

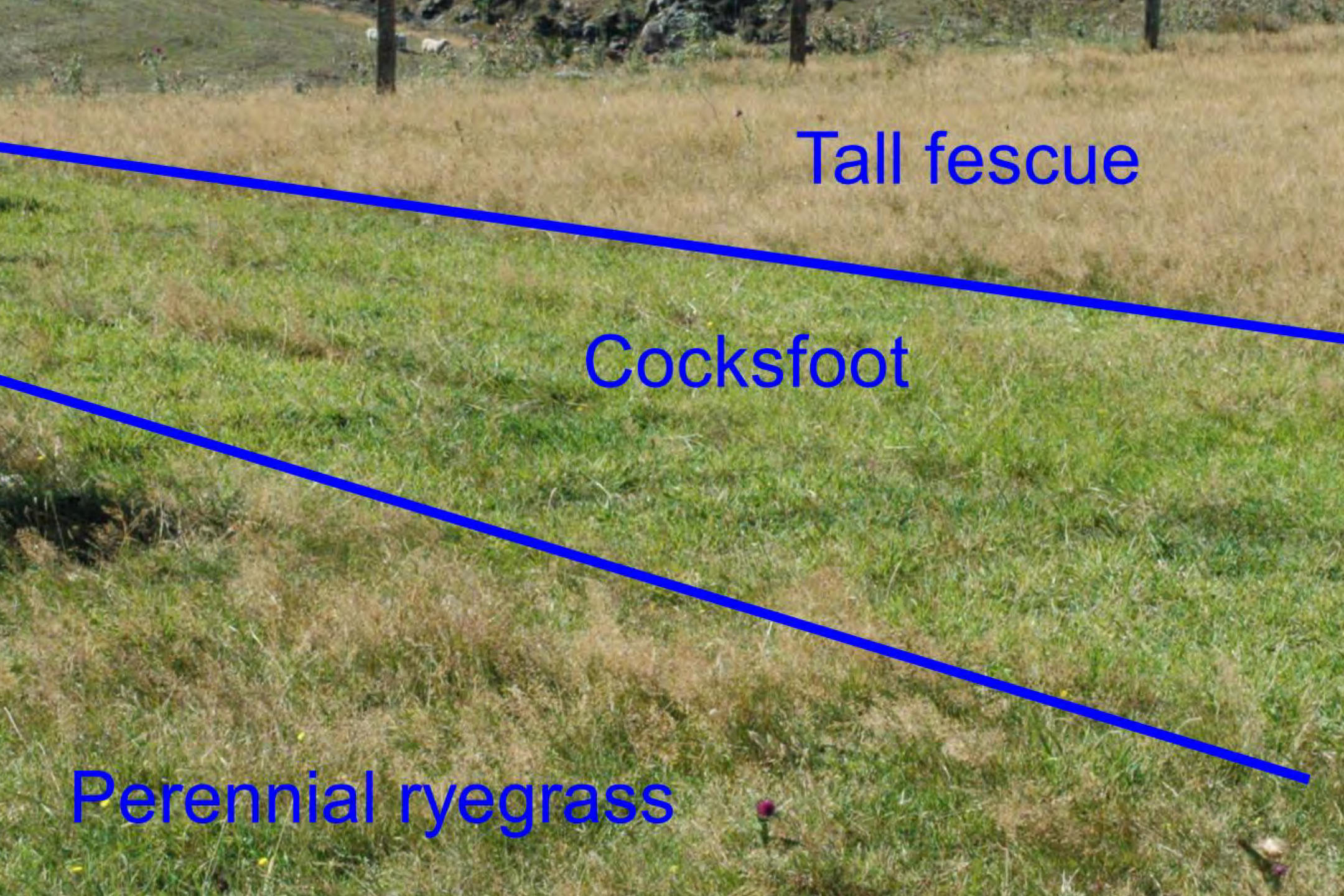
LUCERNE

- agronomy and grazing management

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Professor of Plant Science



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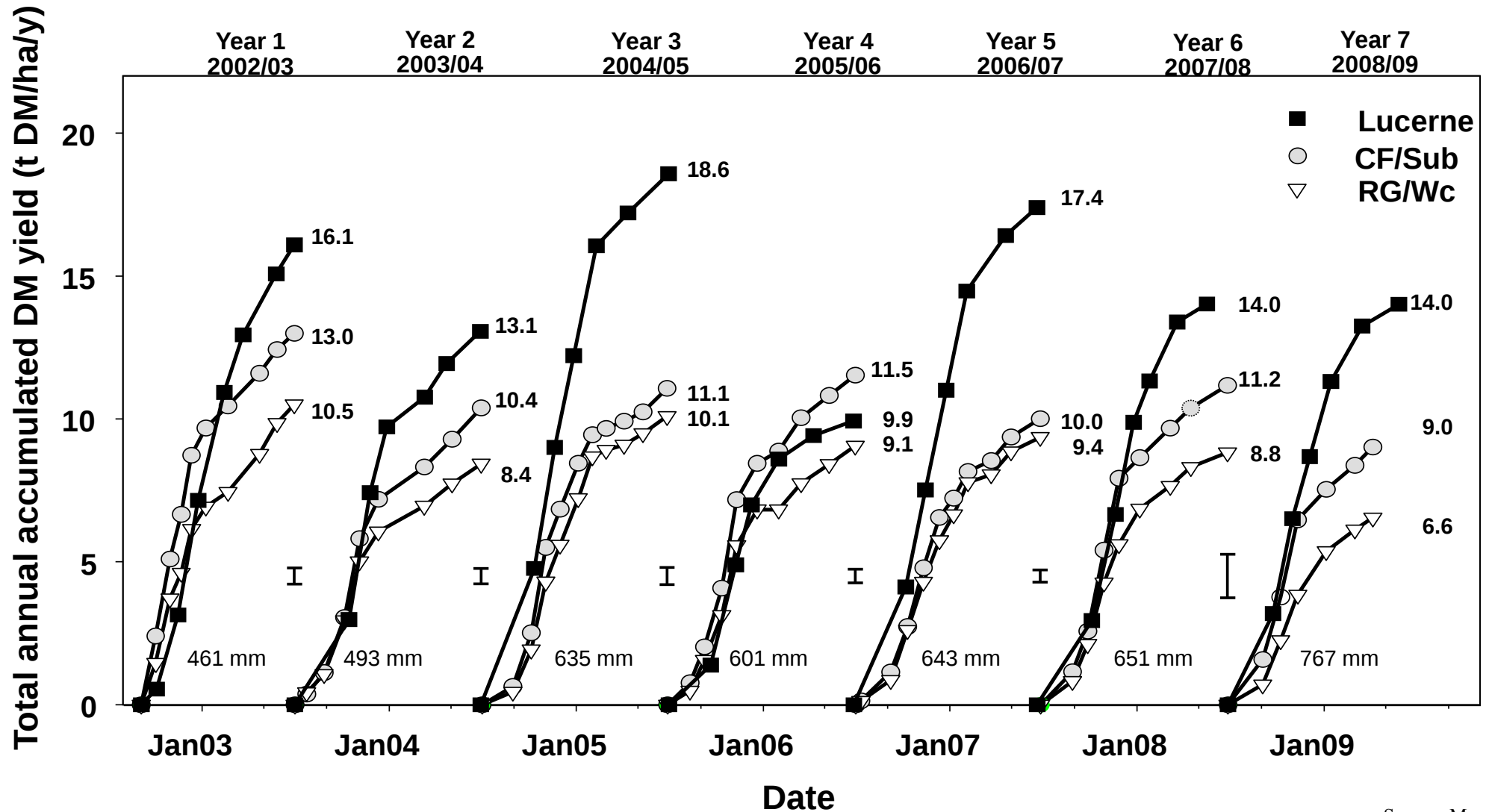


