

**Yield and botanical composition of
lucerne, cocksfoot or ryegrass based
pastures over six years**

Acknowledgements

- Meat & Wool NZ Ltd/ Pastoral21
- The Cocksfoot Growers Association
- Lincoln University

Objective



To quantify annual yield and botanical composition from lucerne, cocksfoot and ryegrass based pastures

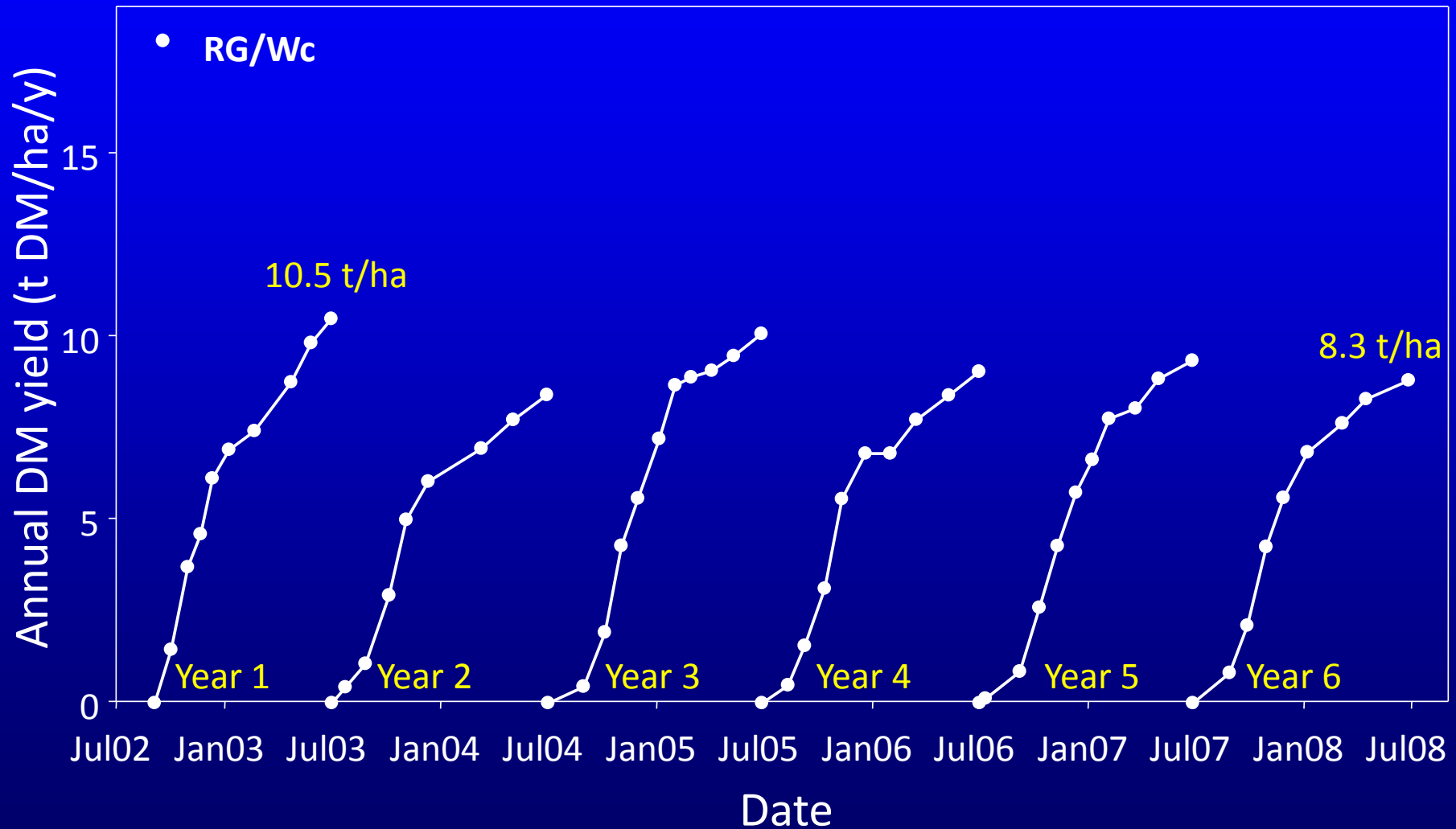
Materials & Methods

- RCB
 - RG/Wc
 - CF/Sub
 - Luc
- 6 replicates
 - 0.05 ha plots

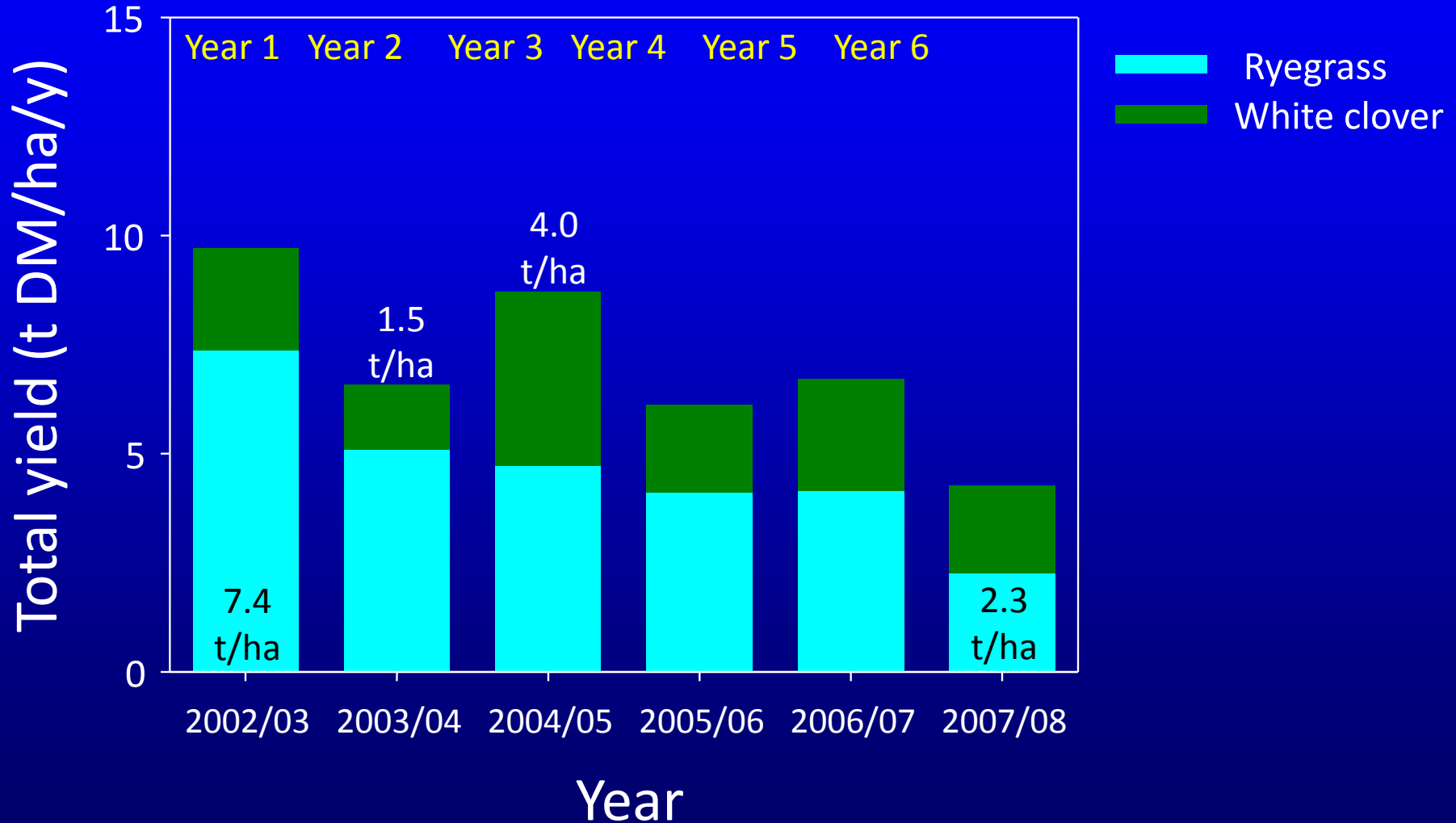
Established autumn 2002

Grazed by Coopworth ewe lambs/hoggets

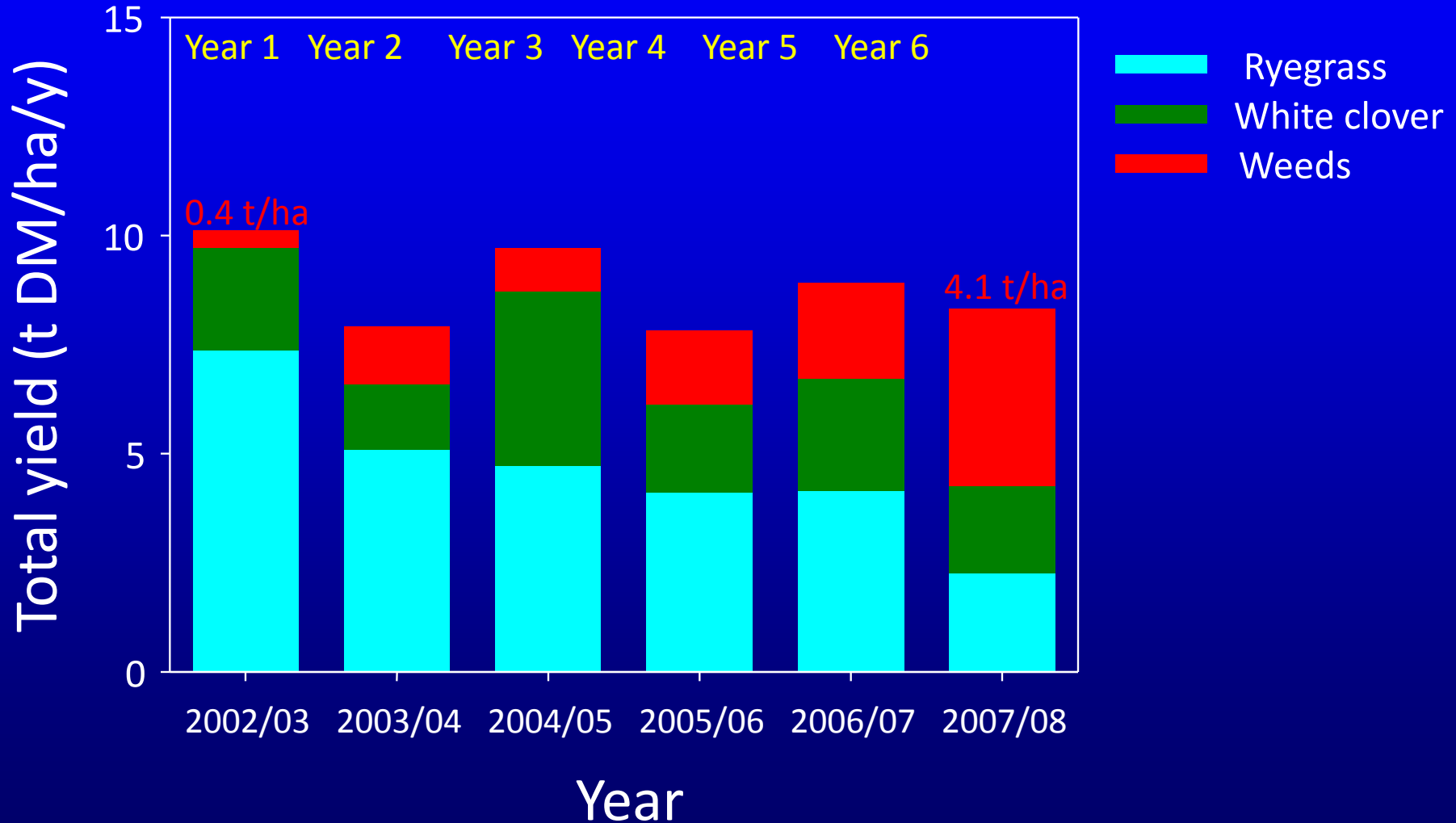
Results - Total Annual Yield



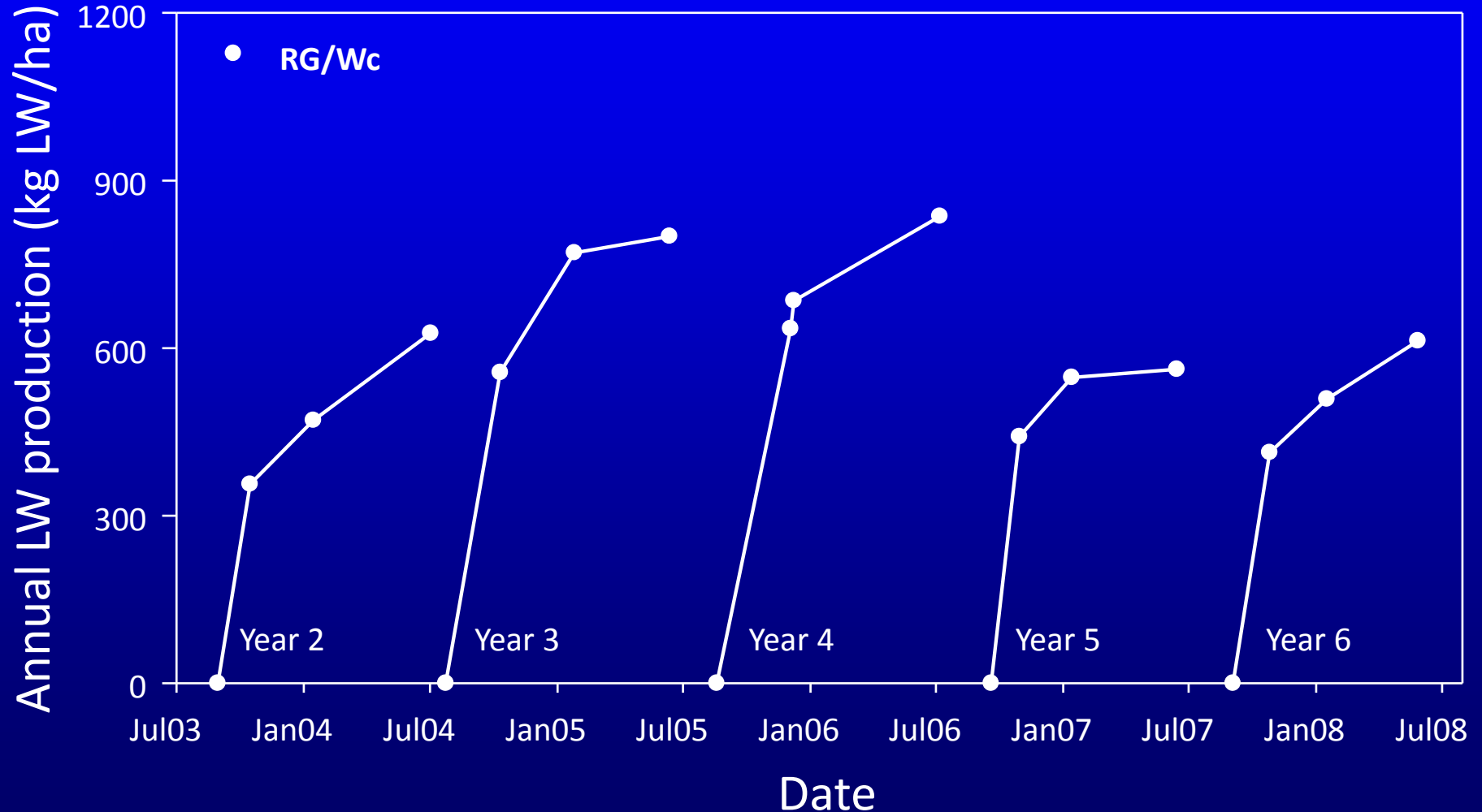
