

# Presentation to 2014 INTELACT CONSULTANT CONFERENCE



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## Agronomy soundbites

- Residuals
- Pasture persistence
- Clover %
- Endophytes
- Sowing rates for new grass
- Progibb
- Less N
- Climate change
- N-retention High sugar grasses / herbs

## Residuals

### Factors to consider when deciding residuals:

- Average ME value of herbage eaten;
  - Sward base has lower ME value!
- Need (or not) to ration animal intake;
  - Dry cow rationing in winter
- Potential impact on persistence;
  - Summer ↓ of stubble reserves = ↓ persistence
- (?) Setting future grazing base.

## Further comment

- Future cover effect of changing intake is greater than present residual effect on growth;
- Some trials reporting high growth from low residual likely confounded by increased senescence losses at higher residual;
- In winter, grazing frequency not residual may be more important.



72 day rotation



16 day rotation



**1 Leaf**

**2 Leaf (lamina above and base below)**

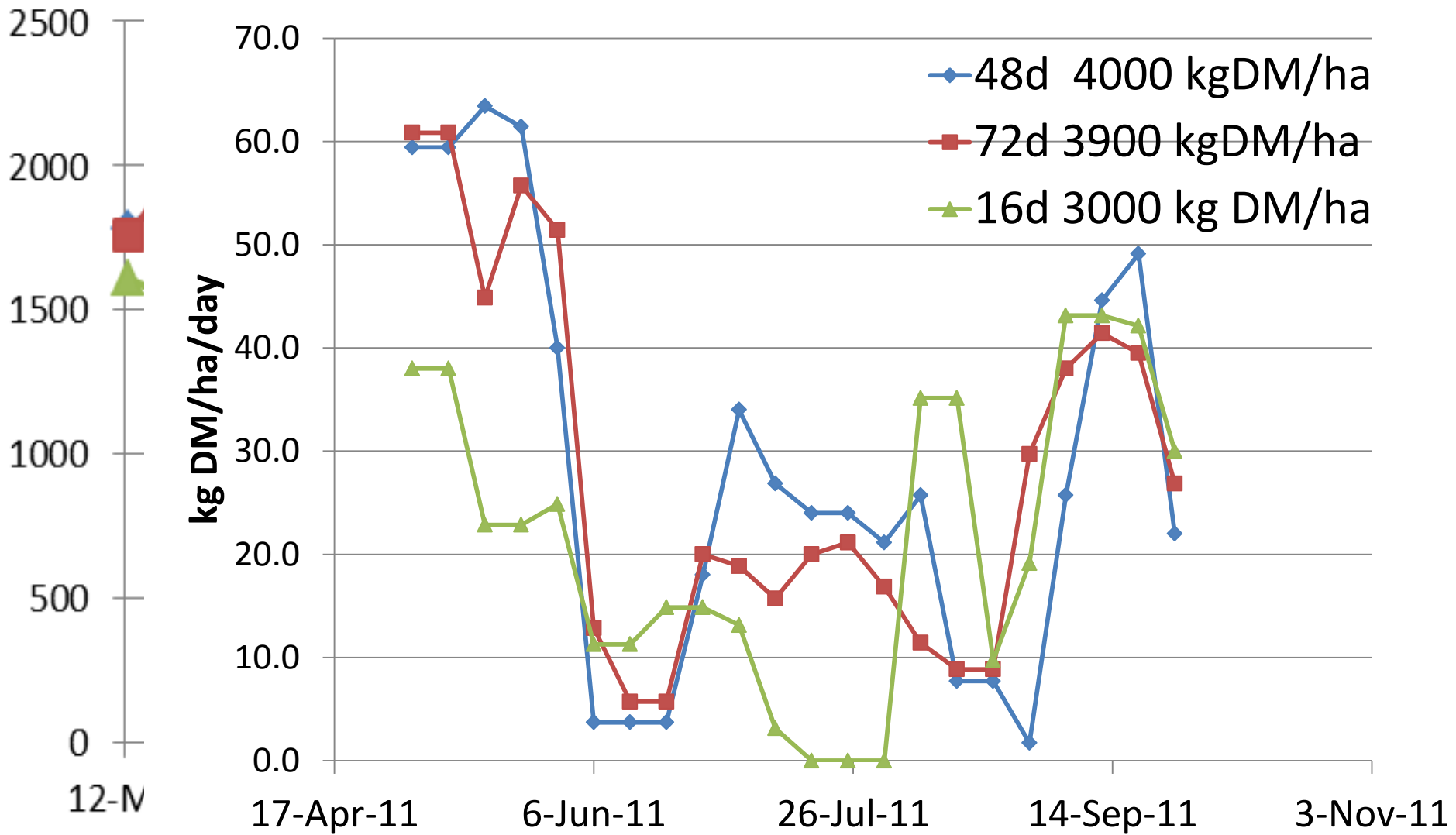
**4 Leaf**

## NIRS analysis (pictured samples)

Component	Leaf 1	Leaf 2 (Lamina)	Leaf 2 (base)	Leaf 4
Crude protein %	25.7	28.5	20.9	22.8
Neutral detergent fibre %	40.1	37.0	50.7	50.0
Soluble sugars/starches %	19.7	19.7	15.4	15.2
Protein:CHO	1.3	1.4	1.4	1.5
Organic matter dig. %	93.3	94.9	81.3	83.7
Metabolisable energy (MJ/kg DM)	13.0	13.2	11.4	11.8

Samples collected mid afternoon on a sunny day and taken to the drying oven within 60 minutes = high soluble sugars and OMD/ME, but relativity valid.