Tall fescue

Cocksfoot

Perennial ryegrass

MaxClover - Lincoln University



RG/Wc pastures

Unsown species <5% in Year 1>45% in Year 6

Spring
Year 2



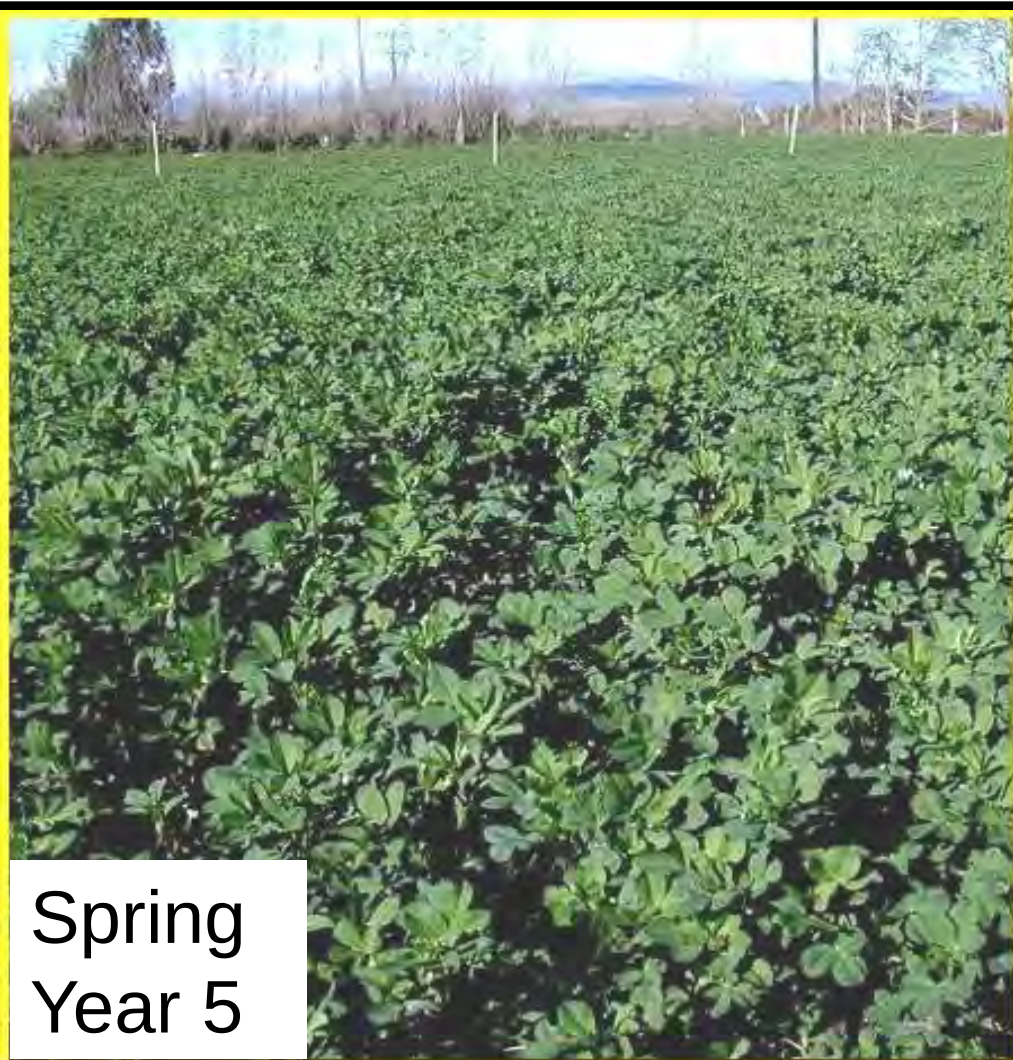
Redgrass and White

Summer
Year 4

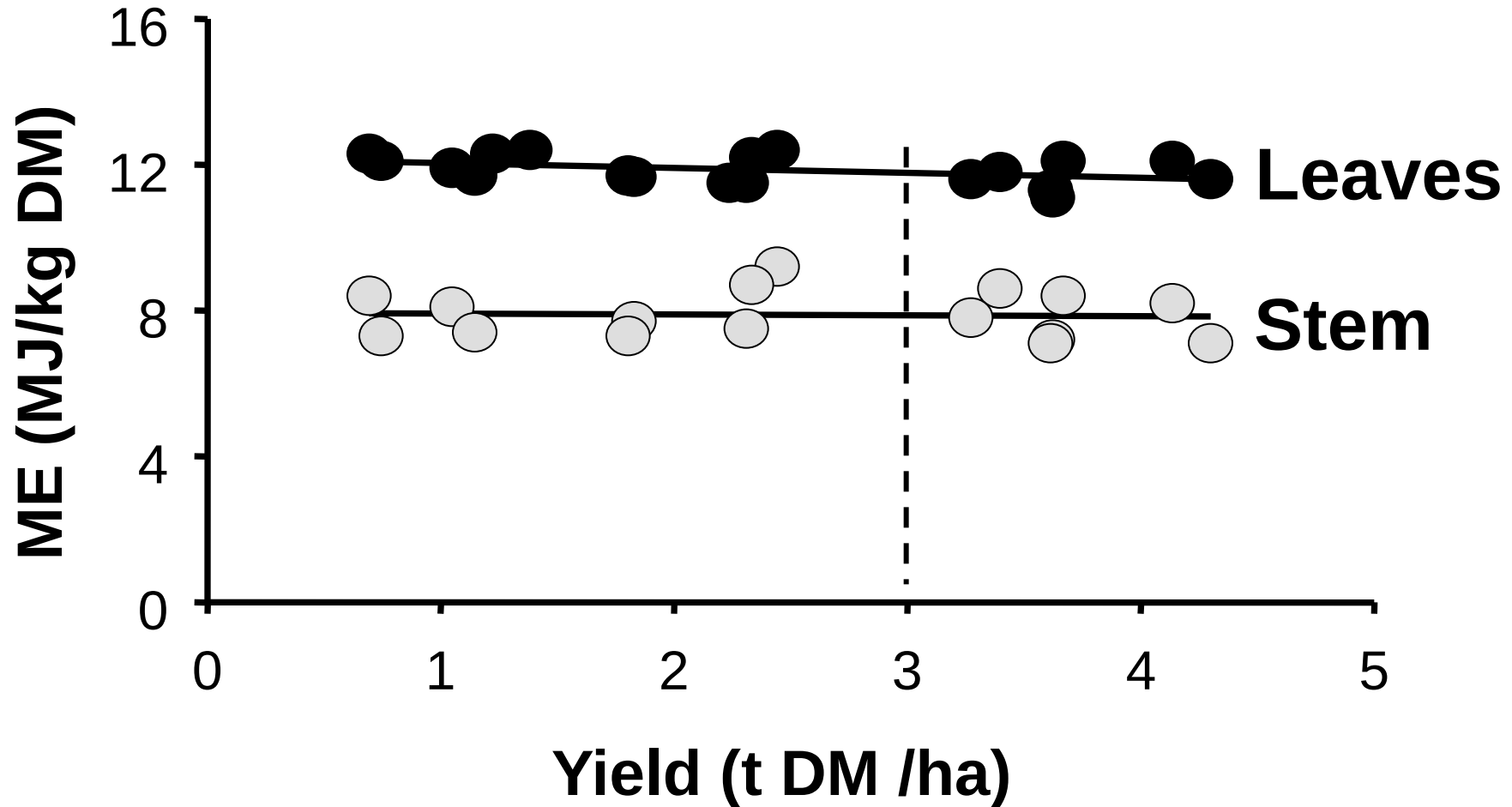


- Annual grasses
- Taprooted dicot weeds

Lucerne pastures



Metabolisable energy of lucerne



Resistance to Pests and Diseases

Cultivar	Dormancy	BGA	PA	SAA	BW	SN	PRR	VW	LD
Grasslands Kaituna	I	R	R	R	R	R	R	-	MR
Grasslands Otaio	I	R	R	R	R	R	R	-	S
Grasslands Torlesse	D	HR	R	R	R	-	R	-	MR
P54Q53	D	MR	MR	MR	HR	HR	HR	-	-
P54V09	D	-	HR	R	HR	HR	HR	HR	-
Runner	D	-	-	-	R	-	S	-	-
Wairau	SD	S	S	S	S	S	S	S	S
WL 325HQ	I	R	R	R	R	MR	R	-	-

BGA = Blue-green aphid

BW = Bacterial Wilt

VW = Verticillium wilt

PA = Pea aphid

SN = Stem nematode

LD = Leaf diseases

SAA = Spotted alfalfa aphid

PRR = Phytophthora root rot

D = Dormant

SD = Semi-dormant

HR = 50%+ resistant

MR = 16-30%

R = Resistant = (31-50%)

S = Susceptible

1. Lucerne establishment

- Soils**
- deep free draining
 - pH 6.0 – 7.0
 - rg/wc fertility

- Sowing**
- inoculated
 - 10-25 mm
 - bare or coated 8-10 kg/ha
 - spring or autumn (grass grub)
 - cultivated or direct drilled
 - after fallow?





