

Plantain: Dairy grazing management

Plantain Plant

The plantain plant has a small tap root and a fibrous root system that seeds profusely though spring and summer. Although it is a perennial, it normally only persists in dairy grazed pastures for 2-4 years, similar to an Italian or hybrid ryegrass.

Persistence in dairy pastures is affected by being too frequently grazed over winter and/or treading damage, especially in wet winters and on heavy clay soils. Plantain and ryegrass compete for light and nutrients, and plantain is not a particularly competitive species. Plantain performs well where there is space between ryegrass plants, created by lower ryegrass seeding rates or poor ryegrass persistence. It also performs well when conditions favour plantain growth and not ryegrass i.e., hot or humid summers as plantain's optimal temperature is around 25°C.

Monitoring plantain persistence on farms in the Taranaki region (from 2018-2020) shows that the first autumn after establishment of an autumn ryegrass/clover/plantain mix (3-4 kg plantain, 4-6 kg clover and 18-22 kg ryegrass per hectare) on 53 paddocks, the percentage of plantain in the sward ranged from 25-50% with the average around 43%. After a season, the content of plantain in the sward on average reduced by 12% to 31% and after 2½ years the plantain content was less than 20% on all but two of the monitored paddocks. This aligns with Agricom's experience over many years in the field.

Plantain is highly palatable and often the preferred plant species for grazing. However, there are situations where plantain palatability becomes an issue due to one of three situations that can develop on farm:

- 1 Plantain can become less palatable when in advanced (hardened) seed head stage or
- 2 Plantain can become less palatable with low to very low plant nitrogen status or
- 3 When grazing rounds become too long and plantain leaves are not grazed. These leaves may not go brown for many months. This leads to "old" leaves with low nutritional value, which become "green skeletons". These leaves attract disease and shorten the life of the plant.

In the field extremely elevated chloride levels have been observed when there have been palatability issues. However, the relationship between chloride and low palatability have not been tested to show cause and effect.



Grazing Management

Plantain is one of the few species that can be managed on a similar rotation length as perennial ryegrass, making it a good fit for the majority of farm mixes. Milksolids performance for plantain has been reported as the same as for ryegrass most of the year, while in hot summers with adequate moisture there have been milk production advantages to plantain over ryegrass.

Recommended grazing management includes:

- 1 Establishment in pure plantain and plantain clover will be improved if it is first grazed when it has reached the 6-8 true leaf stage.
- 2 For future grazings in plantain dominant swards, graze plantain between 18 and 25 days from spring to autumn when plantain reaches 25 cm height.
- 3 When established in a ryegrass mix, graze as soon as plants pass the pull test and before the plantain (and clover if planted) will be affected by shading from the ryegrass, around when plantain has two true leaves.
- 4 For the second grazing in a mixed sward, graze when the plantain plant has 6 true leaves.
- 5 In ryegrass dominant swards follow the usual ryegrass grazing rules of pre-graze 2500-3300 kg DM per hectare down to a consistent, even residual.
- 6 Palatability of the seed head declines from around 18 days after emergence. This can be tested by pinching down the seed head stem until it is hard. At 18 days, the seed head is soft down the majority of its length. For every day after day 18, the seed head lignifies around 1 cm a day and by day 28 the seed head stem is completely lignified and unpalatable. If a large amount of seed head is left in pasture, it needs to be topped to improve future quality and palatability.
- 7 If plantain is rejected at a grazing it is important to reset the pasture or stand by topping as the cows will not eat this rejected material at a future grazing. Leaving too much stem and allowing dead material to build up in plantain stands will also lead to plant loss later in the season due to fungal pathogens and plant disease as well as low palatability.

► *Frequent grazing spring-autumn (18-25 days) based on plant height is key to maintaining palatability*

Key seasonal management decisions

Late Spring/Summer

- Topping maybe necessary in December after seed head and again in the autumn to reset quality feed.
- Loss of palatability can occur in the second year due to low N status, top and apply nitrogen to rectify.
- Graze plantain frequently in summer if moisture is not limiting, even when ryegrass growth is slowing due to higher temperatures.
- Plantain continues to be very responsive to nitrogen when conditions are ideal (greater than 16°C when moisture is not limiting) compared to ryegrass where the response to N declines as temperature starts to effect ryegrass growth rates when above 16°C.

