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AOTEAROA • NEW ZEALAND



Taupo, 29 September 2015

Lucerne Agronomy

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Lucerne Objectives

- Describe management to maximise production, quality and persistence.
- Describe key establishment issues.

Growth:

is dry matter accumulation as a result of light interception and photosynthesis

Development:

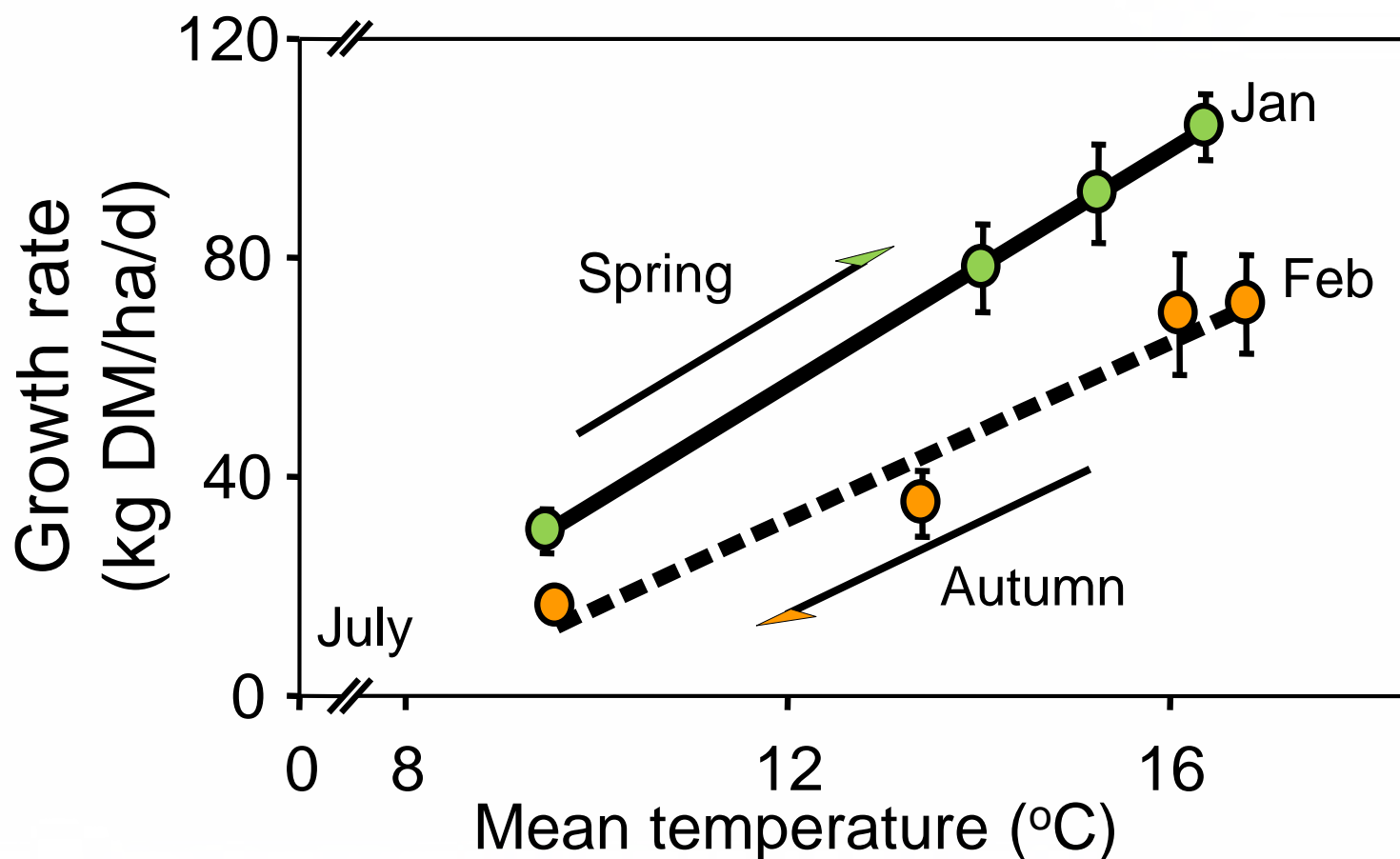
is the 'age' or maturity of the regrowth crop
e.g. leaf appearance, flowering