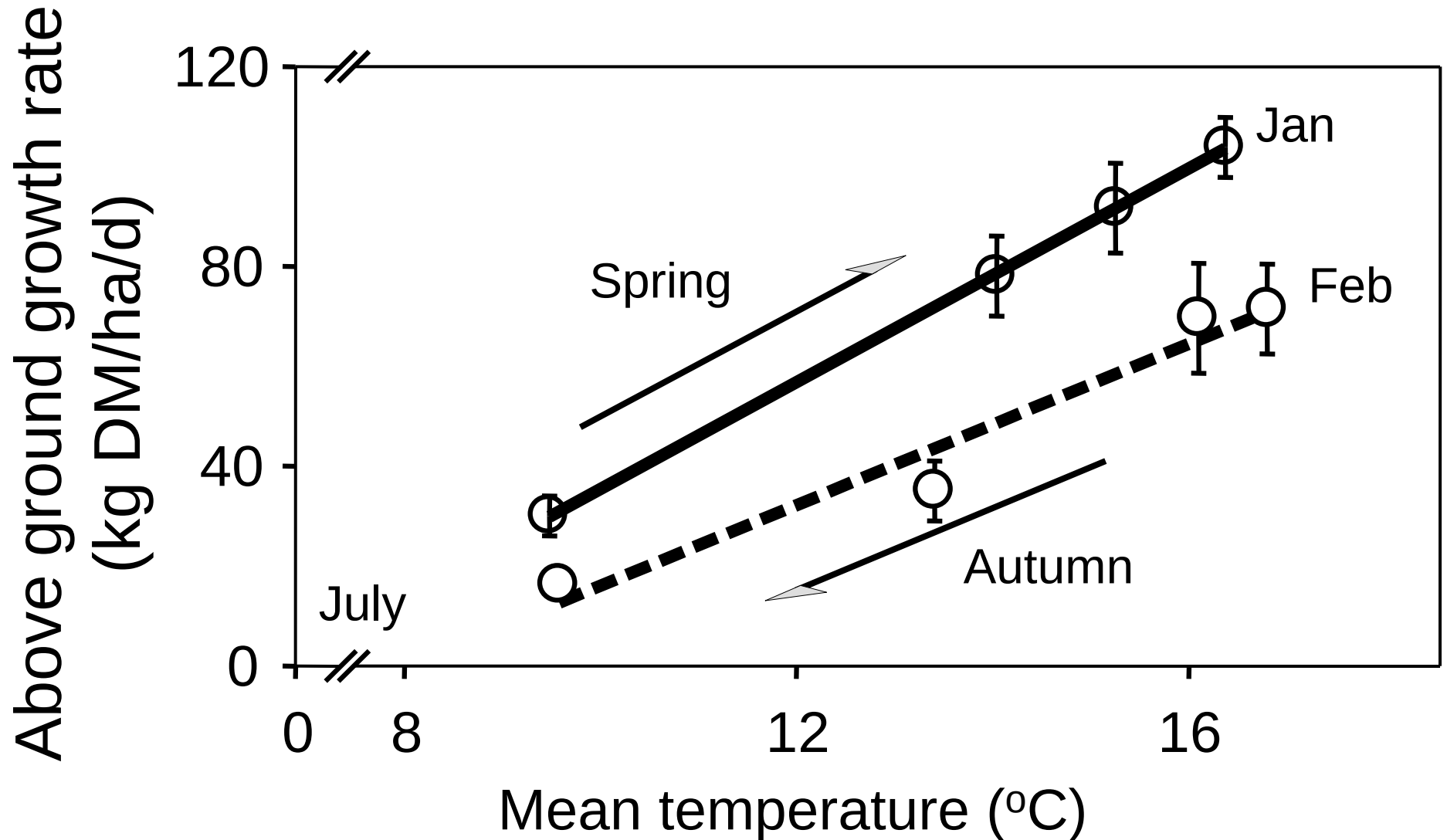
Seasonal grazing management

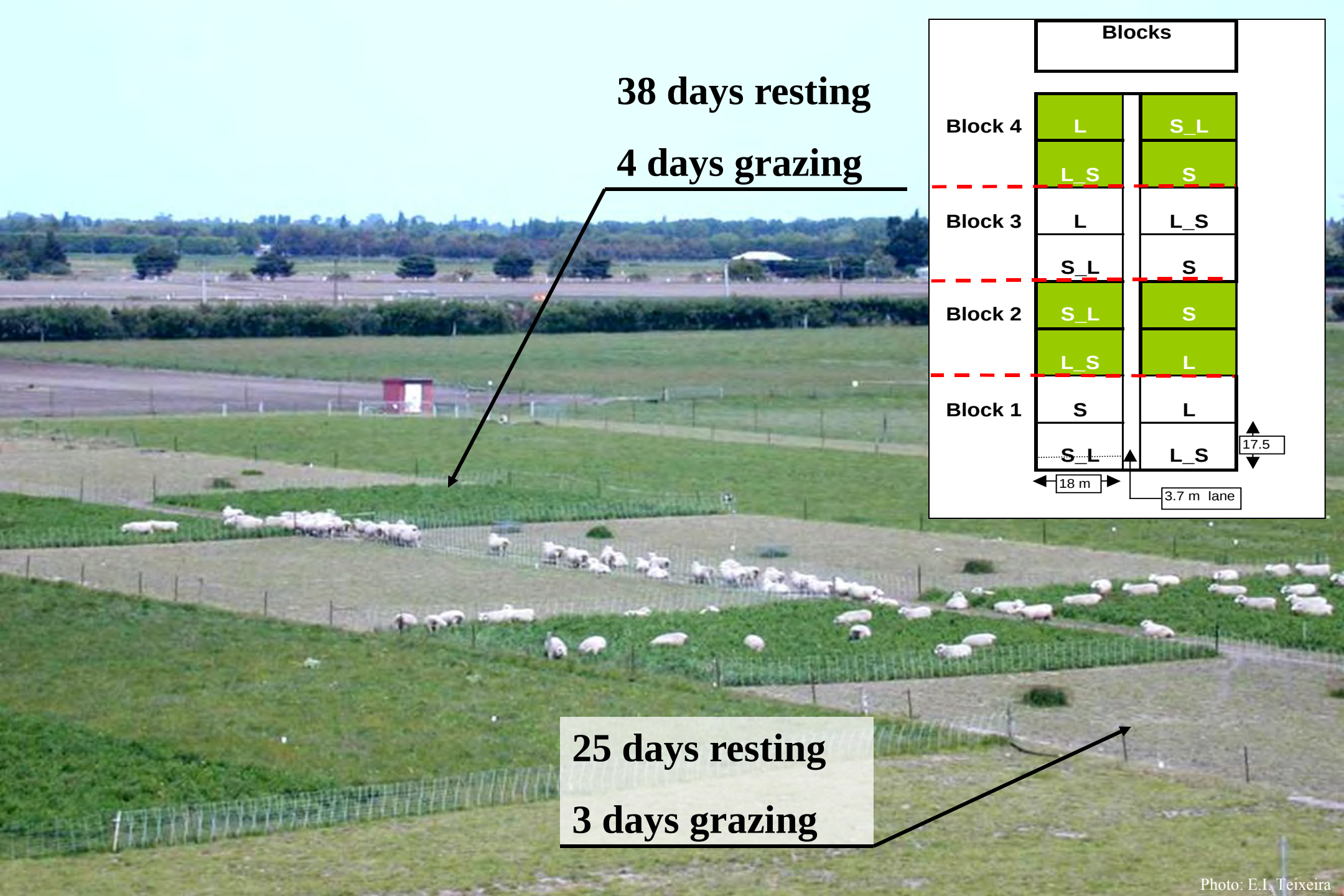
Spring

- 1st rotation aided by root reserves to produce high quality vegetative forage.
- can graze before flowers appear (~1500 kg DM/ha) ideally ewes and lambs but

