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## Utilising a plantain, red clover and white clover mix - A farmer's perspective

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### Cheltenham Downs – brief background and farm description

Cheltenham Downs is located in the Manawatu district of the North Island of New Zealand. The farm was purchased by Landcorp in early 2011. It has a total area of 1427 ha, of which 1237 ha are effective. The farm is primarily utilised as a lamb-finishing enterprise. The property is located in a relatively summer safe area, with a mix of soil types (Rangitikei Sandy Loam and Milton, Te Arakure, Halcombe, Kiwitea, Ohakea, Milson and Manawatu Silt Loams) and has a flat to easy contour. The average rainfall is 1150mm per annum, evenly spread throughout the year. The majority of the farm is in ryegrass-white clover-based pastures. Each year, on average, 100 ha of Hunter brassica and 40 ha of kale are planted. Currently, the farm has 144 ha of the plantain, red clover and white clover mix.

The current management policy includes; finishing lambs (approximately 37,000 lambs in 2014); a ewe breeding flock (of approximately 2000 ewes); growing 3000 ewe lambs for replacements and for sale; trading cattle (approximately 800); dairy heifer grazing (1200 calves from December to May, and then retaining 800 through to the following May).

Lambs are purchased in at an average live weight of 26-27 kg, with a range of 24 to 30 kg. The aim is to slaughter winter lambs at an average carcass weights of 20kg and new season lambs at 18 kg. The aim is to achieve an average 120 g/d live weight gain in the winter lambs and 250 g/d in the new season lambs. Cheltenham Downs has a flexible slaughter schedule and will kill down to lighter live weights in a bad season, or will increase numbers if the opportunity arises in a good season.

### Why switch from finishing lambs on ryegrass white clover to a plantain-clover mix?

There were a number of reasons considered for changing from a system based on ryegrass- white clover to a herb based option; these included:

- i) to achieve faster individual carcass weight gains
- ii) to allow for a higher stocking rate and thus greater carcass gains per hectare
- iii) to allow for a faster turnover of lambs.

However, the aim was not to increase individual carcass weights of lambs at slaughter. To achieve the above three goals, a plantain-clover mix was suggested

by the Landcorp agronomist. The farmer had heard of this option as a potential mix to increase lamb performance by others in the industry although the manager had no experience with it himself. He had in the past tried a ryegrass, white clover and plantain mix with little success.

Once convinced to try the plantain-clover mix, the decision was made to plant enough area (50 ha) to allow for a significant number of lambs to remain on the mix until slaughter. This would allow for a true comparison of performance of lambs on a plantain-clover mix with those on ryegrass white clover mix. Subsequently, it was found that on average lamb growth rates are 100 – 150 g/d higher on the plantain-clover mix than on the ryegrass-white clover sward. In addition, dressing-out percentages are generally higher with the plantain-clover mix, allowing for a greater carcass weight for a given live weight. A further advantage observed is that the plantain-clover mix results in consistent and predictable animal performance, improving the planning for stock buying and selling.

### Management of the plantain-clover mix

The plantain-clover mix used consists of 8 kg of plantain (Tonic), 5 kg of red clover (Sensation) and 3 kg of white clover (Tribute). It is sown in the October/November period following a full cultivation and is planted with a roller drill. Currently, the farm has a mix of one- and two-year old swards, with a total area of 144 ha. The plantain-clover mix is grazed year-round. Once a year, the sward mix is mechanically topped in October, as this has been found to be a period of prolific seed heading. Although seeding still occurs year-round, it has been observed that the lambs struggle to control and consume the seed head in late spring.

### Management of the plantain-clover mix to ensure high performance

The stocking rate of finishing lambs varies throughout the year with an average of 35 lambs per ha. The stocking rate is lowest in winter, at 16 to 20 lambs per ha and peaks in late spring/summer at 40 lambs per ha. Through experience, the manager has found that it is better to have a slightly lower stocking rate than what could be possible, allowing for greater per animal performance. While many guidelines suggest post grazing heights can be to 'a squashed beer

**Table 1** Herbage quality test results for the plantain, red clover and white clover mix.

	September 2013	November 2013	January 2014
Neutral detergent fibre (% DM)	22.3	32.0	34.5
Digestibility of Organic Matter in Dry Matter (%)	76.0	68.0	65.7
Crude protein (% DM)	20.0	21.0	20.1
Metabolisable energy (ME/kg DM)	12.1	11.0	10.5

Average value for each given month. Data from Hill Laboratories, Hamilton, New Zealand.

can height' it is actually better to have slightly higher post grazing height. The manager utilises a post-grazing height rule of 'coffee mug height'. He feels that this higher post grazing height ensures lamb intake is not limited. Further, he believes grazing too low is bad from a plant perspective, in terms of both persistence and herbage regrowth. Pre-grazing heights are between 15 and 30 cm. The plantain-clover mix is rotationally grazed. The aim for this plantain-clover mix is to achieve a persistency of five years before renewal. He believes that maintaining suitable post grazing heights is the key to this.

