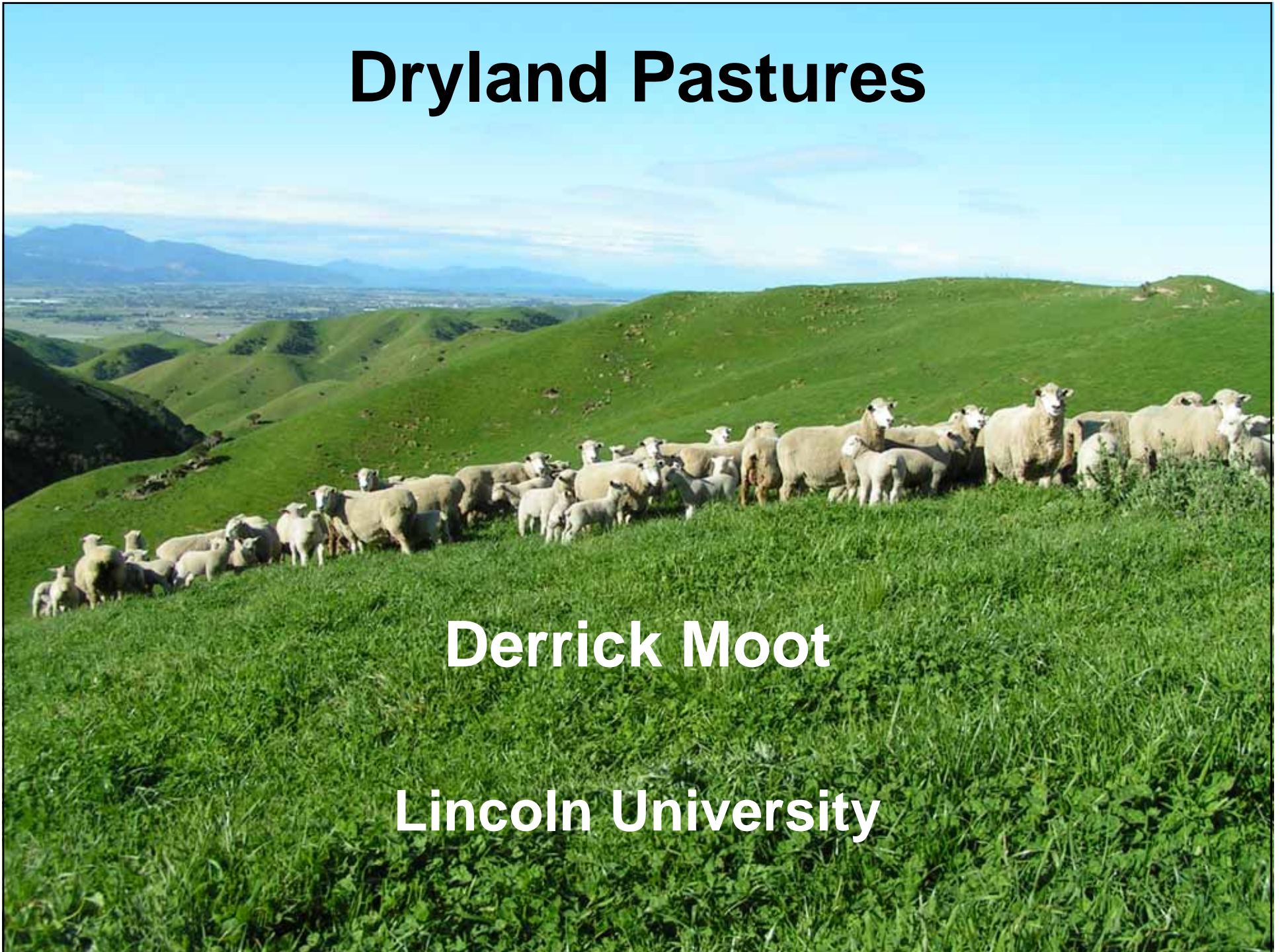


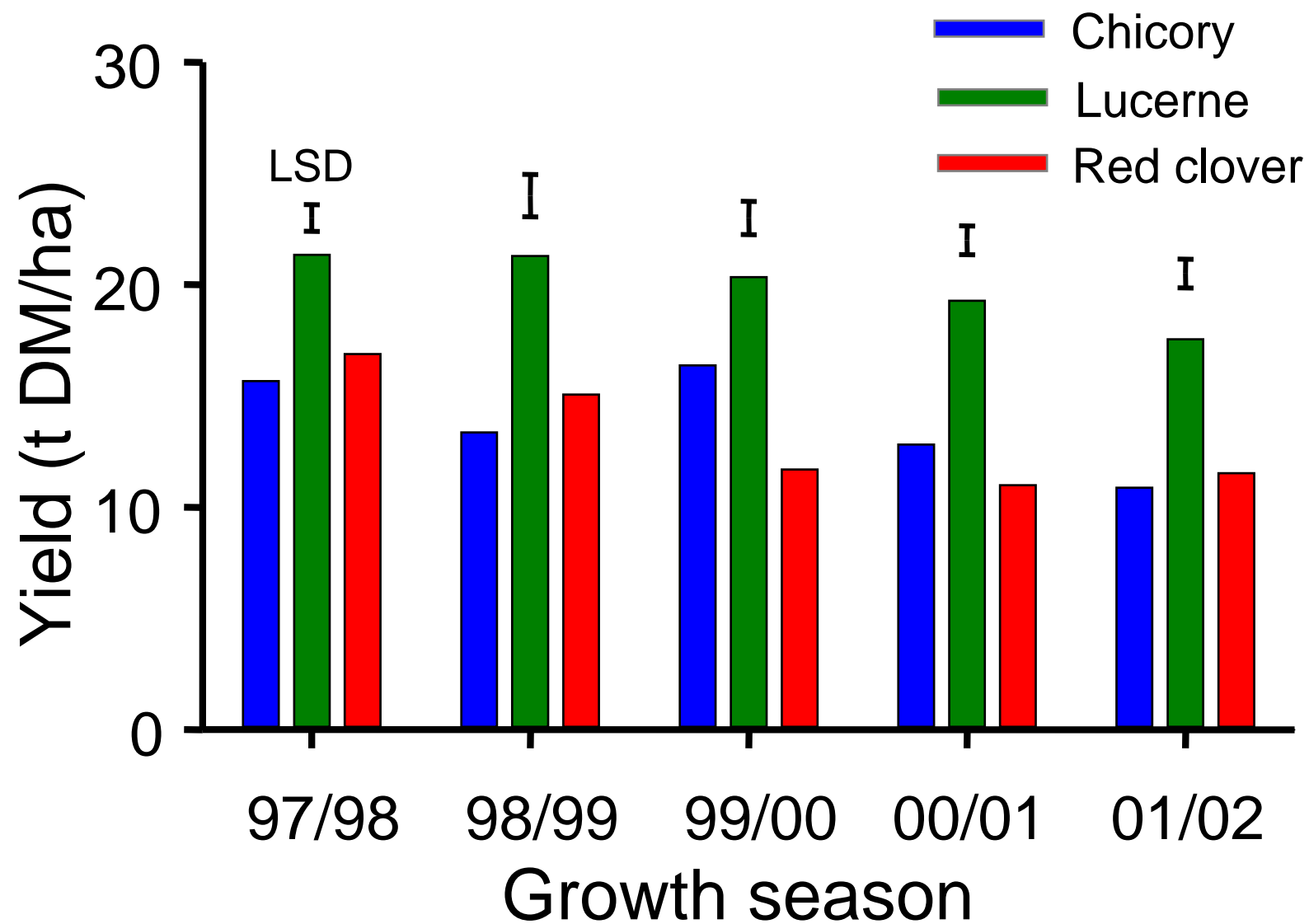
# Dryland Pastures

**Derrick Moot**

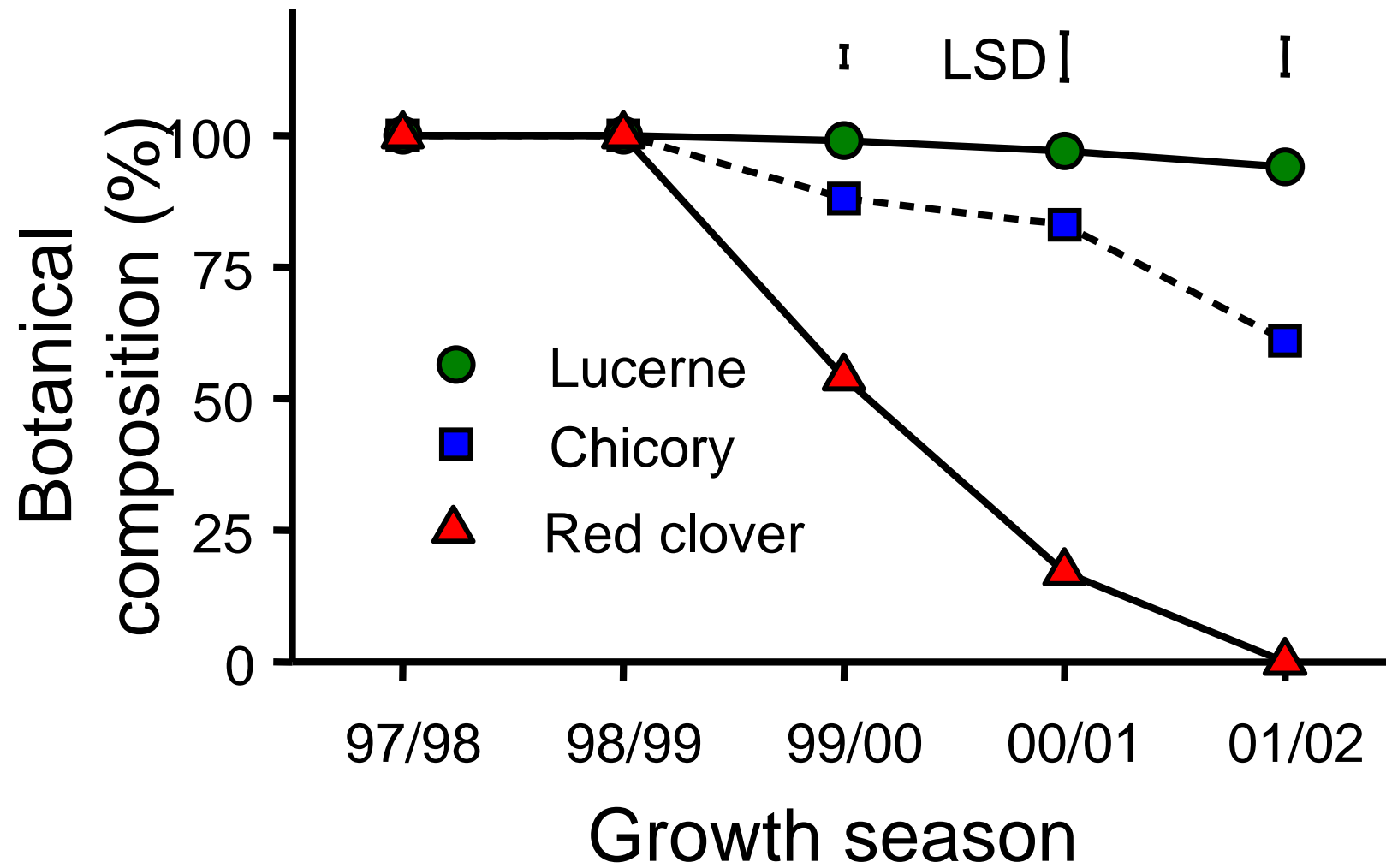
**Lincoln University**