Never lamb on or set stock lucerne

Vegetative growth



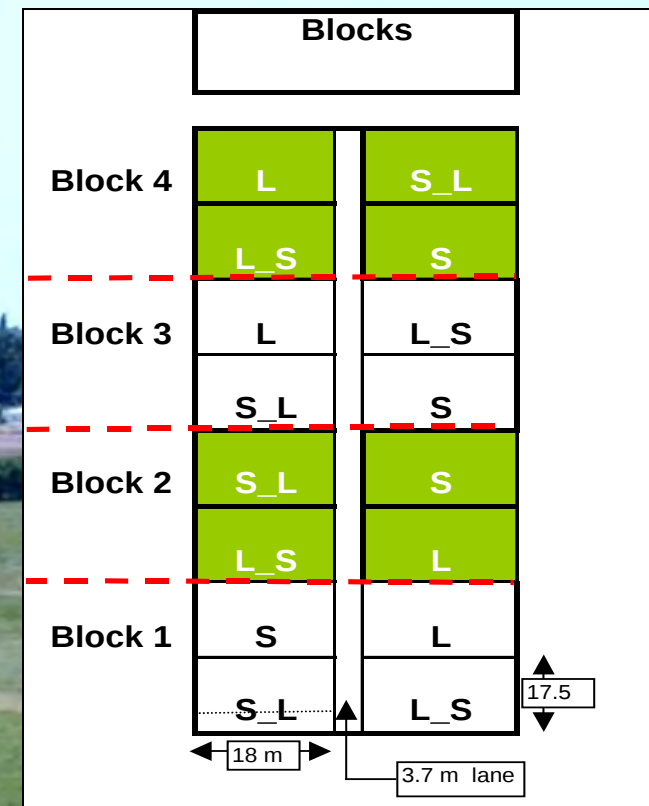


38 days resting

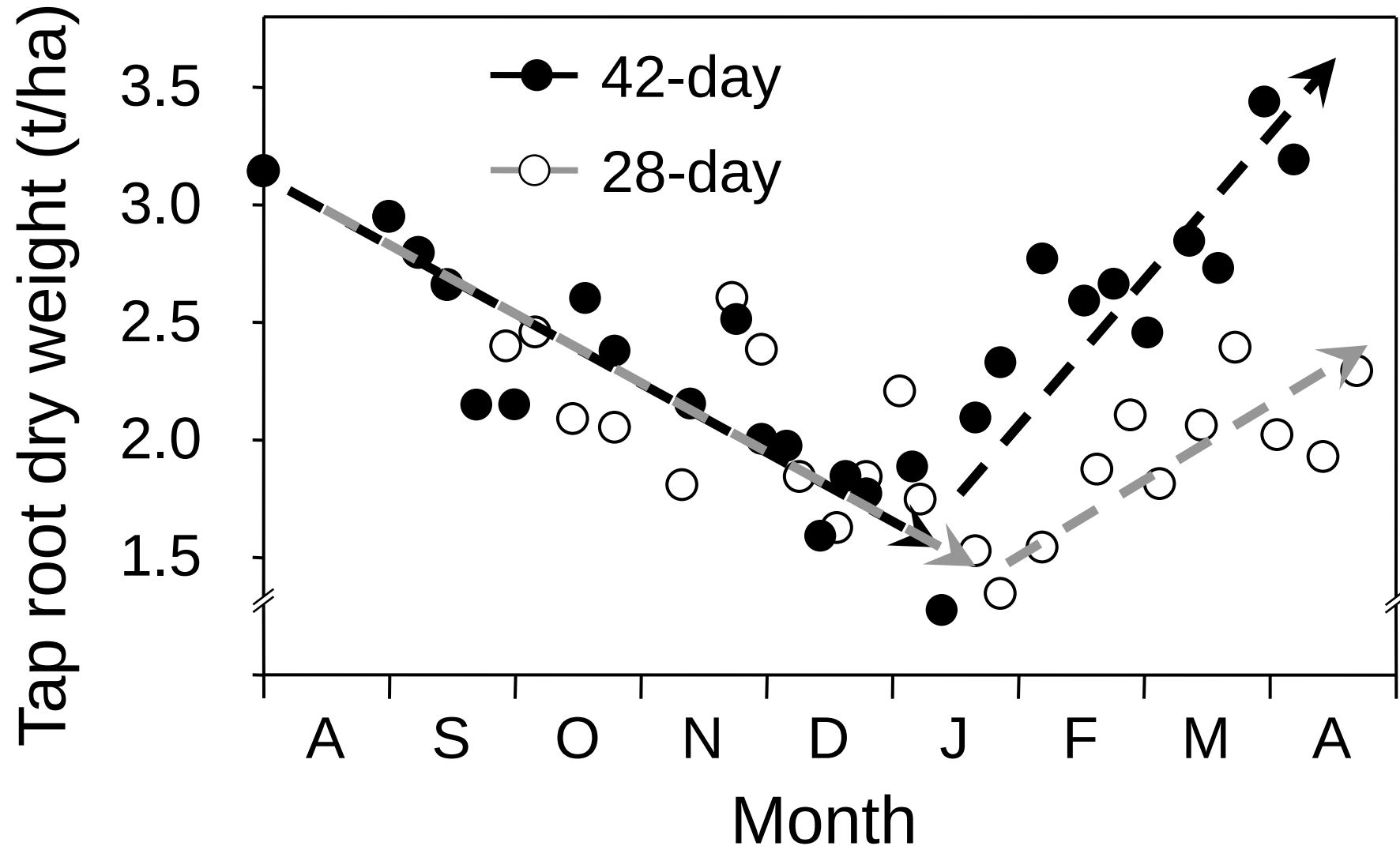
4 days grazing

25 days resting

3 days grazing