Autumn

- Plantain only has a small tap root so in the autumn it does not need a long spell to build up root reserves like lucerne. Rotation length only needs to be extended by 3-5 days in late autumn.
- In autumn, plantain can suffer from insect attack such as porina or plantain moth. Consult an agronomist to determine the best options for control.

Winter

- Over winter, in a mixed pasture, plantain can get grazed too frequently as the grazing interval is dictated by ryegrass that has higher winter growth rates than plantain.
- In pure plantain crops, the rotation over winter is extended to 40 days+ grazing interval (depends on winter soil temperatures) due to its slower growth and taking longer to reach 25 cm grazeable height.

Target covers

- Pre-graze cover (frequency of grazing) is more important than residual – graze it!
- Post-grazing target is 5-10 cm to remove the majority of the leaves and limit the build-up of old green material.
- First year grazing management from a spring sowing is more flexible than year two grazing and can be managed to high pre-grazing height of 25-35 cm which will maximise the annual production of plantain in its first summer and autumn. However, care is needed not to leave these stands for too long as the old leaves will become green skeletons and will lose palatability.
- Pre-grazing height in the second year needs to be no more than 25 cm to limit seed head development and maintain quality. In year 2 allowing plantain to grow over 25 cm does not grow more leaf, just increases growth of lower quality stem.
- Top after grazing if the plantain is left too long so as not to lose quality and palatability (too long grazing rotation or lack of nitrogen or green skeleton leaves).
- Topping may also be required to control weeds e.g., fathen, dock or thistles.

▶ *Plantain should be grazed at 25 cm leaf height to maximize quality and quantity after the first year*

Rotation Length

Season	Time to reach 25 cm height
Spring	3-4 weeks 21-28 days
Summer	2-3 weeks ~ 18-21 days unless summer dry In a dry summer, if rotation length is 30+ days need to remove the stem and dead material (topping or grazing) as if left will result in plant loss from disease in mid-summer early autumn
Autumn	3-4 weeks 21-28 days
Winter	For pure sward, mild winter 5+ weeks; in cold winters 7 weeks + If left too long will need to be hard grazed or topped

Grazing Pure Crops/High Percentage Plantain Pastures

Plantain does not require a transition period before grazing a pure crop if previous grazings have removed all material (no dead material/old leaves) and the grazing interval has not been too long. Any palatability issues will be due to the crop being too old and/or a shortage of nitrogen. To regain quality, top, and if appropriate apply nitrogen.

Bloat

Although a transition period is not required, it is important to take precautions for bloat before grazing pure plantain crops or paddocks with high plantain/clover content:

- Ensure cows are not hungry to avoid gorging on plantain or plantain/clover
- Bloat control, oil or monensin are used prior to grazing "high risk bloat" paddocks and the trough is "spiked" if using an inline dosatron to ensure the first 200 litres plus has bloat oil
- Feed silage, supplement or other pasture prior to cows going into a "high risk bloat" paddock
- Check the cows for bloat an hour after grazing; have a bloat plan (call for help, get cows out of paddock, have bloat drench mix made up with drench gun or drench bottle, sharp knife).

Calcium

Plantain contains up to four times more calcium than young ryegrass. While there needs to be an awareness of the calcium content and a cautious approach taken to including high amounts of plantain in the diet for cows 2-3 weeks before calving, there have been no reports of any increase in the incidence of milk fever in dairy cows. High calcium makes plantain an ideal post calving diet.

Assessing yield for Plantain and Plantain/Clover Swards

Plantain and plantain/clover are lower in dry matter and have less feed in the base of the sward compared to grass-based pastures. Hence, the platometer set at the winter formula (clicks x 140 + 500) overestimates the yield. A more appropriate formula is "clicks x 90 + 500".

If using the winter formula "clicks x 140 + 500" multiply the resulting cover by 70% i.e., if on the winter formula the cover is 2600 kg DM/ha then multiplied by 70%, the actual cover is estimated at 1820 kg DM/ha.

Below is a table of covers calculated with the normal platometer equation of "clicks x 140 + 500", 70% of this winter formula and the suggested plantain platometer formula of "clicks x 90 + 500".

Clicks Platometer										
Estimated cover (kg DM/ha)										
Platometer Winter clicks x 140 + 500	1200	1620	2040	2460	2880	3300	3720	4140	4560	5000
Winter Formula x 70%	840	1130	1430	1720	2020	2300	2600	2900	3200	3500
Platometer Plantain clicks x 90 + 500	950	1220	1500	1760	2030	2300	2570	2850	3100	3400

