plantain cultivar Tonic under dairy cow grazing. Other plantain cultivars may have different requirements. This farm fact focuses on establishment; for management guidelines see farm fact 1-78b.

Key points

- Plantain is an herb with a fibrous, coarse root system that produces 10-19 t DM/ha/year.
- Establishment is best when seed is sown in warm soils (12°C) at <10 mm depth.
- Weeds should be thoroughly eliminated before sowing as there are few suitable post-establishment herbicides.
- Plantain can grow on a range of soils; however it performs best and persists longer when grown in free draining soils.

Characteristics of plantain

Plantain grows throughout New Zealand however; it is best suited to dairy farm situations where the amount and quality of summer feed limits milk production. Plantain plants have a fibrous, coarse root system which provides moderate drought tolerance. Despite moderate drought tolerance, plantain still requires moisture to grow well, and under severe drought growth will be reduced. Under these conditions plants will wilt; however, they recover quickly following rain or application of irrigation or effluent.

Plantain yields recorded in New Zealand over a full year range from 10-19 t DM/ha (average = 16 t DM/ha).

Plantain performs best and will persist longer when grown in free draining soils and is highly responsive to nitrogen, particularly when grown without clover.

Plantain tends to be more persistent than chicory, often remaining productive for 2-3 years. Plant numbers will decline over this time, with the rate of decline depending largely on weed control, nitrogen fertiliser application and grazing management (particularly during wet conditions to avoid pugging). Many weeds tend to invade plantain crops over time.

Uses of plantain

1. Special purpose crop

This is often the best way to utilise plantain in a dairy farm system as it is a high yielding, high quality summer crop. When sown as a special purpose crop, paddocks with suitable soil types and convenient locations can be selected. Management can also be tailored to meet the requirements of the plantain plant.

A special purpose crop also provides an opportunity to break weed and insect cycles (e.g. black beetle, clover root weevil) before pasture renewal. Undesirable grasses (e.g. yellow bristle grass) can be eliminated as grass-specific herbicides can be used.

The recommended seed mix is 8-10 kg/ha plantain with or without clover. If broadleaf weeds are likely to be an issue in the paddock, sowing without clover may be better as the
unregistered broadleaf herbicides for plantain can affect clover. If the crop is planned to last more than two summers, white clover can be broadcast into paddocks once weed control is achieved and chemical residues allow.

2. Grass/clover/plantain mixed pasture

Plantain can be added to a pasture/clover mix at 2-4 kg/ha depending on the content required.

Establishment

Plantain is more sensitive than ryegrass to sowing depth and soil temperature. It establishes best when sown into warm soils (10-12°C) at no greater than 10 mm depth and where there is little competition from other plants in the first three months.

Spring sowing is preferred as plants develop quickly, although sowing in early autumn can still result in successful establishment. Late autumn sowing is not advised as plant development is slower during cooler weather, and July and August are not ideal for the first grazing.

Sowing after cultivation using a roller drill is recommended. Pre-emergence insecticide and treated seed are also recommended. Plantain can be successfully established by direct drilling following herbicide application, however; careful attention is required to ensure the sowing depth is no greater than 10 mm and slug bait should be used.

While broadcasting seed is the simplest and cheapest technique, it reduces plantain plant establishment, increasing weed invasion and reducing yield. The increased cost of direct drilling, compared with broadcasting, is more than compensated for by the increased yield.

Weeds should be thoroughly eliminated before sowing as there are few suitable post-establishment herbicides for plantain. Talk to local seed representatives for herbicide recommendations.

Withholding periods for residual hormone herbicides (e.g. clopyralid, MCPA) must be adhered to as plantain is very sensitive to these herbicides.

Plantain grows on a range of soil types, being adapted to a wider range of soils than chicory. Growth and persistence are maximised on free-draining, high fertility soils that are not prone to waterlogging or treading damage in wet weather.

Soil fertility requirements are as for ryegrass/clover pastures. Nitrogen fertiliser (e.g. 70 kg/ha of urea) improves establishment of plantain.

To ensure a daily diet of 3-4 kg DM/cow of plantain (~20% of diet), the amount of plantain planted needs to be about 5-6 ha per 100 cows.

Plantain should be first grazed no earlier than the six leaf stage (i.e. the plants have six fully grown leaves). This is normally 7-8 weeks after spring-sowing. This ensures that plants have well-developed root systems to improve survival.