Partitioning to roots





Doug and Fraser Avery “Bonavaree” 1100 ha 25% lucerne (55% of easier country)

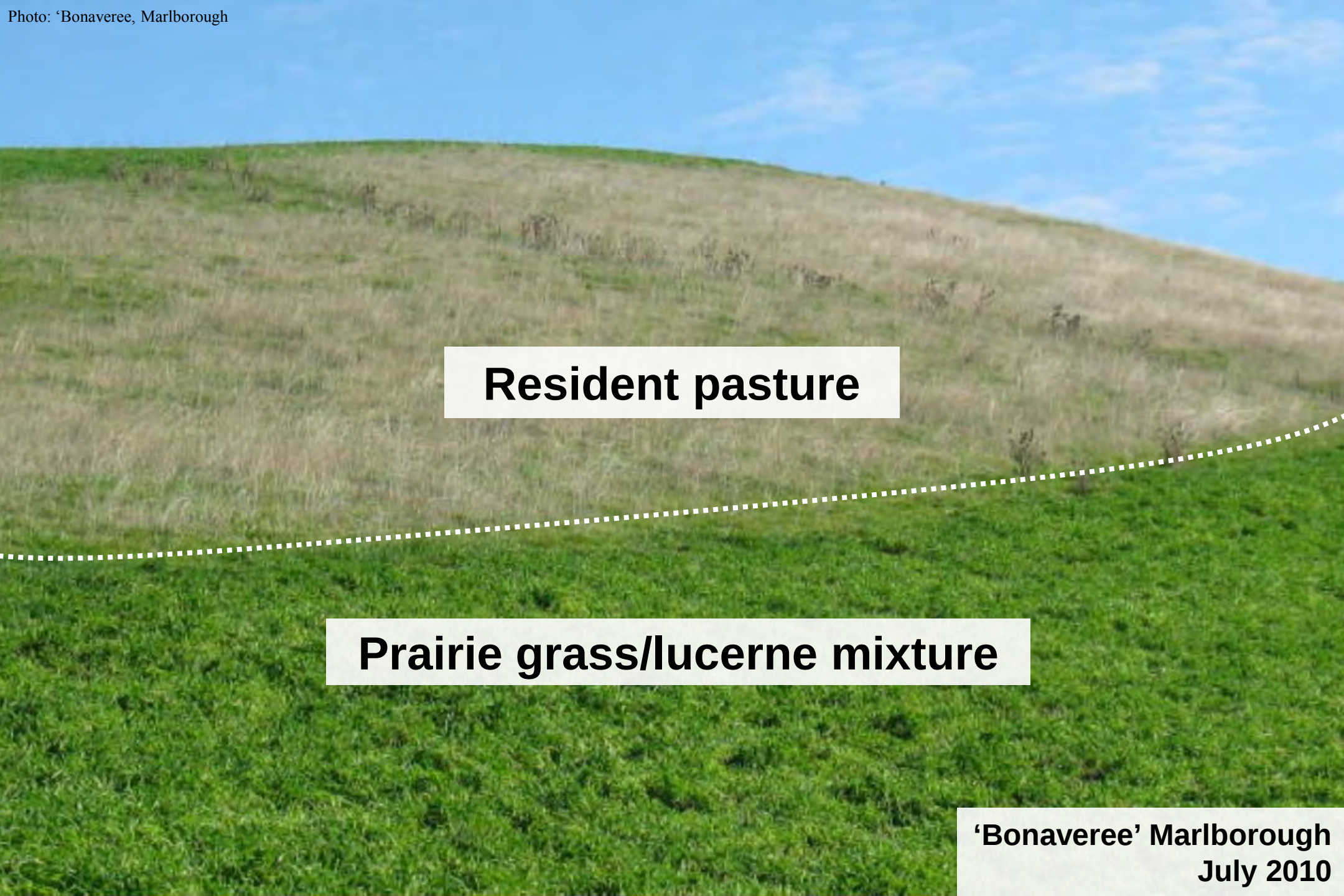


23/01/2005

Seasonal grazing management

Spring/summer (Nov-Jan)

