

Effect of moisture deficit on four perennial ryegrass cultivars

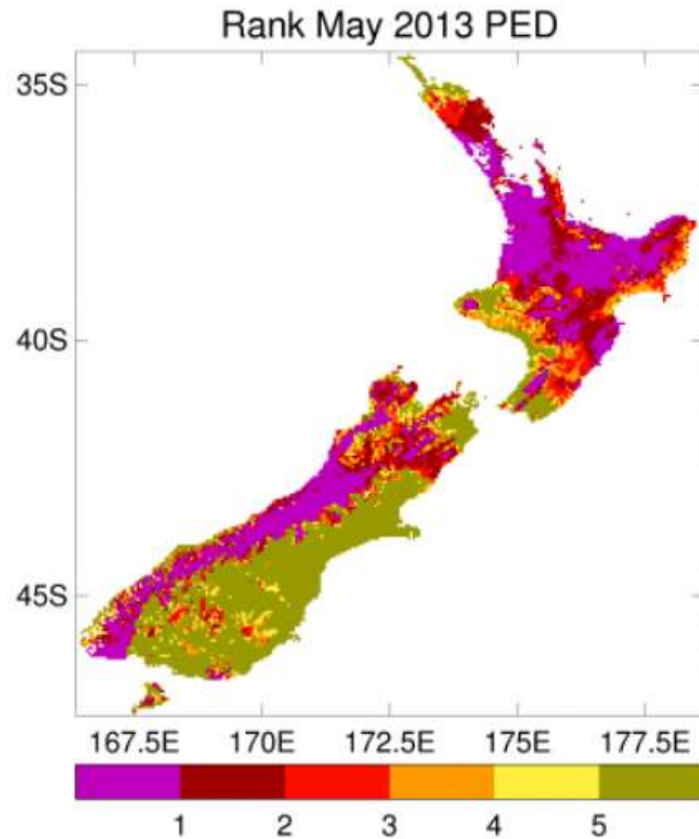


KN Tozer, JR Crush, RM Greenfield, CA Cameron



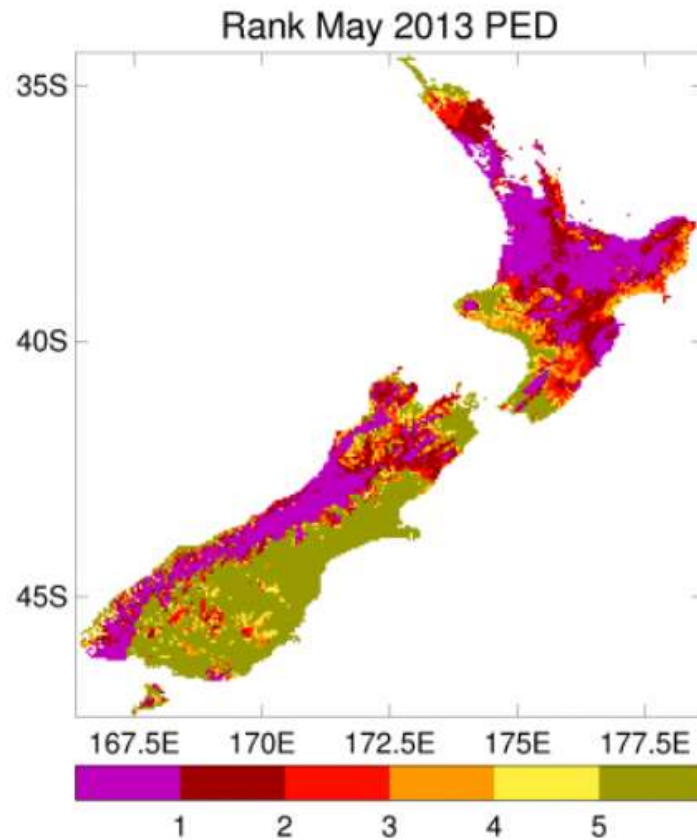
Background

Drought reduces ryegrass productivity throughout New Zealand



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Information on how different ryegrass cultivars respond to moisture deficit is lacking

Aim

To determine how genetic background influences the response of perennial ryegrass to moisture deficit

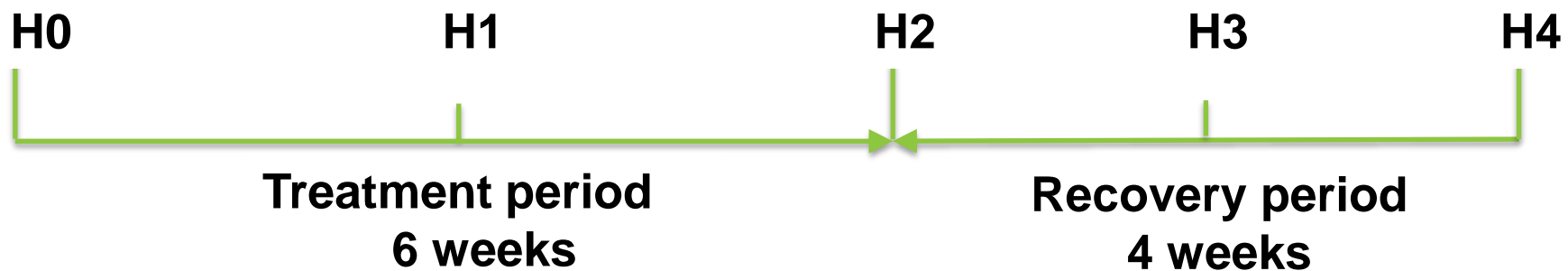
Cultivars

Cultivar	Genetic background	Ploidy
Aberdart AR1	European	Diploid
One50 AR37	Spanish	Diploid
Trojan NEA2	Spanish	Diploid
Bealey NEA2	Spanish	Tetraploid

Study design



- Glasshouse study, root tubes
- Treatments: well-watered vs moisture stressed (no water)
- Five harvests



Results – end of treatment period

- Under moisture deficit:
 - Soil moisture content 24% lower
 - Stubble mass 12% greater
 - Herbage mass 44% lower (only in Aberdart)
- No other moisture deficit effects
- No effect of ploidy on response to moisture deficit

Key messages – end of treatment period

- Mild moisture deficit
- Some consistent trends across all cultivars
- Also cultivar dependent (Aberdart)

Results – end of recovery period

➤ In previously moisture-stressed plants (main effects):

Low molecular weight WSC in stubble 37% greater

Leaf appearance 25% greater

Herbage mass 29% greater

COMPENSATORY GROWTH

Results – end of recovery period

Effects of previous moisture deficit on ryegrass

Interactions

Component	Trojan	One50	Aberdart	Bealey
Stubble mass		34% lower		
Root mass top layer		38% lower		
Root mass middle layer		52% lower	50% lower	
Total root mass		39% lower		
Total biomass	50% greater			

Key messages – end of recovery period

- Compensatory growth (all cultivars)
 - stubble WSC, leaf appearance, herbage mass
- Cultivars respond differently
 - Trojan - greatest compensatory growth
 - One50 - delayed response, reduced growth
 - Aberdart - reduced growth, treatment + recovery period

On-farm implications

- Greatest growth responses during recovery period

**We often focus on management during droughts –
management after drought is as important!**

- Cultivars respond differently

Implications for drought management?

Thank you!

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