# Annual dry matter yields

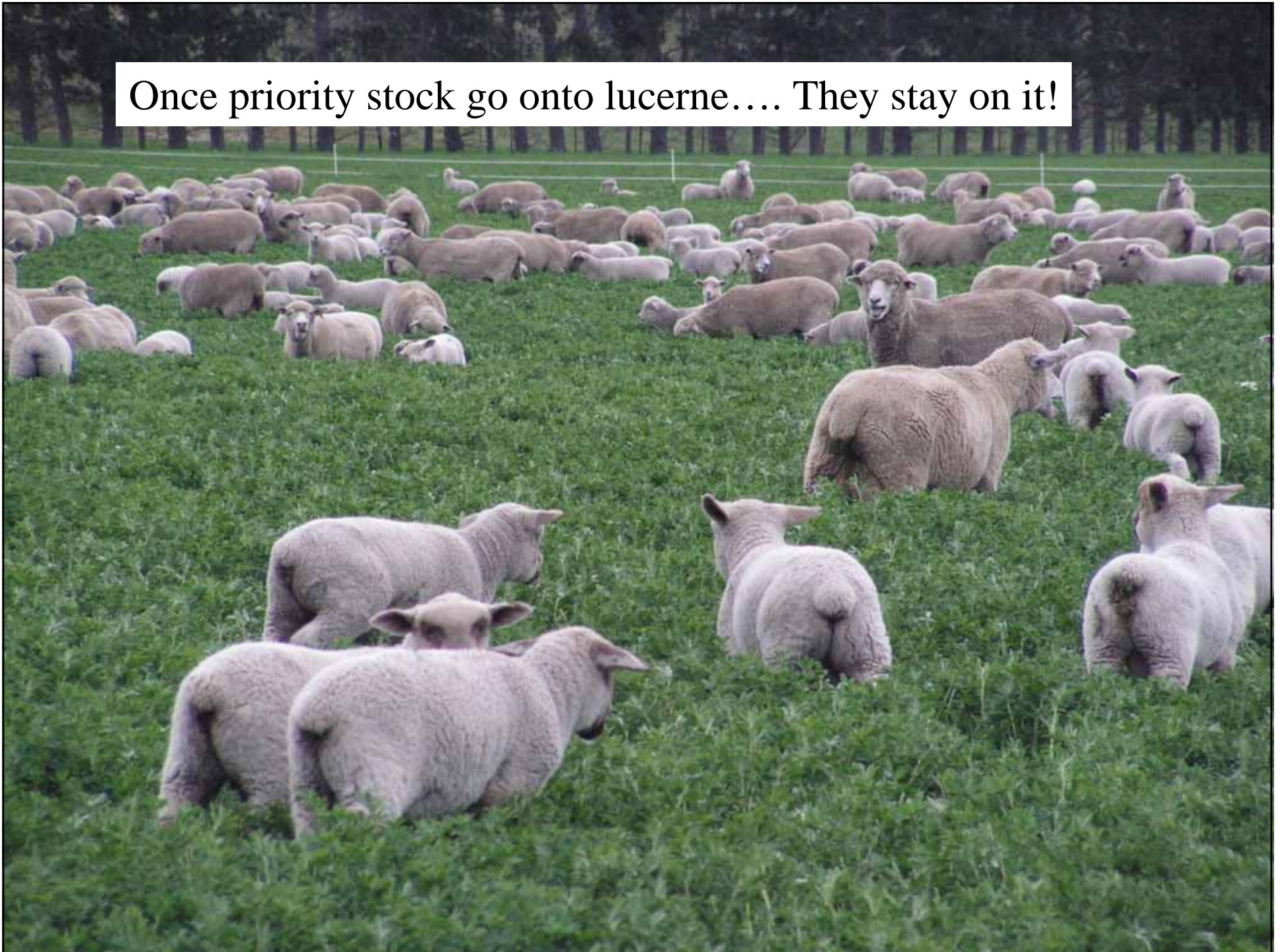


# Persistence

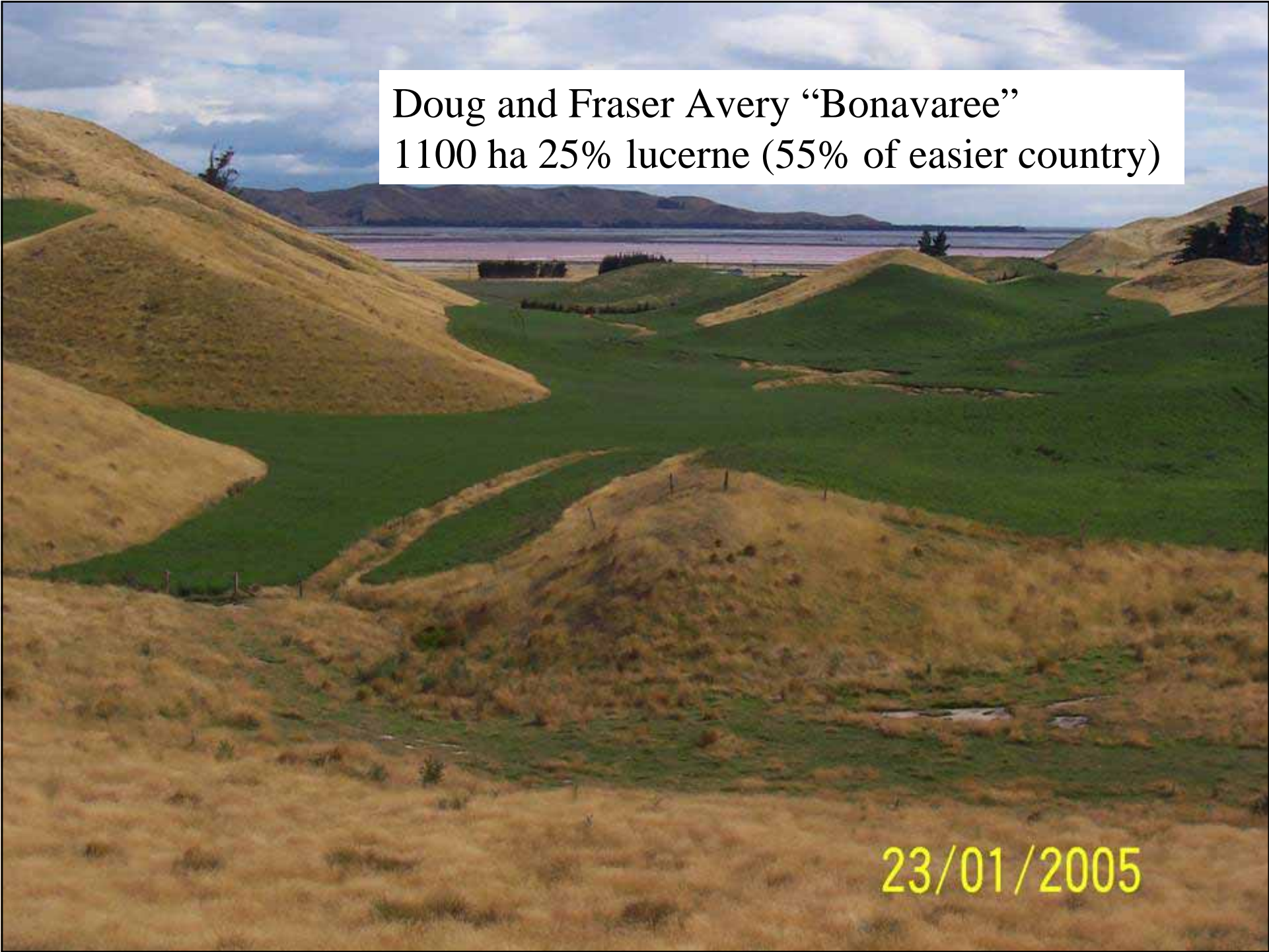




Once priority stock go onto lucerne.... They stay on it!







