



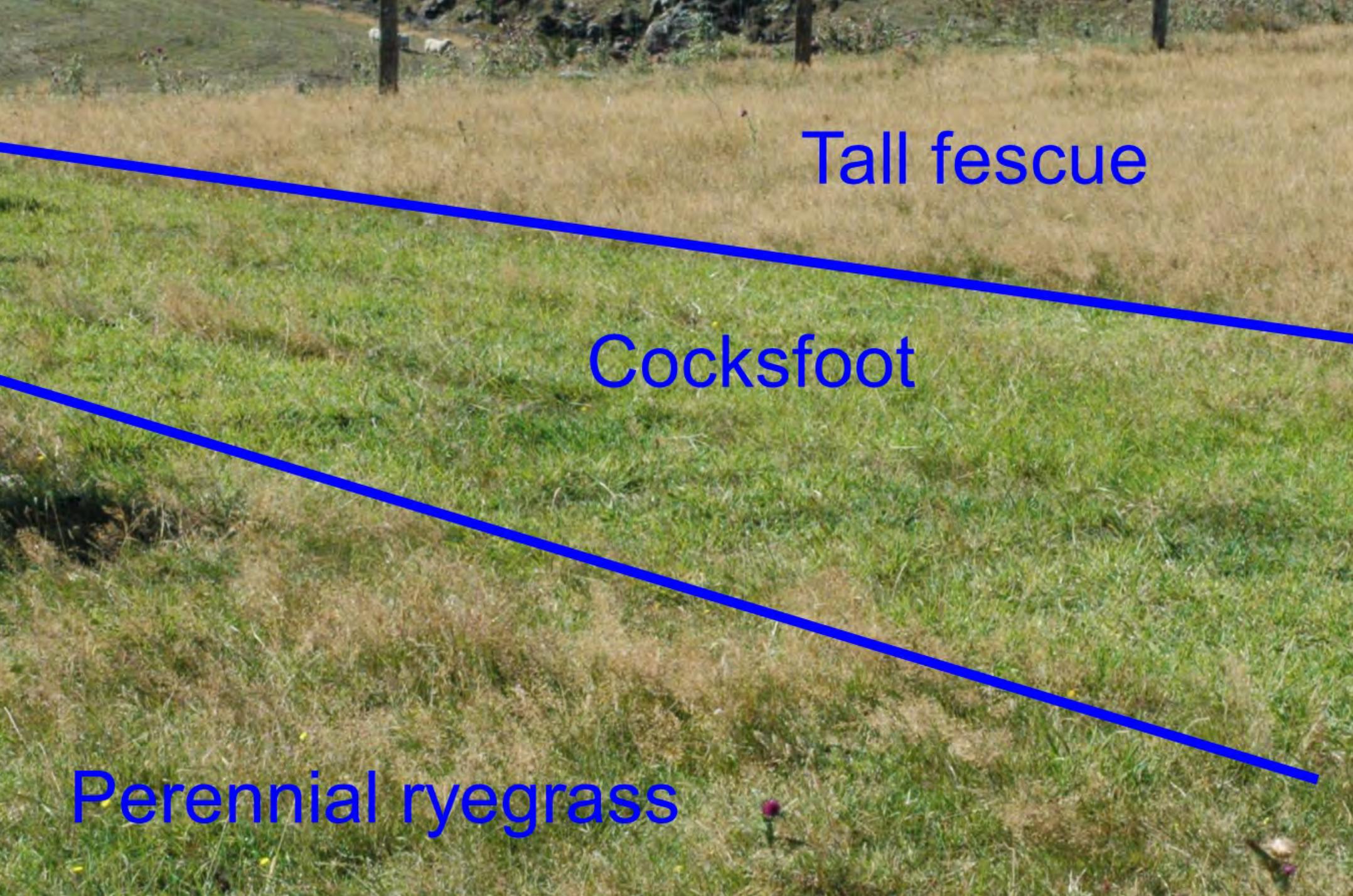
This work by [Derrick Moot and the Lincoln University Dryland Pastures Research Team](#) is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](#).

