



Grain yield and grazing potential of canola across the HRZ

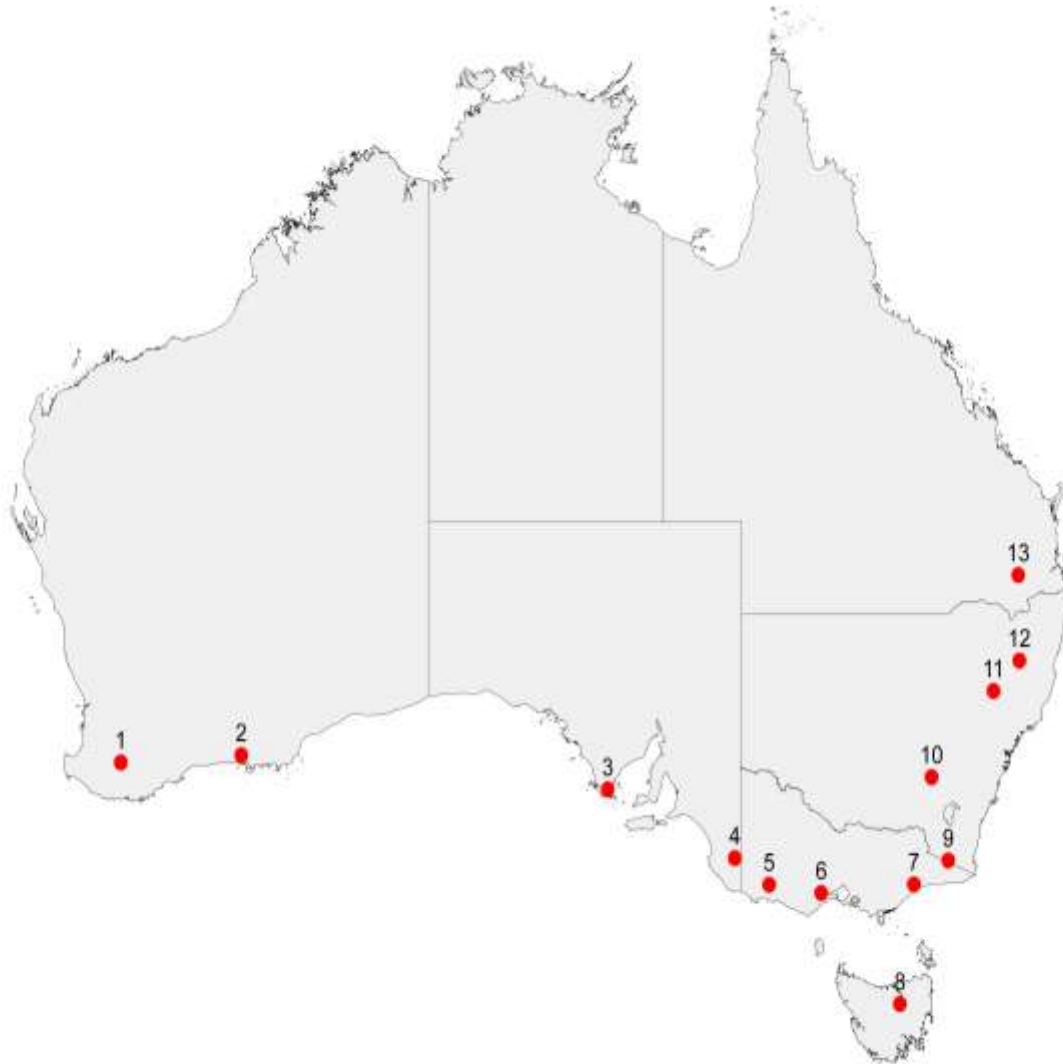
Julianne Lilley, Lindsay Bell and John Kirkegaard

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**Grains Research &
Development Corporation**