# Massey student farmlet rotation length demonstration



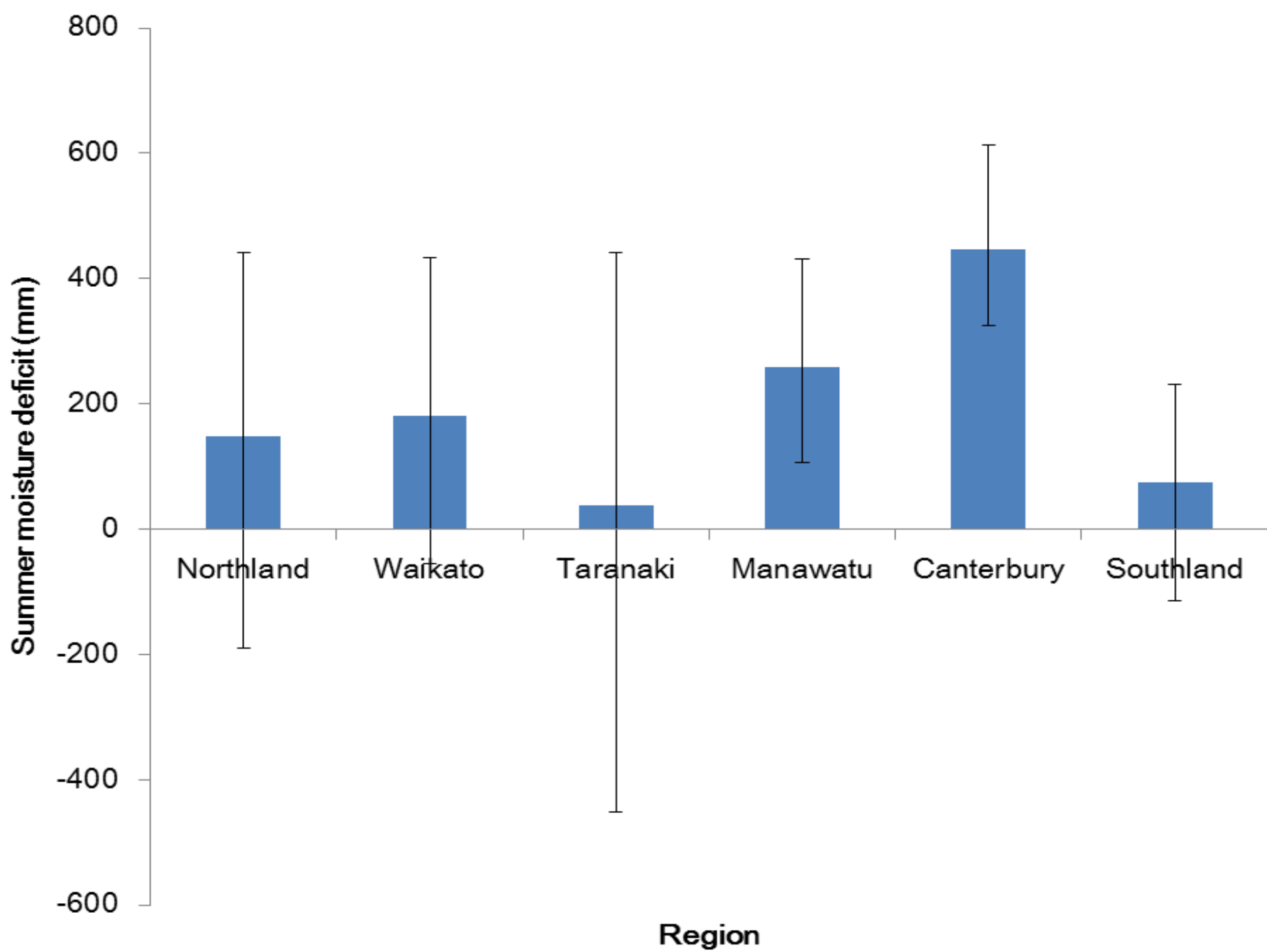
## Pasture persistence

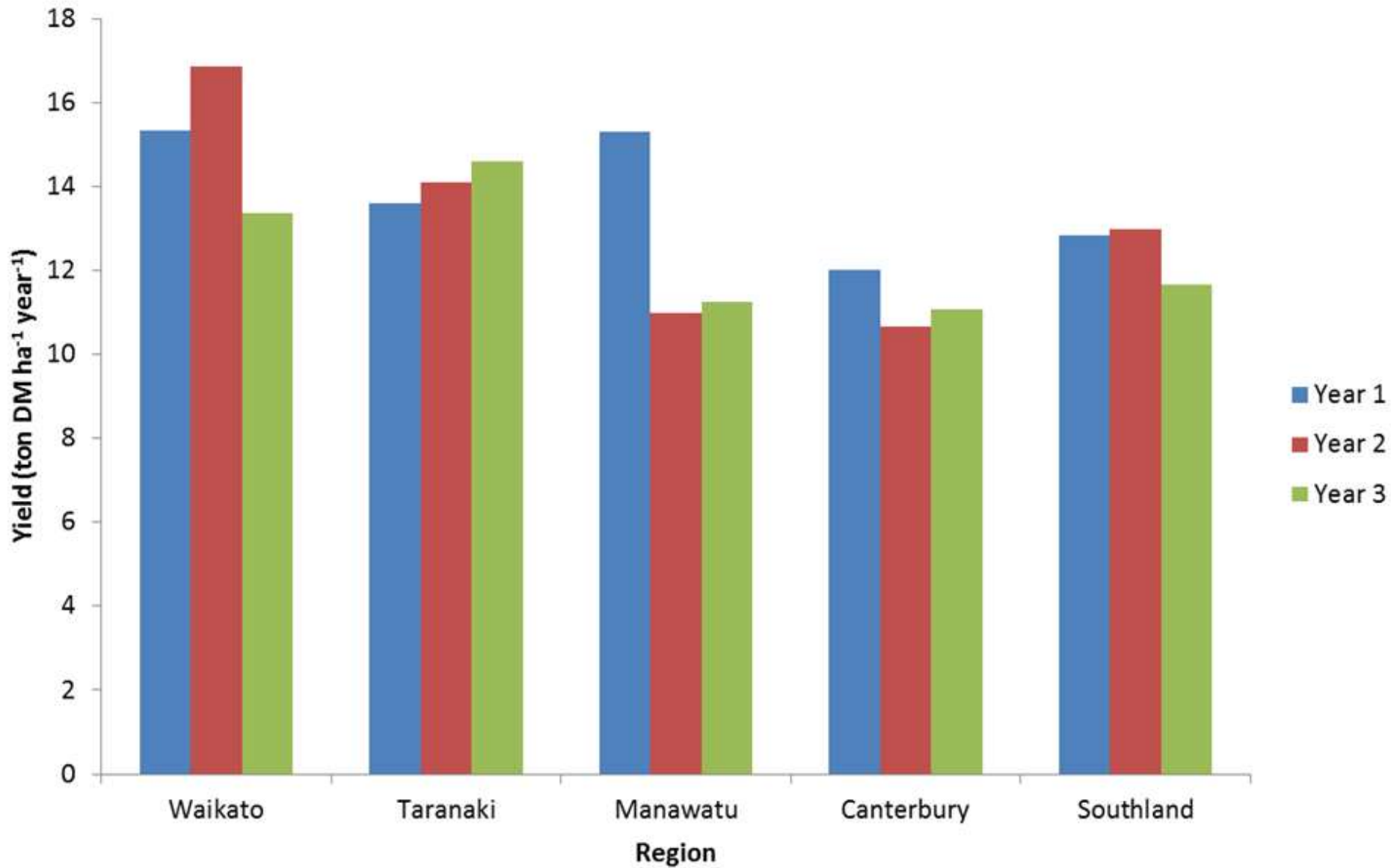
### Widespread farmer concern

- Claims new cultivars yield less or disappear not supported in trials I have seen;
- Summer soil moisture is a key;
- Palatability / ME value probably adds 3% conversion efficiency, grass to milk;
- Match cultivar to client system based on plant breeding strategy of cultivar:



Trojan	14585
Best 7 Breeding lines	14377
Tolosa	14269
Arrow	13777
Alto	13738
One50	13735
Matrix	13568
Abermagic	13514
Aberdart	13435
Extreme	13401
Bronsyn	13392
Samson	13356
Nui	13272
Impact	13231
Revolution	13130
Bealey	13006
Banquet	12632
Commando	12589







# Three breeding germplasm sources

1. Old Pasture	2. “Mangere”	3. “Spanish”
Ruanui	Nui / Ellett	One50, Trojan
Persistence	15% yield ↑ cf. 1	Summer yield potential
		10 % yield ↑ cf 2

But also consider Meadow Fescue infusion, ME value (eg Bealey), high sugar, and other traits.