- Priority is stock production (lamb/beef/deer)
- graze 6-8 weeks solely on lucerne
- 5-6 paddock rotation stocked with one class of stock (7-10 days on)
- allowance 2.5-4 kg DM/hd/d – increase later in season



Resident pasture

Prairie grass/lucerne mixture

**'Bonaveree' Marlborough
July 2010**

Photo: 'Bonaveree, Marlborough

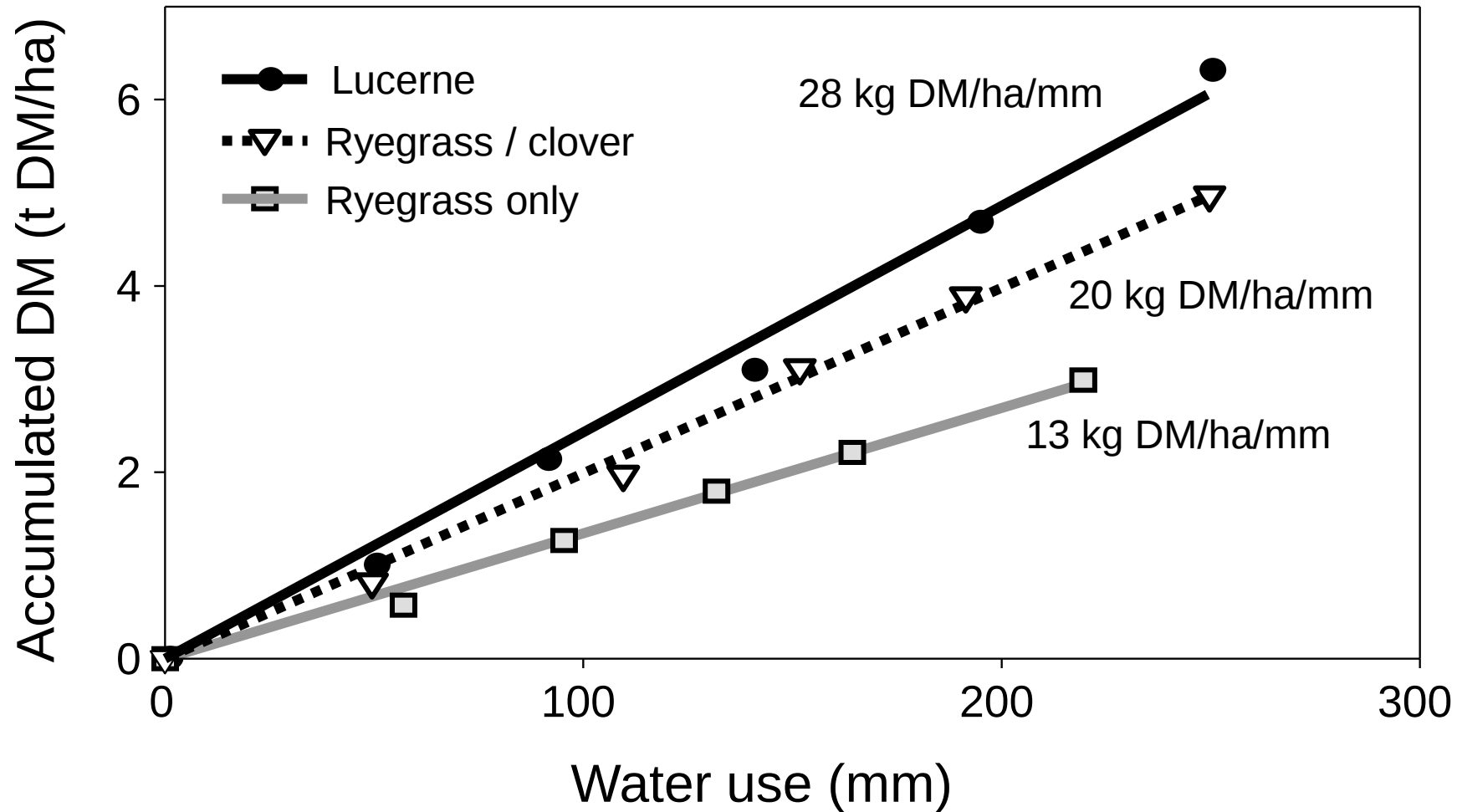


'Bonaveree' Marlborough
July 2010

Maximize reliable spring growth – high priority stock

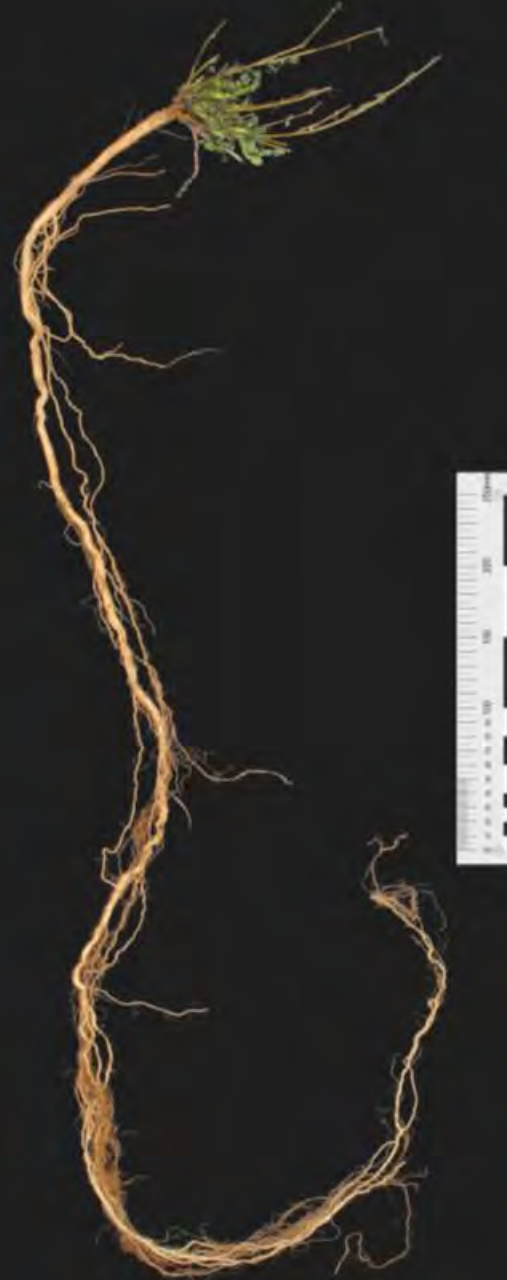


Spring WUE: legume = (nitrogen)



