FACTSHEET

Animal production from annual clover/plantain based pastures

February 2022

Should I add herbs to my pasture mix? What spring liveweight production should be expected on these pastures?

On the summer dry east coast, the majority of pasture growth and animal production occurs in spring. To sell prime lambs (>33 kg/hd) before feed supply declines lambs need to gain 300 g/hd/d over 100 days.

The Lincoln University Dryland Pastures Research team investigated animal and pasture production from ryegrass or cocksfoot pastures established with annual clovers and plantain. These included:

- a hybrid perennial ryegrass/sub clover/plantain mix (PL/Sub),
- a hybrid perennial ryegrass/sub + balansa cover/ plantain mix (PL/S+B),
- a cocksfoot/sub clover/plantain mix (CF/Sub),
- a cocksfoot/sub + balansa cover/plantain (CF/S+B).

The hybrid perennial ryegrass failed after Year 2 and oversowing was unsuccessful. These pastures then became plantain (PL) dominant.

This fact sheet summarises their key findings with emphasis on spring, as the main animal and plant production period in summer dry systems.

KEY MESSAGE

- Over four years, pre-weaning mean daily liveweight gains of twin lambs averaged 327 g/hd/d across all pastures.
- Liveweight of lactating ewes ranged from a loss of (-)47 g/hd/d (PL/S+B pasture in 2016/17) to a gain of 220 g/hd/d in Year 2 (2014/15).

Figure 1. Ewes and twin lambs grazing the MaxAnnuals experiment in spring (Photo: RJ Lucas, Lincoln University).

SPRING LIVEWEIGHT GAINS

Averaged over five years, Coopworths stocked at 14 ewes+twins/ha had mean daily lamb growth rate of 327 g/hd/d which was not affected by pasture type (Figure 3). Lamb growth was buffered by ewe LWt. Lactating ewes gained 100 g/hd/d more on PL than CF-based pastures in Years 2 and 3. Therefore, post-weaning the ewes on PL-based pasture had higher condition than those grazing CF-based pastures.

Figure 2. Ewe with twin lambs at Ashley Dene.

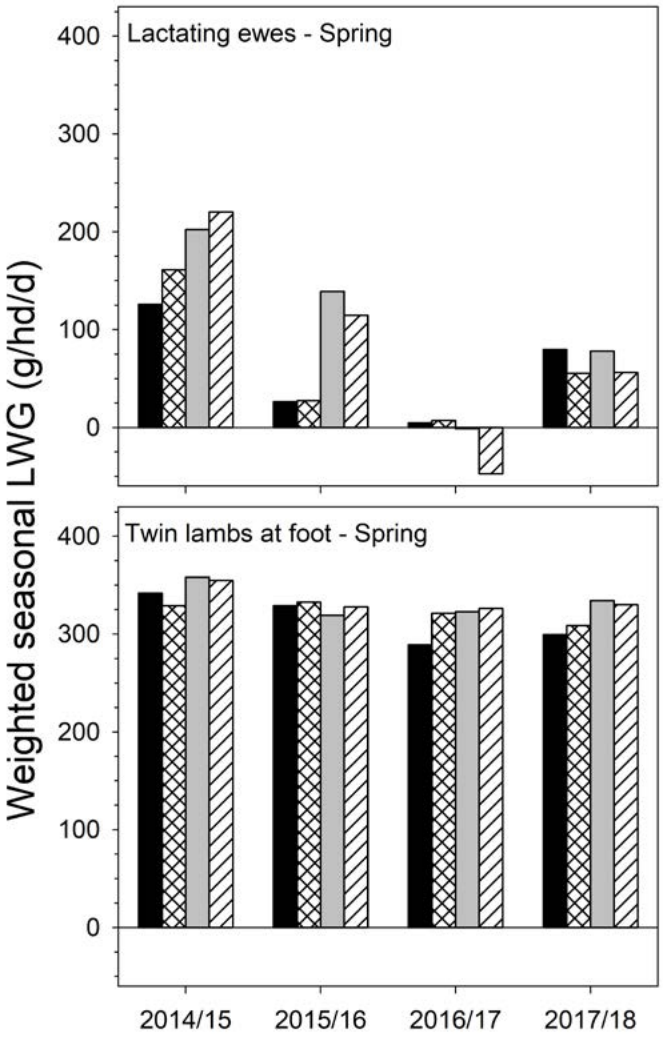

Figure 3. Pre-weaning mean daily liveweight gains of ewes and twin lambs grazing CF/Sub (■), CF/S+B (▩), PL/Sub (▒) or PL/S+B (▨) dryland pastures at Ashley Dene, Canterbury.