## Endophytes

**Let's try an experiment!**

Please write down on your note paper the name of one commercial endophyte strain:

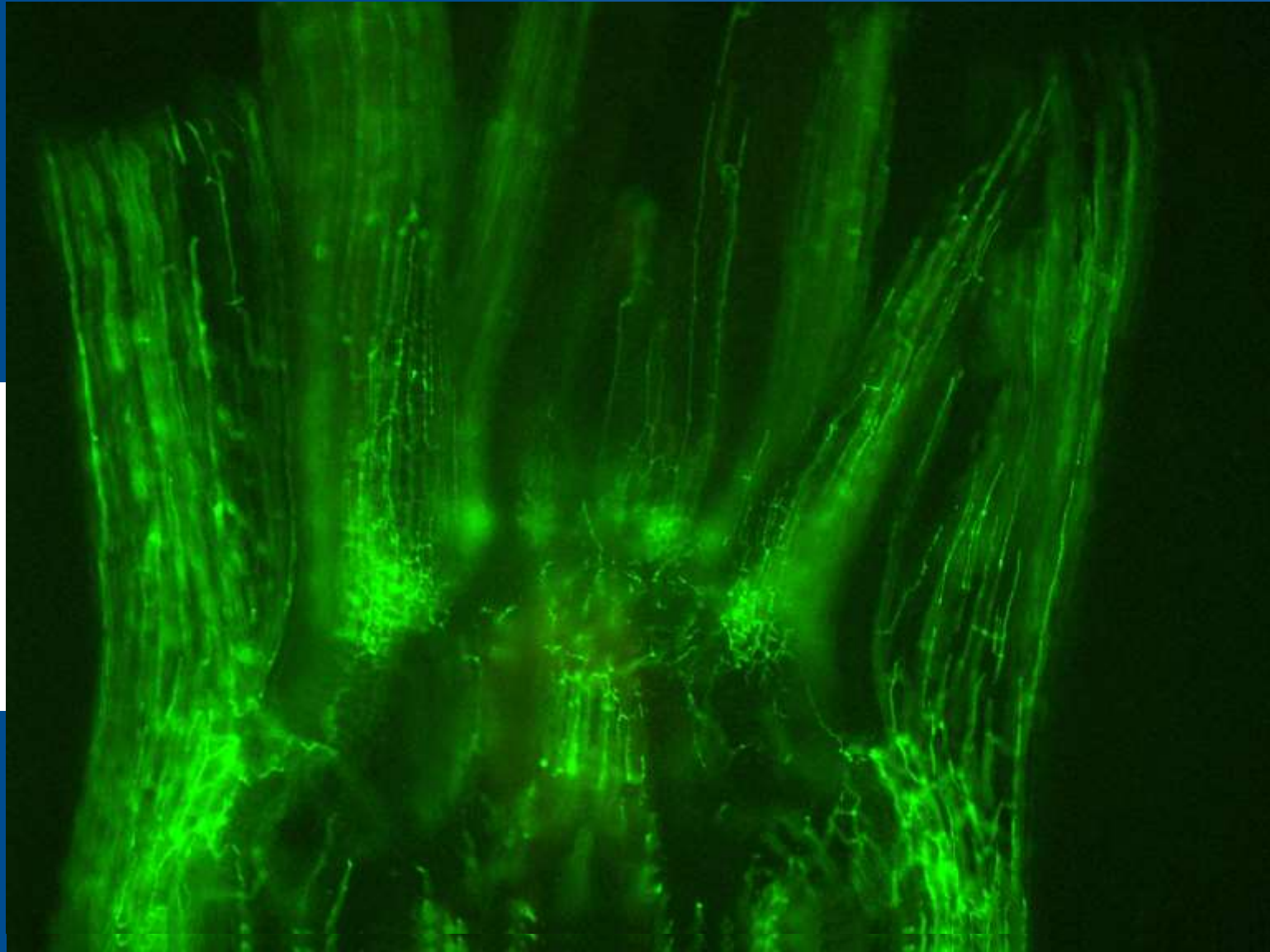
## Further comment

- Fungus partner provides a number of benefits to host plant: insect feeding deterrence, drought tolerance ( $\uparrow$ osmotic tension ?), suppression of fungal pathogens;
- Logically has to be a metabolic cost to the plant to support the fungus.

# Three commercial endophyte strains

AR37	NEA2/6	Grub out U2
AgResearch	NZ Agriseeds	Cropmark
Janthitremms	Peramine + (x?)	Lolines (?) (fescue derived)
Broad spectrum insect control	Favourable trial yield results	Good concept, need trial data