**Growth and development are both
influenced by environmental signals**

The canopy: the energy capture device



Vegetative growth



Experiment 2

flexible grazing

38 days resting

4 days grazing

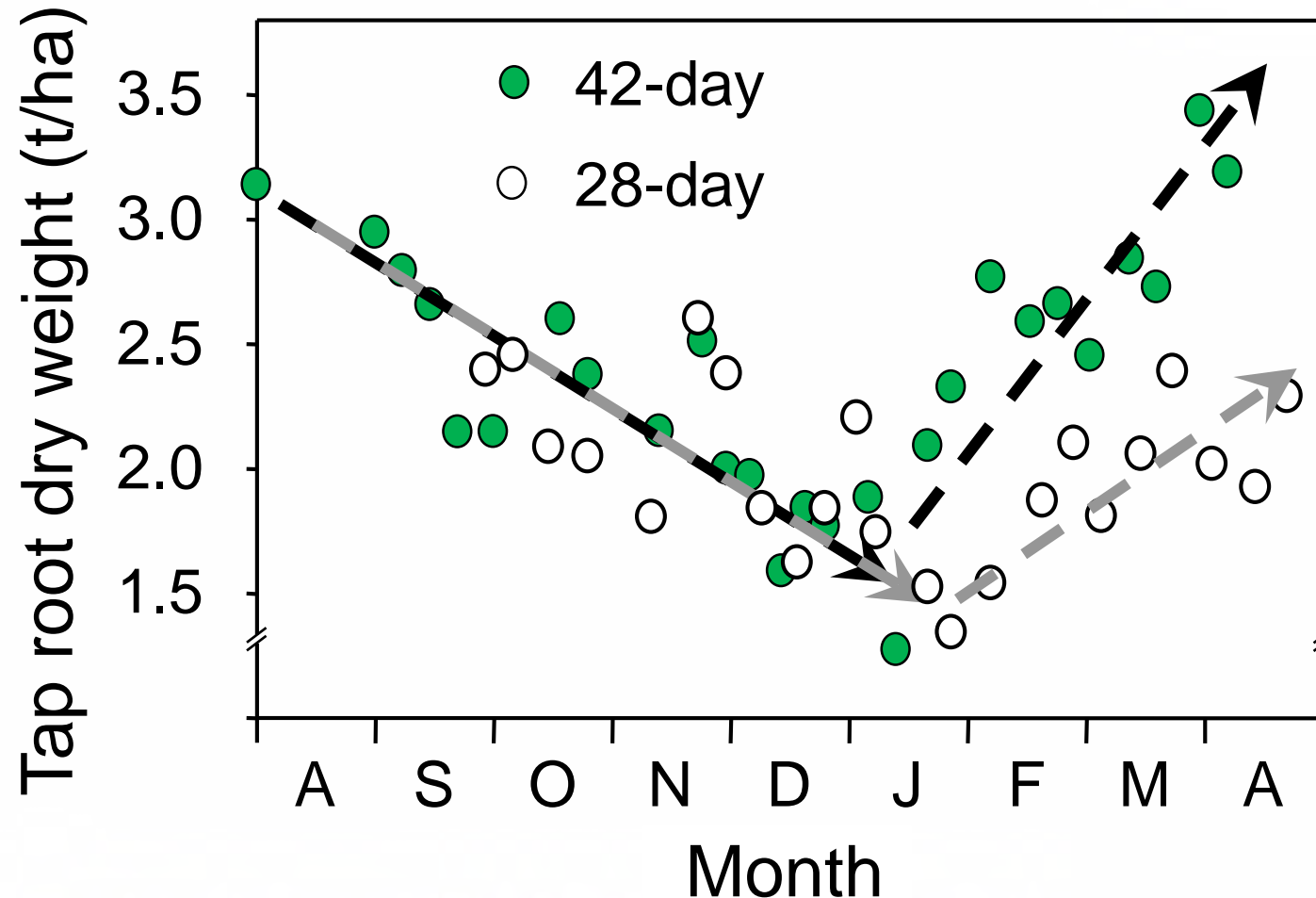


25 days resting

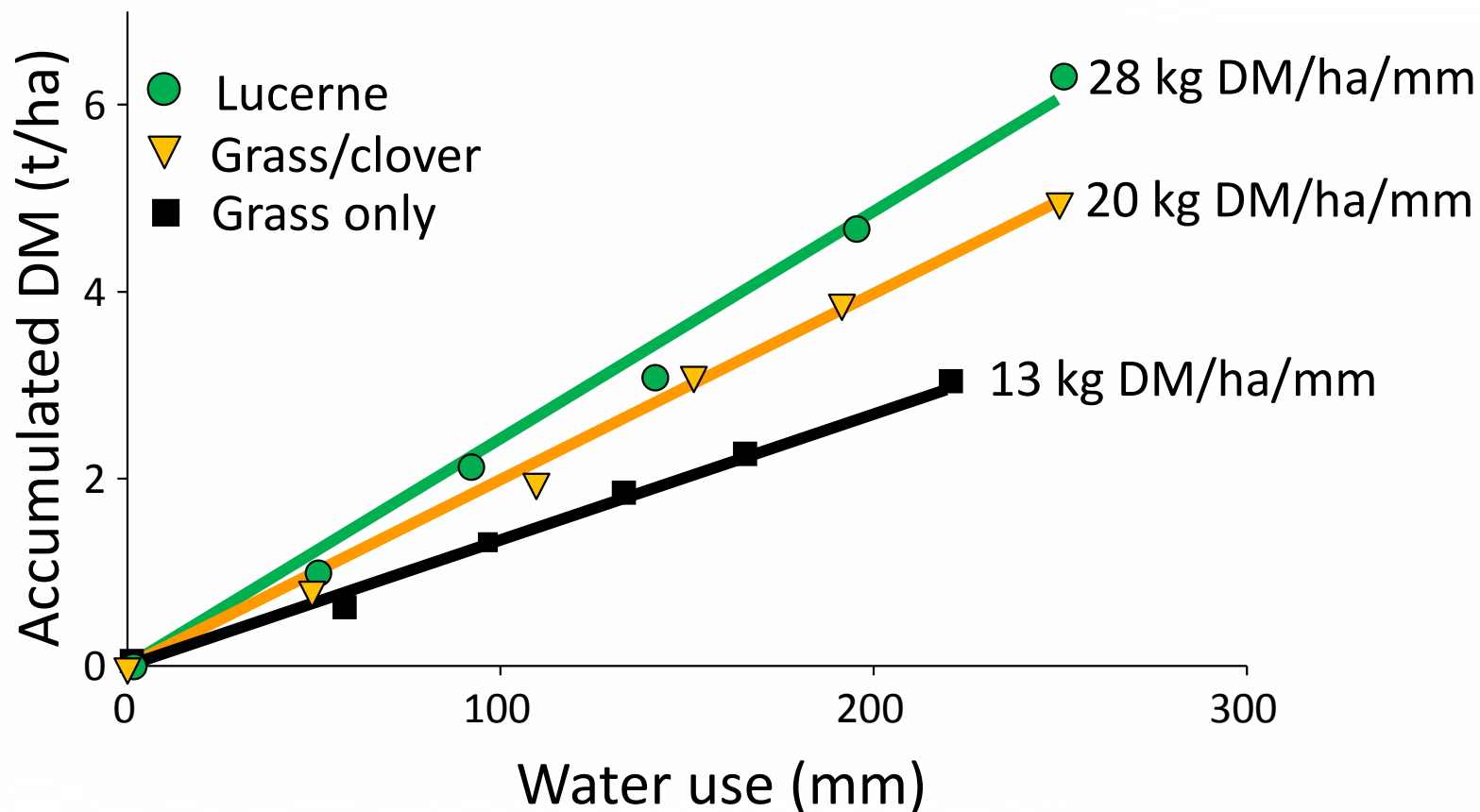
3 days grazing



Partitioning to roots



Spring WUE



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

Growing point at the top of the plant



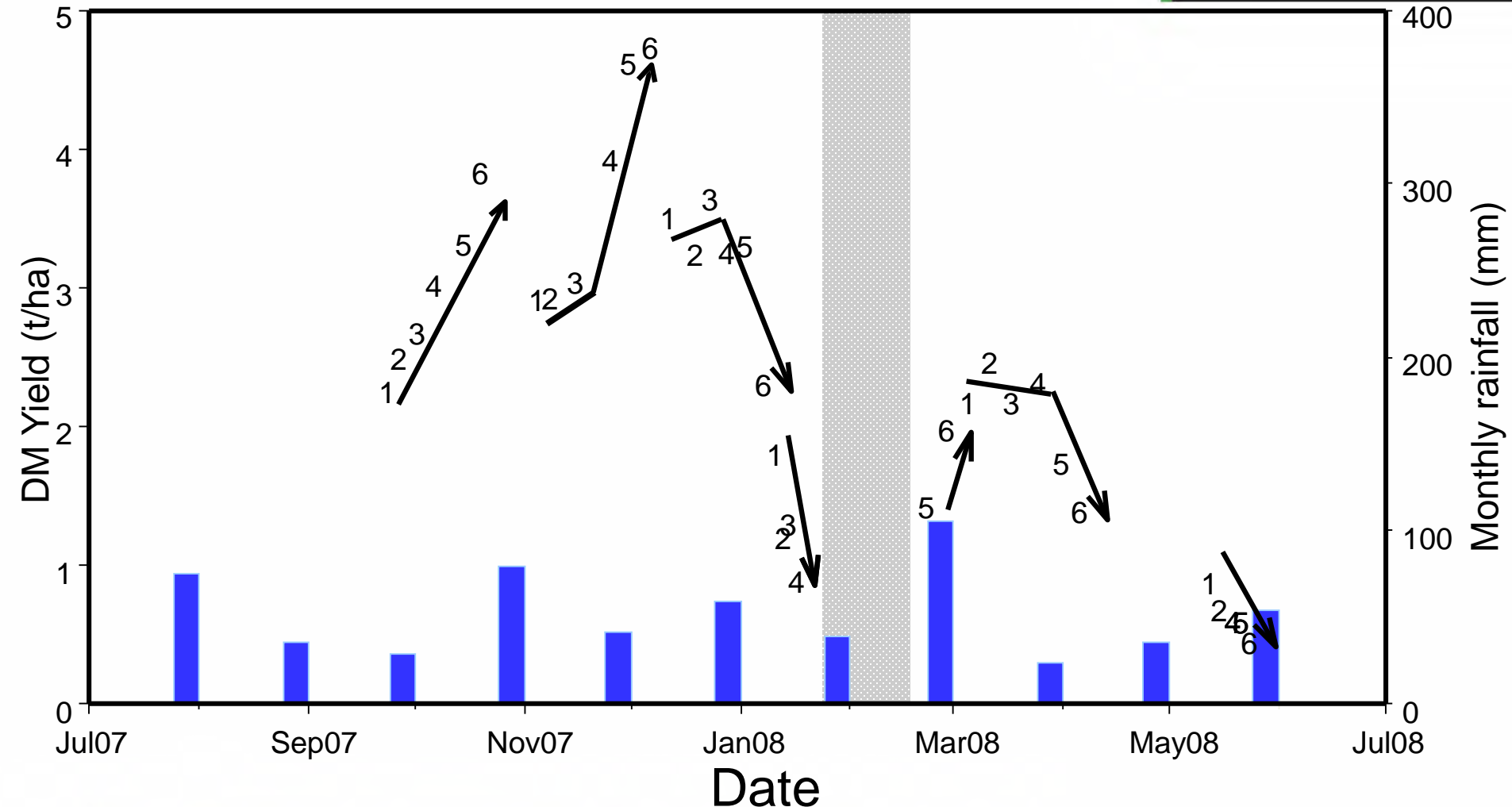
Spring grazing

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

MaxClover – 38-42 day rotation



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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

5th September 2011 – Cave, South Canterbury