SPRING DRY MATTER YIELD AND COMPOSITION

The PL-based pasture contained more annual clover in 2014/15 and 2017/18, due to reduced competition from grass. This contributed to ewes maintaining condition in spring. In 2016/17 ewes were affected by foot scald in spring. This compounded poor ewe performance from pastures after a series of false strikes the previous autumn. This meant there was minimal clover on offer to lactating ewes in all pastures. Higher plantain yields in the PL-based pastures were unable to compensate for the loss in pasture quality from reduced clover content and ewes lost (-)9.8 kg LWt/ha compared with a gain of 1 kg/ha on the CF-based pasture.

Generally, total dry matter production was similar for all four pastures (Figure 4).

Hybrid ryegrass yield peaked in Year 2 (2014/15). However, it did not survive into Year 3 (2015/16) when plantain contributed 45% of the total yield. This increased to 60% in Year 4 (2016/17). Cocksfoot had low yields (173 kg DM/ha) in Year 1 (2013/14; not shown) as it is slow to establish but from Year 2 the cocksfoot yield exceeded the ryegrass.

Sub clover yield ranged from 185 kg DM/ha to 3050 kg DM/ha. Its contribution was influenced by the timing of rainfall in the previous autumn. The highest sub clover yields came when rain fell in mid-March, followed by more rainfall events. The lowest sub clover yield came after a 'false strike' when rainfall triggered sub clover germination at the end of January, but inadequate rain fell in the following six weeks to keep plants alive. Balansa clover yield was highest in the first year (400 kg DM/ha; not shown) and decreased to 200 kg DM/ha in second year. From 2016/17, balansa yield was negligible at <3% of the total yield.