# Endophyte distribution in the meristem region



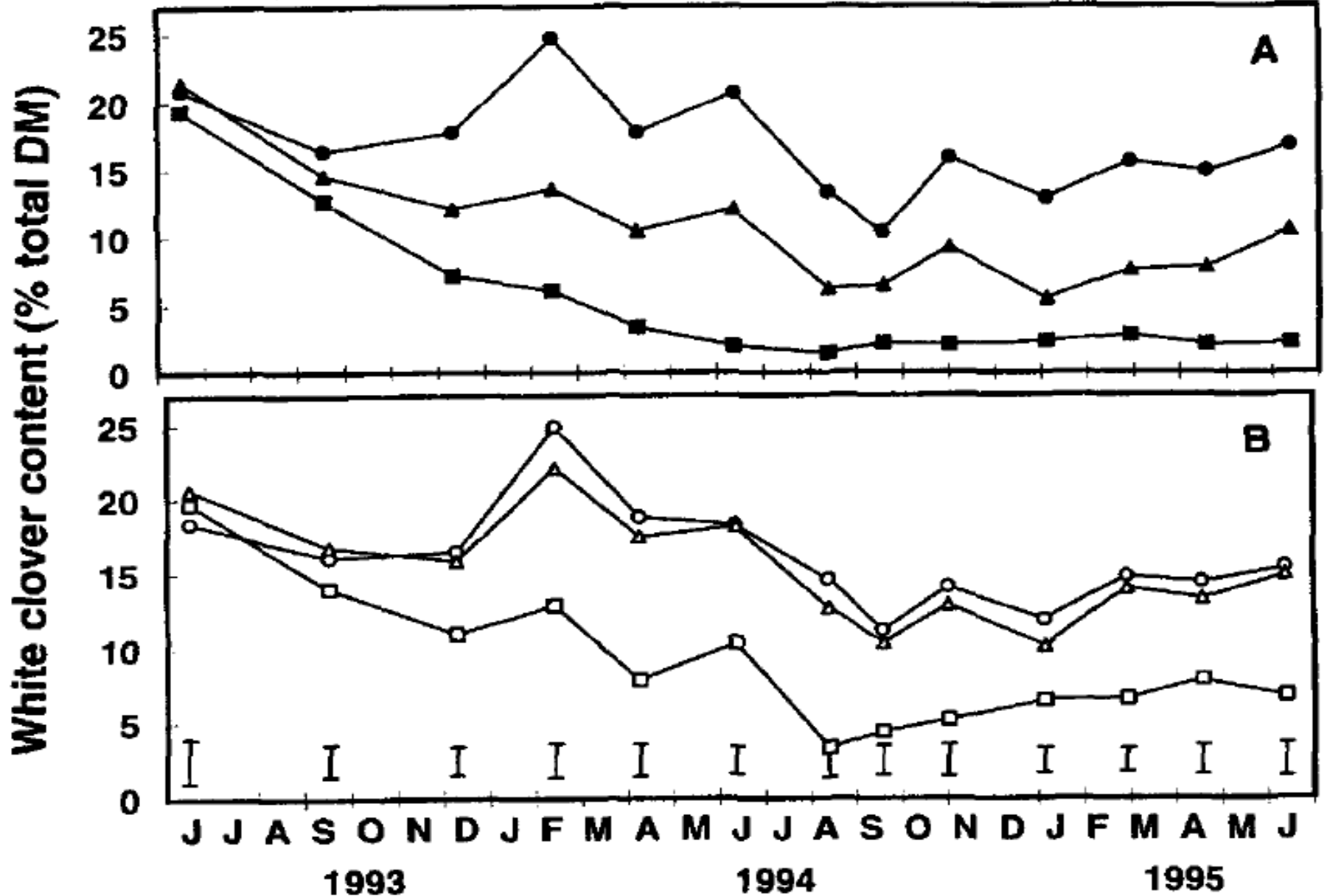
Confocal laser  
microscope  
image.

Photo courtesy  
M Christensen,  
AgResearch

## Clover %

### Possible factors in sward clover %

- Increasing N use;
- Seed planted too deep for small seed;
- Ryegrass seedling competitiveness;
- Endophyte allelopathic effect;
- Suppression by high winter covers.
- Spring treading effect.



Sharon Harris NZJAR 39(1996):152 A, LSR, B HSR  
 0, 200, & 400 kg N/ha/year.





## Sowing rate (new grass)

### Nothing to add to Brougham (1957)

- Ryegrass seeding rate from 10 kg/ha to 50 kg/ha gives similar 12-month yield, but 3-month yield  $\propto$  seeding rate.
- Use heavier rates for rapid ground cover or to suppress weeds or if expecting seedling loss;
- Use lighter rates to increase clover % and increase plant size.

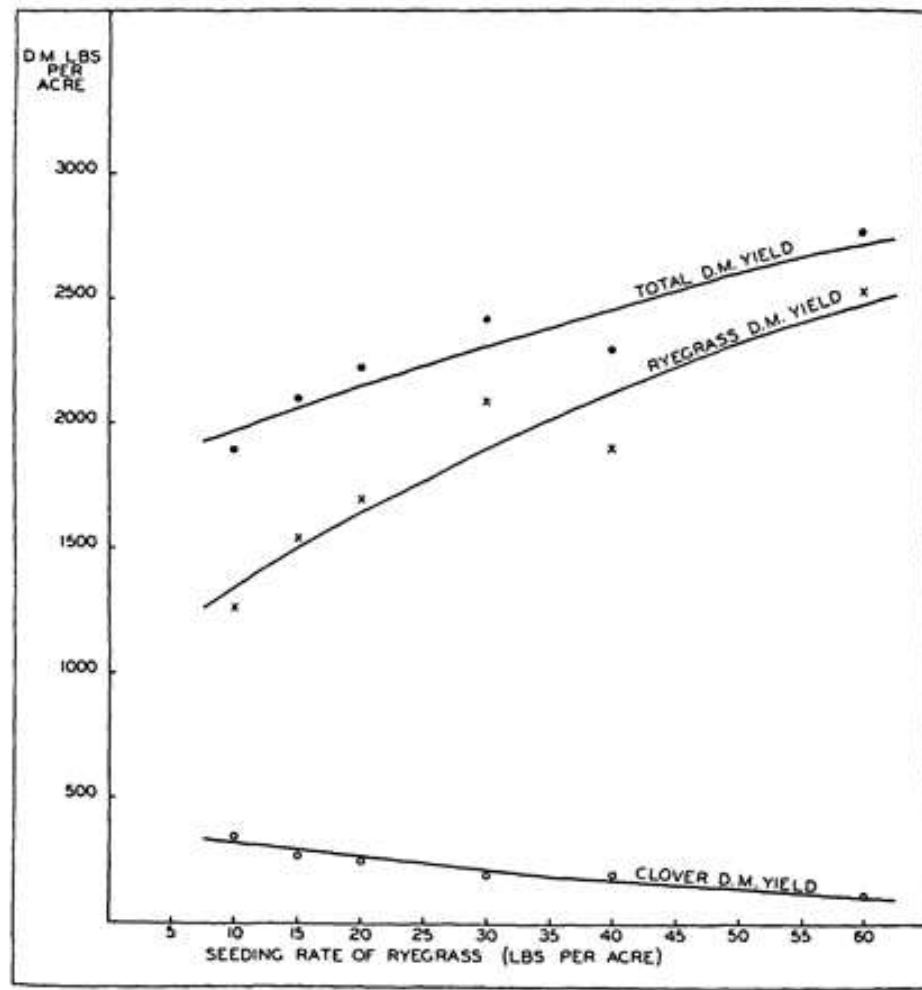


FIG. 1.—Relationships between Total and Species Yields and Seeding Rate of Short Rotation Ryegrass for the 1st Period.