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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



14 ewes + twins/ha

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High numbers for 7-10 days



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Fibre and salt

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Maximize reliable spring growth – high priority stock



Seasonal grazing management

Early autumn (Feb-April)

- terminal drought \Rightarrow graze standing herbage
- allow 50% flowering
- long rotation (42 days) somewhere between Jan and end of May.

**\Rightarrow build-up root reserves for spring growth
and increase stand persistence**

Autumn = flowering plants



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

Establishment

- Soils
- deepest free draining soils
 - pH 6.0
 - RG/Wc fertility

- Sowing
- 8-10 kg/ha
 - 10-25 mm
 - peat inoculated 8-10 kg/ha
 - *spring* or *autumn*???
 - cultivated/direct drilled (DAP)



**Lucerne root
~8 months after sowing
> 1.5 m length**

Establishment

Year Two

Total annual yield (t DM/ha)

Ashley Dene

17 kg DM/day
 $R^2 = 0.88$

13 kg DM/day
 $R^2 = 0.60$

Iversen Field


80 kg DM/day
 $R^2 = 0.98$

50 kg DM/day
 $R^2 = 0.95$

**Yield was reduced
when sowing
was delayed**

Oct Nov Dec Jan Feb Oct Nov Dec Jan Feb

Sowing date



Autumn Spraying

Timing is Critical
Most important tool
Glyphosate, granstar, penetrant

Key Results

Conserve soil moisture
Kill mass root systems

Drilling seed with fertiliser

Direct drilling = seed + fertiliser



Sowing rate and date

Established 2007 LU – Templeton silt loam

Coated 'Grasslands Kaituna' lucerne.