Botanical composition - RG/Wc



Botanical composition - RG/Wc



Results - Annual LW production

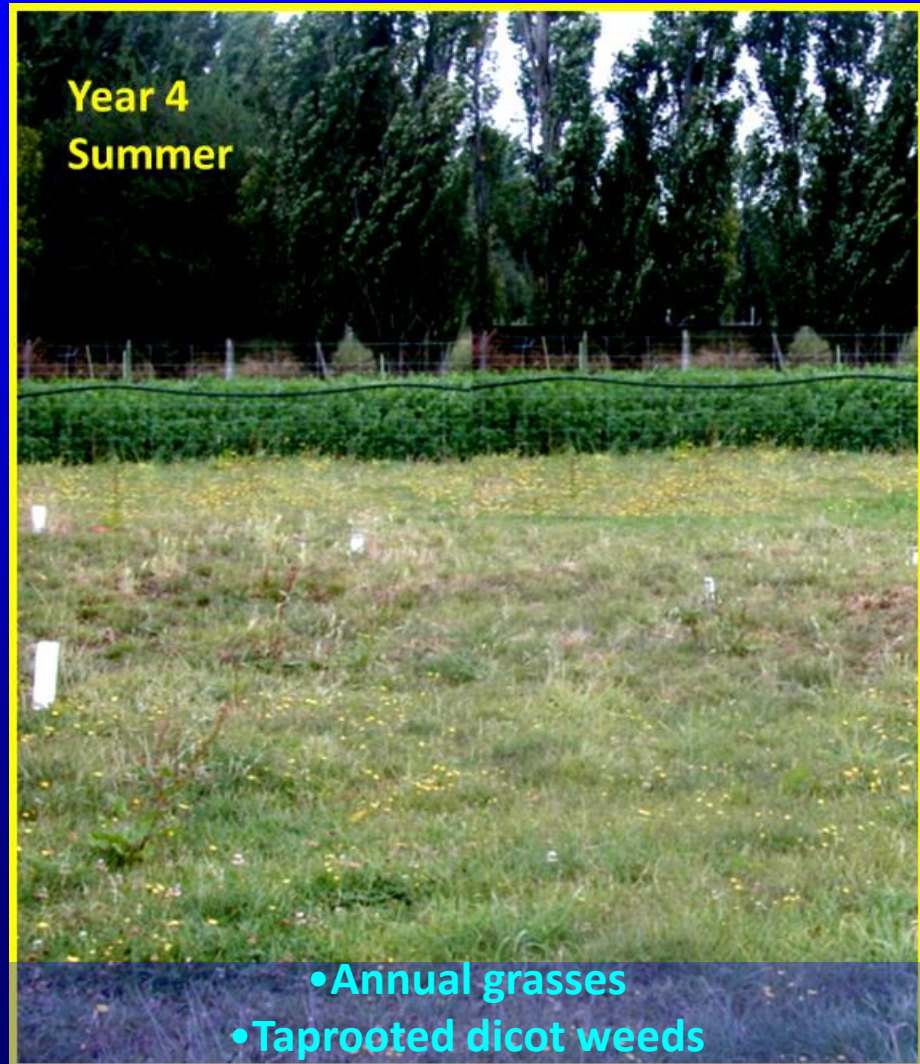


Results - Annual LW production

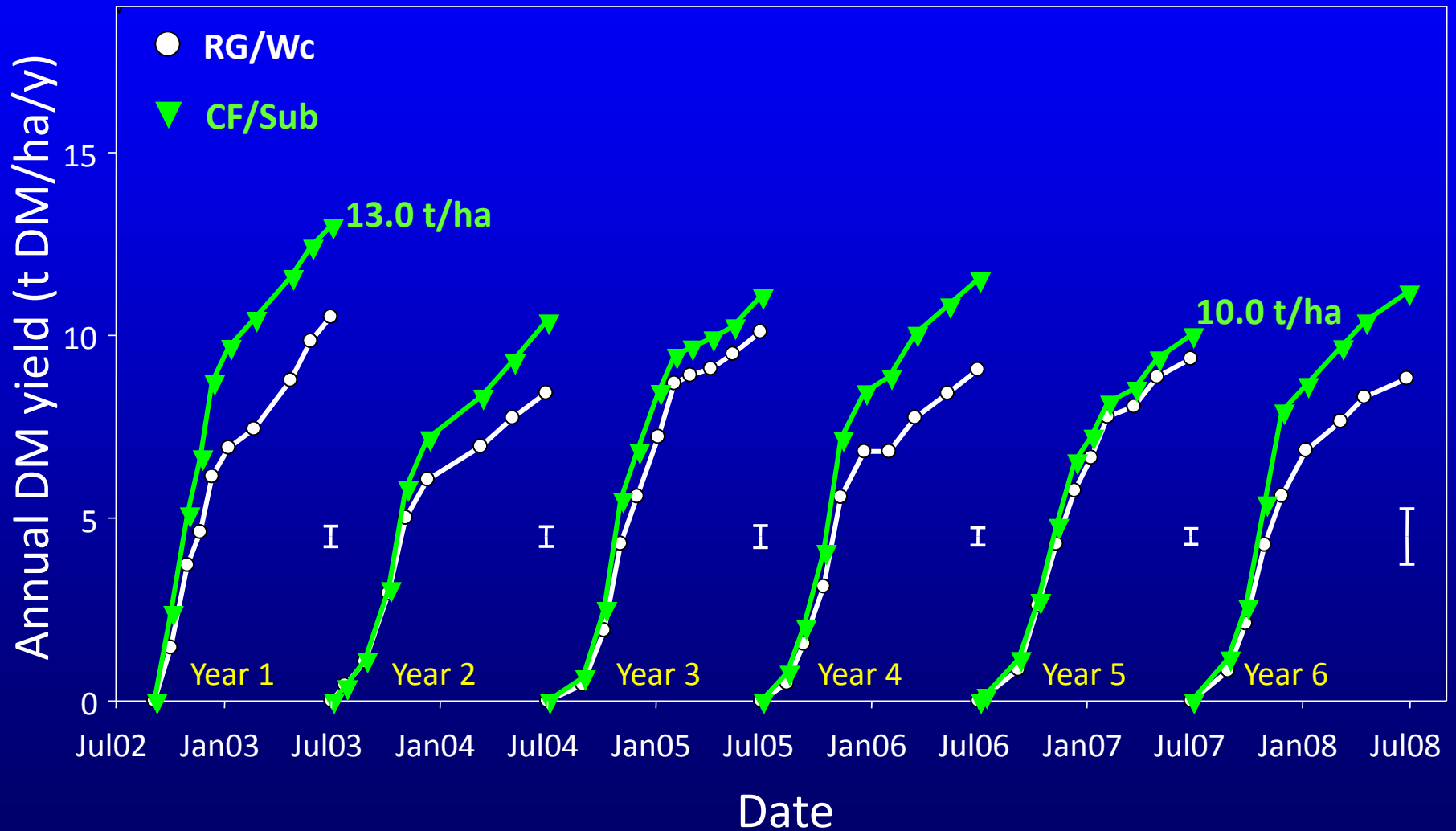
Year 2
Spring



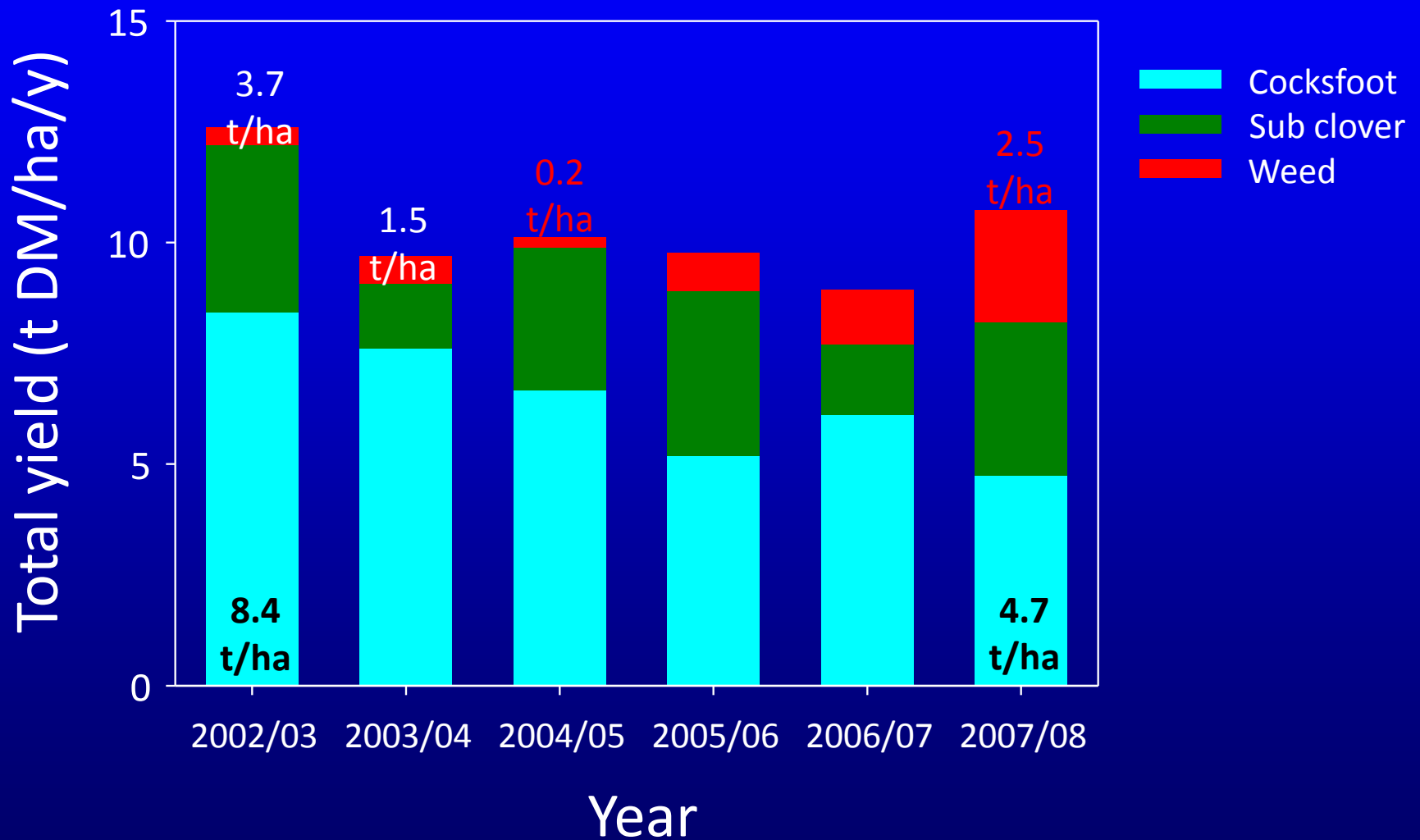
Year 4
Summer



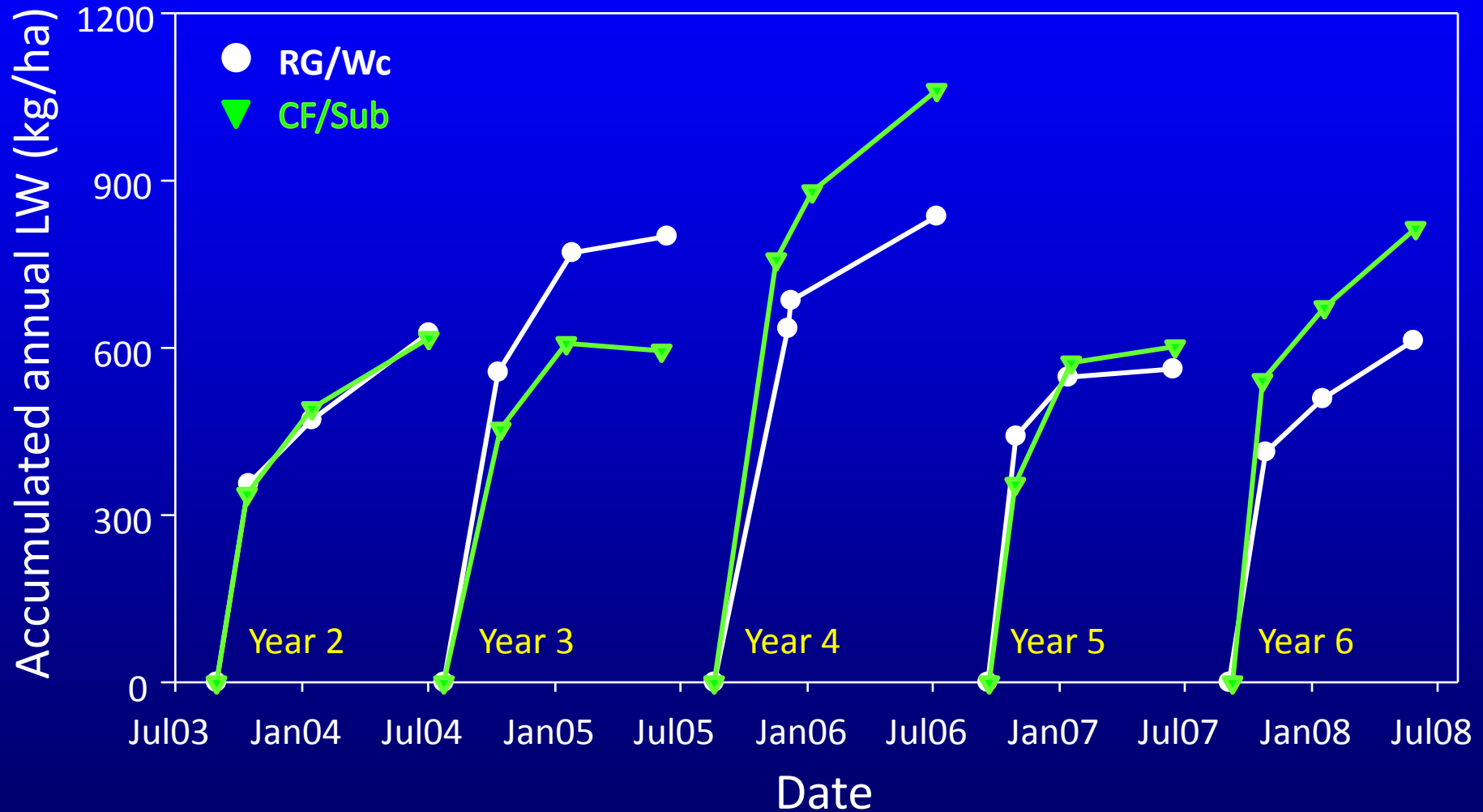