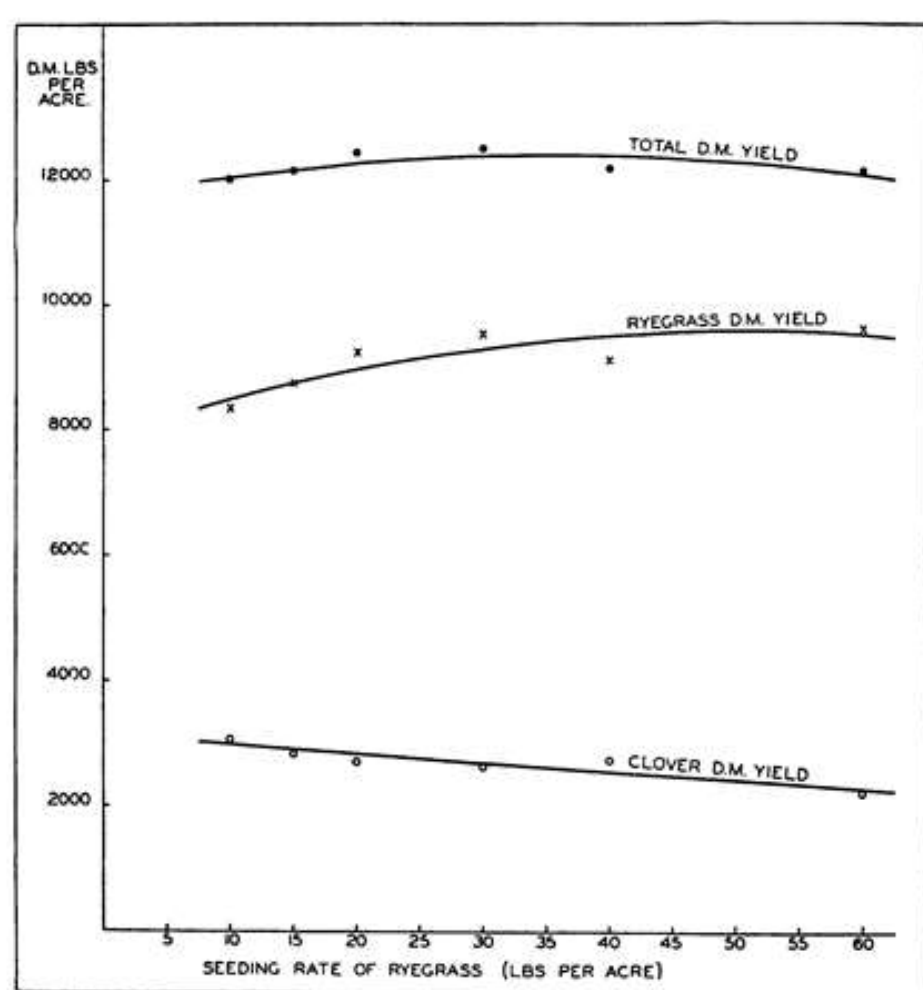


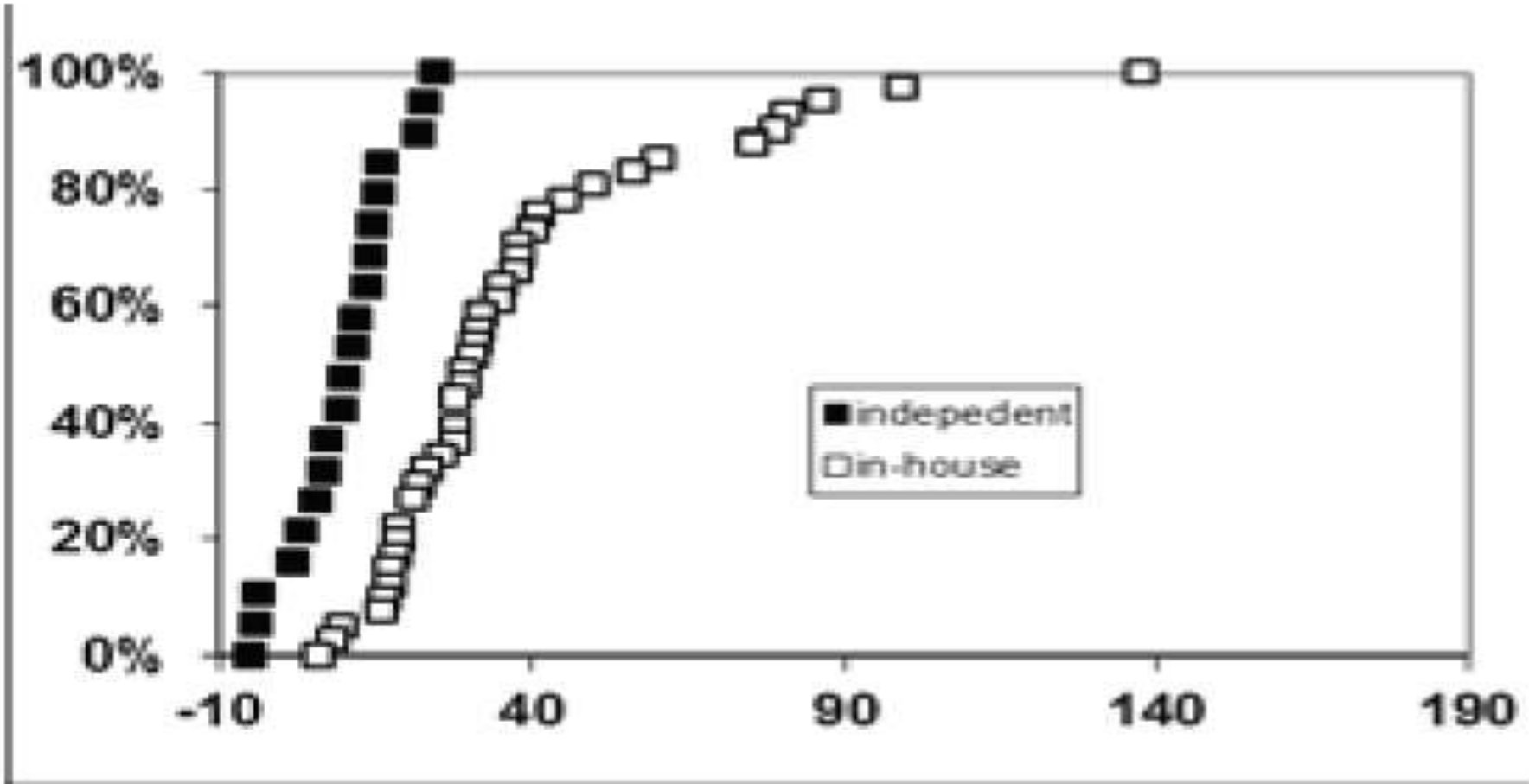
FIG. 4.—Relationships between Total and Species Yields and Seeding Rate of Short Rotation Ryegrass for the full Period.