Four sowing dates

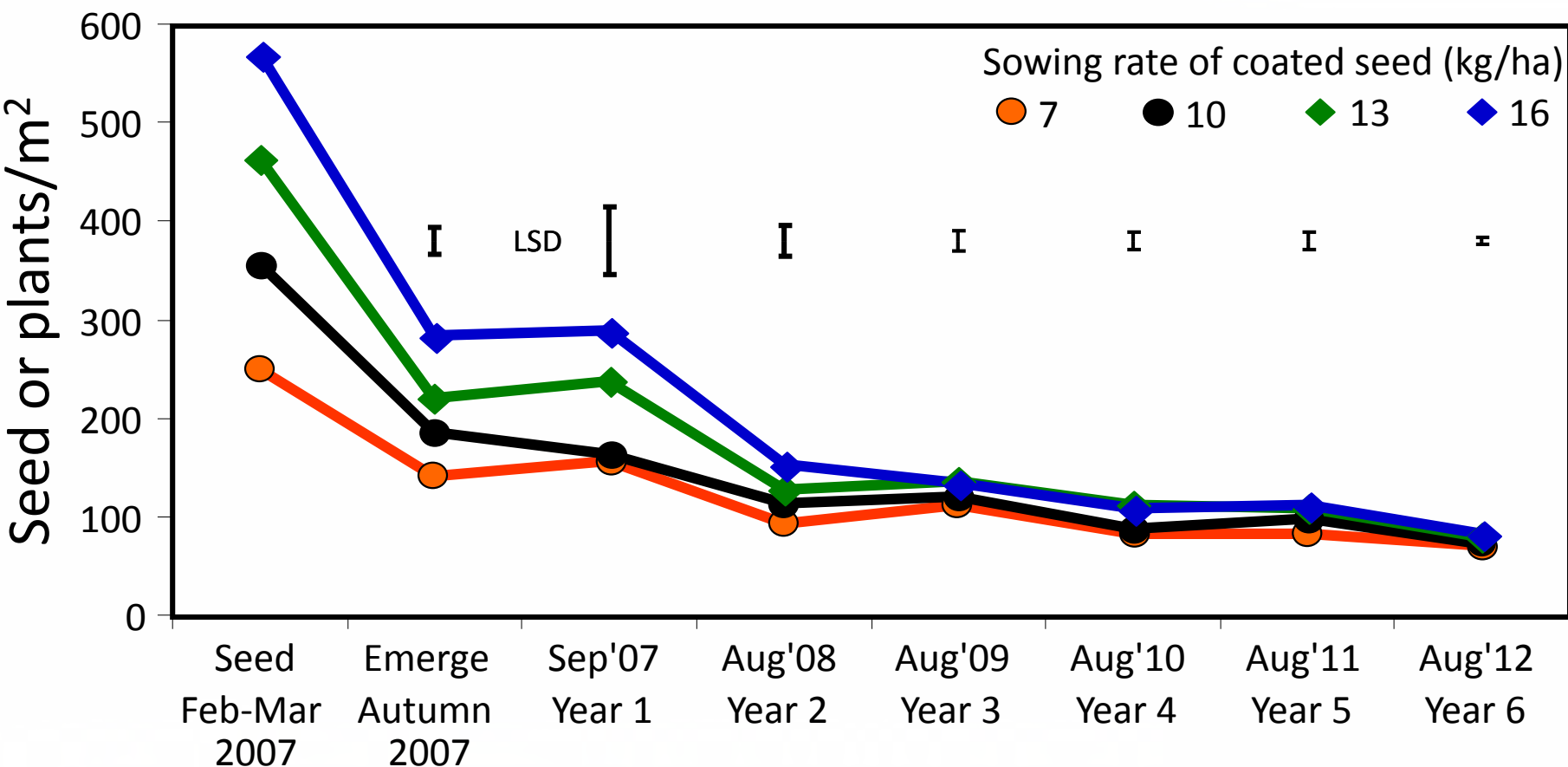
- **21 February,**
- **2 March,**
- **16 March and**
- **30 March**