# LUCERNE

- **agronomy and grazing management**

Dr Derrick Moot  
Professor of Plant Science



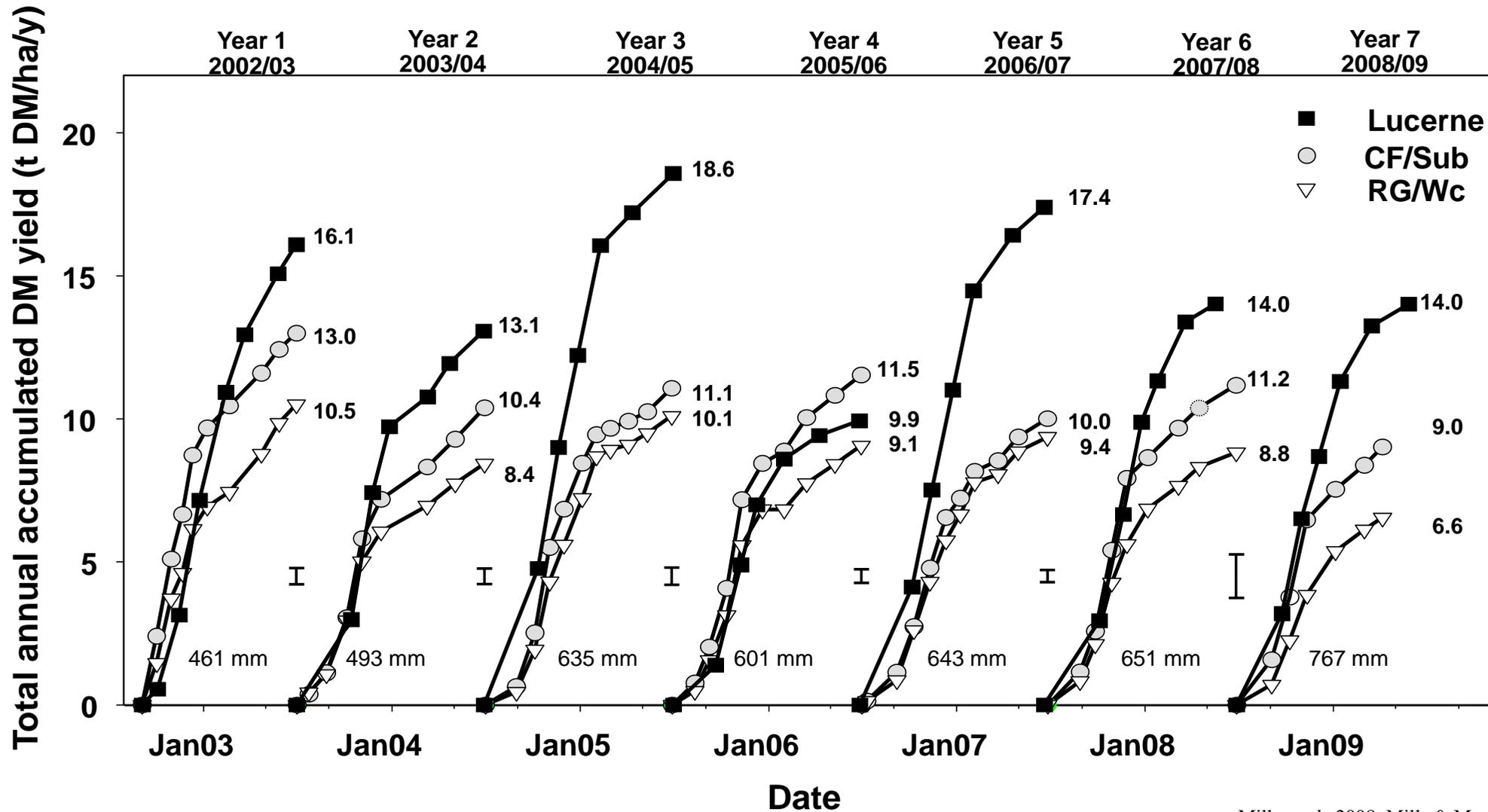


Tall fescue

Cocksfoot

Perennial ryegrass

# MaxClover - Lincoln University



# RG/Wc pastures

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

Spring  
Year 2



Eye-grass and White

Summer  
Year 4

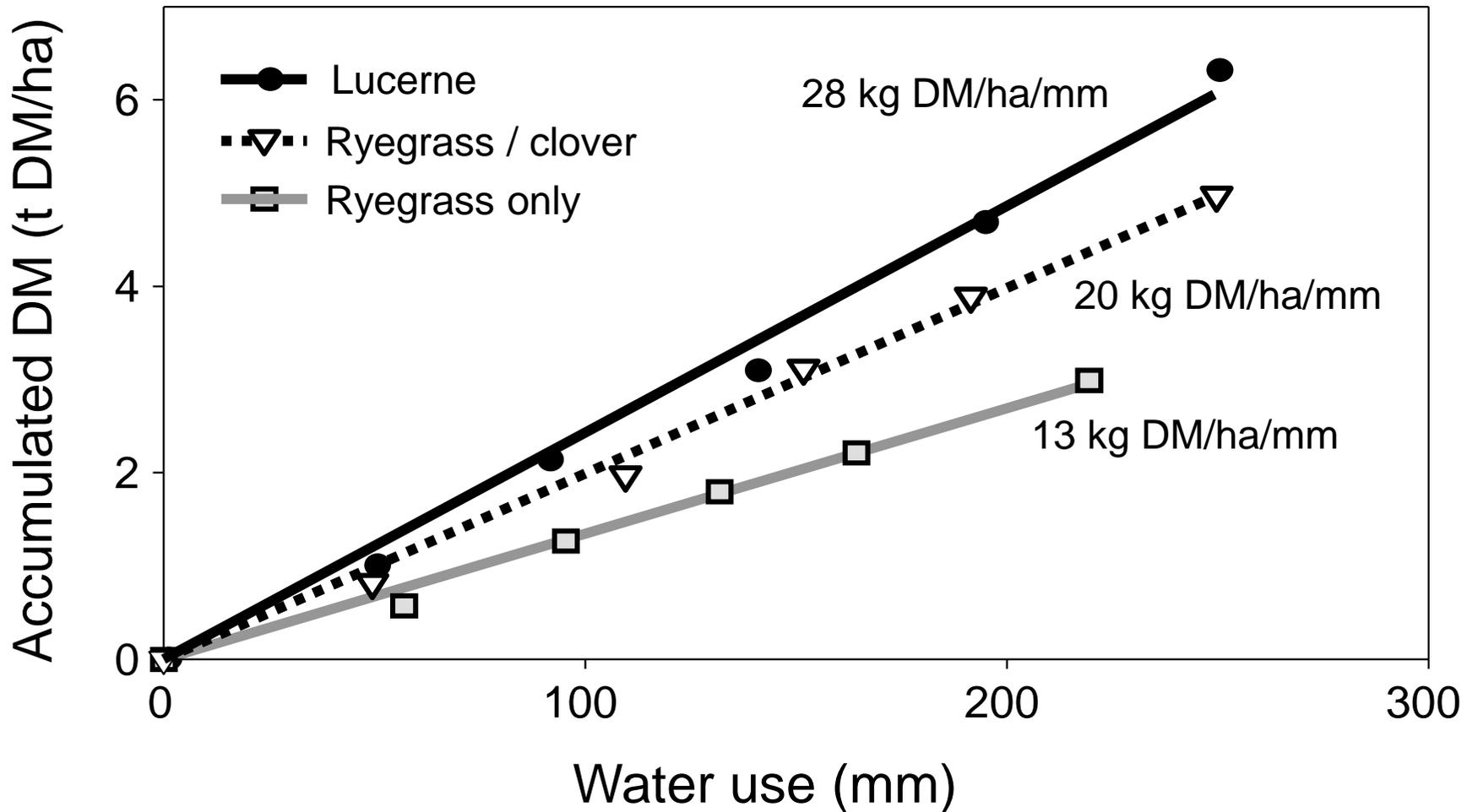


- Annual grasses