Integrating dual-purpose crops in the High Rainfall Zone

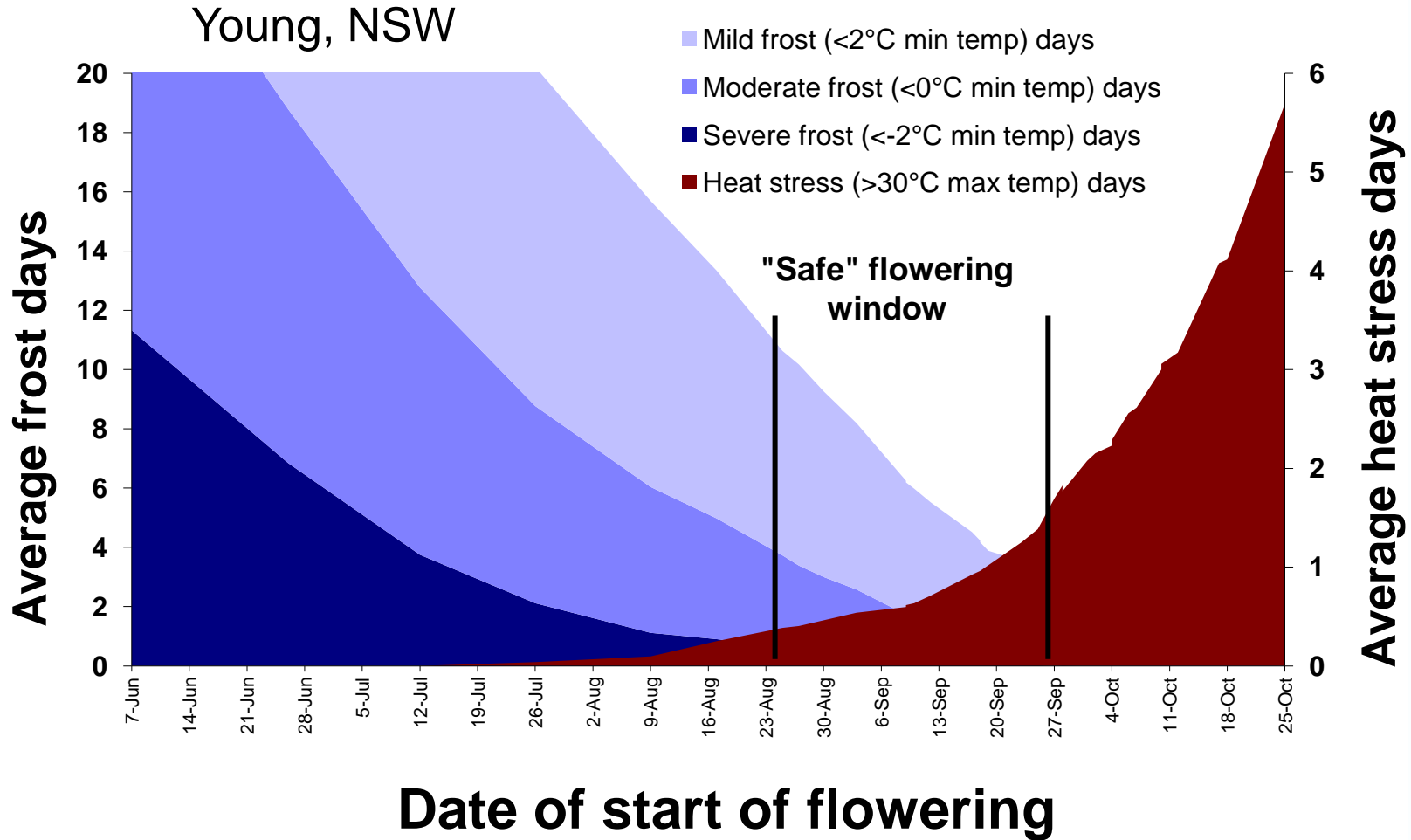


1. Kojonup
2. Esperance
3. Cummins
4. Naracoorte
5. Hamilton
6. Inverleigh
7. Bairnsdale
8. Cressy
9. Delegate
10. Young
11. Quirindi
12. Armidale
13. Pittsworth

Steps in assessing dual-purpose potential

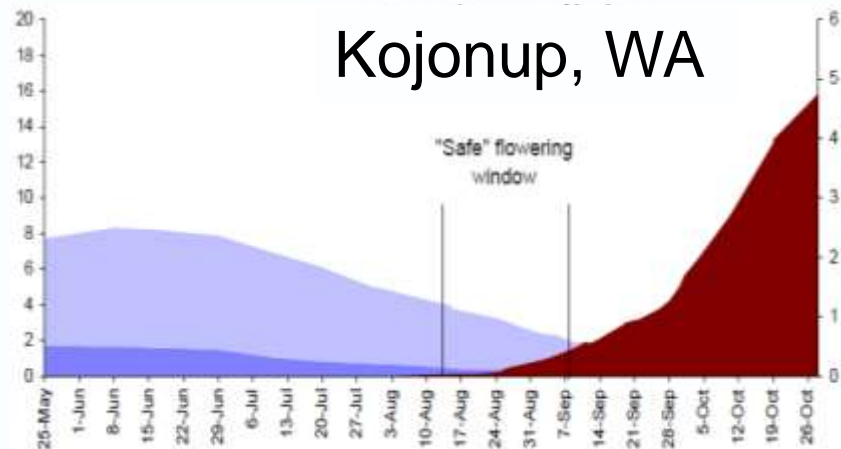
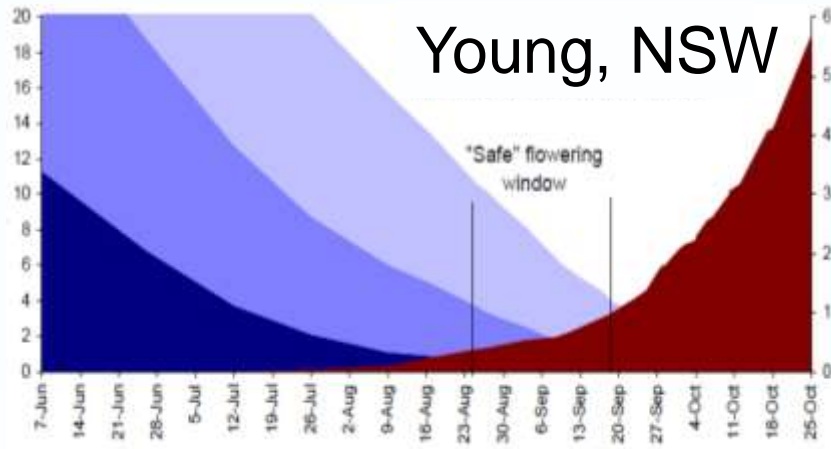
- **Identify optimum flowering window**
- **Link optimum flowering date to sowing time**
- **Estimate sowing opportunity**
- **Predict forage, grazing and yield outcomes**