Four sowing rates

- **Equivalent to bare seed @ 7, 10, 13 and 16 kg/ha**

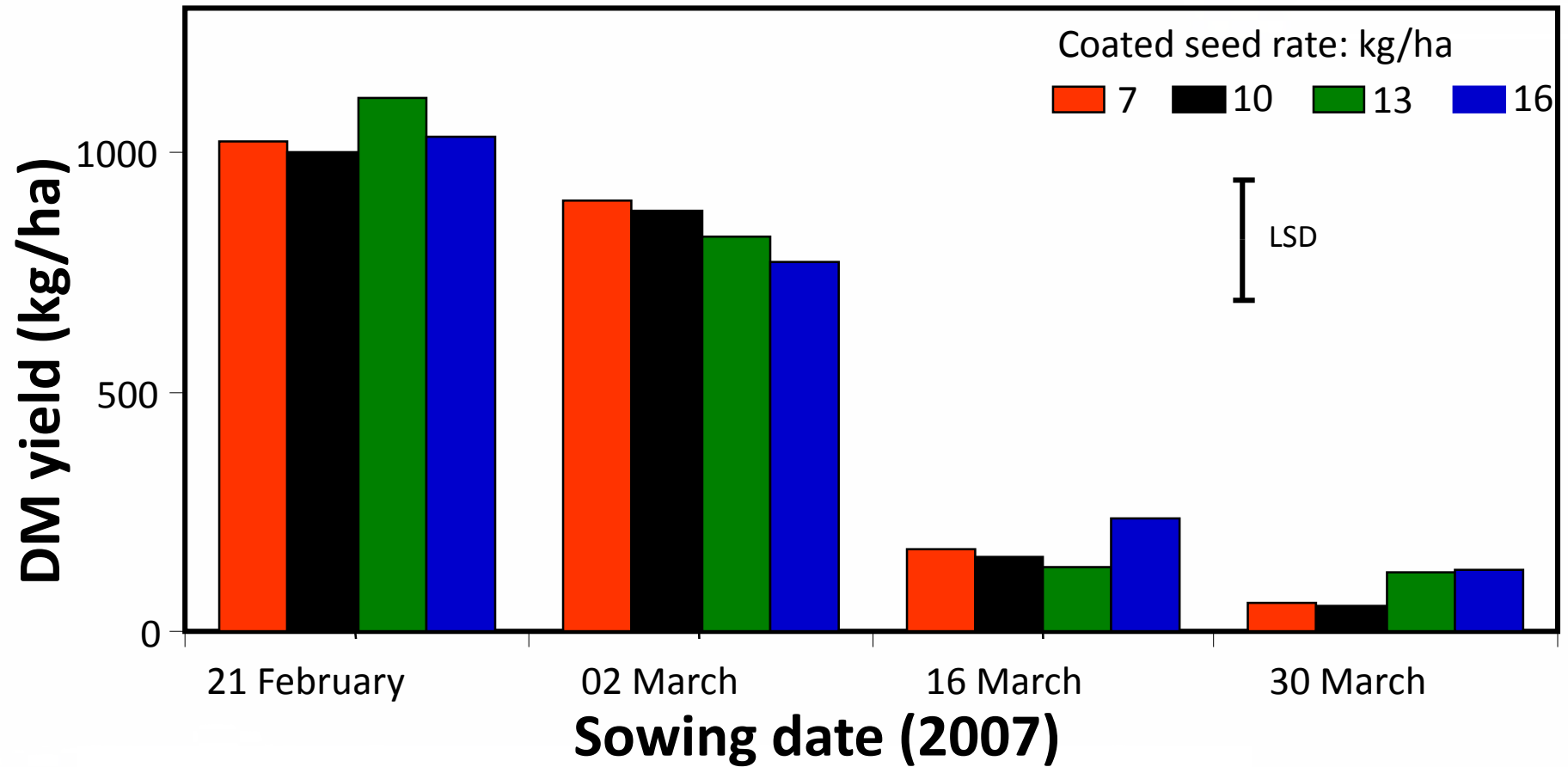
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Sown seed & plant population over time



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Seedling lucerne yield to early June



