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Lincoln University
Te Whare Wānaka o Aoraki
AOTEAROA • NEW ZEALAND

Liveweight gain of young sheep grazing perennial lupin-cocksfoot pasture compared with pure lucerne pasture

Alistair Black, Travis Ryan-Salter, Gavin Loxton, Derrick Moot

New Zealand's specialist land-based university

- Merino sheep farmers in the high country of the South Island of New Zealand face the challenge of increasing efficiency and productivity.

- **Expansion of the area planted in lucerne (*Medicago sativa*) is the obvious and widely adopted option.**

- However, lucerne is unsuitable for low pH, high soluble Al soils.
- Other pasture legumes used in NZ are also unsuitable.

One possible opportunity may involve cocksfoot (*Dactylis glomerata*) and perennial lupin (*Lupinus polyphyllus*) pasture.

- **We quantified the performance of Merino sheep grazing perennial lupin-grass pasture on-farm at Tekapo in NZ South Island.**

- **44°03′54″S, 170°29′22″E, elevation 677 m**

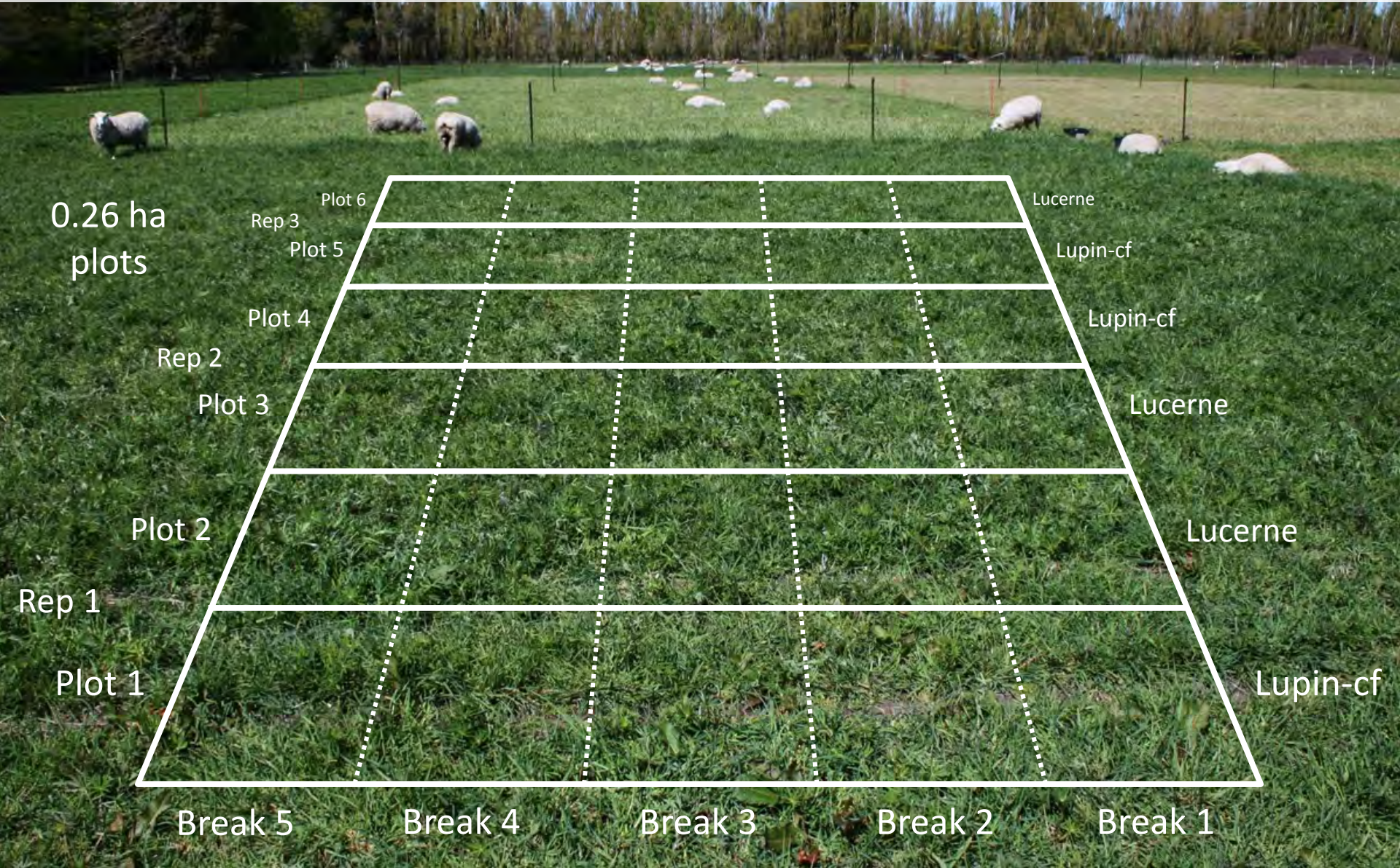
Objective of this study

- To quantify sheep LWG, herbage yield and water use of perennial lupin-cocksfoot pasture relative to pure lucerne (control).

- Done at Lincoln University 43°38′53″S, 172°27′24″E, elevation 9 m

Sown Dec 2013

‘Russell’ & ‘Blue’ lupin 30 kg/ha with ‘Kara’ cocksfoot 10 kg/ha
‘Force 4’ lucerne 15 kg/ha



Animals

- Coopworth breed, female
  - Aug 2014: hoggets (39 kg) onto Lupin-cf
  - Sept 2014: hoggets (47 kg) onto lucerne
  - Nov 2014: shearing
  - Feb 2015: new lambs (34 kg)