Identify optimum flowering window

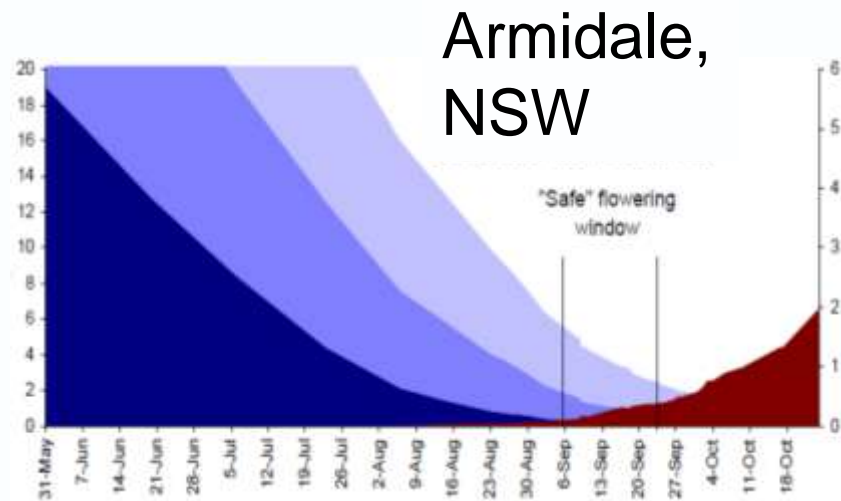
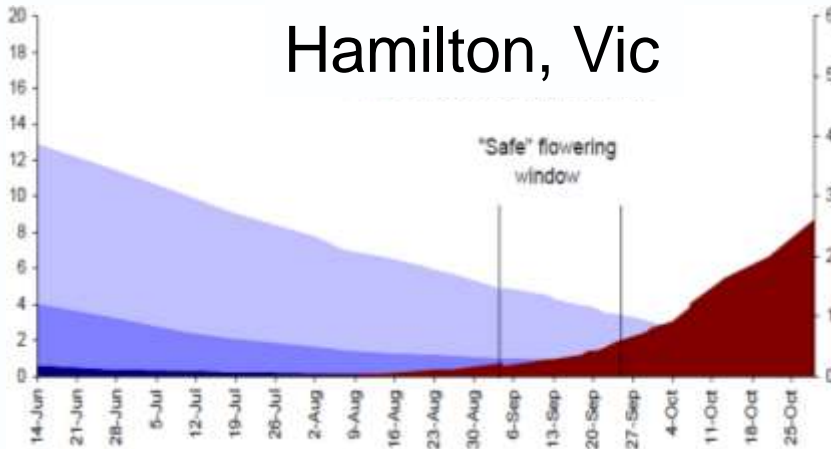