Lucerne root

~8 months after sowing
> 1.5 m length



Spring/summer (cont'd)

- target 1500-2500 kg DM/ha on entry
- lambs until leaf and stem top is gone
 - ⇒ ewes to clean-up following lambs
- Dairy – allowance of 1.75x intake
- 1-5 day breaks (Sth America 4.7M ha)



Rotation 1 Pre-graze
Plot 1 (21/9/07)
2.3 t DM/ha
20-25 cm tall

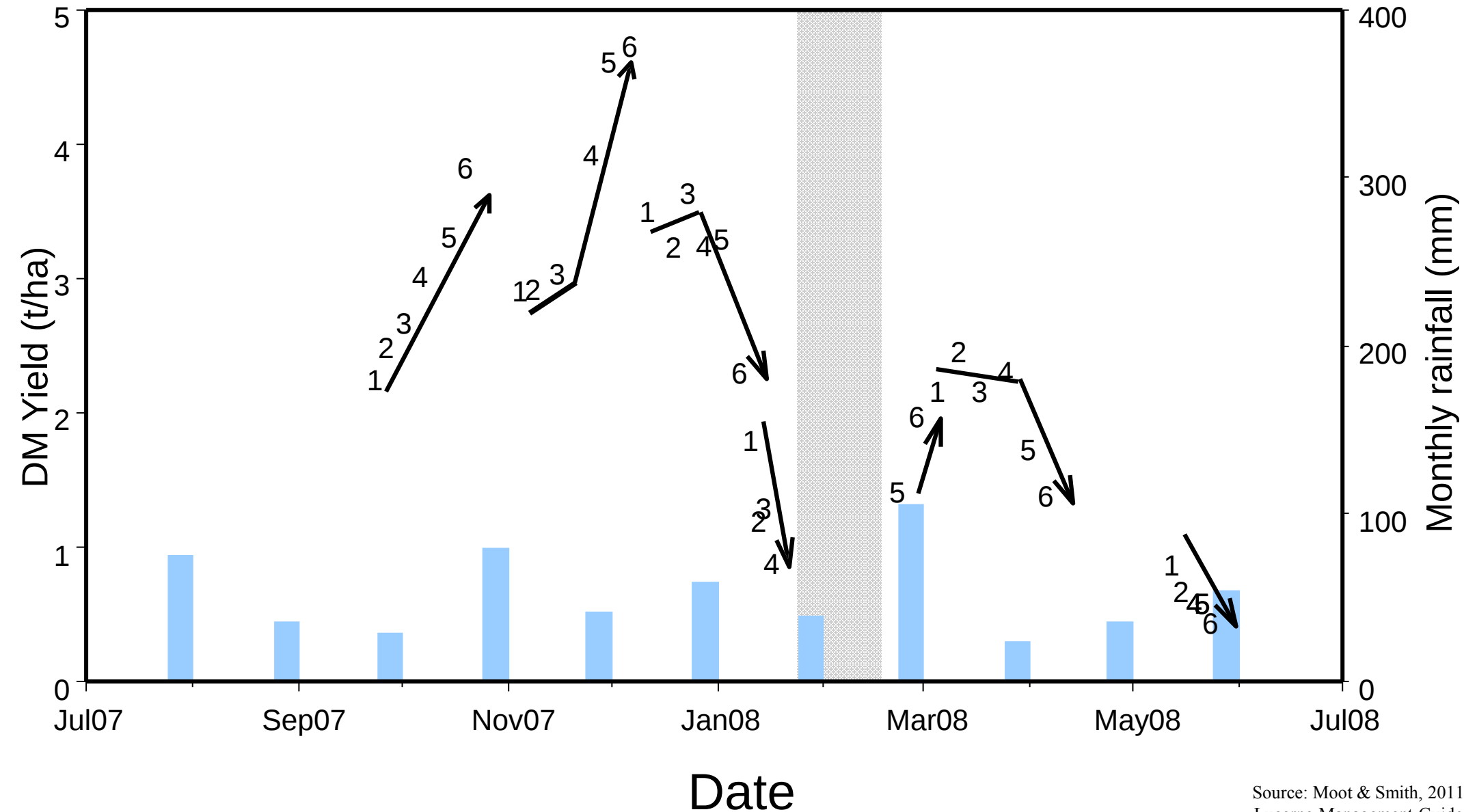




Rotation 2 Pre-graze
Plot 1 (2/11/07, 38 d)
2.9 t DM/ha
35-40 cm tall

Plot 31
Date: 2/11/07
Pre-graze

Grazing Rotations at Lincoln University

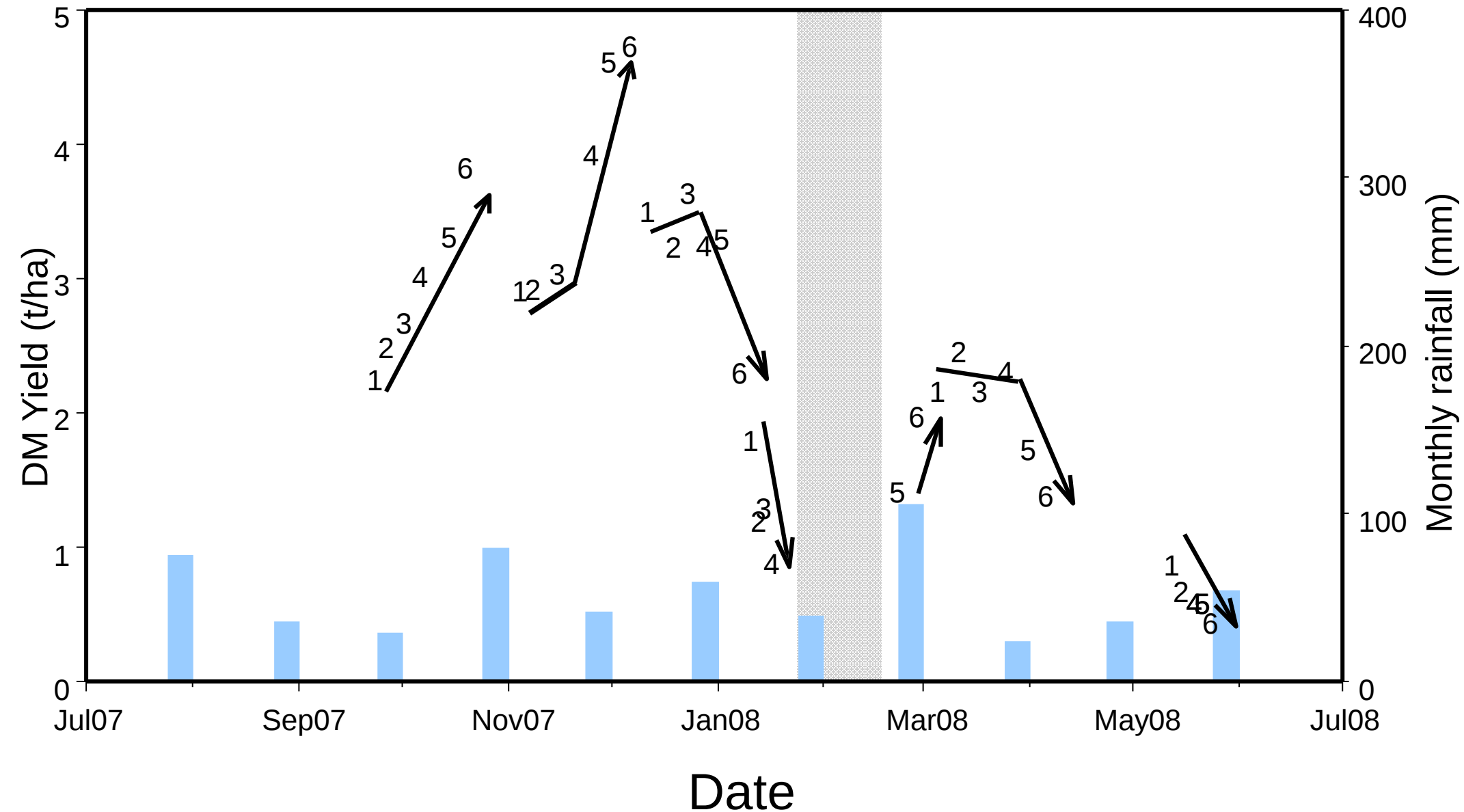








Grazing Rotations at Lincoln University





Rotation 4 Pre-graze
Plot 6 (28/2/08) **2.0 t DM/ha produced in 51 d**

Post-graze (4/3/08) **0.6 t DM/ha**
UTILISATION = 70%

Creating a net of opportunity



Any autumn rain grows high quality feed



18.12.2006

Seasonal grazing management

Late autumn/winter (May-July)

- hard grazing once growth stops (frost)
 - ⇒ decrease aphid population
- spray for weeds 10-14 days after winter graze
 - grazing/spraying early July
 - nodes developing at low temperatures

3. Animal health

- **Redgut:** problem on high quality feeds – fibre
- **Bloat:** cattle more than sheep – capsules
- **Na def. (0.03%):** salt licks/fence-line weeds/pasture
- Require 0.11% Na - sheep/beef/dairy (13%)
- **Leaf spot in autumn:** avoid flushing on older lucerne
 - new regrowth or tops only are O.K.







Ewe hoggets grown on lucerne 54 kg ave





Corriedale 2th flushed on wilting lucerne



Lucerne (is not grass!!!)

- flushing at Bonaveree

04.03.2009



Photo: DJ Meot

4. Fertilizer

- Higher requirement from cutting than grazing
 - 2% K = 20 kg/ha/t DM removed

- 50% K super = 80 kg/ha/t DM removed

Or

- KCL = 40kg/ha/t DM removed + P and S from super



Photo: DJ Meol

5. Weed Control

Bad weeds = grasses and tap rooted flat weeds

Never set stock in spring

⇒ stand open for summer annual invasion control:
herbicide before July 1

K super if conserving (soil K > 6)

6. Conservation (high protein)

- Hay – first cut in spring is heaviest
- Crimper/conditioner
 - need rapid moisture loss from stems
- Leaves are the nutritious part
 - bale with dew in evening
- Silage – wilted/chopped
 - inoculant/pasture added to help fermentation

Continuous conservation without prolonged autumn flowering will decrease stand persistence



**Only conserve a
true surplus**

26/10/2004

'Bonaveree' Marlborough
July 2010

Waterlogged

Close up of a prairie grass and lucerne mixture