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

23/01/2005





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

**- flushing at Bonaveree**

04.03.2009



**These are urine patches**

400 kg N/ha

15 t DM/ha/yr

← 30 kg DM/mm water

**this is GRASS...**

↑ 6 t DM/ha/yr

10 kg DM/mm water

**N deficient grass**





Tall fescue

Cocksfoot

Perennial Ryegrass



# Objective

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



# Materials & Methods

- **RCB**
  - RG/Wc
  - Luc
  - CF/Sub

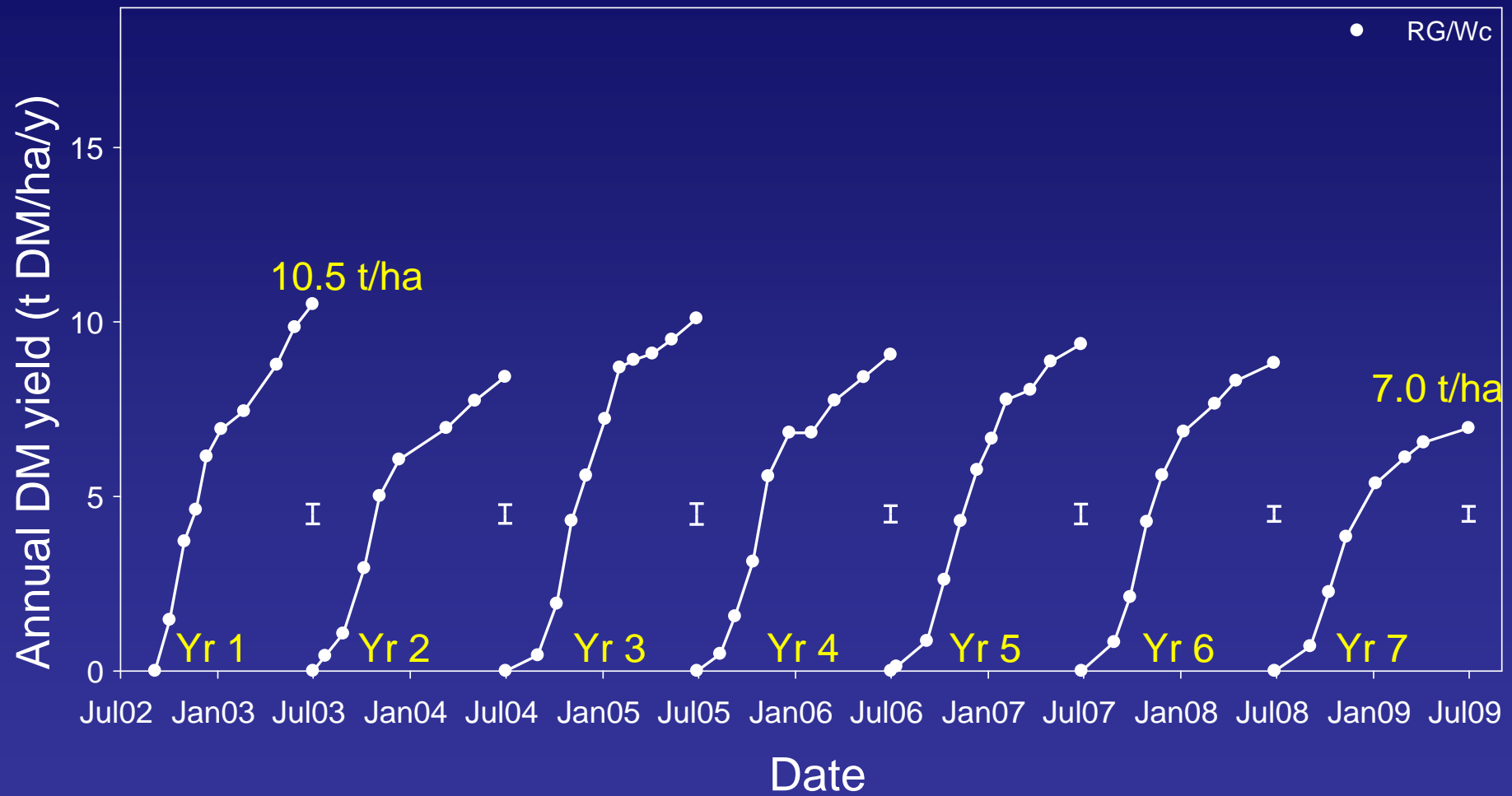