- Taprooted dicot weeds

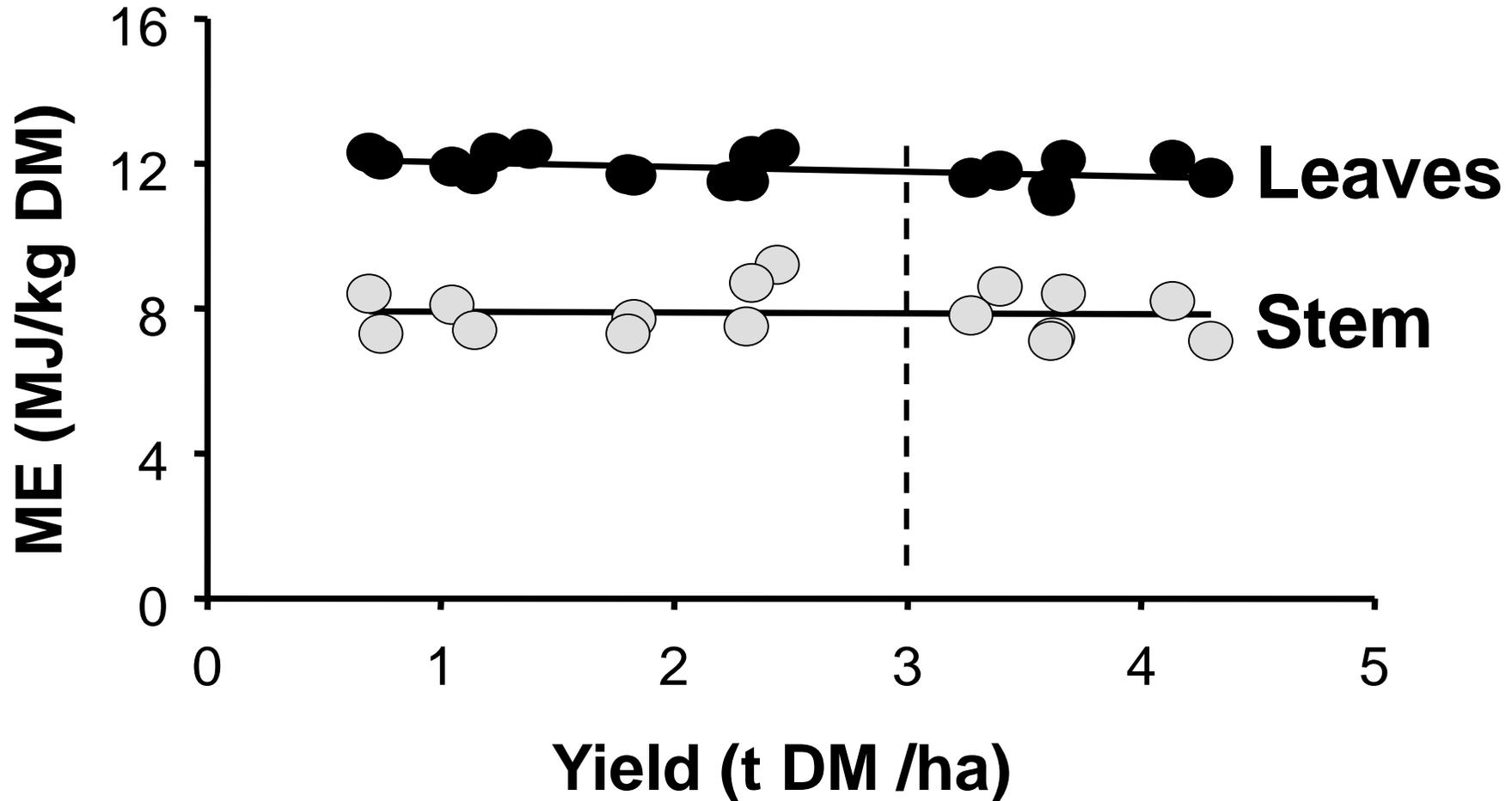
# Lucerne pastures



# Spring WUE: legume = (nitrogen)



# Metabolisable energy of lucerne



# 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?

# Pre-development

- browntop
- hieracium
- sweet vernal
- <5% legume

- 
- Low palatability
  - Low production
  - Low legume

# Lime and Fertiliser Application

Lime 3-5 ton/ha  
Fertiliser 250-500kg/ha



## Typical 0.15 m soil test results for pre (2008) and post (2010) fertiliser applications from three Central Otago farms.

Pre-Development (2008)	pH	Olsen P (ug/ml)	Potassium (QTU)	Sulphur (ug/g)	Aluminium (mg/kg)
Hills Creek	5.2	10	5	14	2.6
Huntleigh	5.2	10	5	1	6.3
Styx	5.2	13	13	3	5.7
Post-Development (2010)					
Hills Creek	5.8	19	9	31	0.9
Huntleigh	6.0	18	4	25	1.5
Styx	6.1	29	13	23	1.1