Results - Total Annual Yield



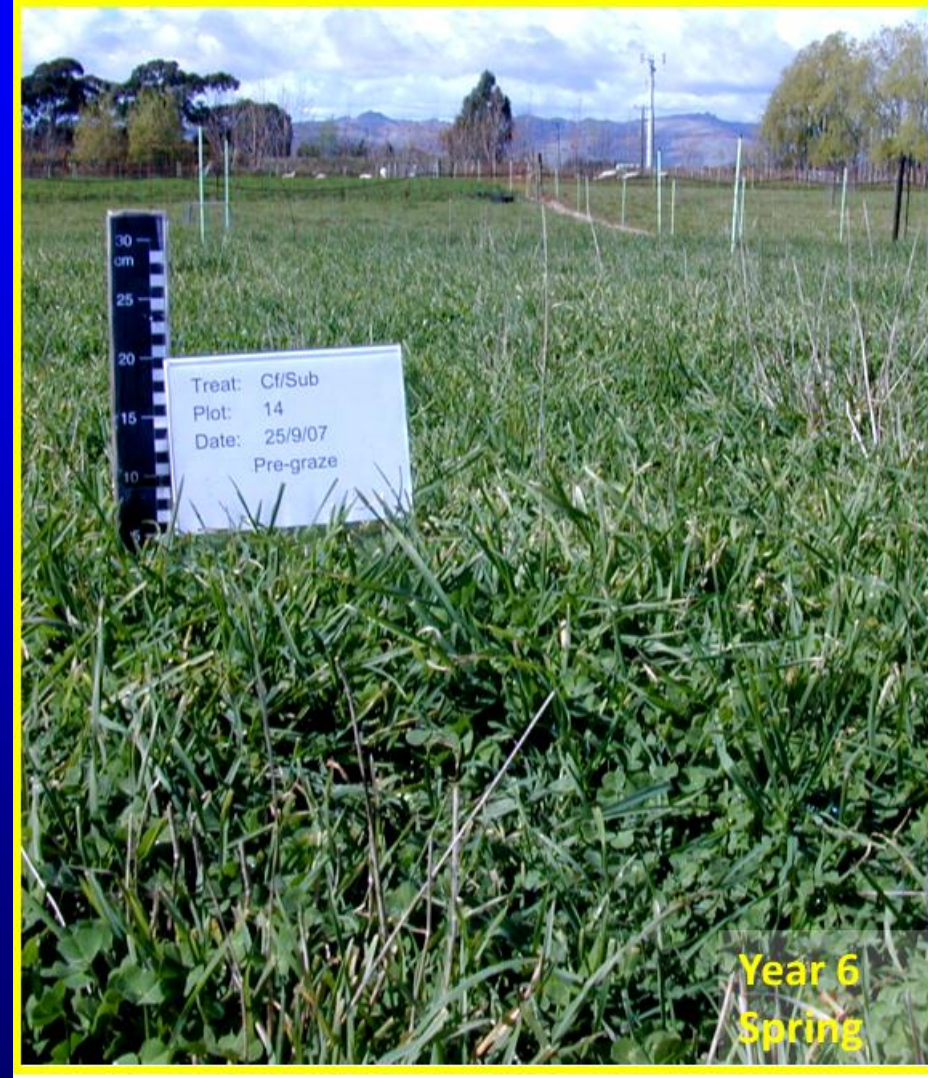
Botanical composition - CF/Sub



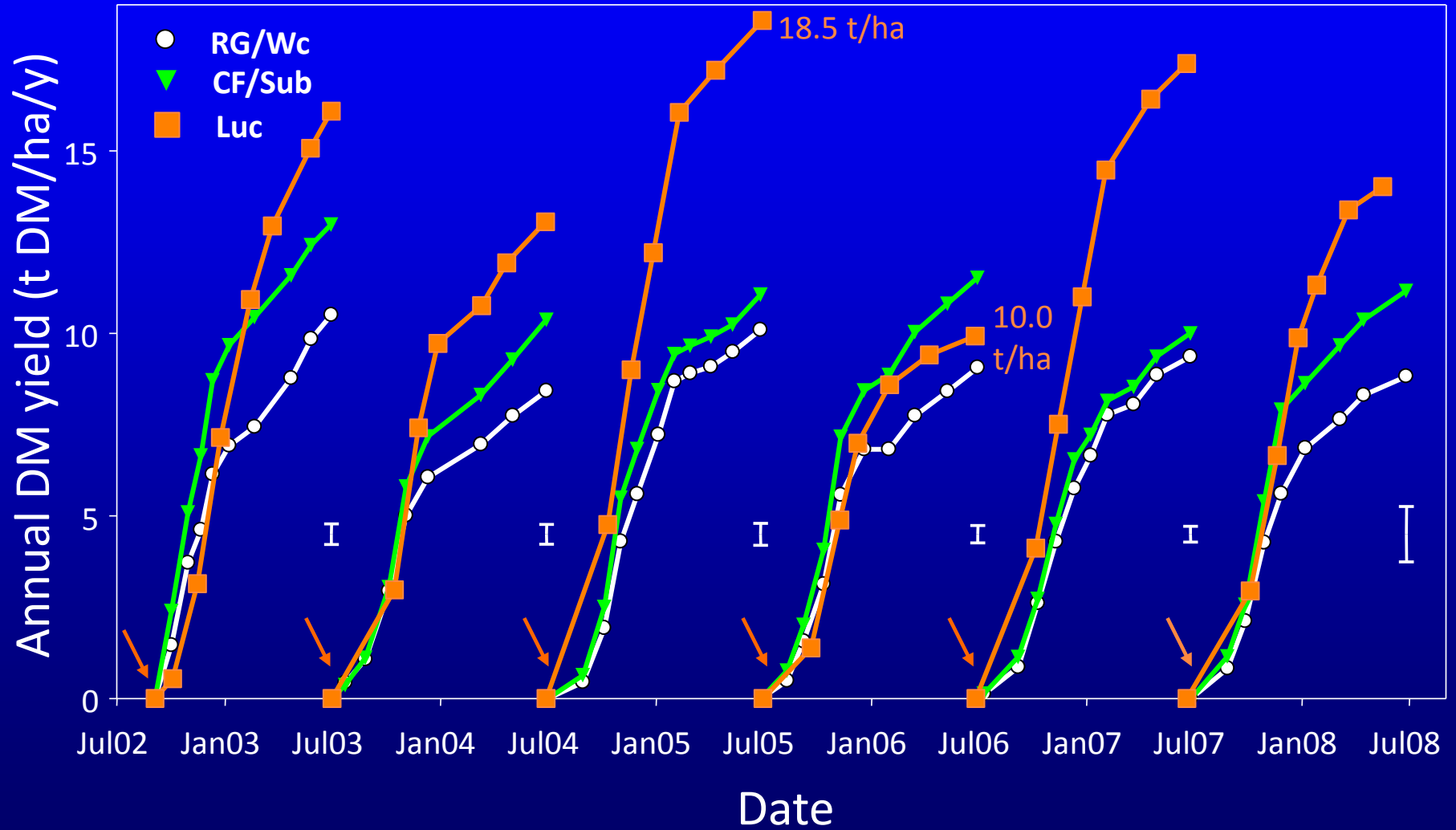
Annual LW production



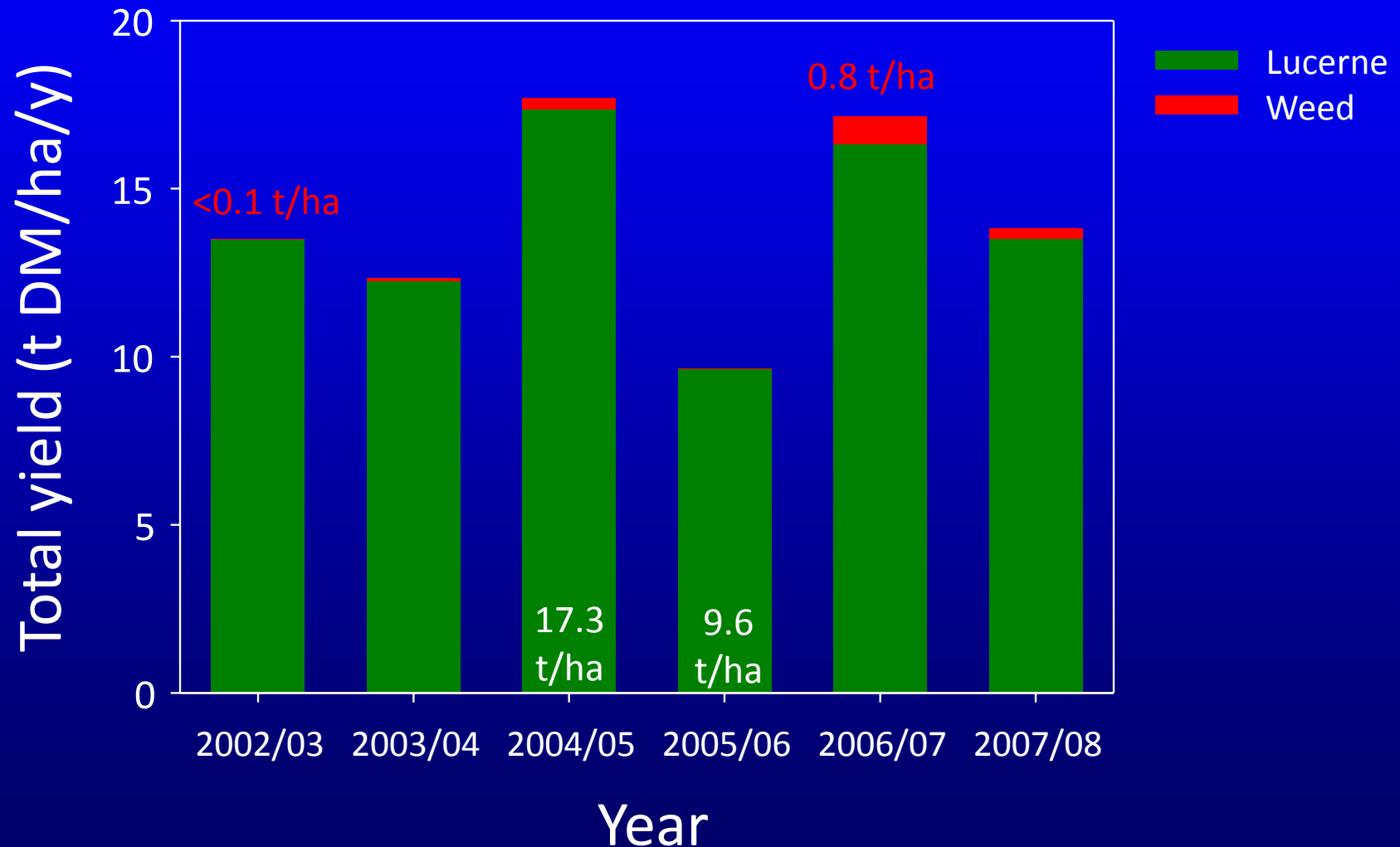
Annual LW production



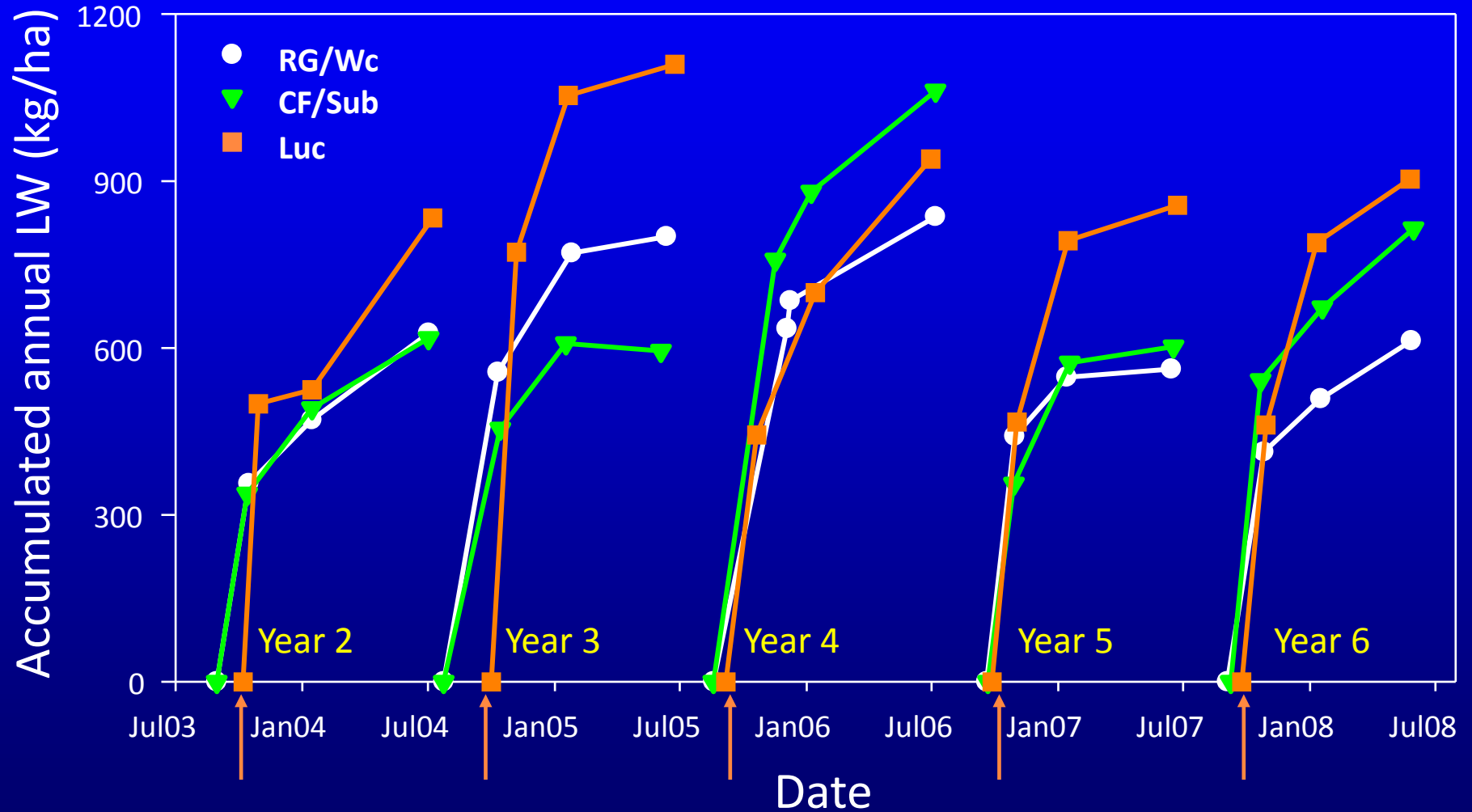
Results - Total Annual Yield



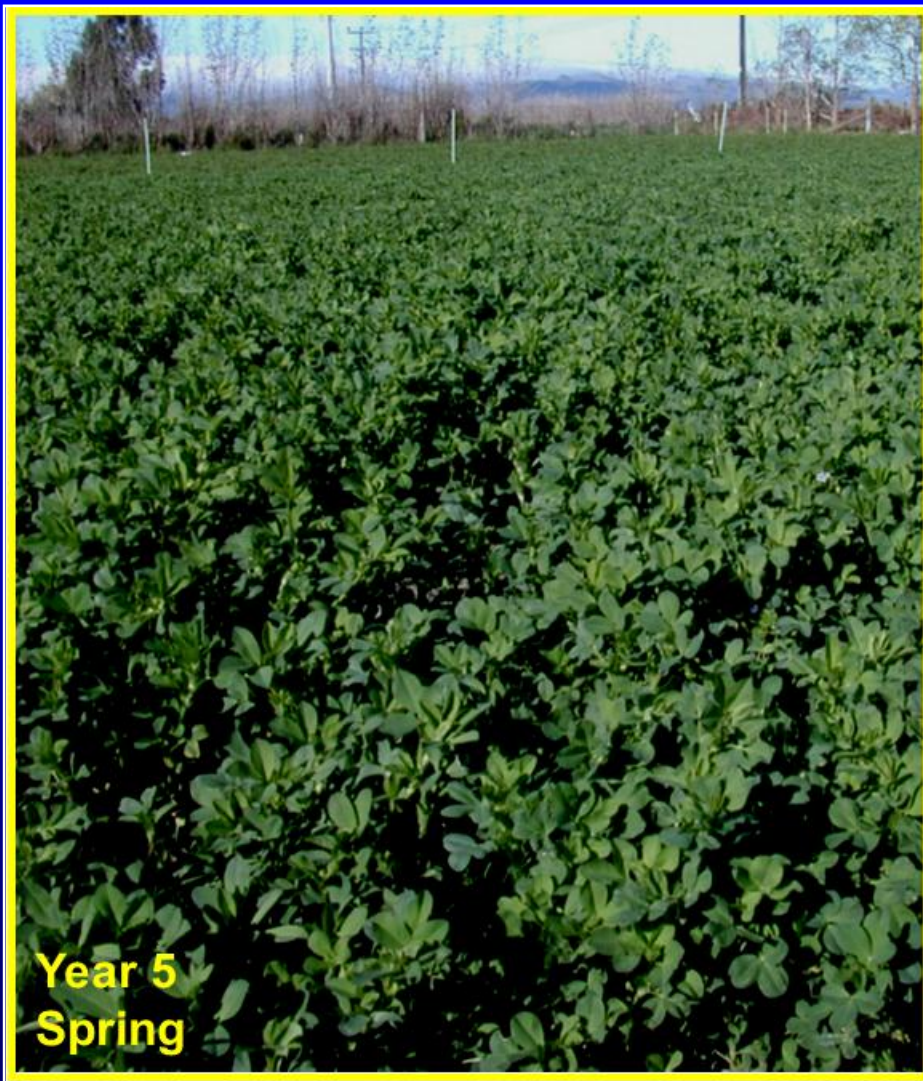