Risks vary depending on site

Average frost days



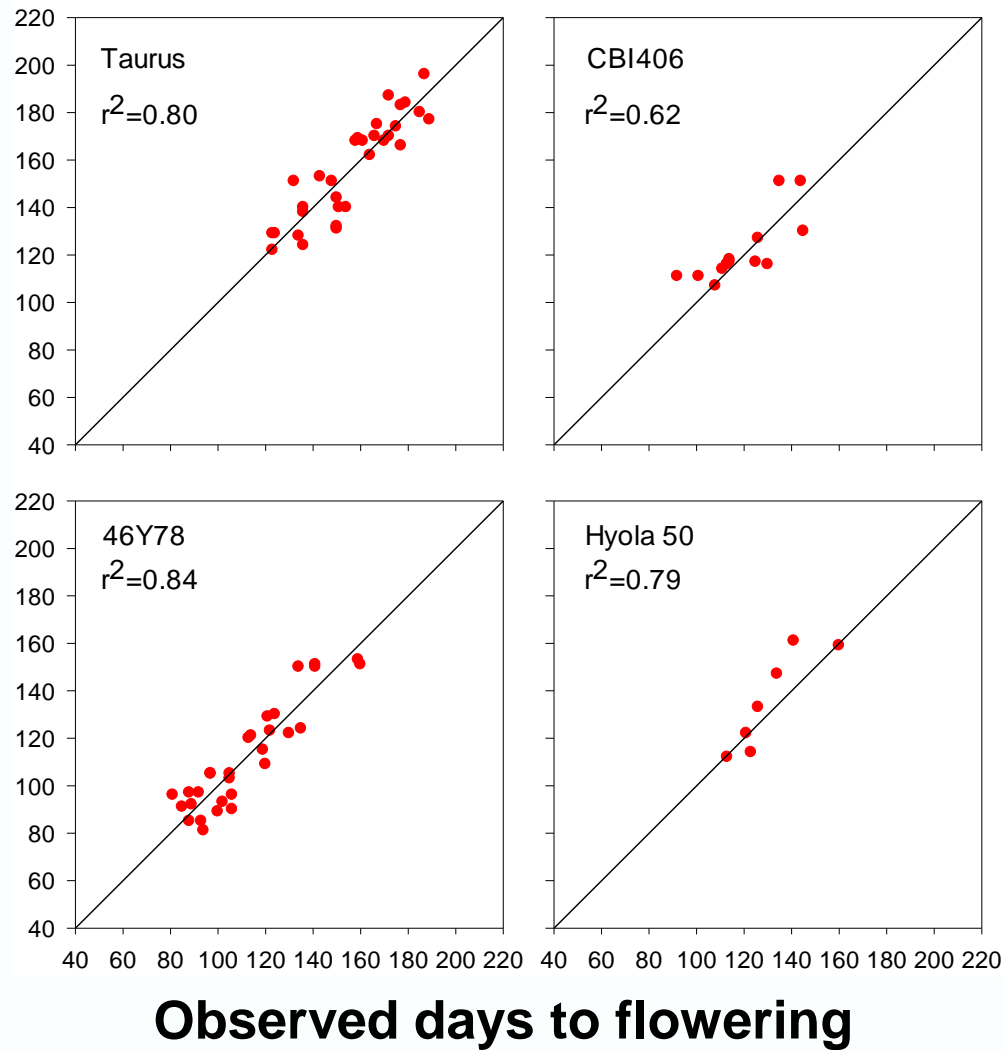
Average heat stress days



Date of start of flowering

APSIM model parameters for phenology

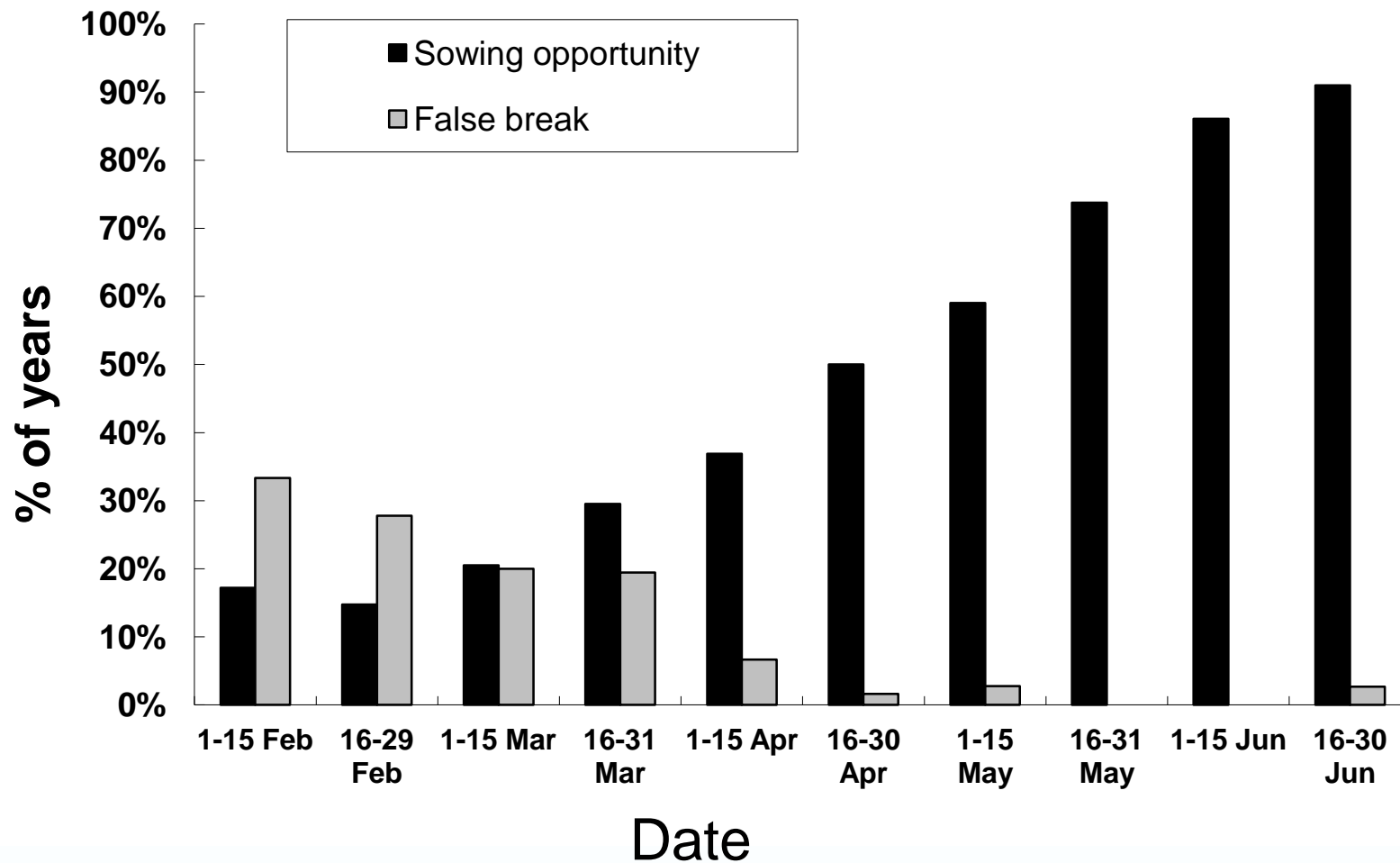
**Predicted days
to flowering**



Observed days to flowering

Sowing opportunity (based on sowing rule)