- 6 replicates
  - 0.05 ha plots

Established autumn 2002

MEAT & WOOL  
NEW ZEALAND

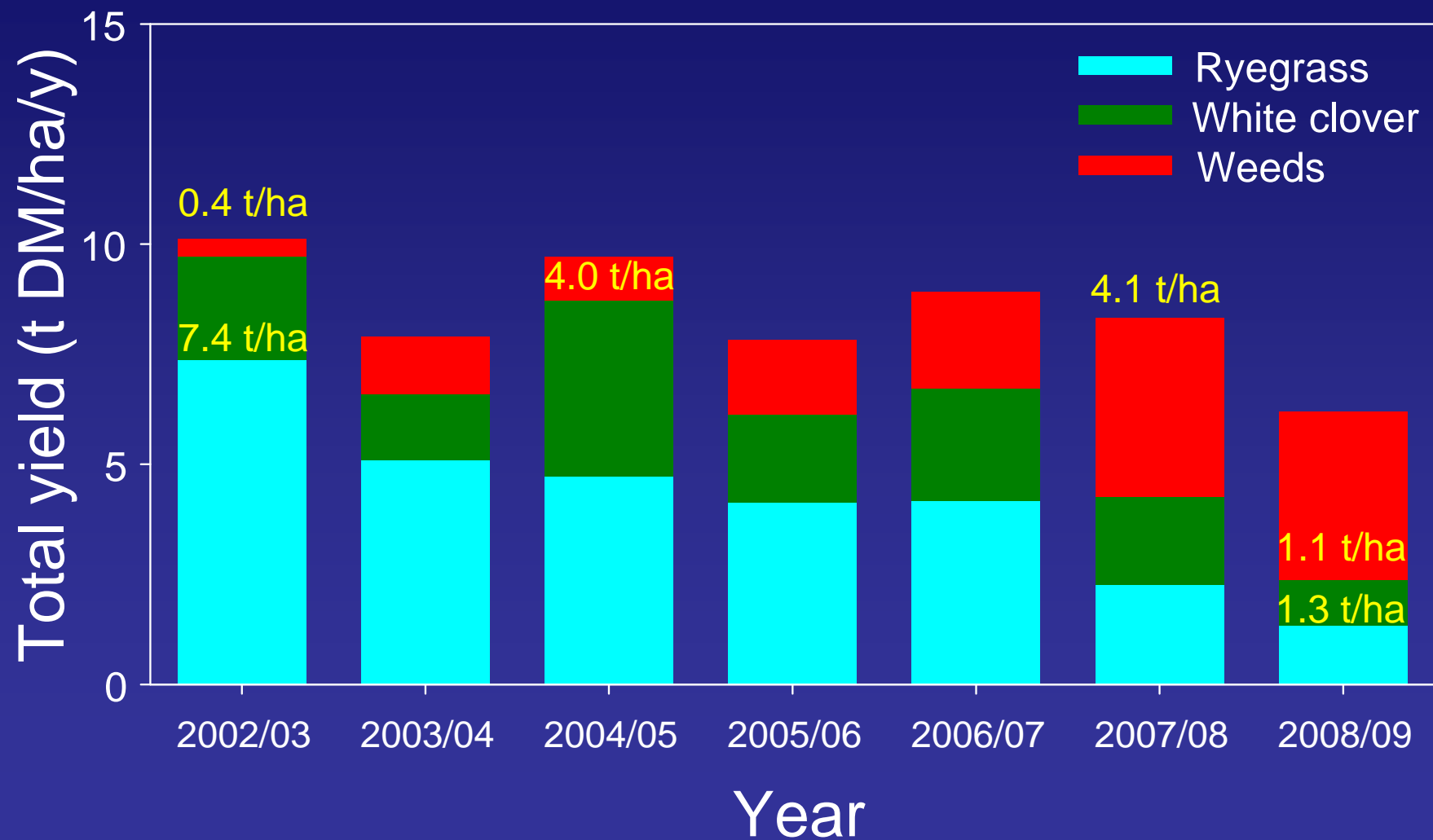


# Results - Total Annual Yield





# Botanical composition - RG/Wc





# Annual LW production

Year 2

Spring



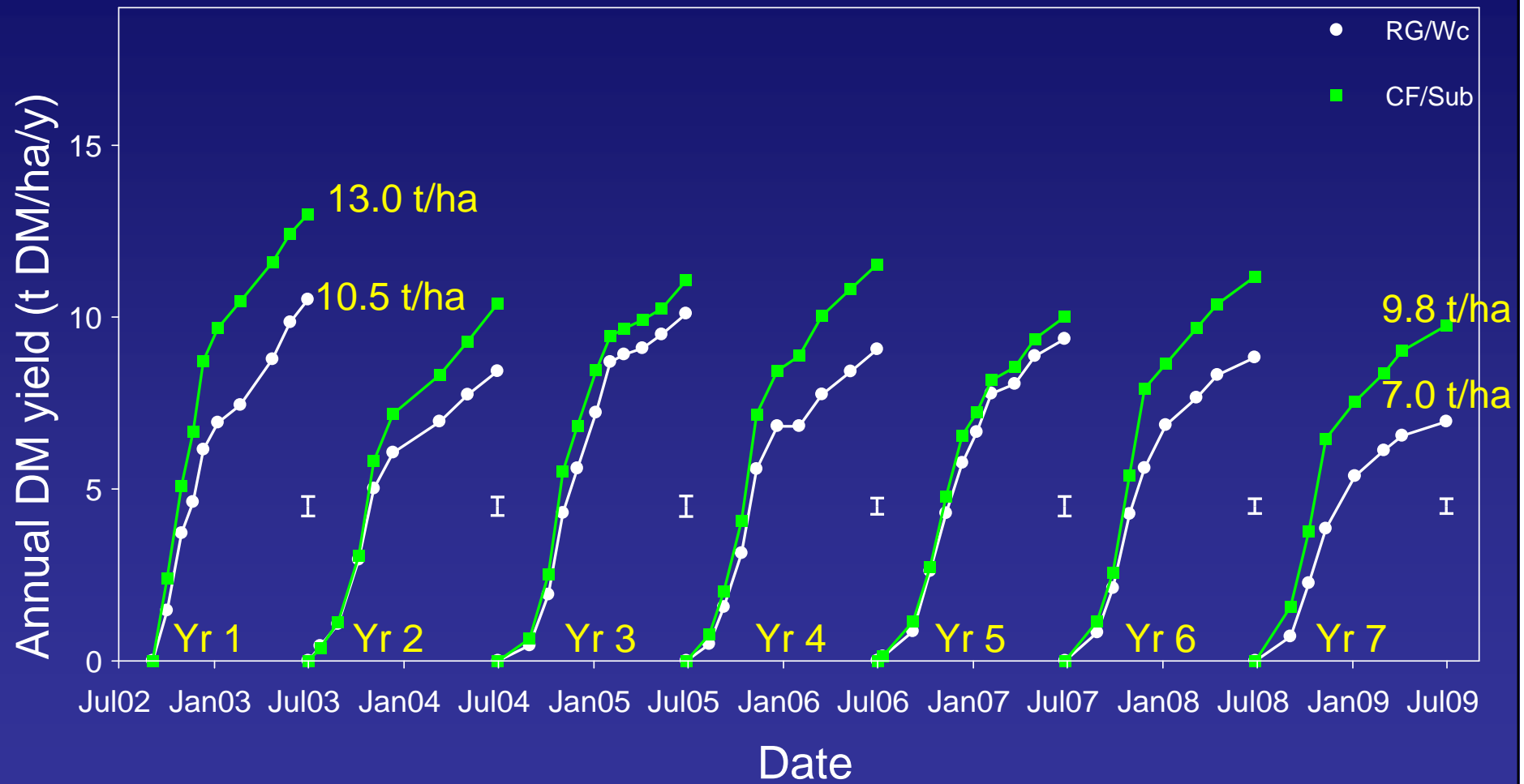
Year 4

Summer



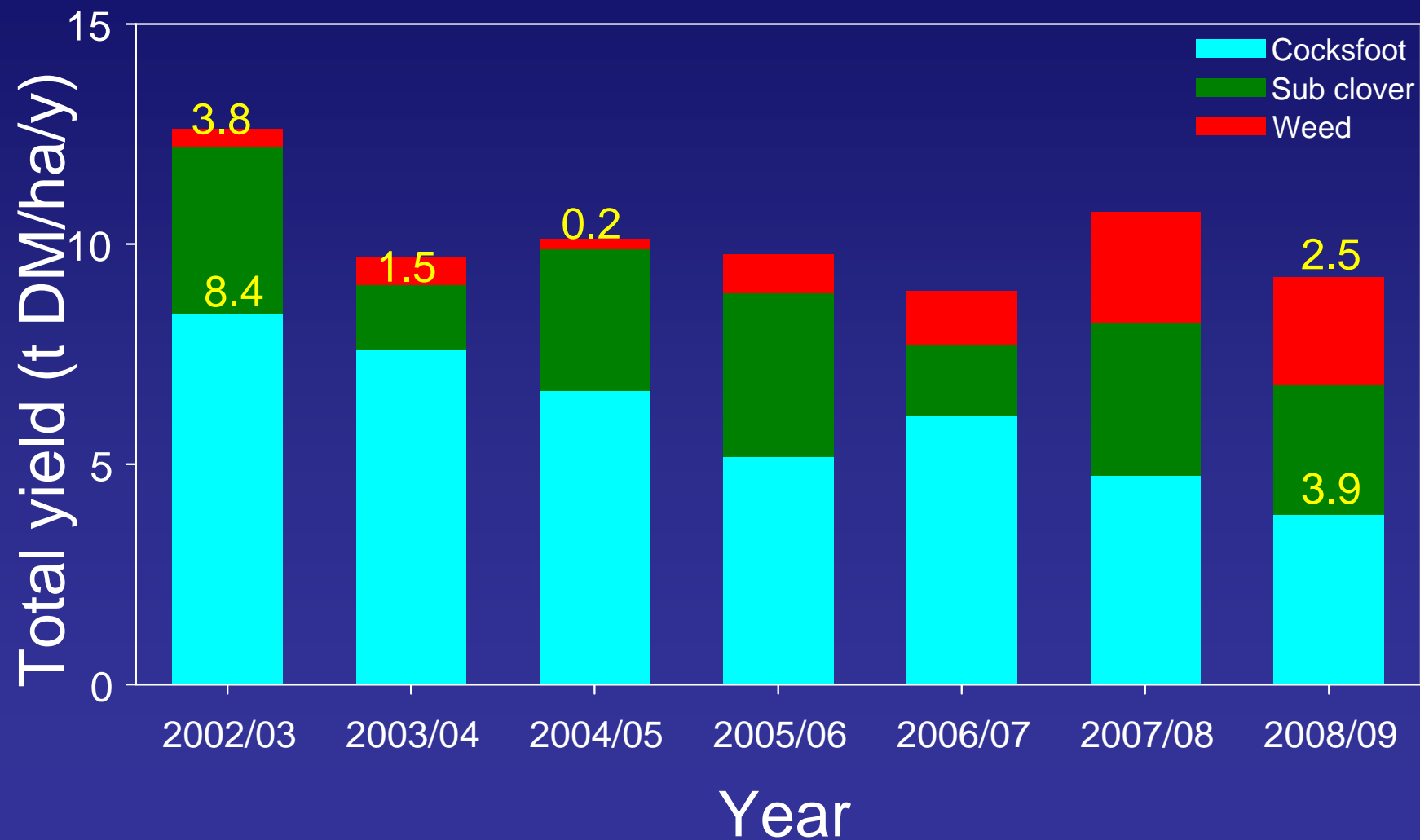


# Results - Total Annual Yield



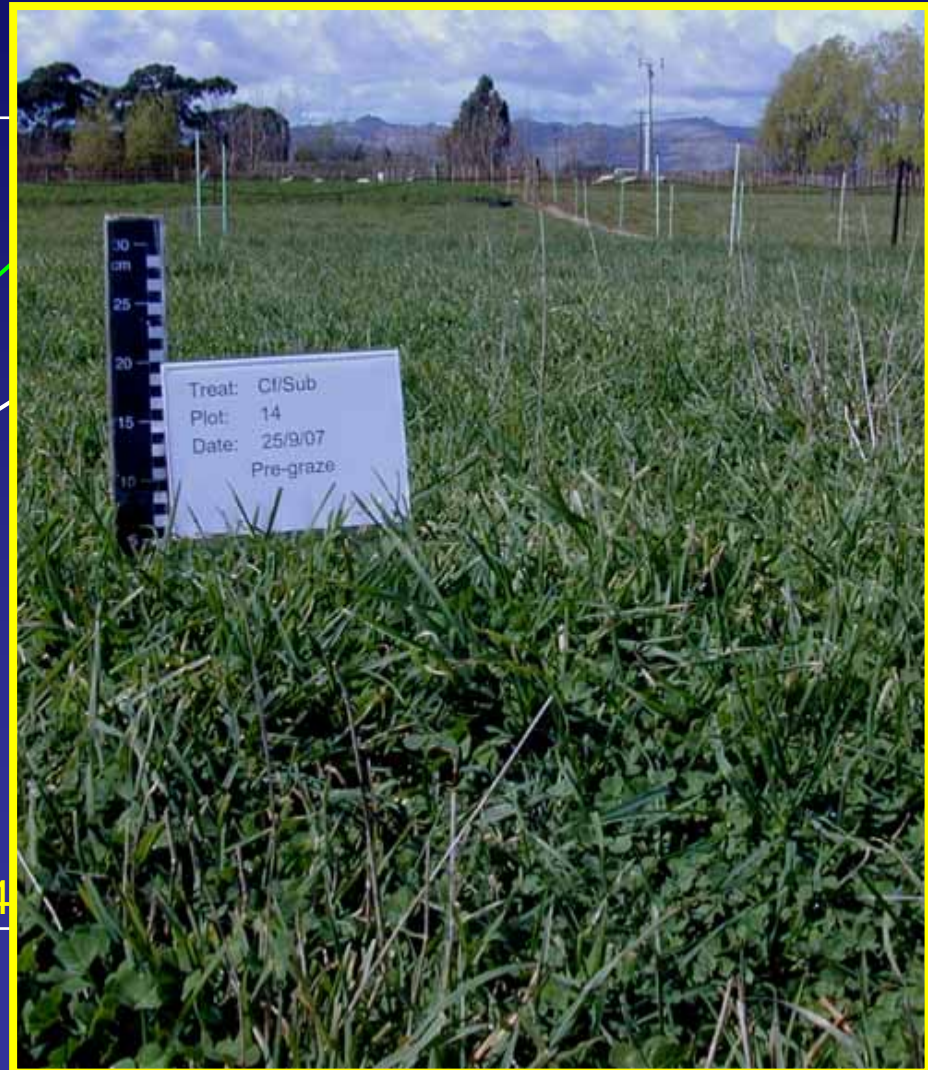


# Botanical composition - CF/Sub



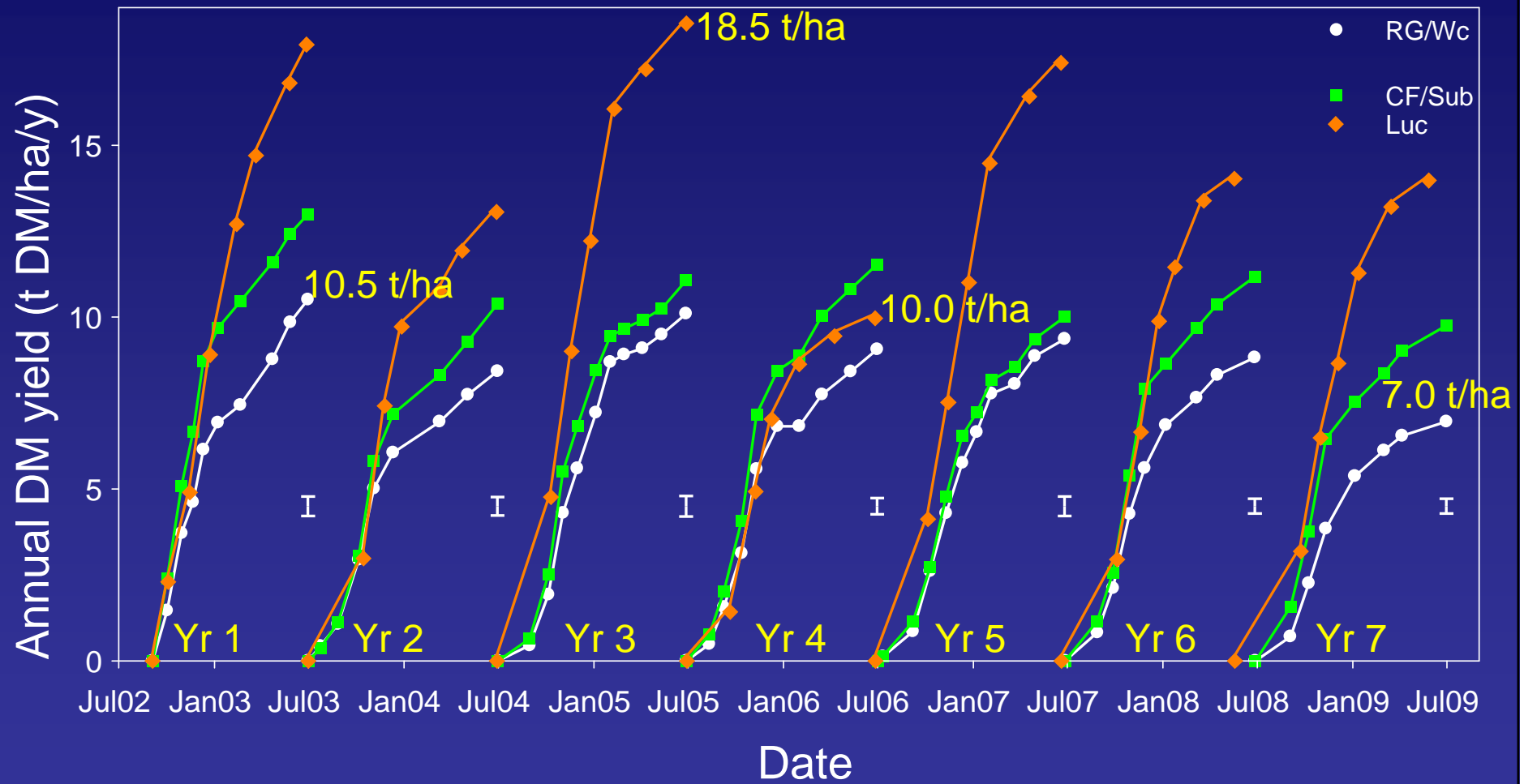