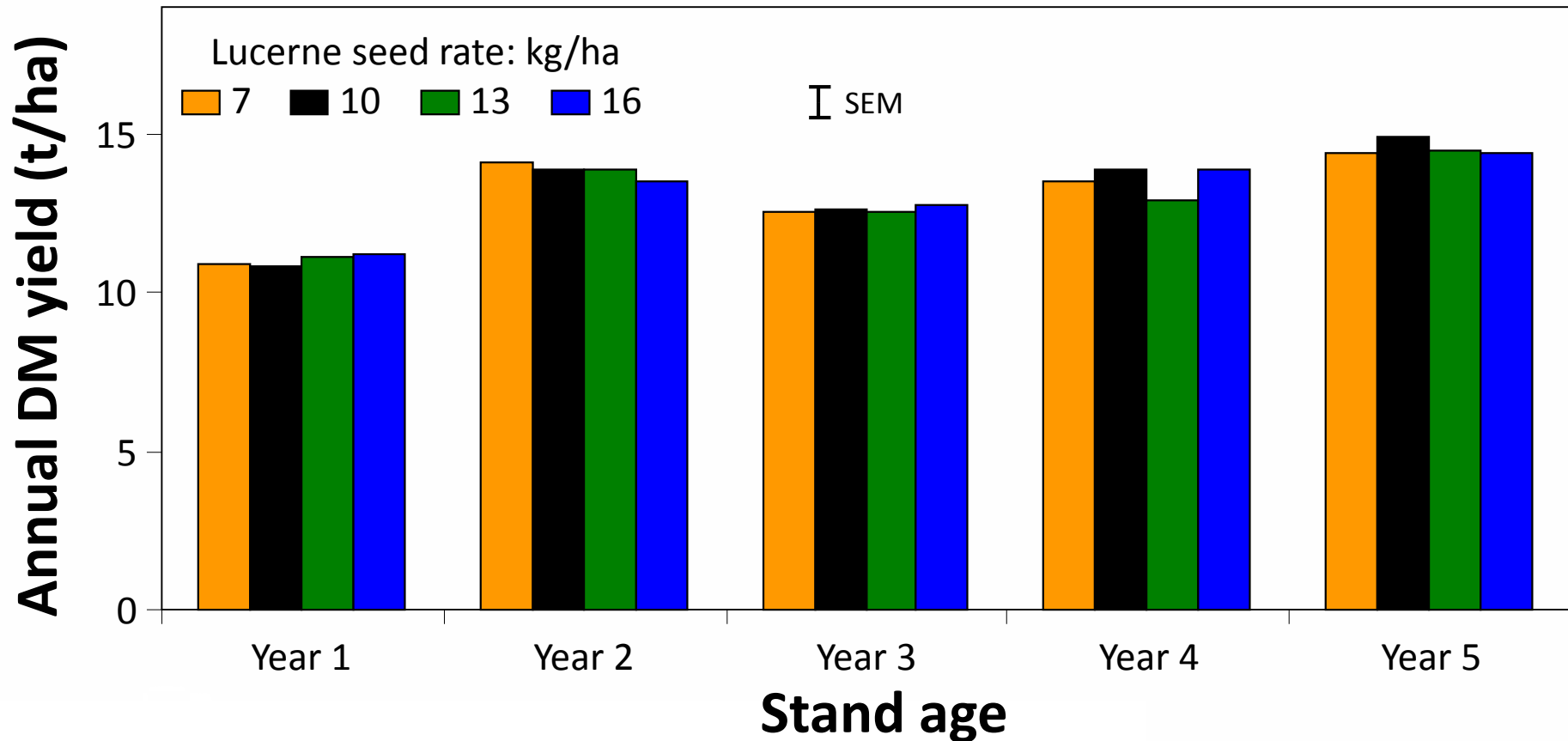
Weeds present @ 09 October 2007 (Year 1)