Young, NSW



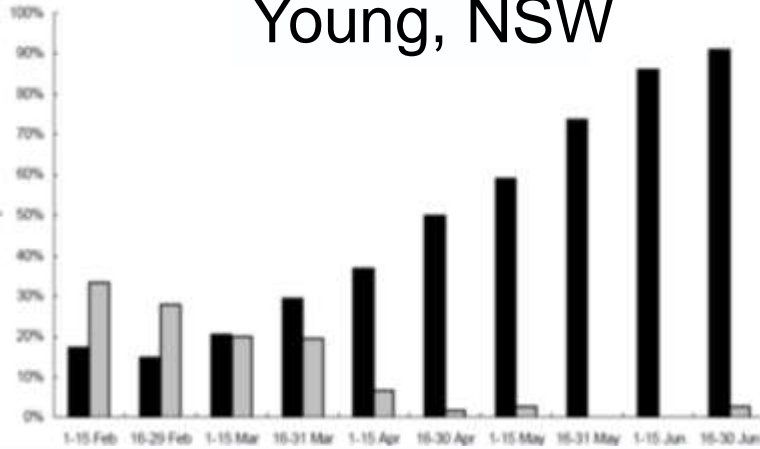
Sowing opportunity (based on sowing rule)

■ Sowing opportunity

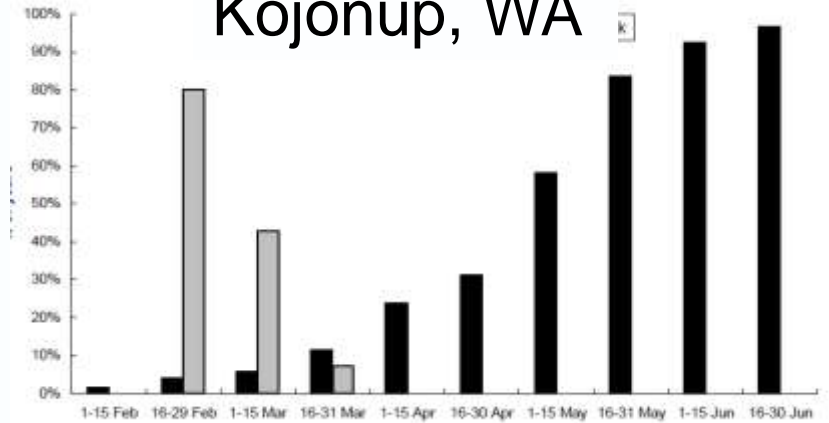
□ False break

% of years

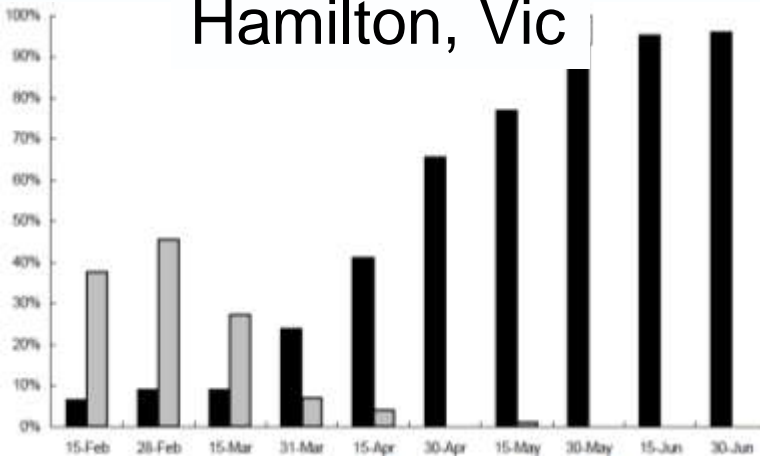
Young, NSW



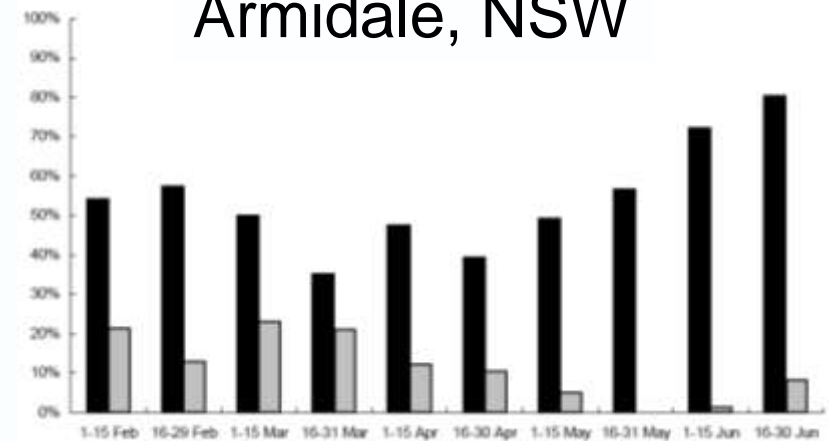