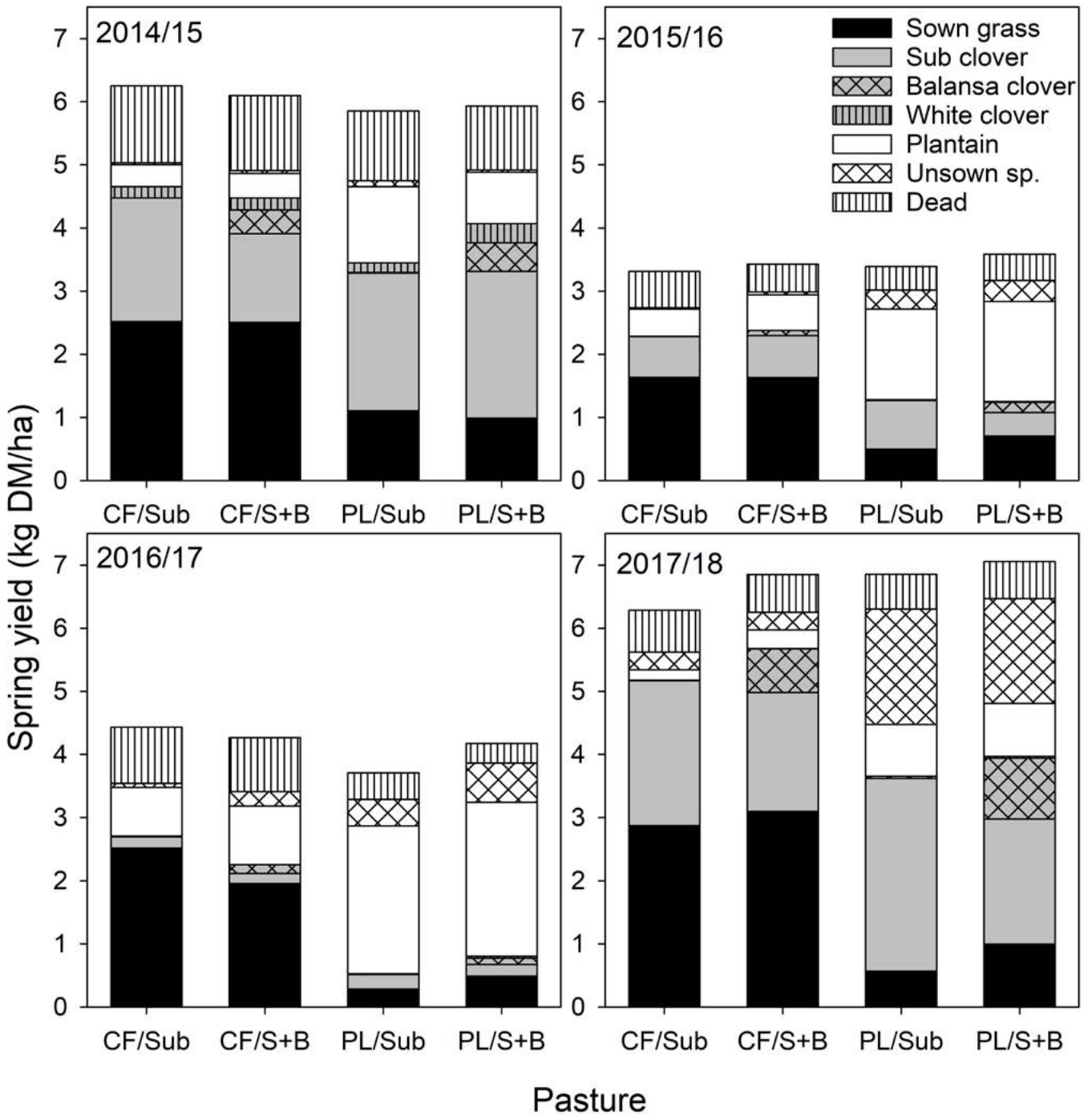

Figure 4. Botanical composition of CF/Sub, CF/S+B, PL/Sub and PL/S+B dryland pastures in spring over a five year period at Ashley Dene, Canterbury. The error bar is SEM for the sown pasture components (grass+clovers+plantain).

Figure 5. Plantain based (left) and cocksfoot based (right) pastures in spring of 2017/18.

PERSISTENCE

After 2017/18 (Year 5) the persistence of the PL-based pasture declined with sown species comprising of 70% of the pasture compared with 86% for the cocksfoot pasture. When we returned to the pastures in Year 8 (spring 2020) only 28% of the PL-based pastures was from originally sown species. In contrast, sown components accounted for 60% of yield in the CF-based pastures. In a dryland environment cocksfoot pastures are more persistent and less susceptible to weed invasion than plantain based pastures.

REFERENCES

Taylor BJO, Mills A, Smith MC, Lucas RJ, Moot DJ. 2021. Yield and botanical composition of four dryland pastures at Ashley Dene Research Farm over 8 years. Resilient Pastures – Grassland Research and Practice Series 17: 29-37.

Mills A, Lucas RJ, Moot DJ. 2014. 'MaxClover' Grazing Experiment: I. Annual yields, botanical composition and growth rates of six dryland pastures over nine years. Grass and Forage Science 70: 557-570.

Mills A, Lucas RJ, Moot DJ. 2015. 'MaxClover' Grazing Experiment. II. Sheep liveweight production from six grazed dryland pastures over eight years. New Zealand Journal of Agricultural Research 58: 57-77.

FURTHER INFORMATION

www.beeflambnz.com/knowledge-hub/video/establishing-legumes-dryland-pastures-professor-derrick-moot

www.beeflambnz.com/knowledge-hub/PDF/live-weight-production-sheep-grazing-dryland-pastures.pdf

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ACKNOWLEDGEMENTS

This factsheet was produced as part of Phase II of the Pastoral 21 Programme, funded by the Ministry for Business, Innovation & Employment; DairyNZ; Beef + Lamb NZ; and Fonterra, and Ministry for Primary Industries, Sustainable Farming Fund.

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