Liveweight gain


Herbage yield


Botanical composition


Water use


Feb 2013


Oct 2014


Dec 2014

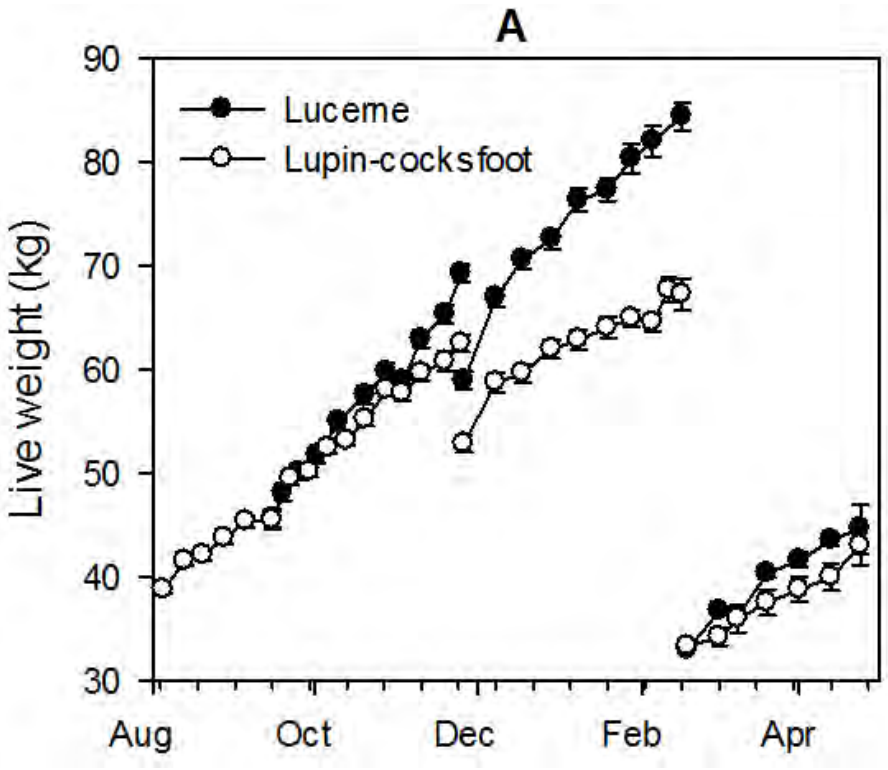

Jan 2015

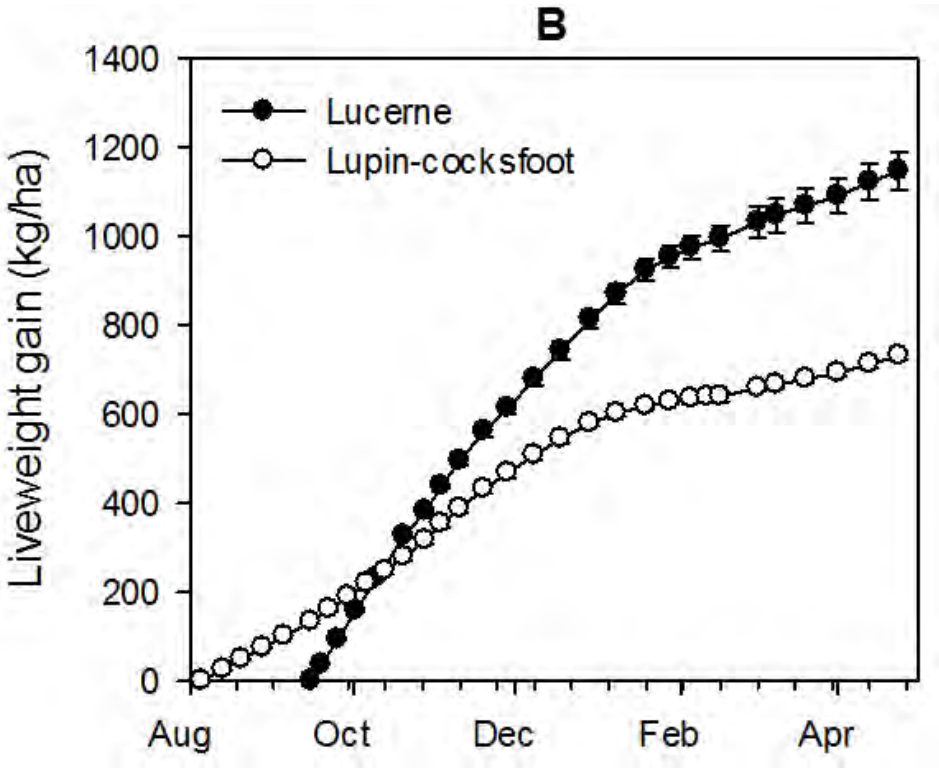

Jan 2015


Mar 2015

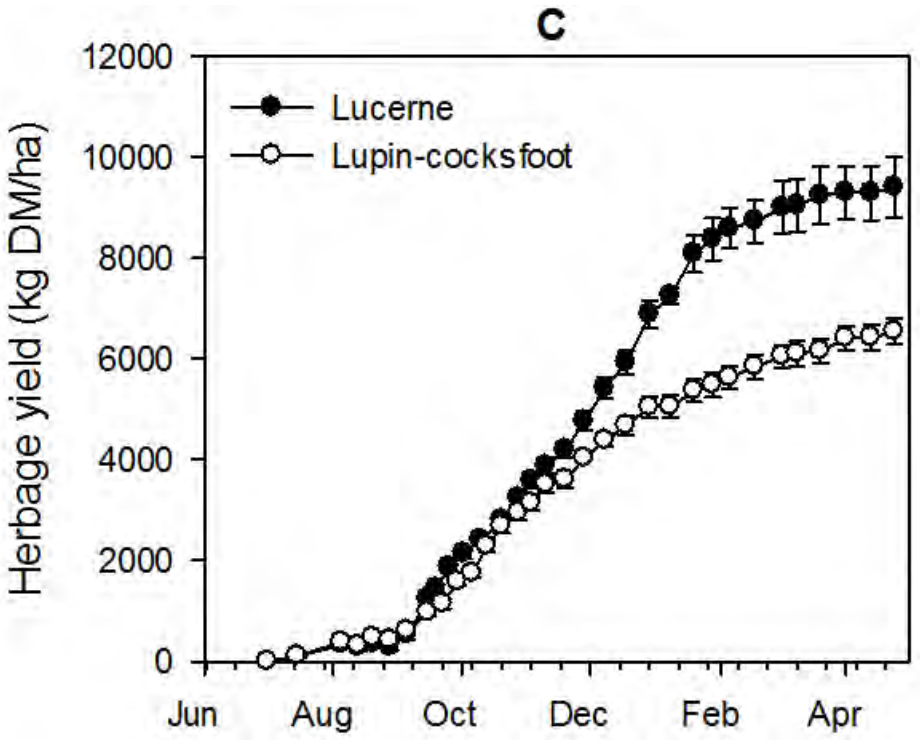

May 2015