'Bonaveree' Marlborough
July 2010

‘Tama’ annual ryegrass overdrilled into runout lucerne (12 yrs)



'Tama' annual ryegrass overdrilled into runout lucerne (12 yrs)
- Close up -



A photograph of a lush green lucerne field. In the foreground, a large sheep with thick, grey wool stands facing the camera. To its left, a smaller lamb is partially visible, also looking towards the camera. In the background, two more sheep are grazing. The field is densely packed with green lucerne plants. Two speech bubbles are overlaid on the image: one pointing to the large sheep and another pointing to the lamb.

***They grow
healthier with
lucerne...***

Baaah...



18 February 2011
LU SI Farmer of the Year – Doug Avery

Acknowledgements

- Beef & Lamb NZ Ltd/ Pastoral21
- Lincoln University
- MAF Sustainable Farming Fund



Ministry of Agriculture and Forestry
Te Manatū Ahuwhenua, Ngāherehere



References

- Brown, H. E. and Moot, D. J. 2004. Quality and quantity of chicory, lucerne and red clover production under irrigation. *Proceedings of the New Zealand Grassland Association*, **66**, 257-264.
- Dunbier, M. W. and Easton, H. S. 1982. Longer stand life with new cultivars. *In*: R. B. Wynn-Williams (ed). Lucerne for the 80's. Special Publication No. 1. Palmerston North: Agronomy Society of New Zealand, 121-126.
- Mills, A., Smith, M. C., Lucas, R. J. and Moot, D. J. 2008. Dryland pasture yields and botanical composition over 5 years under sheep grazing in Canterbury. *Proceedings of the New Zealand Grassland Association*, **70**, 37-44.
- Moot, D. J. 2012. An overview of dryland legume research in New Zealand. *Crop and Pasture Science*, **(In Press)**.
- Moot, D. J., Brown, H. E., Pollock, K. and Mills, A. 2008. Yield and water use of temperate pastures in summer dry environments. *Proceedings of the New Zealand Grassland Association*, **70**, 51-57.
- Moot, D. J., Brown, H. E., Teixeira, E. I. and Pollock, K. M. 2003. Crop growth and development affect seasonal priorities for lucerne management. *In*: D. J. Moot (ed). Legumes for Dryland Pastures Proceedings of a New Zealand Grassland Association Inc Symposium held at Lincoln University, 18-19 November, 2003, 201-208.
- Moot, D. J. and Smith, M. 2011. Practical Lucerne Management Guide. 9 pp. Online: www.lincoln.ac.nz/dryland
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Lucerne: agronomy & management

Professor Moot gave this presentation at:

Hawarden, North Canterbury

On:

23 August 2010