When lambs arrive on the farm, they are given appropriate animal remedies (i.e. drench) and then are placed straight onto the plantain-clover mix where they remain until slaughter. They have noticed no ill-health effects in lambs from grazing the plantain-clover mix. It is important that urea is applied twice a year at a rate of 80 kg per ha in spring and in autumn. A maintenance level of fertiliser is also applied once a year.

### Monitoring lambs on the plantain-clover mix is an important management tool

A sub-set of lambs are electronically tagged and their performance is monitored. The monitoring is linked with FarmIQ. Three to four times a year, herbage samples are sent for laboratory quality assessment (Table 1). It is felt that this is important management practice, as it helps with the

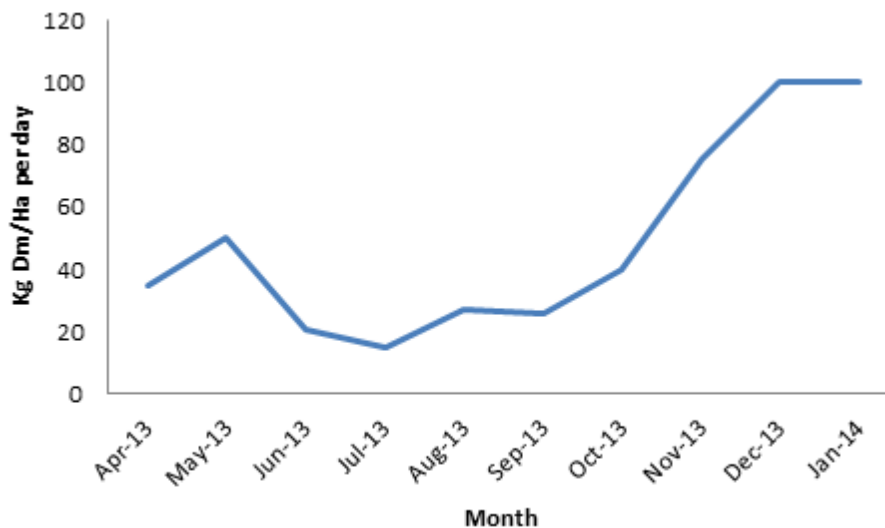
understanding of animal performance. In addition, herbage exclusion cages are used to estimate monthly herbage production (Figure 1) which assists in the planning of rotation lengths and for the buying and selling of lambs. The aim is for the plantain-clover mix to yield 12 – 17t DM per year.

### Other uses for the plantain-clover mix

The tail-end dairy heifers are grazed on the plantain-clover mix to increase daily live weight gains allowing them to catch up to target live weights. Ewes are not set stocked on the plantain-clover mix, but twin- and triplet-rearing mobs will be introduced as soon as lambing is finished and rotated through the mix. The aim is to improve weaning weights of lambs and ewes.

### Disadvantages of the plantain-clover mix

The main issue that has been encountered is the control of weed species including grasses. This has generally been controlled by spraying with 'Dictate' (bentazone) in spring to control weed species, and 'Sequence' (clethodim) to control grasses, although the later

**Figure 1** Average monthly herbage production (kg DM/ha) for the plantain, red clover and white clover mix (Plantain mix). Data collected via exclusion cages.

does have a withholding period which requires careful management. They have found that some paddocks have had a high pennyroyal infestation, and these have required control using 'Kamba' (dicamba). However, a side-effect of this spray is that it has killed the clover in the plantain-clover mix, and has resulted in paddocks that are plantain only. These paddocks display lower animal performance than those which have clover. It is planned that clover will be re-introduced into these paddocks at a later date.

### **Future planning**

At this stage, it is intended to keep the plantain-clover area at about the same size. This is due to the risk of removing more area for cultivation in the summer period resulting in areas being taken out of production and thus requiring de-stocking. A risk of increasing the area in plantain-clover is the requirement to procure more lambs in the peak lamb

finishing season, to meet the extra herbage production, at a period when schedule prices are not favourable. It is believed that 10% of the total farm area in the plantain-clover mix fits the system best.

### **Conclusion**

On Cheltenham Downs, the use of a plantain, red clover and white clover mix has been found to be a successful herbage mix for finishing lambs. The farm has only been utilising this mix for two years, and during that time has developed its own management guidelines to ensure high performance. While the mix has been very successful, it does have its own challenges, such as weed infestation which requires precise management. Given the appropriate grazing and weed control management, results to date suggest that the plantain, red clover and white clover mix has the potential to persist for at least five years.