Botanical composition - Lucerne



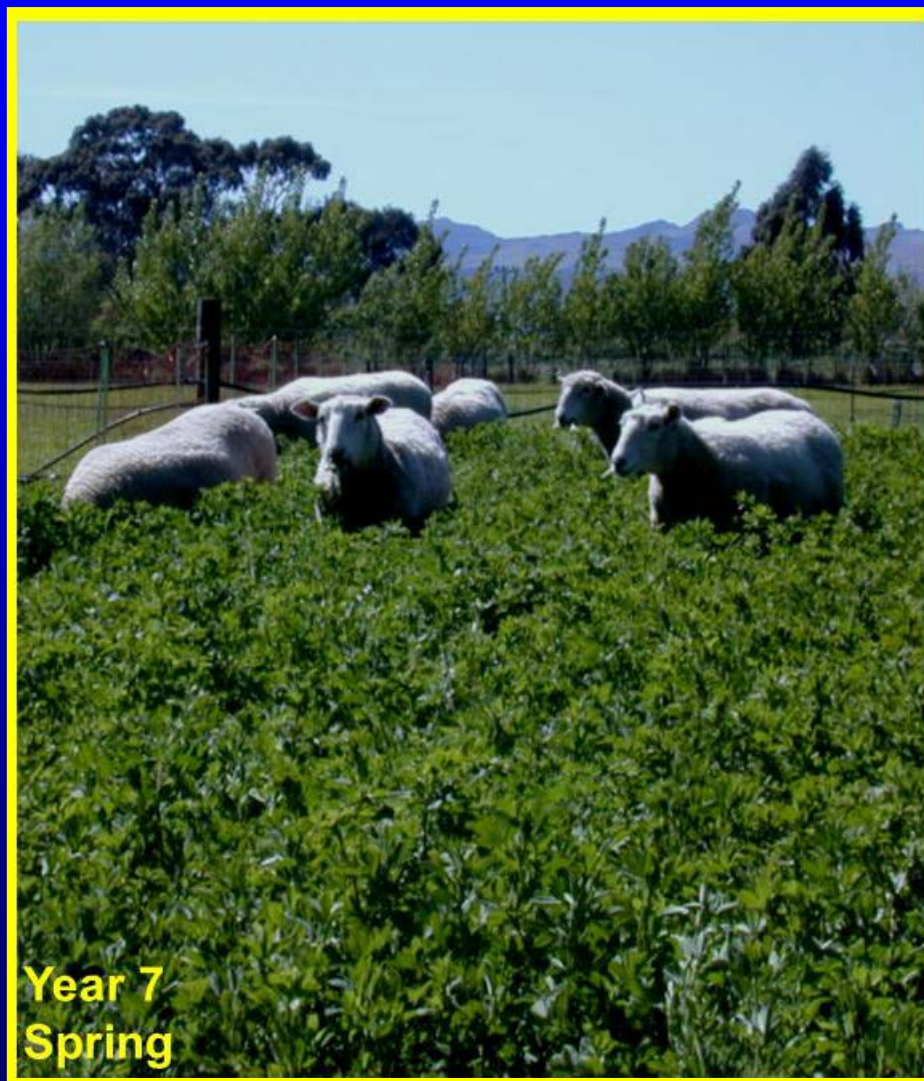
Annual LW production



Annual LW production



**Year 5
Spring**



**Year 7
Spring**

Conclusions

- **Lucerne:**
 - Highest DM and LW production
- **RG/Wc: >8 t DM/ha/y**
 - sown species 94% to <50%
- **CF/Sub: best grass based pasture**
 - Sub clover >3 t/ha/y (86% desirable spp in Yr 6)
- **Cocksfoot pastures with sub and white complement lucerne in summer dry environments with unpredictable rainfall**

Lucerne issues

Lambing time

- Average 23% higher but 3-weeks later
- Ewes and lambs on lucerne pre-weaning?
- Increase flexibility of lucerne management
 - “graze at 10% flowering?”