Kojonup, WA



Hamilton, Vic



Armidale, NSW



Sowing date

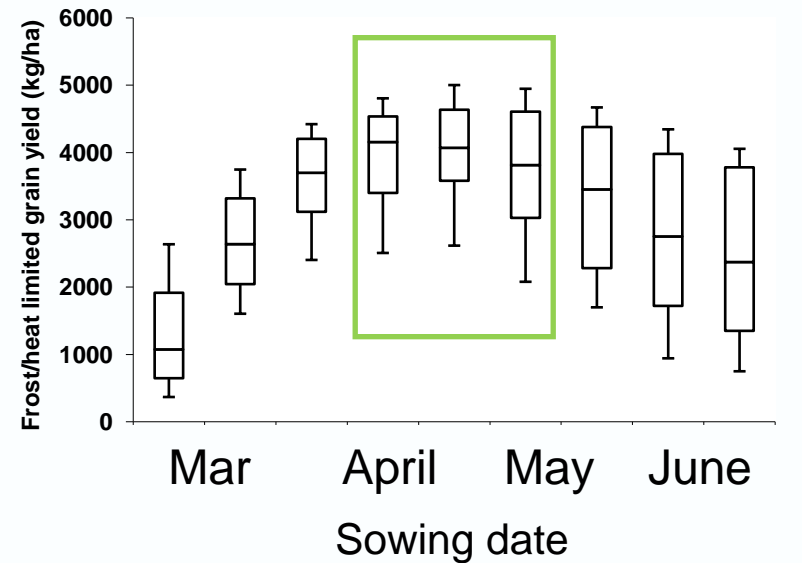
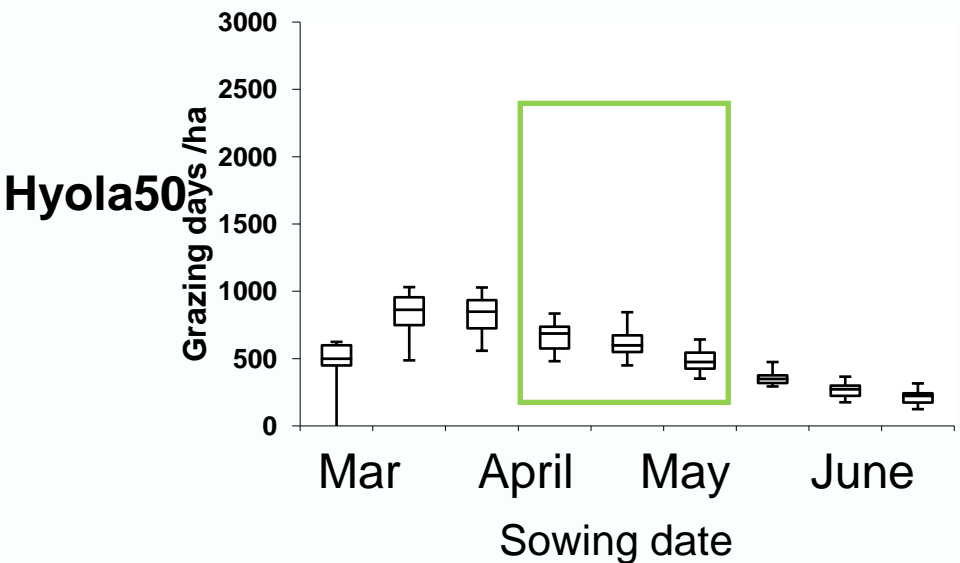
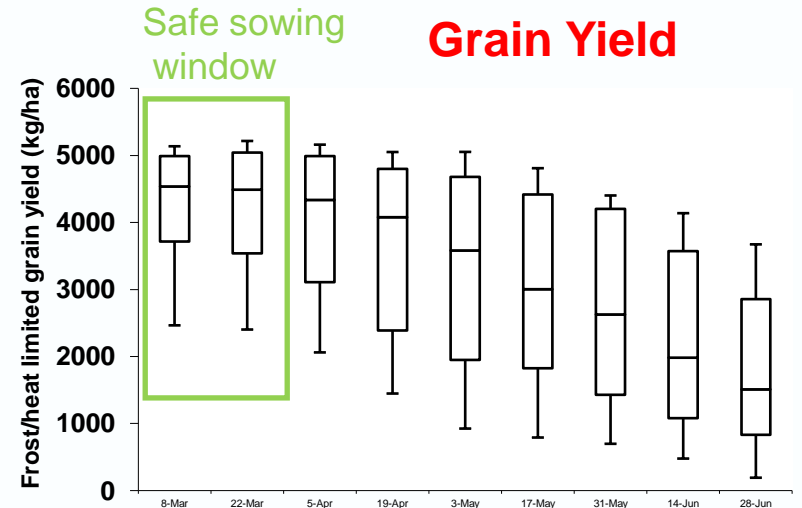
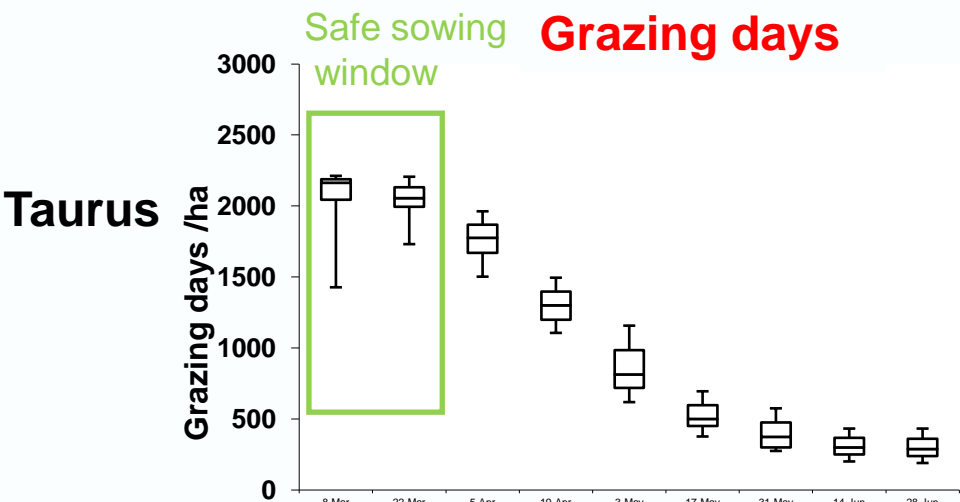
Factorial simulation analysis