## LessN

### Claimed to enhance N response: ...

- Urea readily absorbed via leaves & foliar absorbed N should be more efficient.
- (Only 25% plant capture with soil-applied N though ~ 50% if soil cycling counted).



**Figure 10.** Frequency distribution of the differences (%) between the urea40+LessN treatment and the urea40 treatment for the in-house trials and the independent trials (data from Donaghys 2012)

For the independent trials the average difference was 10% (CI = 4%, range -5 to 25%). For the in-house trials the difference was 38% (CI = 9%, range 6–137%). Edmeades, Proc NZGA 74(2012):222

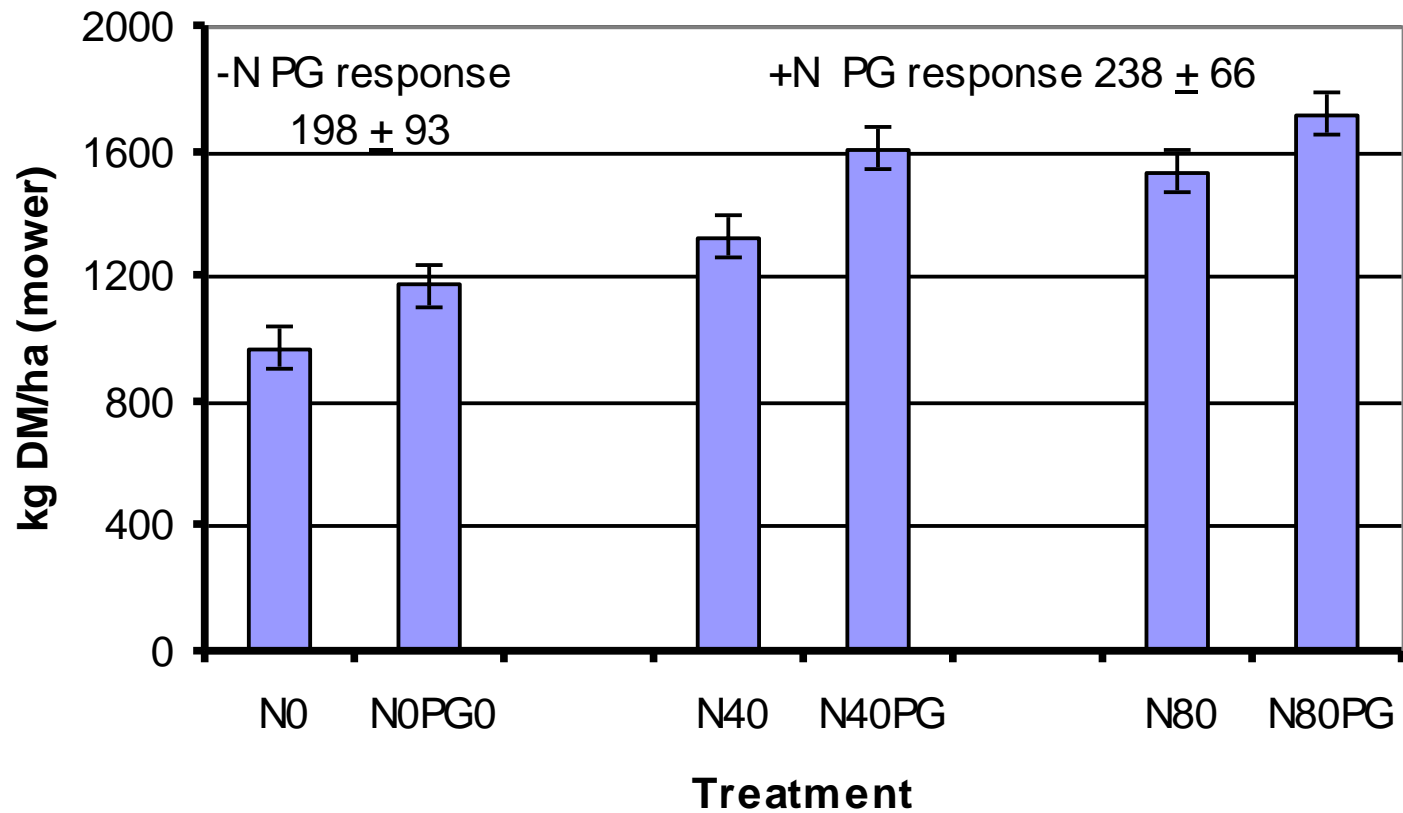
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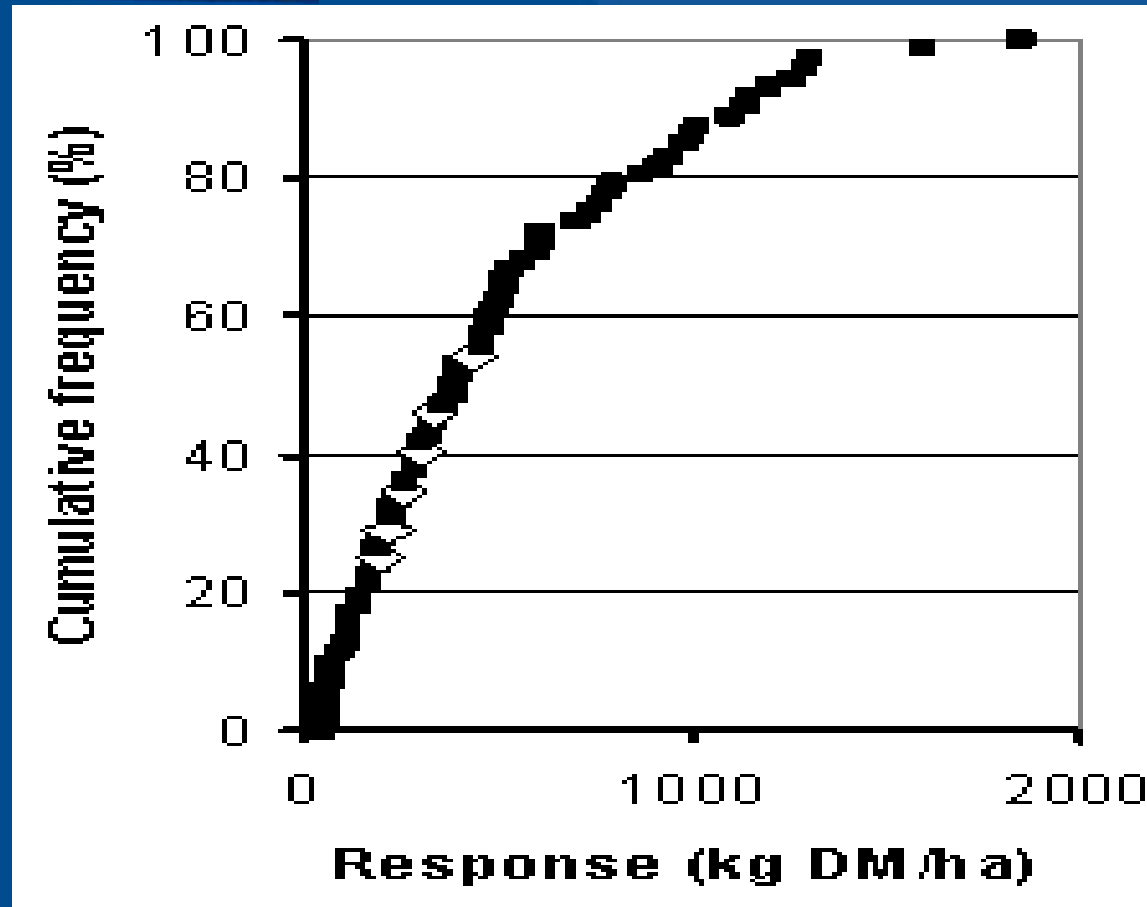
## Progibb