Growth:

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

Development:

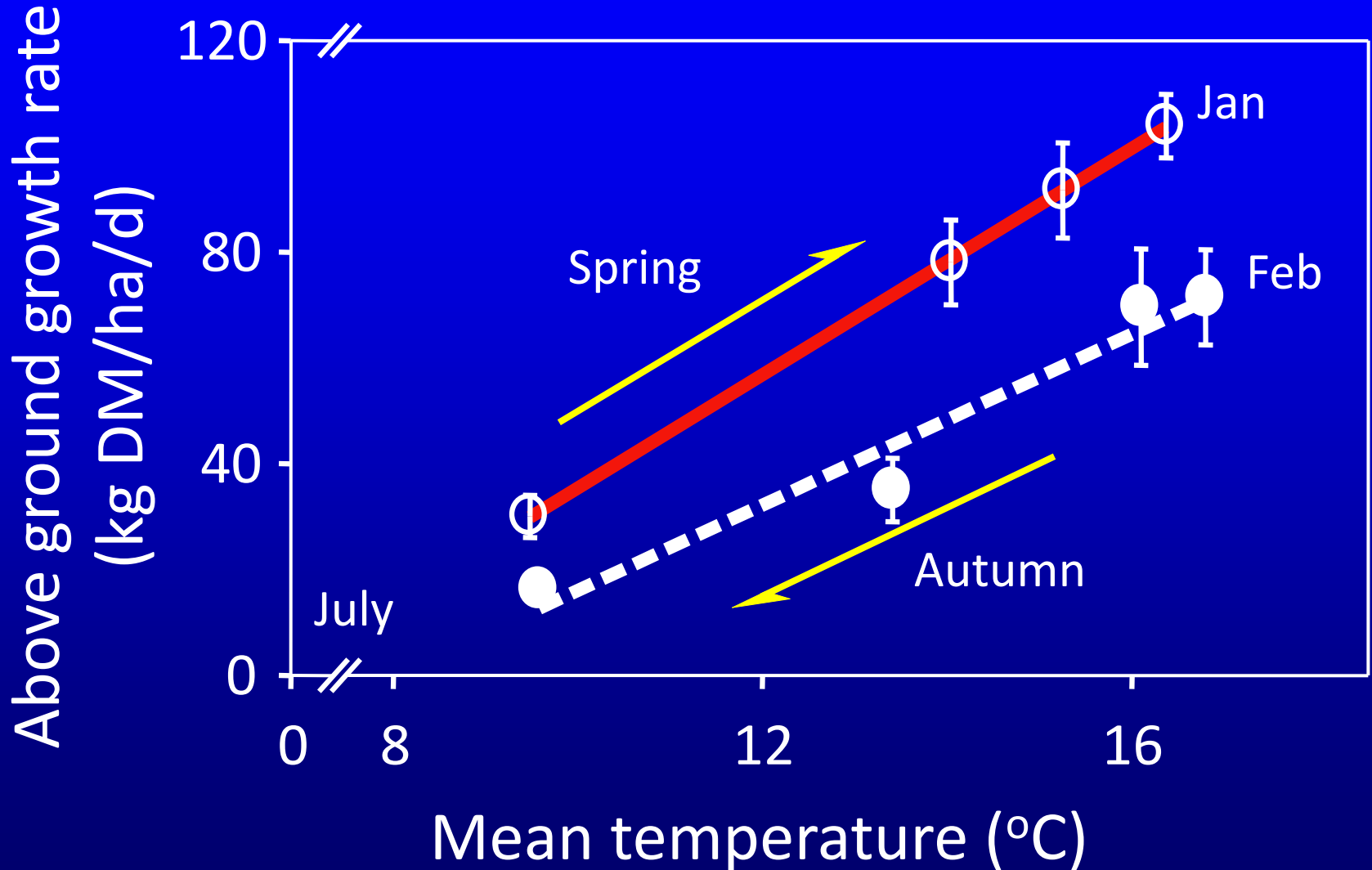
is the 'age' or maturity of the regrowth crop e.g. leaf appearance, flowering

