



ANIMAL PRODUCTION FROM LUCERNE BASED PASTURES

In dryland areas lucerne provides high quality feed for grazing. But should lucerne be grown as a monoculture or as a mixed sward?

Over a five year period, the Lincoln University Dryland Pastures Research team investigated animal and pasture production from three lucerne based pastures. These included a pure lucerne stand, a lucerne/socksfoot mix (Luc/CF) and lucerne with brome (prairie grass or grazing brome; Luc/brome). This fact sheet summaries the key findings with emphasis on spring, which is the main animal and plant production period in dryland systems.

▶ KEY MESSAGE

Animal liveweight production was greatest from pure lucerne stands, particularly in spring for lactating ewes with twin lambs. Lucerne/grass mixes had similar animal production to pure lucerne in the first two years when these mixes were actually still lucerne dominant.



Figure 1. Ewes and twin lambs grazing a lucerne/grass mix in spring (Photo: M.C. Smith, Lincoln University).

Figure 1 shows a grass dominant sward in mid spring. In all mixes the animals selectively ate the lucerne from the mixed pastures before consuming much of the grass. This was consistent with previous work showing animal preference for 70% legume and 30% grass in their diets.

ANNUAL ANIMAL PRODUCTION

In each year, the majority of animal production occurred in spring. Figure 2 shows that around 800kg/ha of liveweight was produced in the first spring when ewes and lambs were grazing pure lucerne and lucerne dominant cocksfoot mixes.

In year 2, the pure lucerne and Luc/CF produced more liveweight than Luc/Brome. Year 3 was dry and all pastures were destocked early indicating lambs sold as stores in this drought year. In years 4 and 5, pure lucerne produced the greatest annual liveweight gain, with the greatest advantage (30-50%) in spring grazing of ewes and lambs.

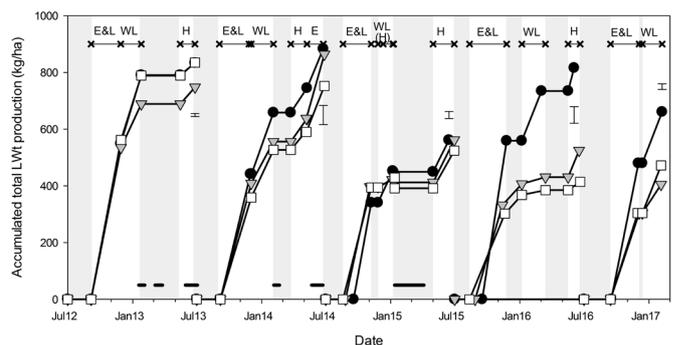


Figure 2. Annual accumulated LWt production (kg LWt/ha) from a lucerne monoculture (●), Luc/Brome (□) or Luc/CF mixes (▽) for five growth seasons at Ashley Dene, Canterbury. Grey areas indicate periods where pastures were destocked. Thick black horizontal lines (—) indicate periods of 'maintenance' grazing.

PASTURE PRODUCTION

Figure 3 shows the dominance of lucerne in all pastures in years 1 and 2. This resulted in similar animal production from all pastures. The lower yield in year 3 (2014/15) was due to an early drought which restricted growth on these shallow stony soils. In years 4 and 5, the Luc/Brome was invaded by weeds more than the other two pastures. The differences in total annual pasture production reflect the differences in summer rainfall between years. The lucerne and cocksfoot responded to summer rainfall quicker than the brome and thus provided more summer grazing.