Sown 21 Feb 2007

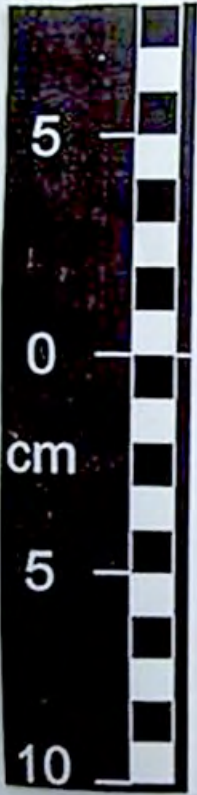
Sown 30 Mar 2007



Annual yield in relation to sowing rate



Sown: February October



Sampled: June

Taproot mass

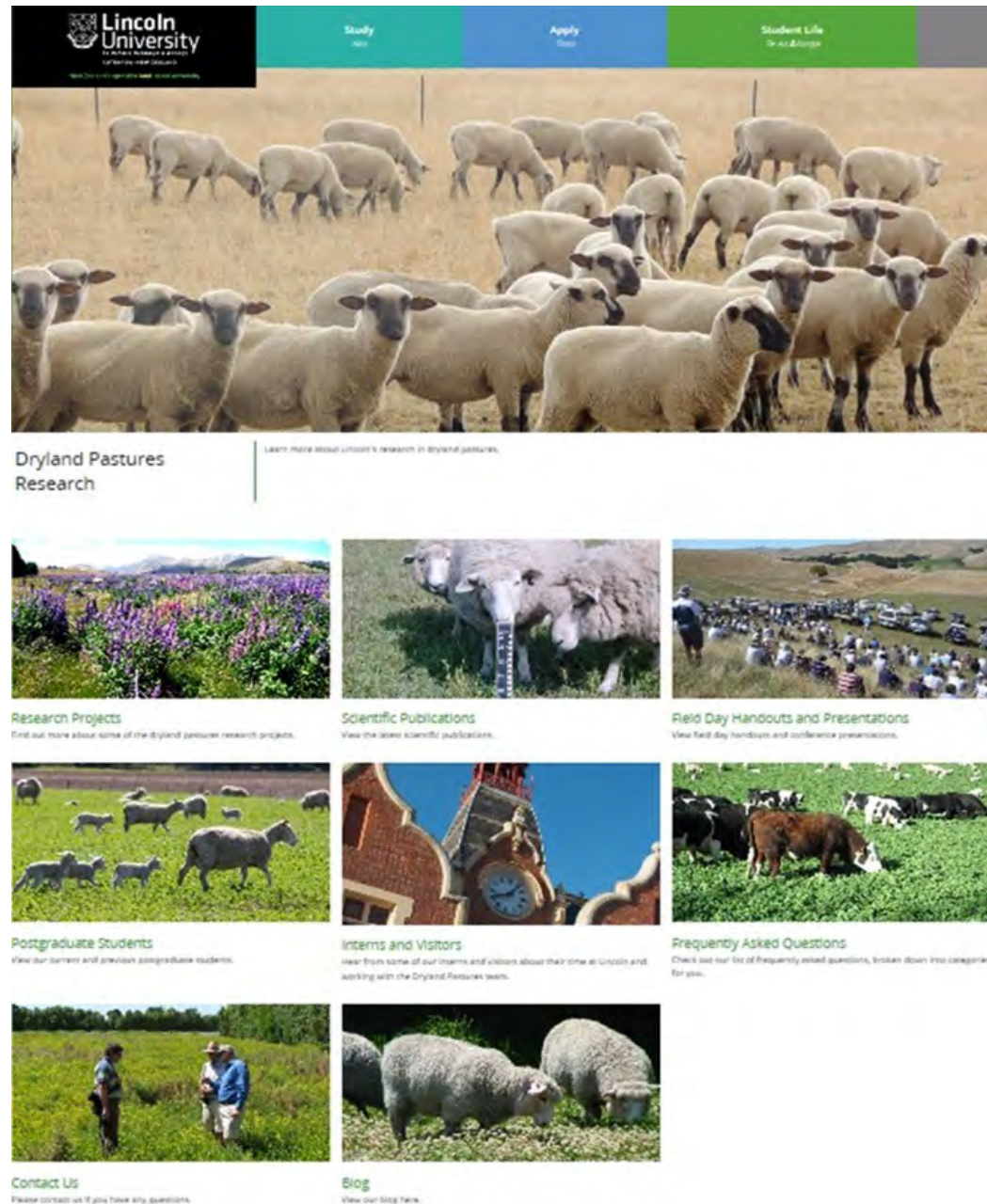
Conclusions from establishment

- Spring sow - October
- Yield in year one is lower due to partitioning
- Plant population self thins over time
- Sow on deep soils

The website...

Info on:

- Current projects
- Field day presentations
- Scientific publications
- FAQs
- Postgraduate study



www.lincoln.ac.nz/dryland

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