- A ‘de-repressor’ of blocked plant processes – can release stored carbohydrate, eg;
- 8g/ha active ingredient – no advantage to increased rate;
- Reliable response ~ 300 kg DM/ha;
- Complementary to N;
- No effect on forage nutritive value.

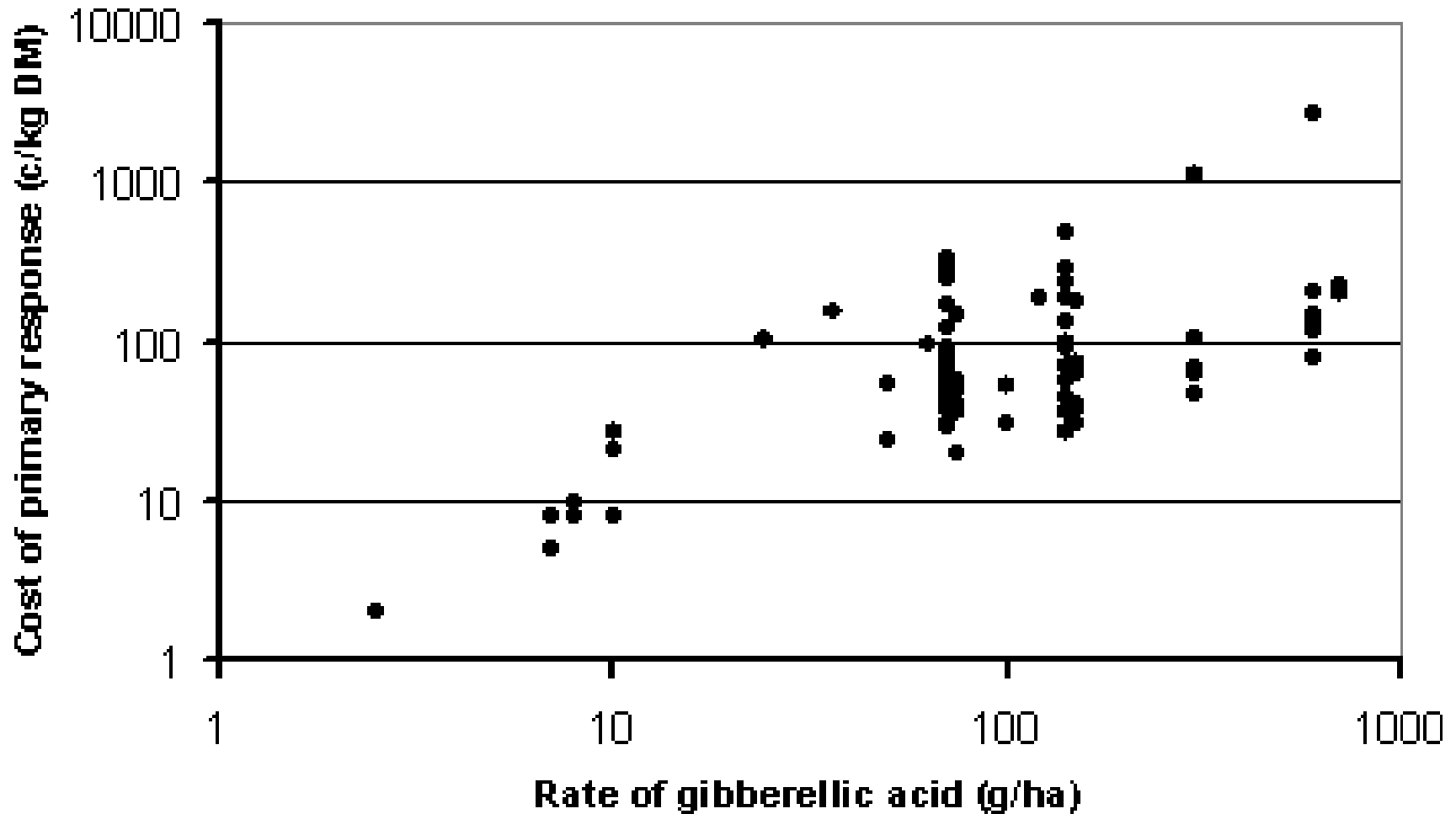
# Massey trial



# Response frequency



# Cost effectiveness



## Climate change

### Another experiment; choose a viewpoint:

- Climate change is a scientific hoax;
- Climate change is over-stated;
- Climate change is a concern but not our problem;
- We need to be concerned about climate change.