# Autumn Spraying

- Timing is Critical
- Most important tool
- Glyphosate, granstar, penetrant

## Key Results

- Conserve soil moisture
- Kill mass root systems

# 2<sup>nd</sup> Spray – Spring

## Glyphosate, insecticide, penetrant

Result from Autumn spray, photo taken 1 November 2010

Drilling seed with fertiliser  
Direct drilling = seed + fertiliser



Styx Station

Sown

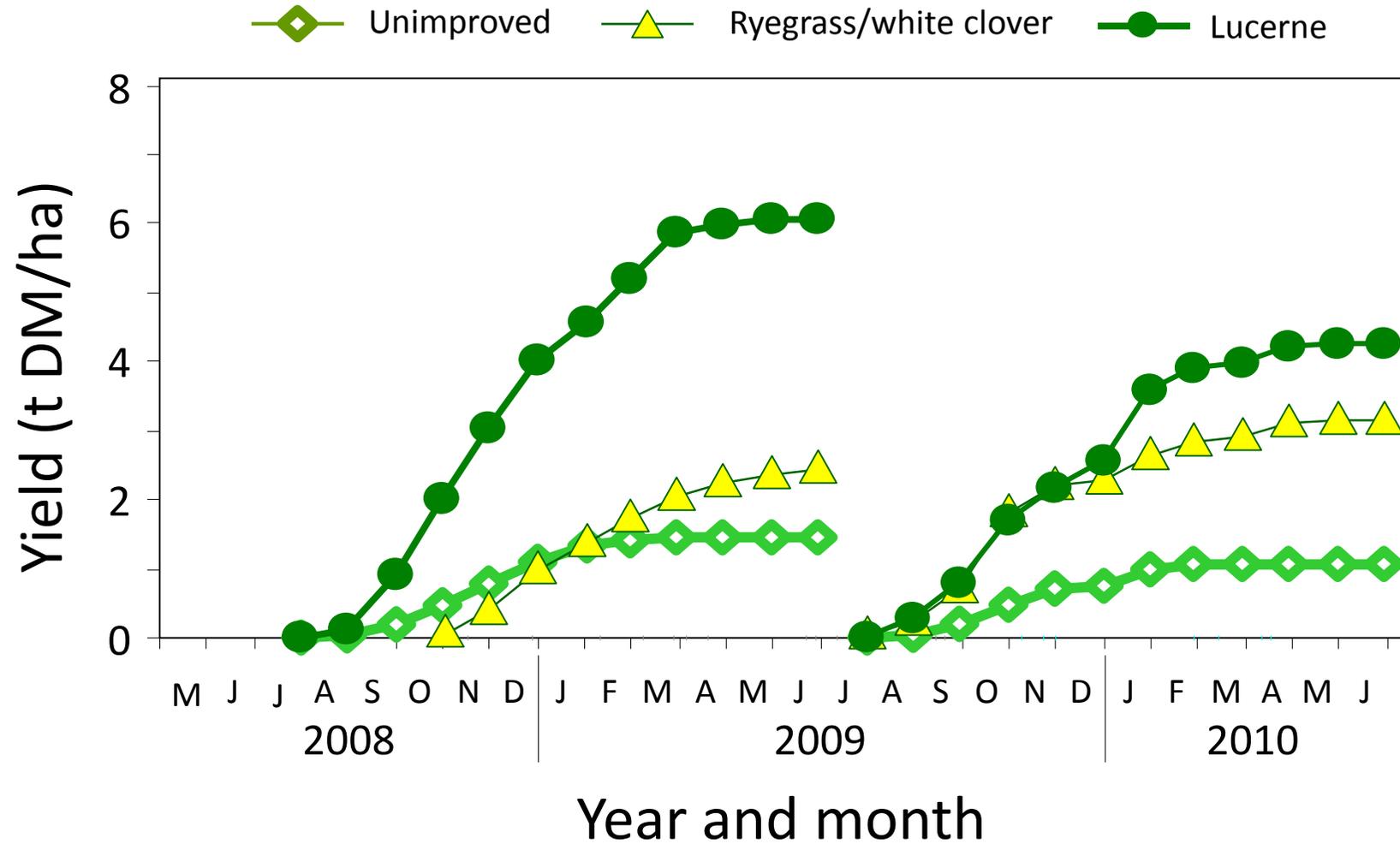
21/11/2007

Photo taken

1/11/2010



# Pasture growth



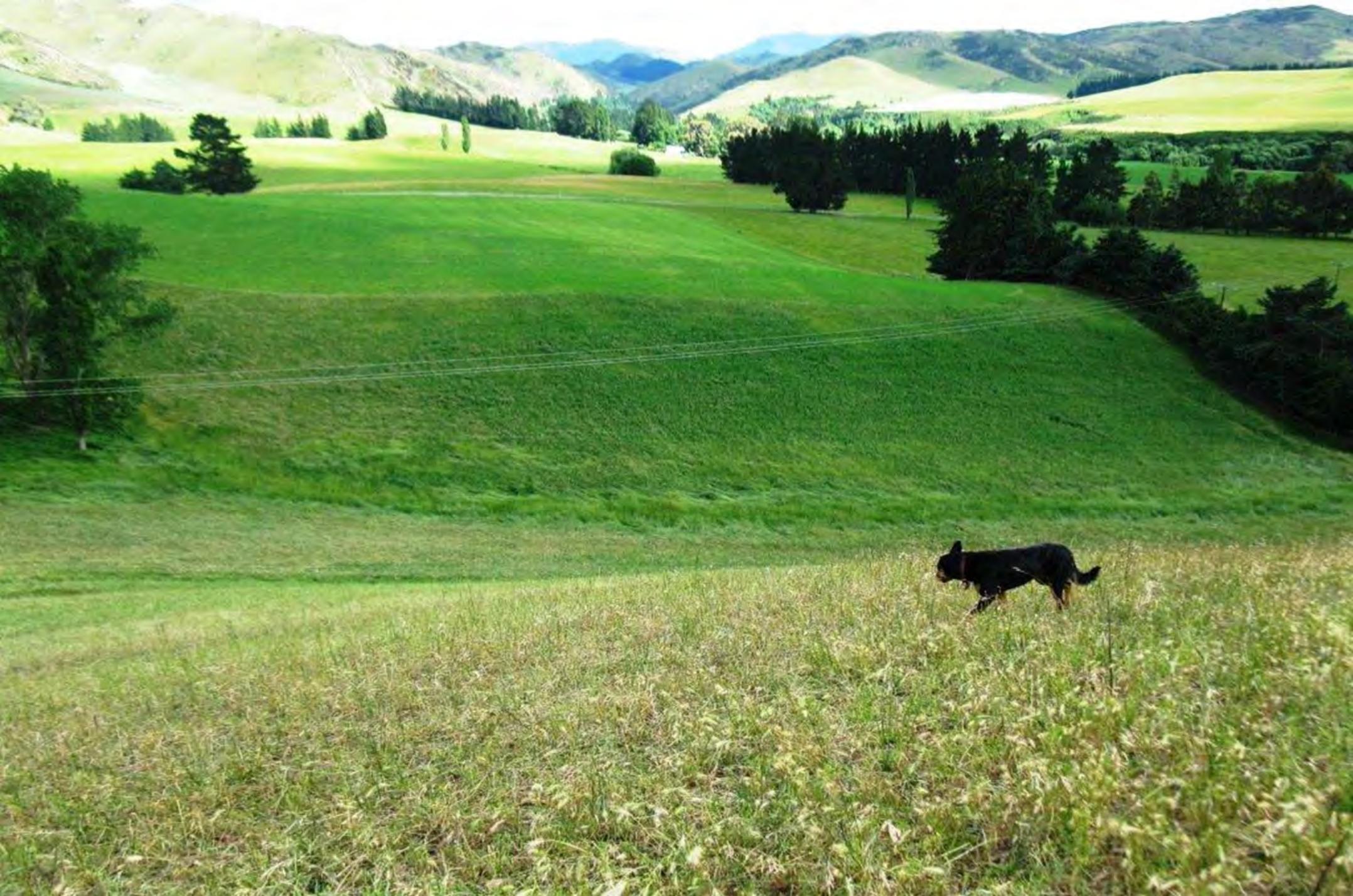




# Doug and Fraser Avery 'Bonavaree 1100 ha 30% lucerne (65% of easier country)







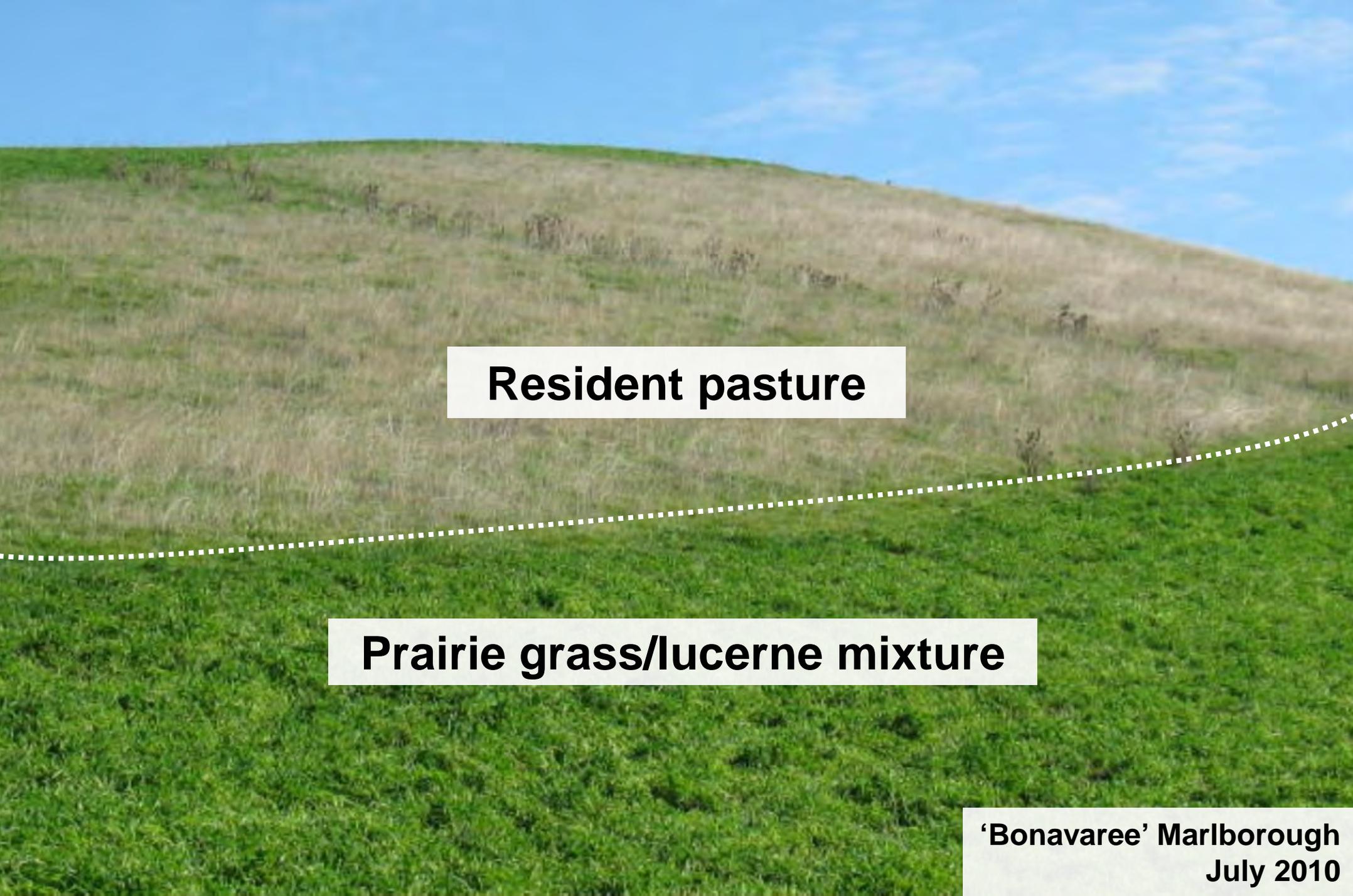


# Seasonal grazing management

## *Spring*

- 1<sup>st</sup> 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**