- 13 sites
- Fortnightly sowing (8 Mar – 28 June)
- 3 nitrogen rates at sowing (50, 150, 250 kg N/ha)
+ 100 kg N/ha post grazing
- 4 plant densities (20, 40, 60, 80 plants/m²)
- 4 cultivar types
 - Slow winter (eg Taurus)
 - Spring x winter intermediate (eg CBI406)
 - Slow spring (eg 46Y78)
 - Fast spring (eg Hyola50)
- Simulated for 50 years (1960 to 2009)
- Frost/heat sensitivity

Predicted Forage and Grain Yield

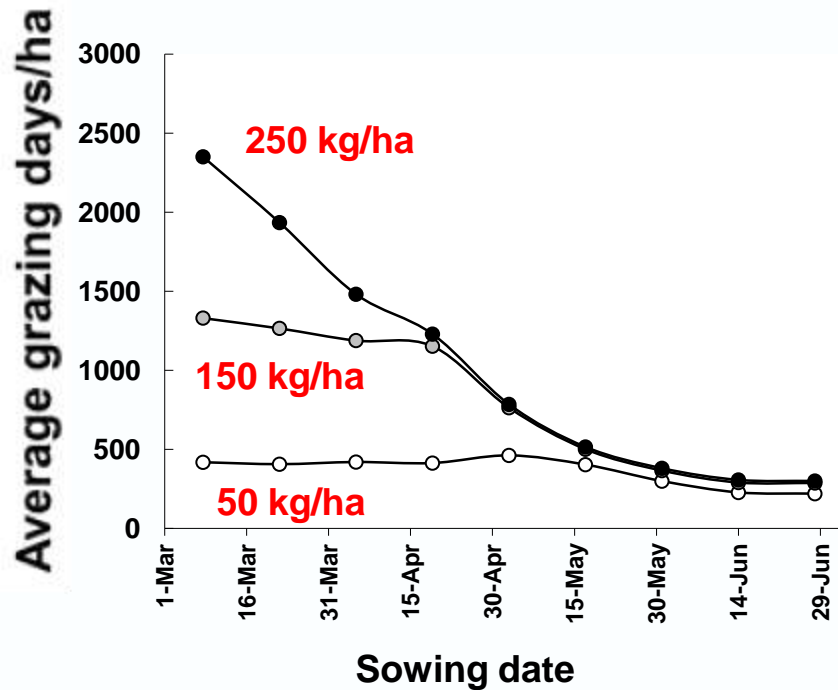
Location	Optimal window to commence flowering	Cultivar – phenology type	Sowing window intervals									
			8 Mar	22 Mar	5 Apr	19 Apr	3 May	17 May	31 May	14 Jun	28 Jun	
Kojonup	18 Aug-9 Sep	Slow winter	14%									
		Winter x spring			41%							
		Slow spring					80%					
		Fast spring						97%				
Hamilton	1-21 Sep	Slow winter	57%									
		Winter x spring			90%							
		Slow spring					100%					
		Fast spring					100%					
Young	27 Aug-18 Sep	Slow winter	43%									
		Winter x spring		70%								
		Slow spring				86%						
		Fast spring					82%					