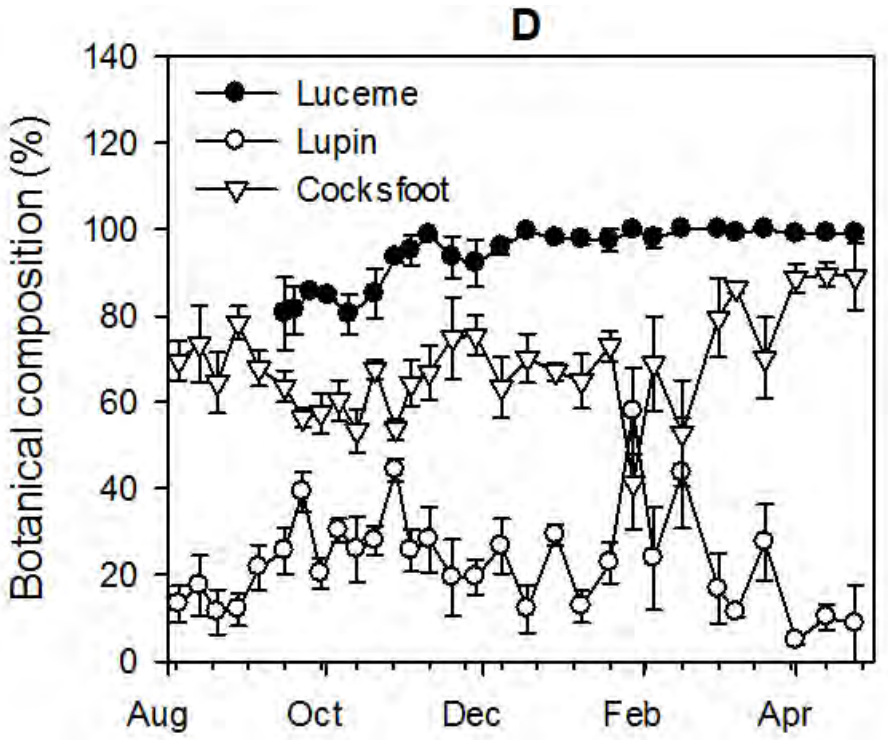
Liveweight gain



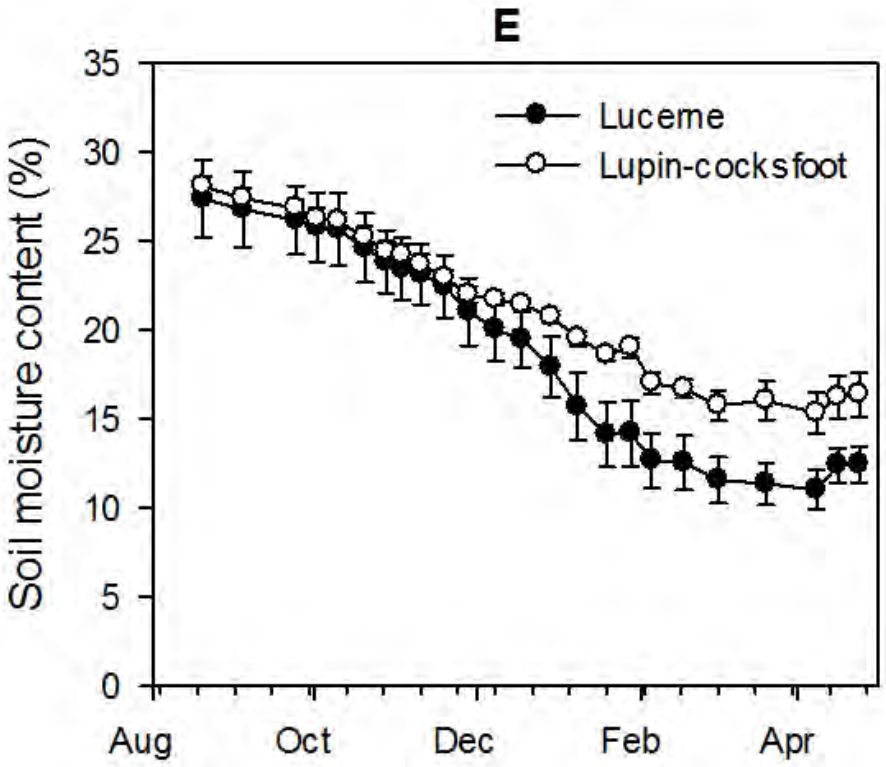


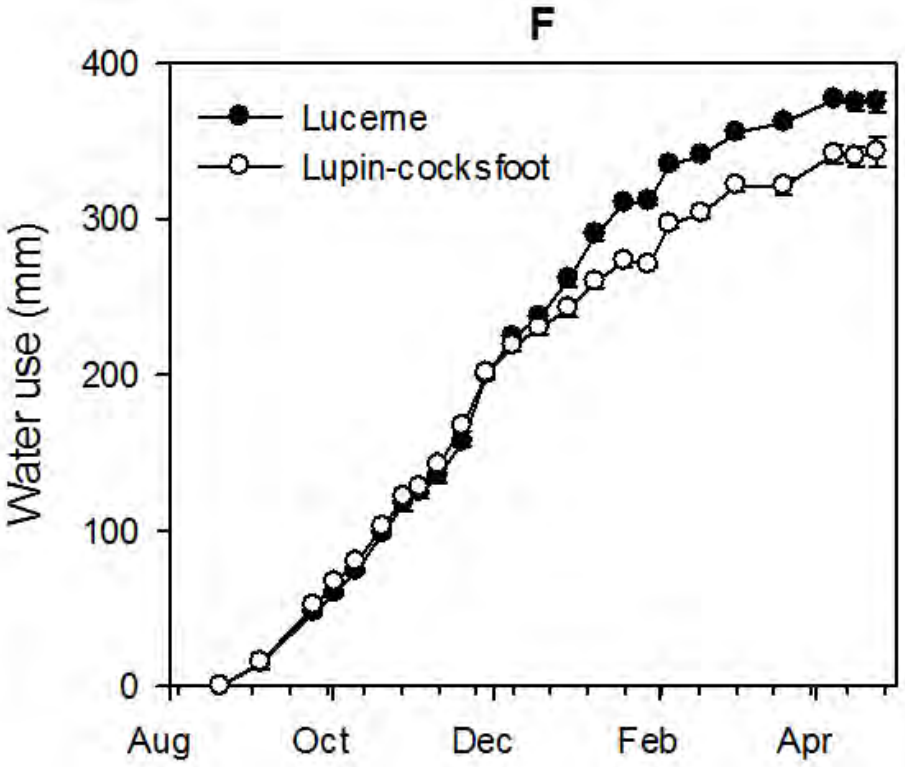
Herbage yield





Water use


E
Soil moisture content (%)
35
30
25
20
15
10
5
0
Aug
Oct
Dec
Feb
Apr
Lucerne
Lupin-cocksfoot


F
Water use (mm)
400
300
200
100
0
Aug
Oct
Dec
Feb
Apr
Lucerne
Lupin-cocksfoot

Water use efficiency

Pasture	Sheep LWt gain (kg/ha per mm)	Herbage DM yield (kg/ha per mm)
Lucerne	3.1	24
Lupin-cocksfoot	2.1	18

Conclusion

- The perennial lupin-cocksfoot was 65-70% as productive as pure lucerne

  - sheep LWG (64%)
  - herbage DM yield (70%)
  - water-use efficiency of LWG (68%)

  under lowland conditions without irrigation in the first year after establishment.

Acknowledgements

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