# Annual LW production



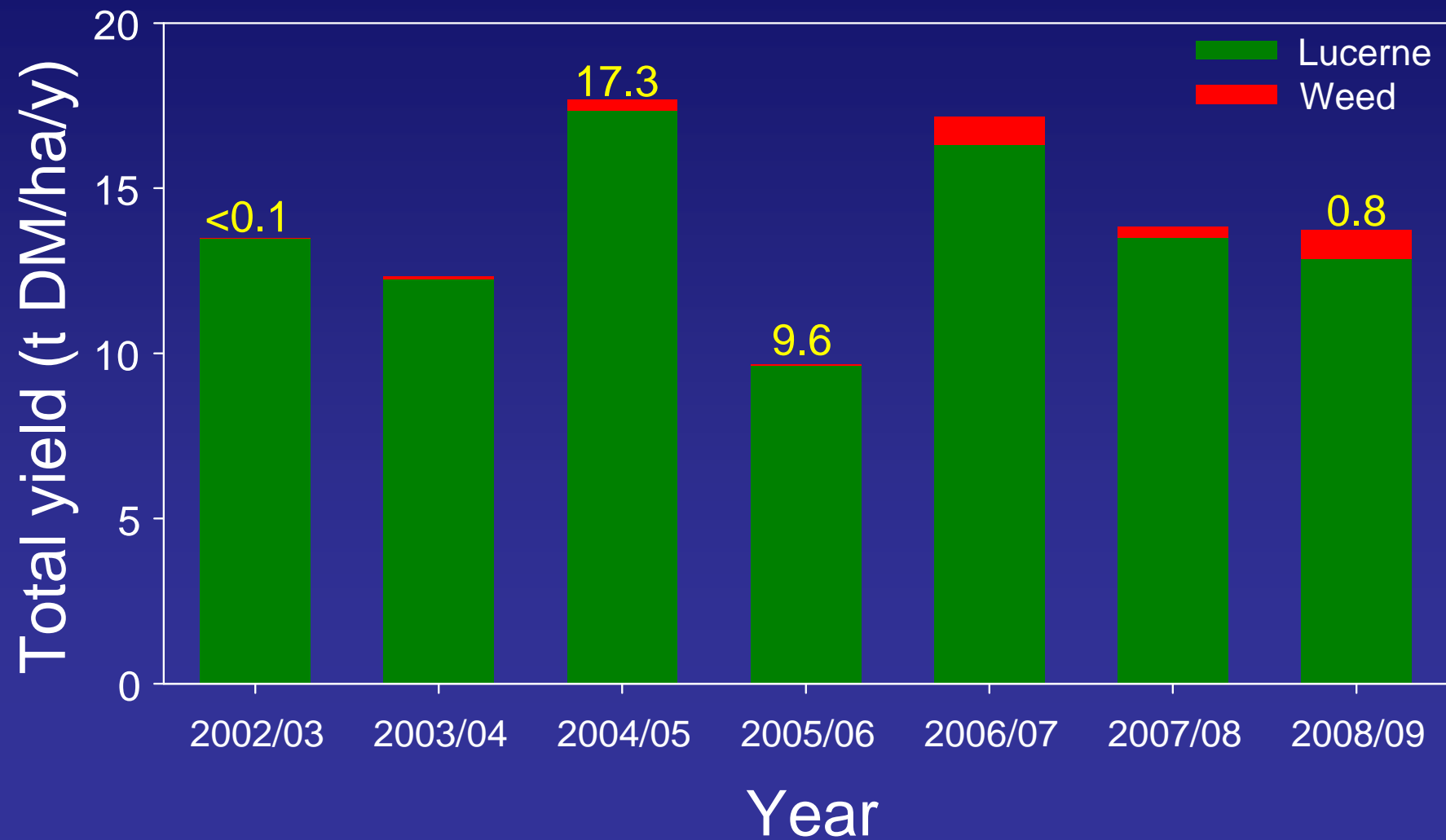


# Results - Total Annual Yield





# Botanical composition - Lucerne





# Annual LW production



# Summary

- **Lucerne** : If you can grow it do so – “king of forages”  
- learn how to graze it.
- **RG/Wc** : Weedy not persistent grass or clover suited to irrigated or high rainfall environments – endophyte?
- **CF/Sub**: Overall, best performing grass based pasture for lowland dryland situations –where you can drill – 10 kg/ha of cultivars with different flowering dates!