Forage and grain yield – variability and risk

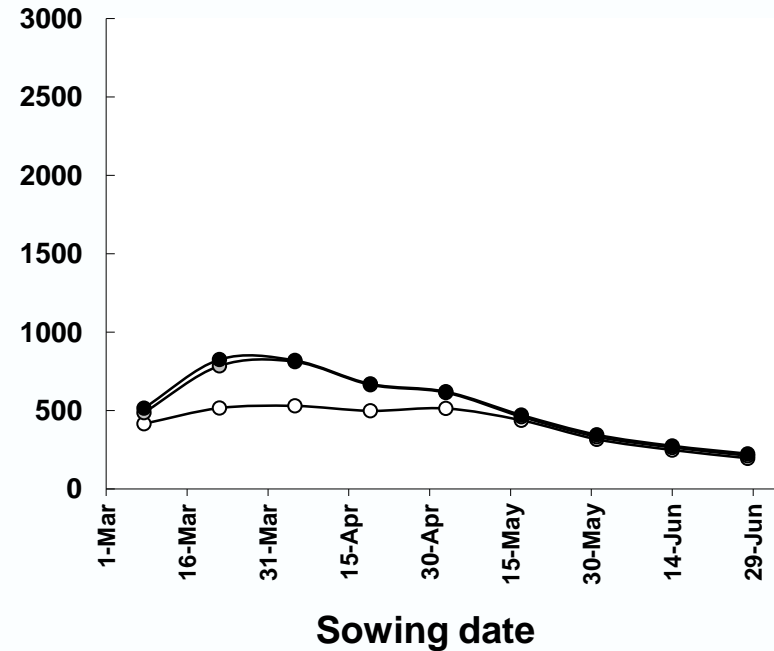


Effects of N on forage for grazing

Taurus



Hyola50



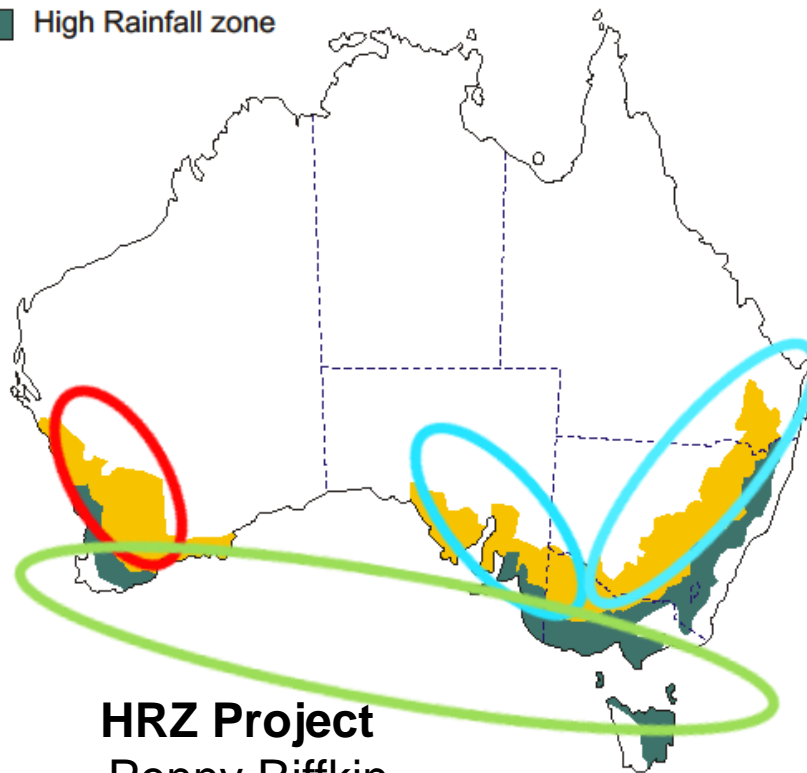
Density is also important

Summary

- APSIM predictions matched experiments and farmer experience
 - Phenology
 - heat / frost rules
- Significant potential in the HRZ
- Nitrogen will be key
- Future
 - Phenology for new cultivars
 - Capturing hybrid / herbicide tolerance types
 - Improve frost and heat impacts

New Integrated National Projects

- Wheat- Sheep Zone
- High Rainfall zone



WA Project

Mark Seymour DAFWA
Heping Zhang CSIRO

“Eastern” Project

NSW/SARDI
(McCaffrey/Brill/Ware)

CSIRO Team
Kirkegaard/Lilley
Whish
McBeath

HRZ Project
Penny Riffkin

Thank you

CSIRO Agriculture

Julianne Lilley

t +61 2 6246 5536

e Julianne.Lilley@csiro.au

www.csiro.au



Frost and Heat sensitivity

Stress	Level	Daily temperatures (minimum/maximum)	Sensitive stage	Yield reduction per day
Frost	Mild	0 to 2°C	2-8 weeks after start of flowering	0%
	Moderate	-2 to 0°C		2%
	Severe	< -2°C		10%
Heat	Mild	30 to 33°C	For 6 weeks after start of flowering	10%
	Moderate	33 to 36°C		18%
	Severe	> 36°C		35%