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

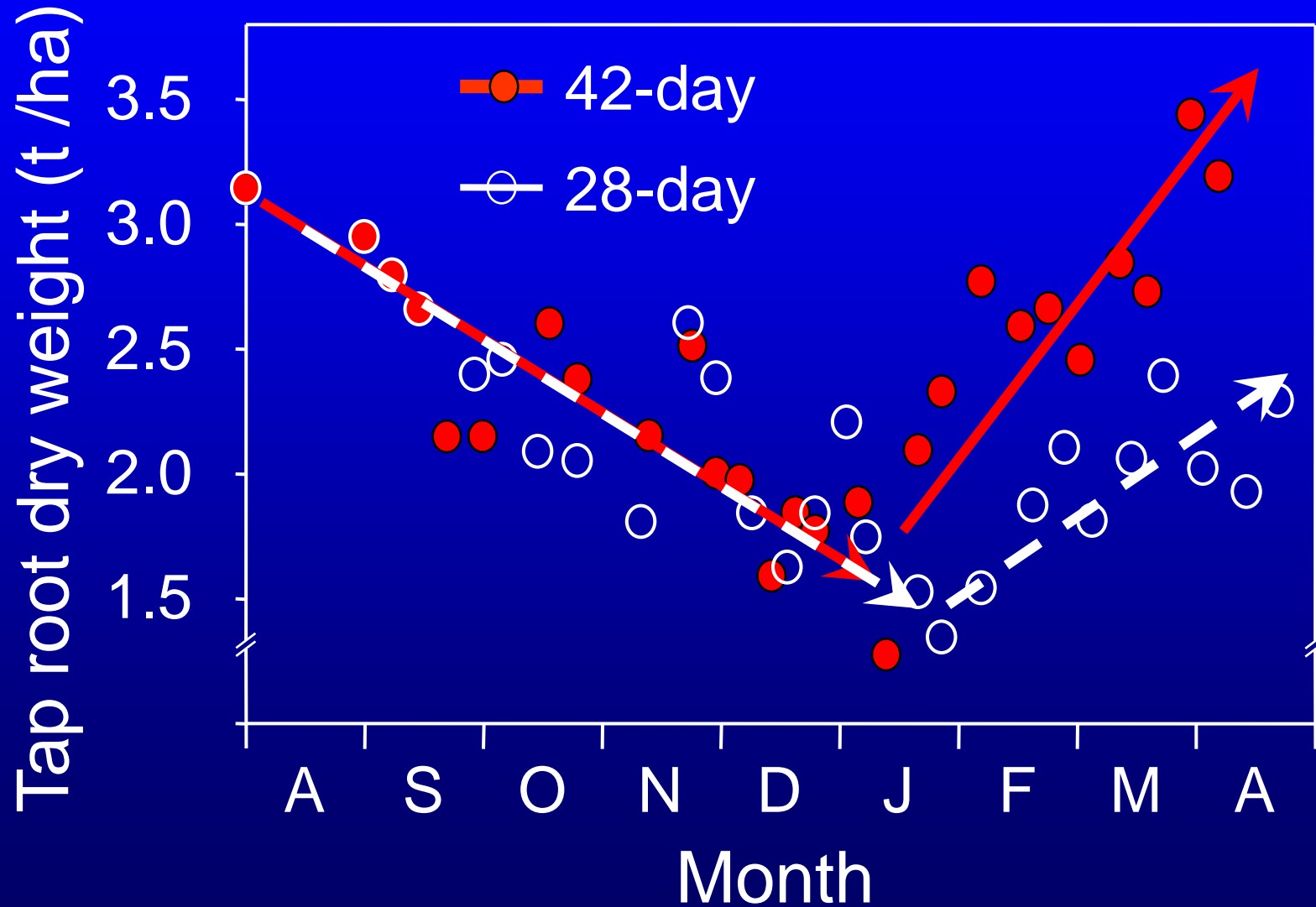
The Canopy: the energy capture device



Vegetative growth



Partitioning to roots



**28-day
rotation**



**42-day
rotation**

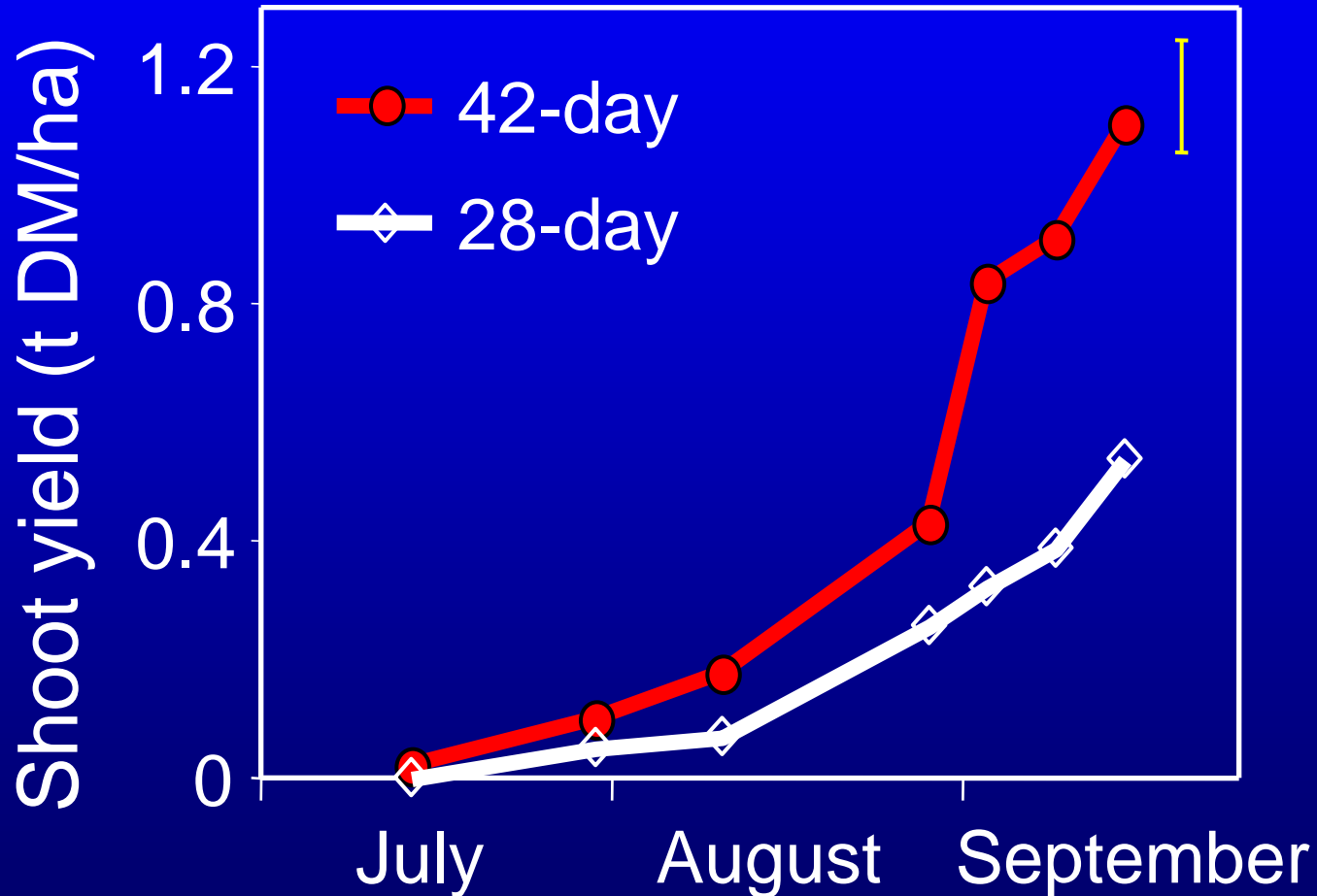
Seasonal grazing management

Early autumn (Feb-April)

- drought \Rightarrow graze standing herbage
- allow 50% flowering
- long rotation

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

Dry matter production in spring





First paddocks grazed in autumn are
first paddocks used in spring.

Lucerne development

A) Vegetative

- Leaf appearance at successive nodes morphology
- Constant in Thermal time
 - 35 °Cd in winter – summer
 - delayed in autumn (40 - 60 °Cd)

8 Aug 2001

7
6
5
4
3
2
1
0

cm



22 Aug 2001

13
12
11
10
9
8
7
6
5
4
3
2
1
cm



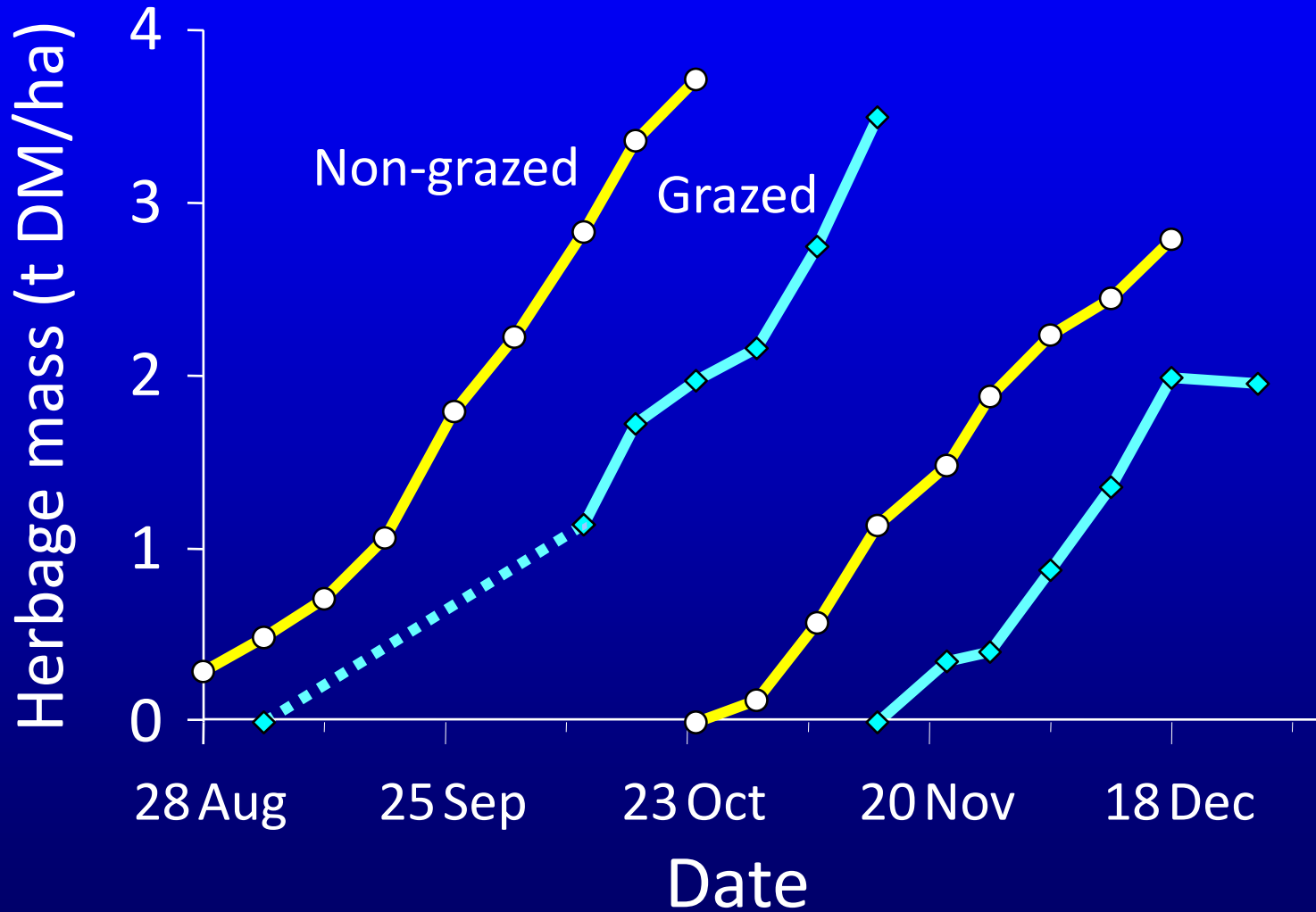
12 Sep 2001



Photo: H.E. Brown



Dryland Lucerne - Ashley Dene



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 June
nodes developing at low temperatures*

Lucerne development

B) Reproductive (flowering)

- Long day plant
flowers earlier in summer than spring/autumn due to photoperiod
- Time of flowering is also temperature dependent
e.g. 380-550 °Cd as photoperiod changes (14.5-16.5 h)



Photo: K.M. Pollock

Implications for 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

Photo: Bonaveree, Marlborough

Lambing (set stock) on grass paddocks



11/08/2004



Once priority stock go onto lucerne.... They stay on it!

Doug and Fraser Avery "Bonaveree"
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 (10 day max.)
- allowance 2.5-4 kg DM/hd/d – increase later in season








Summary

- Spring is animal priority
 - *can graze before flowering or buds (2000 kg DM/ha)*
- Ewes and twin lambs pre-weaning
- Autumn/winter is time for the plant
- Always 7-10 day rotation – spring, summer and autumn
- High quality feed for high value stock
- Never set stock lucerne

A photograph of a lush green field of lucerne (alfalfa) with several sheep. In the foreground, a large, thick-fleeced sheep stands on the right, looking towards the camera. To its left, a smaller lamb is partially visible. In the background, two more sheep are grazing. A white speech bubble with a black outline is positioned in the upper center of the image, containing the text "They grow healthier with lucerne...".

*They grow
healthier with
lucerne...*

References

- 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.
- Mills, A., Smith, M. C. and Moot, D. J. 2008. Liveweight production from dryland lucerne, cocksfoot or ryegrass based pastures. *In: Global Issues, Paddock Action. Proceedings of the 14th ASA Conference, 21-25 September 2008, Adelaide, South Australia* http://www.regional.org.au/au/asa/2008/concurrent/managing_pastures/5830_millsa.htm.
- 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.