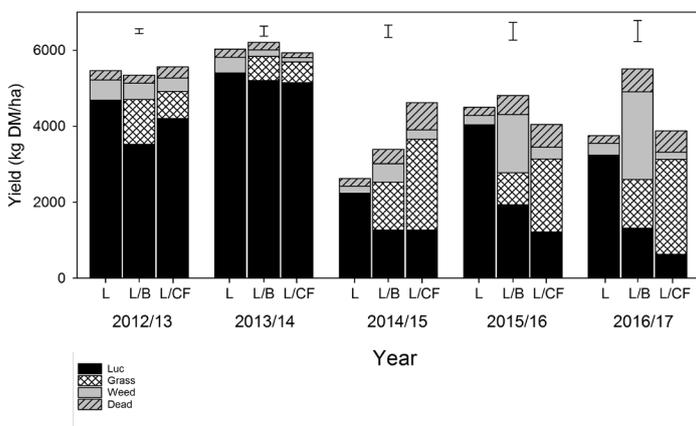


Figure 3. Spring DM yield from lucerne (Luc), sown companion grass, weed and dead components of lucerne monocultures (L), lucerne/brome (L/B) and lucerne/cocksfoot (L/CF) pastures at Ashley Dene, Canterbury over five growth seasons.

SPRING LIVELWEIGHT PRODUCTION

Figure 4 shows a strong relationship between the amount of lucerne in the sward and the liveweight gain when averaged across all pastures. The line shows that the animal production increased by 1 kg of liveweight for every 7 extra kilograms of lucerne grown. The exception was in 2013/14 when the wettest spring resulted in the highest lucerne and total pasture yield. However, animals experienced foot scald in that year which reduced their growth rates.

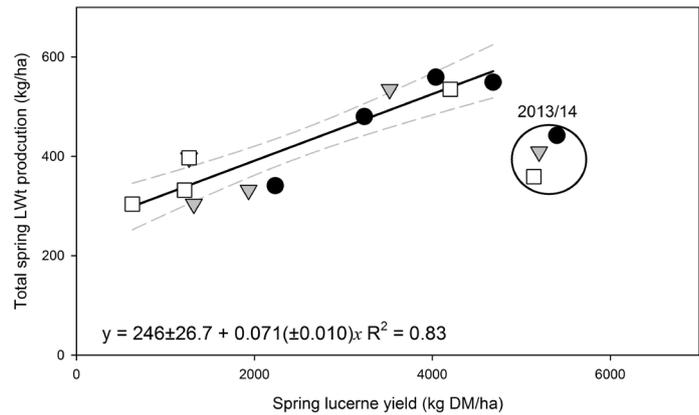


Figure 4. Net total spring liveweight (LWt) production (kg/ha) against total spring lucerne yield in Luc (●), Luc/brome (▽) and Luc/CF (□) pastures over five years at Ashley Dene, Canterbury. Note: 2013/14 data (circled) was excluded from analysis due to poor livestock performance resulting from foot scald.

REFERENCES

Moot, D. J., Smith, M. C. and Mills, A. 2019. Liveweight and dry matter yield from dryland lucerne and lucerne/grass mixes. *New Zealand Journal of Agricultural Research* XX, XXX-XXX (*In Press*). DOI: www.doi.org/10.1080/00288233.2019.1645703

Mills, A., Smith, M. C. and Moot, D. J. 2019. Relationships between sheep liveweight production and dry matter yield for lucerne-based pastures in spring. *Journal of New Zealand Grasslands* 81, 69-74. Moot D. J., Anderson P. V. A., Anderson L. J. and Anderson D. K. 2019. Animal performance changes over 11 years after implementing a lucerne grazing system on Bog Roy Station. *Journal of New Zealand Grasslands*, 81, 75-80. DOI: www.doi.org/10.33584/inzg.2019.81.390

FURTHER INFORMATION

[Lucerne book](#)

[Lucerne text service](#)

[FS112 - Pasture Mixes for dryland farming systems](#)

[FS106 - Production and persistence of dryland pastures](#)

ACKNOWLEDGEMENTS

Beef + Lamb New Zealand would like to thank and acknowledge Professor Derrick Moot and Dr Anna Mills and Lincoln University for their assistance with this fact sheet.

Factsheets are made possible by sheep and beef farmer investment in the industry. Beef + Lamb New Zealand is not liable for any damage suffered as a result of reliance on the information contained in this document. Any reproduction is welcome provided you acknowledge Beef + Lamb New Zealand as the source.