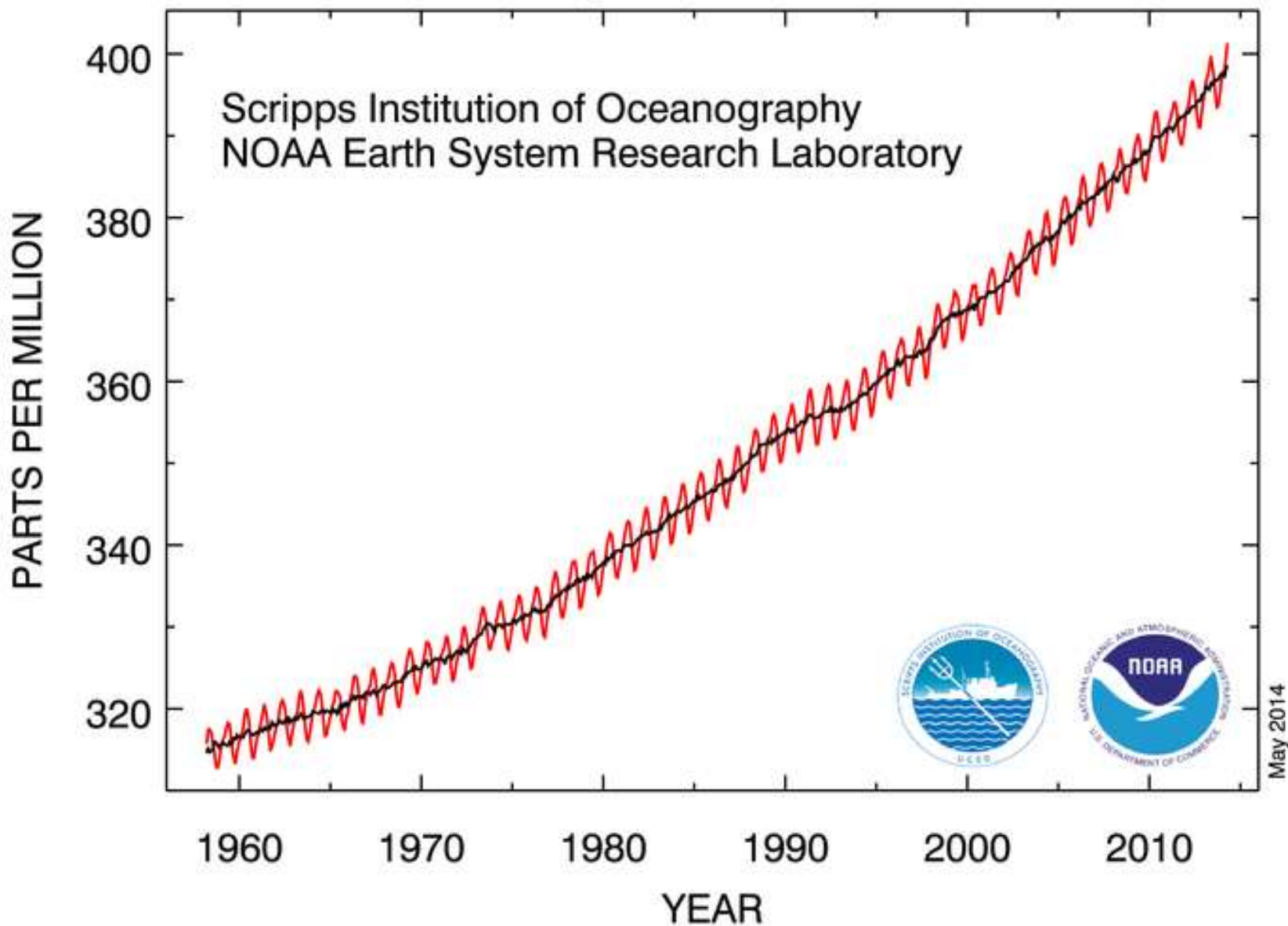
Forget bows  
and arrows,  
we can just  
carbon tax  
'em!

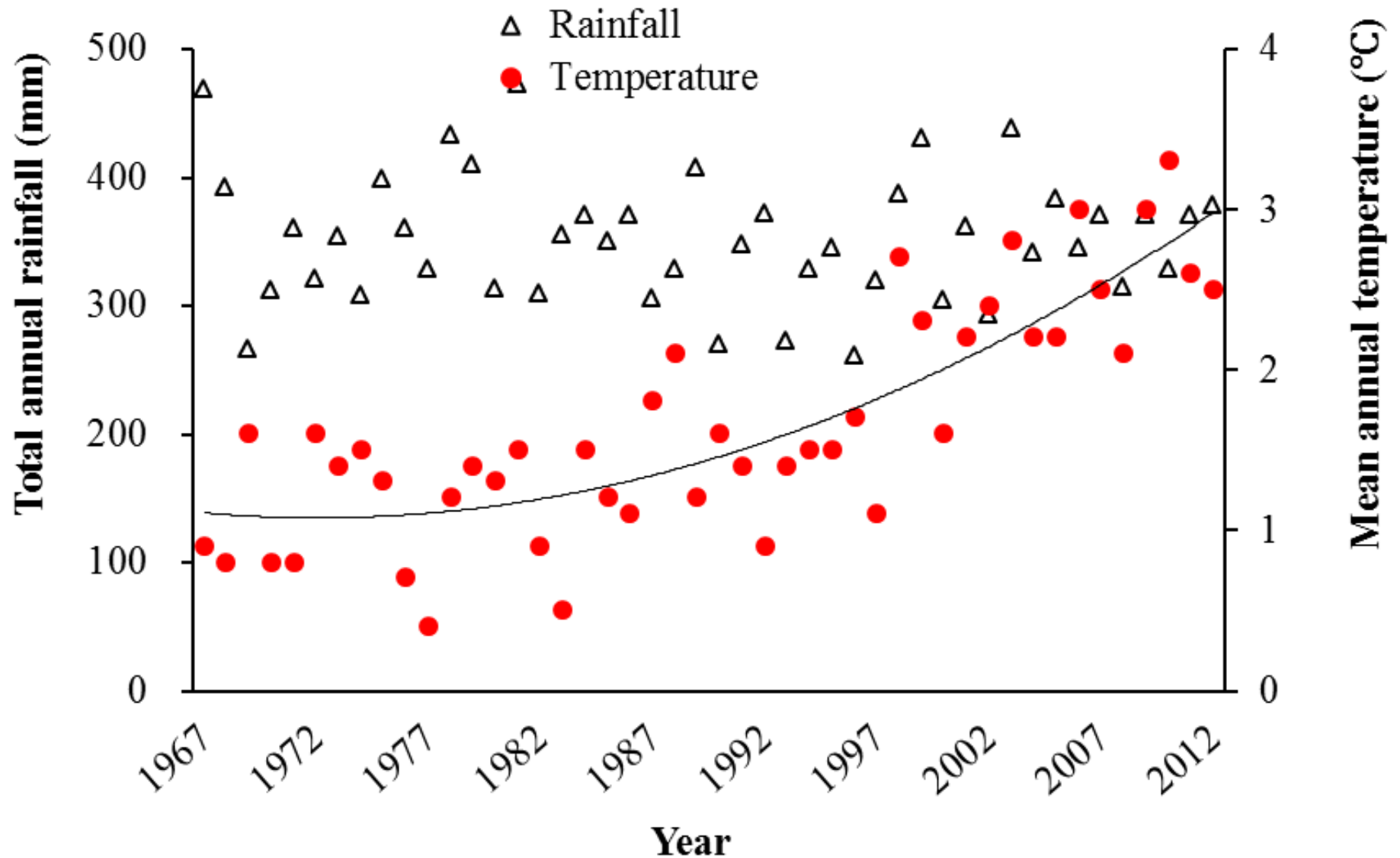
Robin'  
RUSSEL  
HOOD

GREENS

CHIKAK

# Atmospheric CO<sub>2</sub> at Mauna Loa Observatory





# Temperature trends on the Tibetan Plateau