# Build seed bank in first year



Early flower – late Sept



Late flower – mid Oct



Seed maturing – early Nov



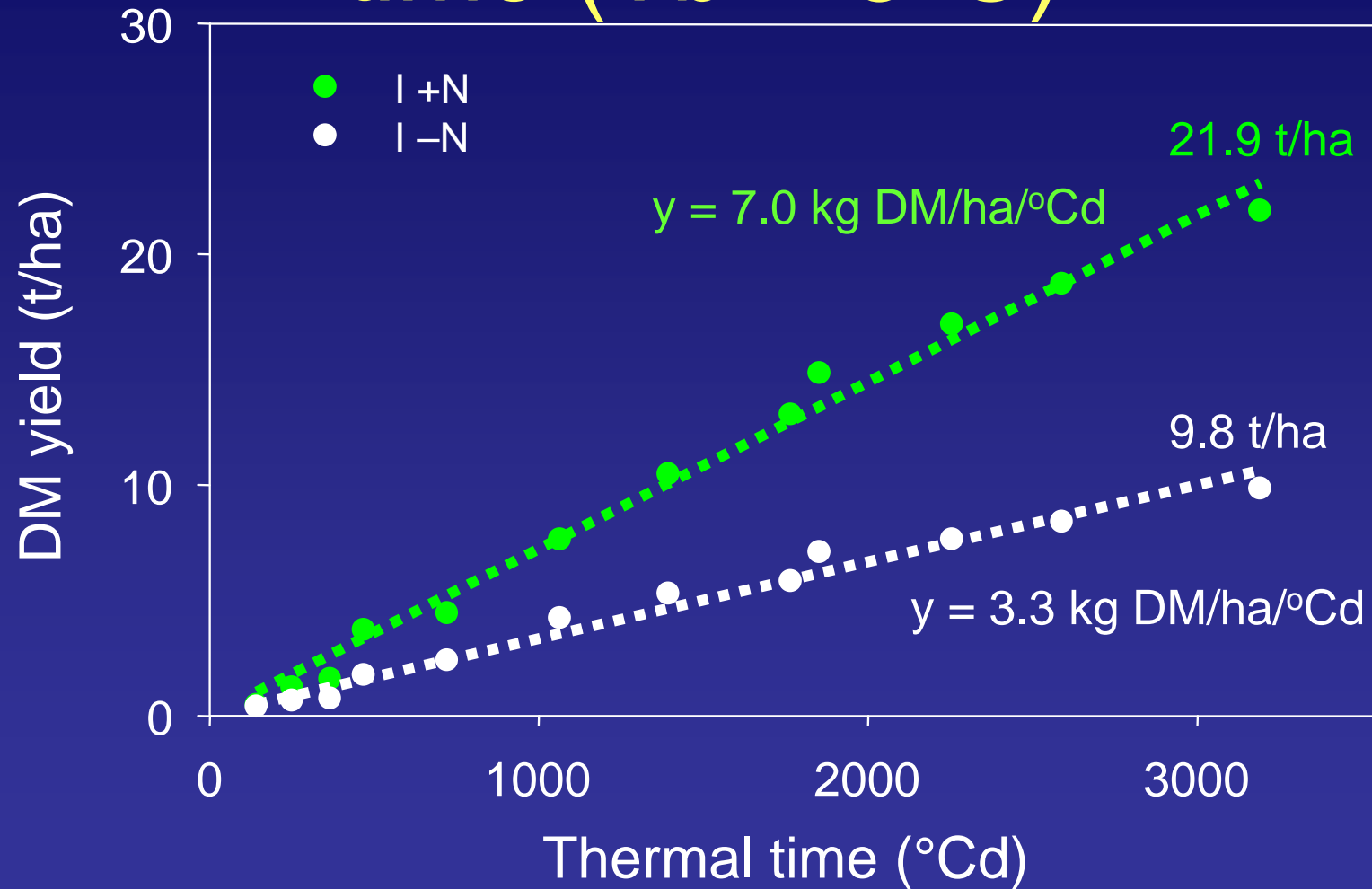
Mature seed – late Nov








# DM yield response to thermal time ( $T_b = 3^\circ\text{C}$ )

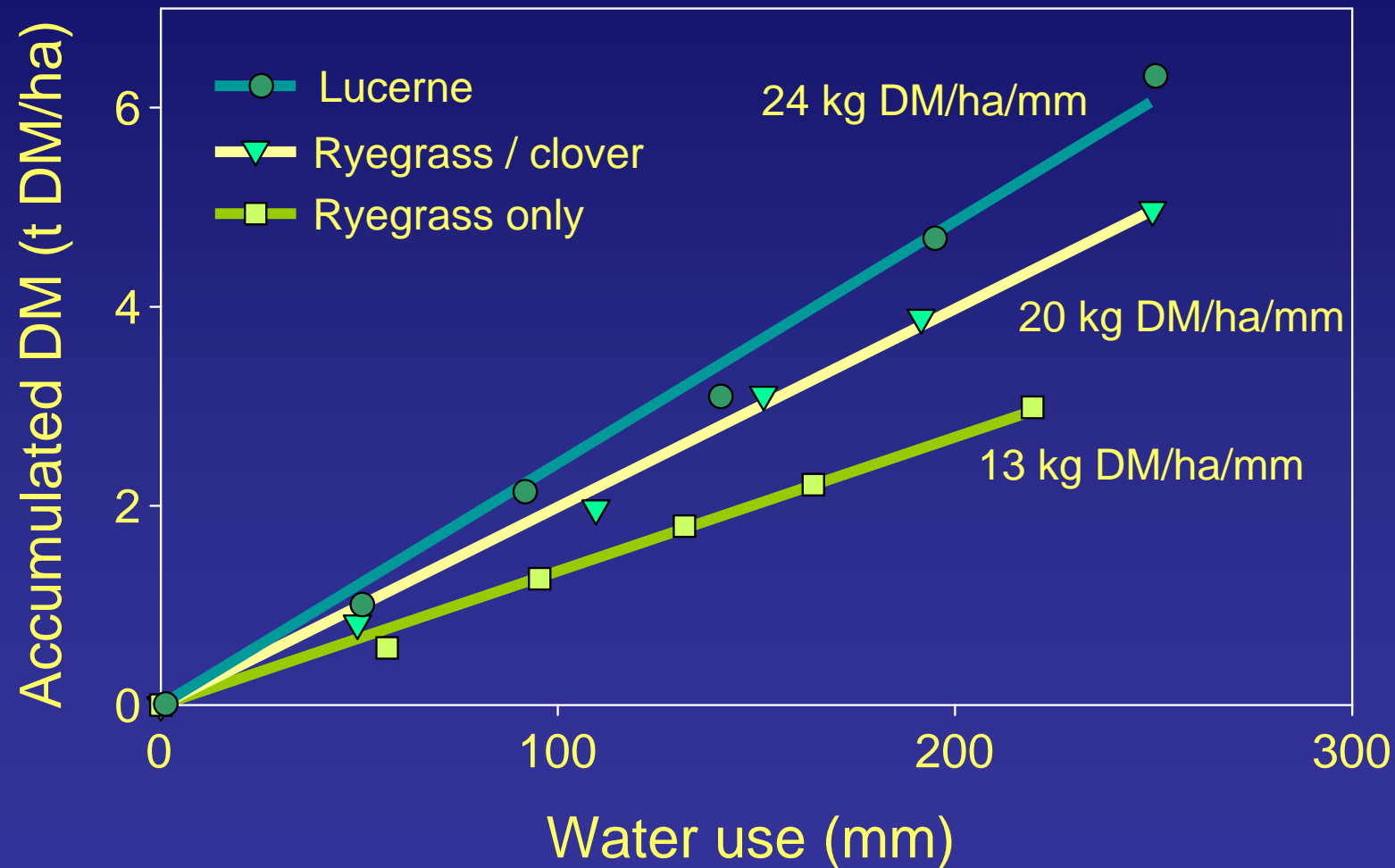




**Clover....(no grass)**  
**30 kg DM/mm water**



# Spring WUE: legume = (nitrogen)





**Sheep prefer 70% legume, 30% grass**

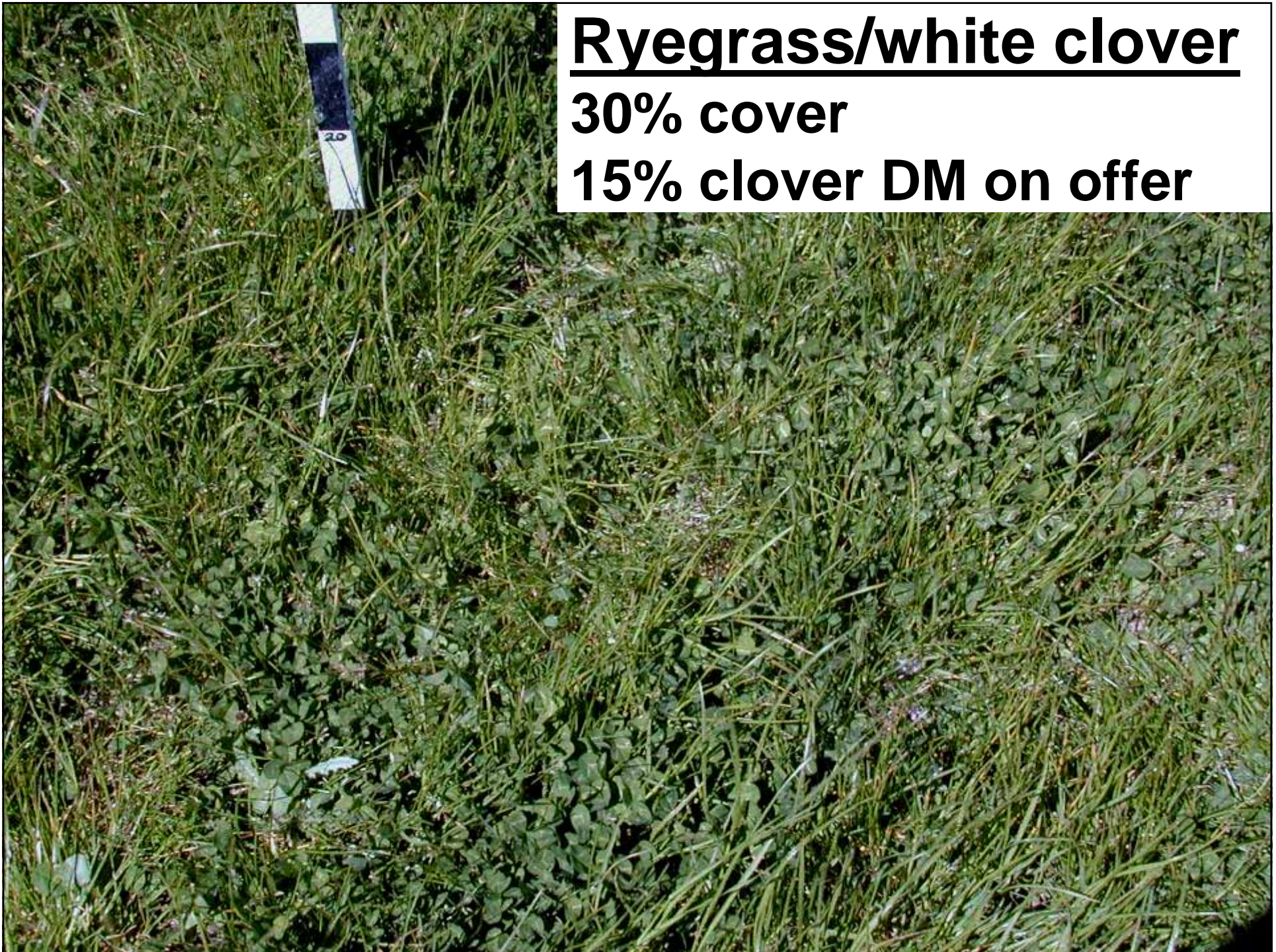




# Ryegrass/white clover

**30% cover**

**15% clover DM on offer**







**Tall fescue/Caucasian/Sub clover**  
**90% cover, 60% clover DM on offer**



# How to get more legume??

- Grass is a WEED!!!! (in the eyes of clover)
- Understand competition: - Grass vs. Legume
  - N, P, S, K – grass has more roots
  - Water – annual clovers, deep rooted perennials
  - Light – taller legumes?