**Resident pasture**

**Prairie grass/lucerne mixture**

**'Bonavaree' Marlborough  
July 2010**



**'Bonavaree' Marlborough  
July 2010**

# Maximize reliable spring growth – high priority stock





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

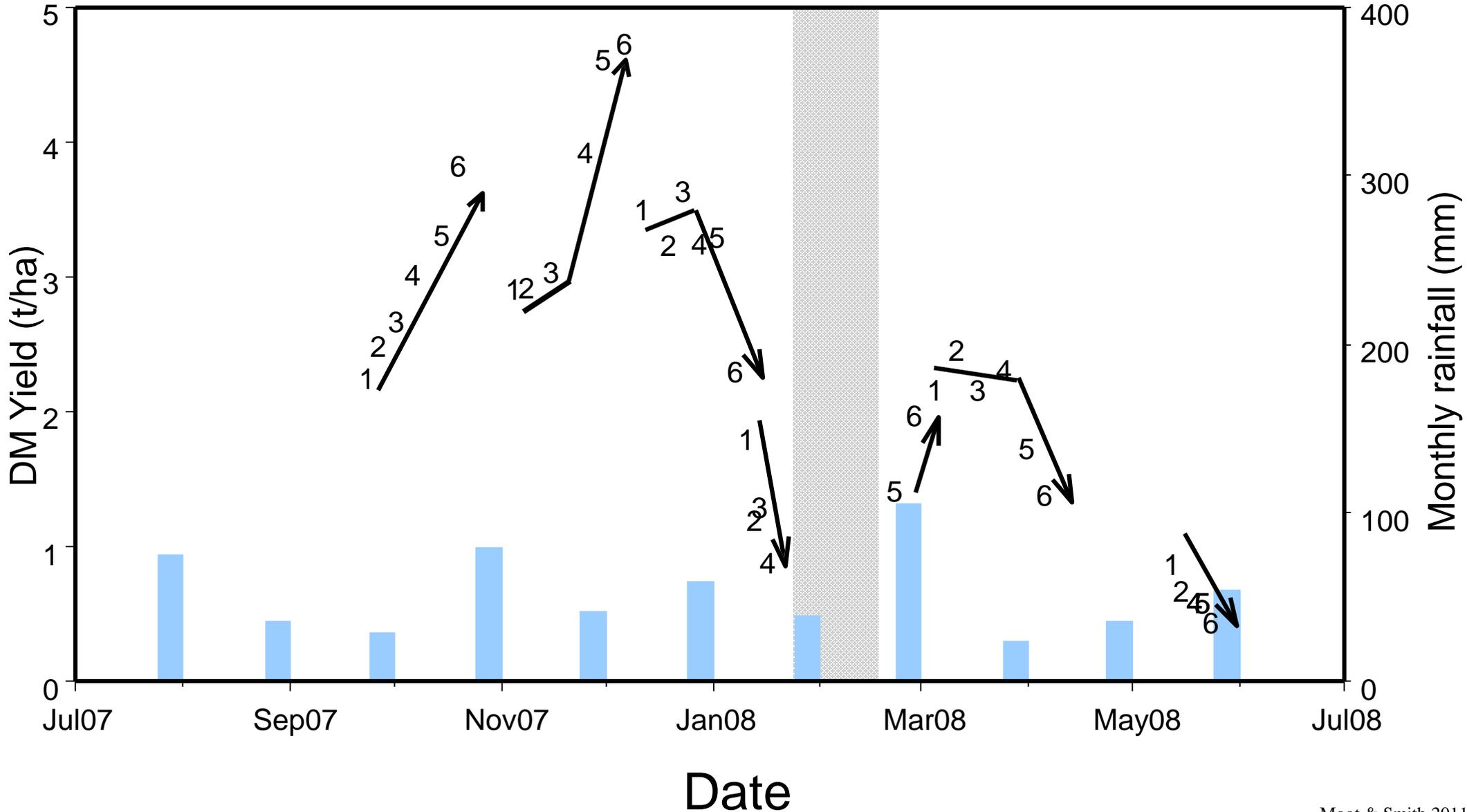






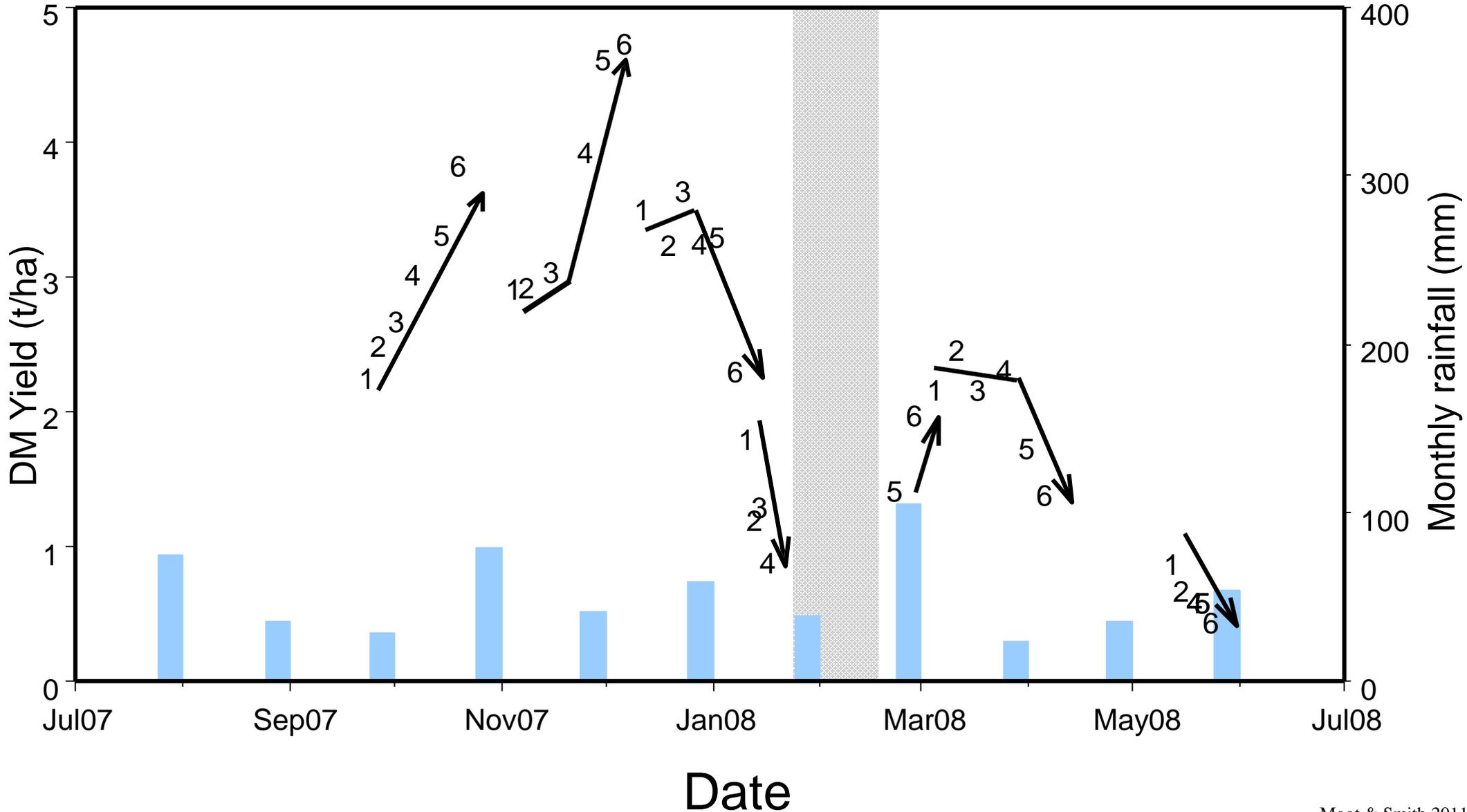
Photo: 'Bonavaree'  
Marlborough







# 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%**

# 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





Photo: 'Bonavaree'  
Marlborough

**Corriedale 2th flushed on wilting lucerne**



**Lucerne (is not grass!!!)**

- flushing at 'Bonavaree'

04.03.2009

# 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 Moot  
Lincoln University

# 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)

**'Bonavaree' Marlborough**  
**July 2010**



Photo: 'Bonavaree'  