- Management: -
  - Sow legume friendly grasses at low seeding rates
  - Grow legumes alone, overdrill grasses later
  - Use a range of legume species & cultivars
  - Avoid N fertiliser on grass/legume pastures
  - Build large seed bank in the first year, manage to maintain it

A wide-angle photograph showing a vast field of pink gland clover flowers. The flowers are small, numerous, and densely packed, creating a sea of pink. The green leaves of the plants are visible between the flowers.

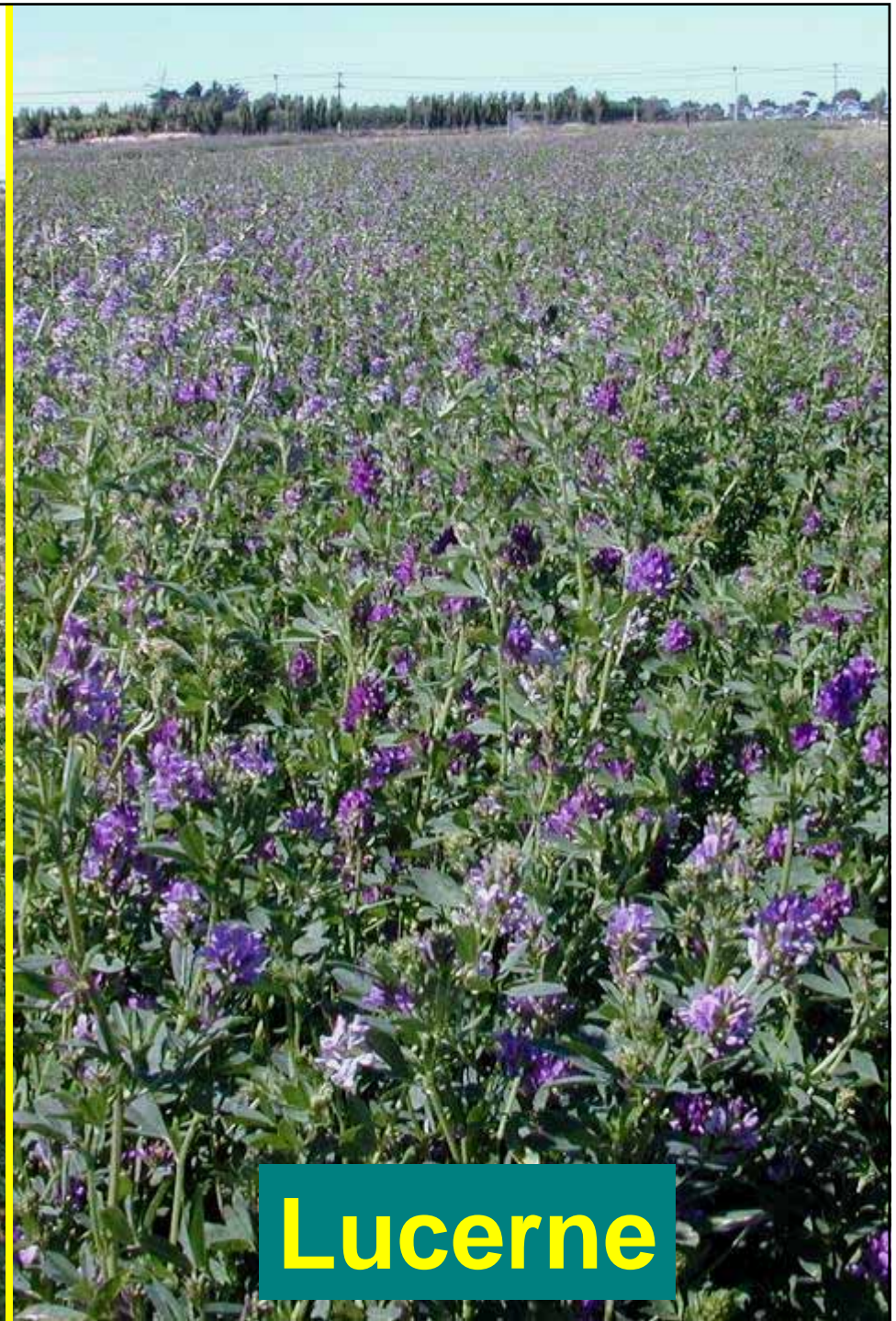
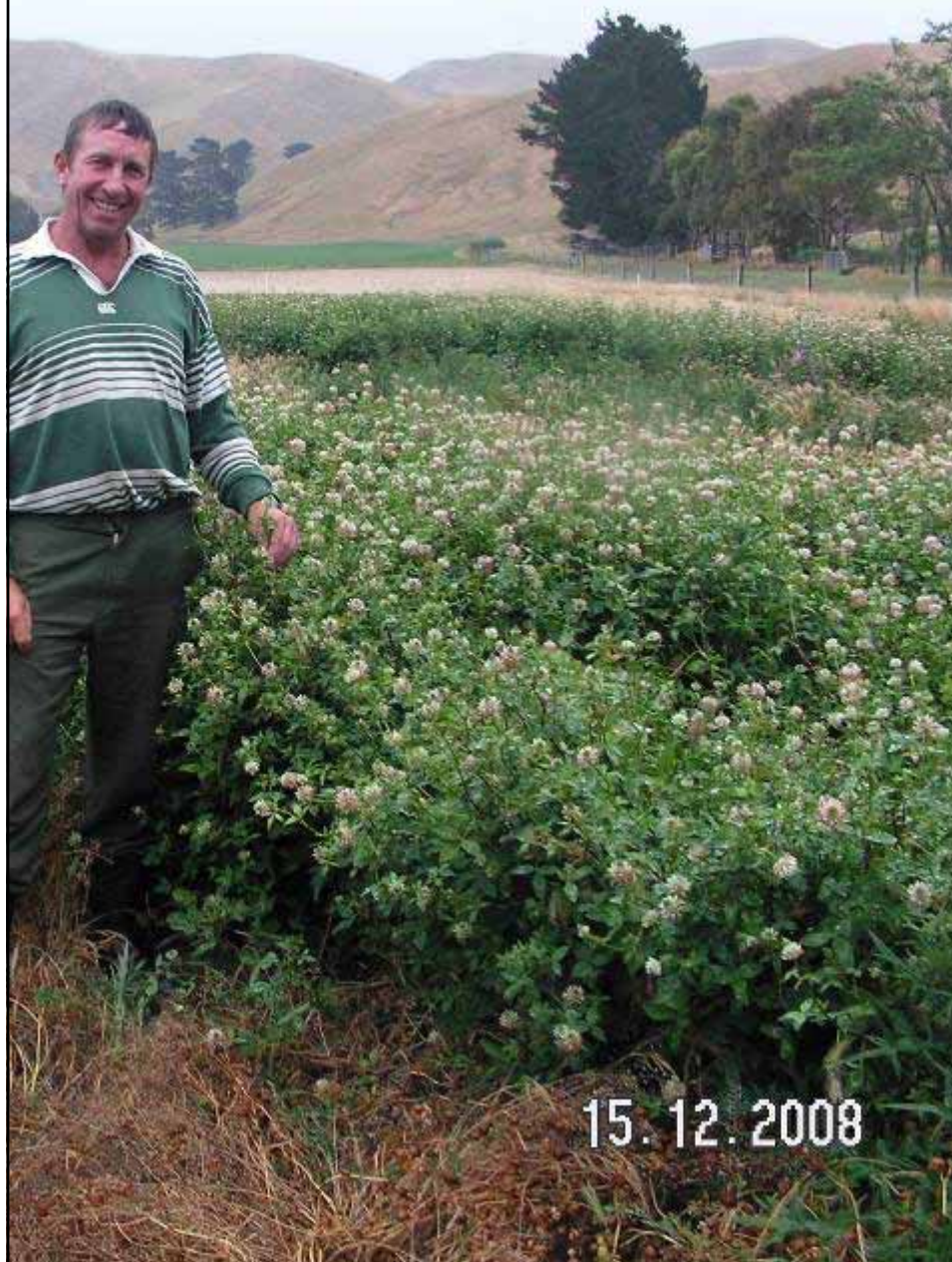
**Gland clover**

A close-up photograph of Balansa clover. The image shows several large, green, deeply lobed leaves with serrated edges. Above the leaves are several flower heads, which are clusters of small flowers, some in bloom and some as dried, brownish structures.

**Balansa clover**

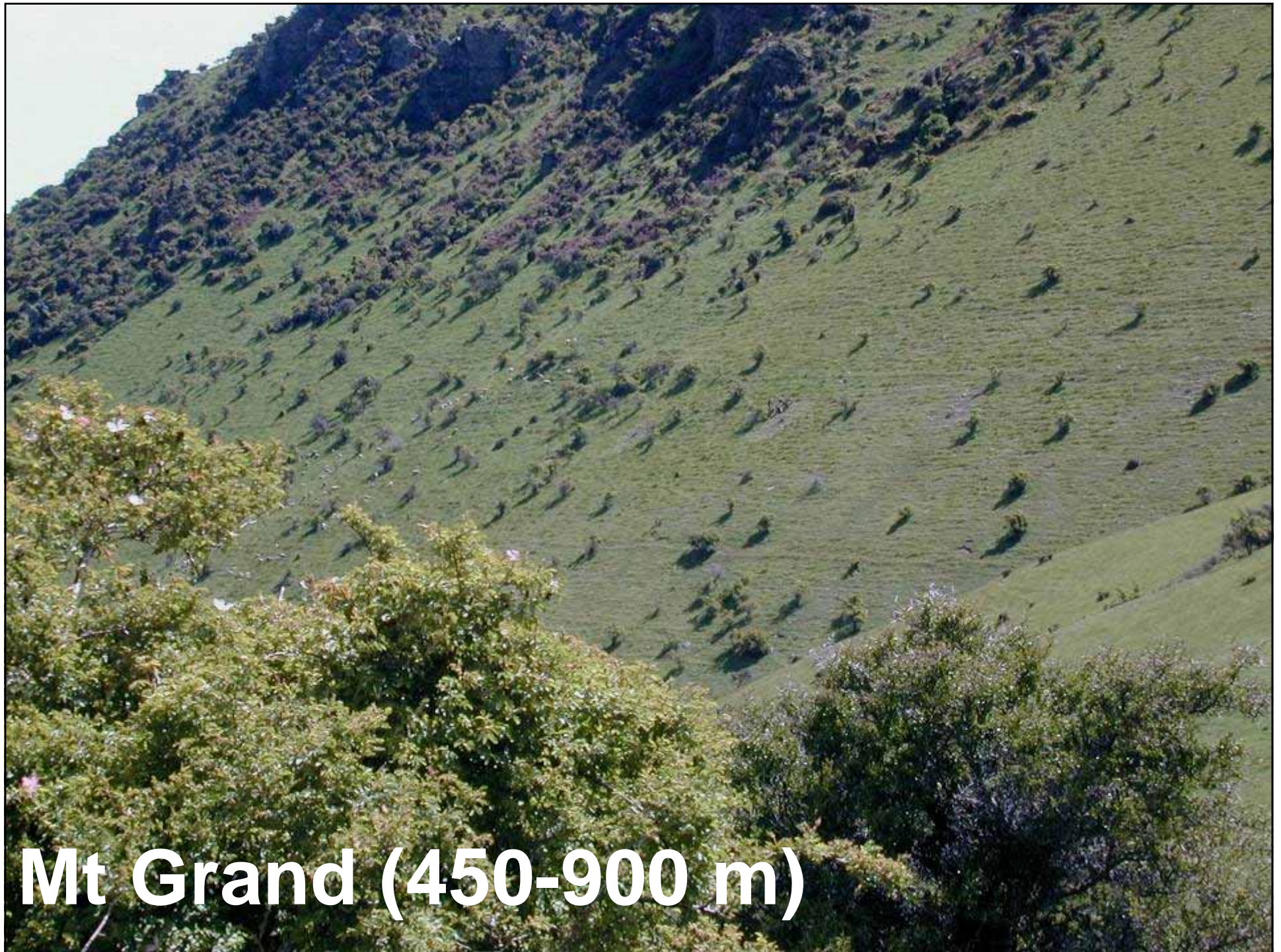


# Arrowleaf clover



**Lucerne**





**Mt Grand (450-900 m)**





**Cluster = where sub may grow**



**Striated**



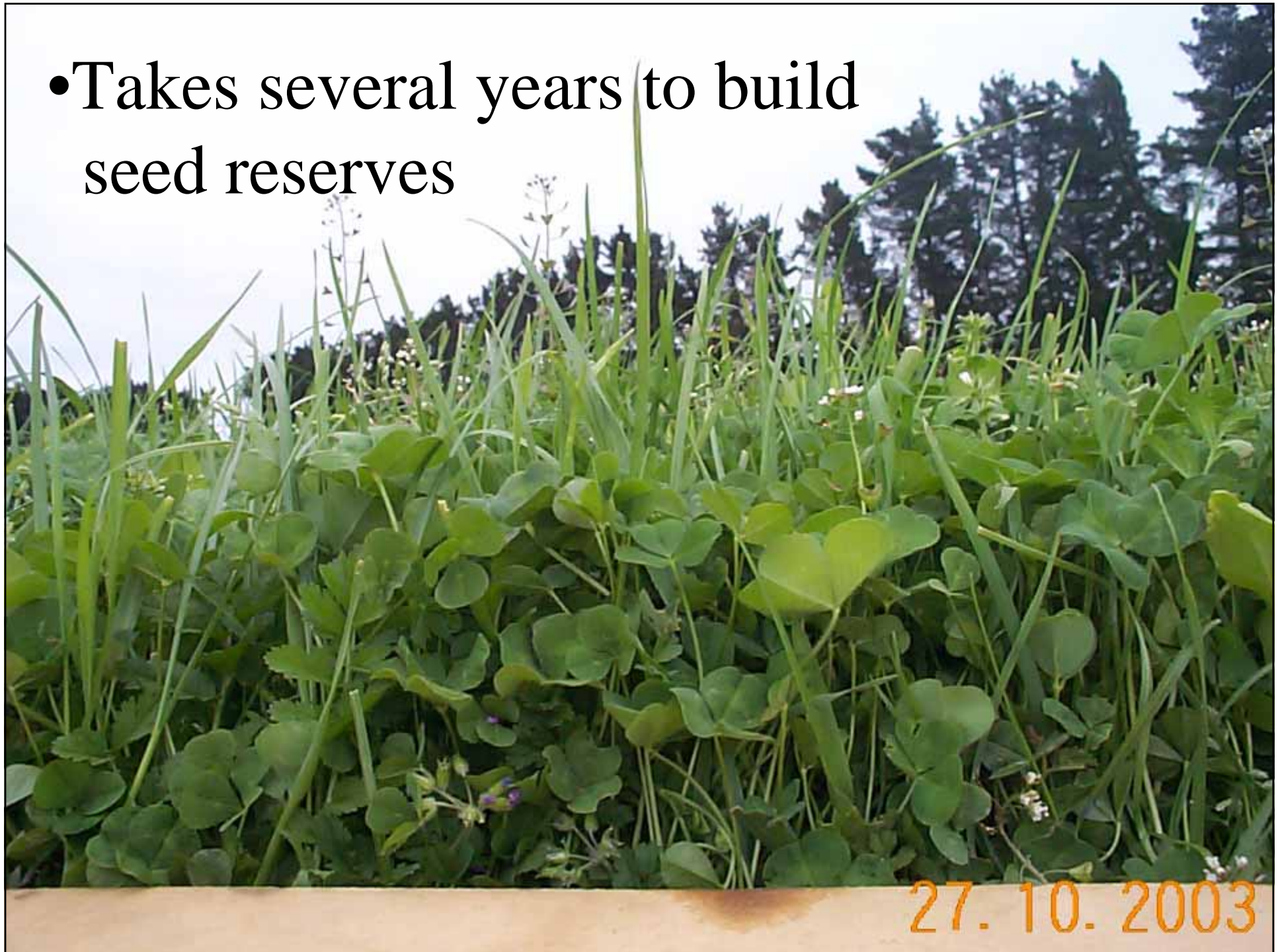
**Suckling**



**Haresfoot**



- Takes several years to build seed reserves





# Conclusions

- Dryland resilience requires different species, grazing management and takes time.
- Capture light and maximize soil moisture by focussing on legumes.
- Become a legume fanatic, hate the grasses
- For economic survival dryland farmers must increase legume production each year.
- Ask/talk about “legumes” and “pasture”.
- Use legumes as the green driver of your business.



# Acknowledgements

- Meat & Wool NZ Ltd/ Pastoral21
- The Cocksfoot Growers Association
- Lincoln University
- MAF Sustainable Farming Fund





**Mt Barker sub**



**Denmark sub**