Marlborough

**Waterlogged**





# Close up of a prairie grass and lucerne mixture



**'Bonavaree' 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 field with several sheep. In the foreground, a large, fluffy white sheep stands facing the camera. To its left, a smaller lamb is visible. In the background, two more sheep are partially visible. Two speech bubbles are overlaid on the image. The first bubble, located in the upper left, contains the text 'Field day 18th February Marlborough'. The second bubble, located in the center, contains the text 'Baaah...'.

*Field day 18<sup>th</sup>  
February  
Marlborough*

*Baaah...*

# 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.
- Kearney, J. K., Moot, D. J. and Pollock, K. M. 2010. Dryland lucerne production in Central Otago. *Proceedings of the New Zealand Grassland Association*, **72**, 121-126.
- Mills, A. and Moot, D. J. 2010. Annual dry matter, metabolisable energy and nitrogen yields of six dryland pastures six and seven years after establishment. *Proceedings of the New Zealand Grassland Association*, **72**, 177-184.
- Mills, A., Smith, M. C., Lucas, R. J. and Moot, D. J. 2008. Dryland pasture yields and botanical composition over five years under sheep grazing in Canterbury. *Proceedings of the New Zealand Grassland Association*
- 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. and Smith, M.C. Practical Lucerne Management Guide. 9 pp. Online: [www.lincoln.ac.nz/dryland](http://www.lincoln.ac.nz/dryland)

# **Lucerne: agronomy and grazing management**

**Professor Moot gave this presentation at:**

**Cave**

**On:**

**29 Mar 2011**