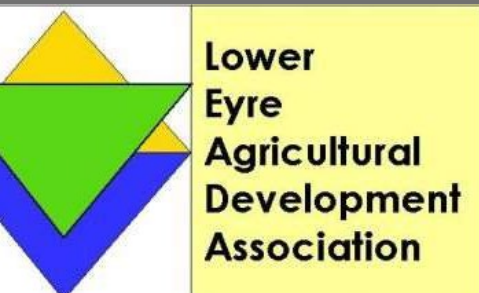


# Lower Eyre Trial Update

SOUTH  
AUSTRALIAN  
RESEARCH &  
DEVELOPMENT  
INSTITUTE  
**PIRSA**

**Andrew Ware**

LEADA Expo, 13<sup>th</sup> March 2018



**PREMIUM**  
FOOD AND WINE FROM OUR  
**CLEAN**  
ENVIRONMENT



# Lower Eyre Trial Update

- Canola varieties
- Matching variety to sowing time

# New Canola Varieties - 2017

**useed Quartz** – mid hybrid Conventional. Yields well in > 2t/ha environments

**Pioneer 43Y92 CL** – early hybrid CL – yielded well across in long GS year, 2016

**aintly CL** – mid hybrid CL

**Yola 350TT** – early hybrid TT – yielded well across in long GS year, 2016

**yTTech Trophy** – early mid hybrid TT– 2017 1st year in NVT – cost sharing  
seed price

**F Ignite TT** – mid/late hybrid TT

# 2017 South Australian NVT Conventional

Variety/ Site	Spalding	Arthurton	Keith	Frances
<b>Conventional</b>				
AV Garnet	79	91	92	96
Hyola 50	-	101	103	101
Nuseed Diamond	99	101	98	95
Nuseed Quartz	98	107	111	111
<i>Site mean yield (t/ha)</i>	<i>2.29</i>	<i>3.08</i>	<i>1.71</i>	<i>3.08</i>
<i>Lsd (0.05%)</i>	<i>10</i>	<i>5</i>	<i>9</i>	<i>10</i>

Long Term results: <https://app.nvtonline.com.au>

# 017 South Australian NVT Imidazolinone Tolerant

Property/ Site	Riverton	Spalding	Turretfield	Arthurton	Minlaton	Lameroo	Keith	Frances
Warfield								
Waker CL	97	70	103	99	103	108	99	98
Wala 575CL	92	84	89	96	90	91	95	86
Wheeler 43Y92 (CL)	-	117	99	-	105	97	103	-
Wheeler 44Y90 (CL)	106	117	100	107	102	93	107	100
Wheeler 45Y91 (CL)	97	86	93	98	-	-	-	92
Wintly CL	99	98	105	100	97	110	102	111
Worby V7002CL	96	111	-	93	97	-	92	117
mean yield (t/ha)	2.87	2.05	2.61	3.29	3.07	1.35	1.92	2.89
(0.05%)	6	11	6	5	8	13	8	11

# 2017 South Australian NVT Triazine Tolerant

Variety/	Site	Riverton	Spalding	Turretfield	Arthurton	Minlaton	Lameroo	Keith	Fraser
Triazine Tolerant									
Bonito	-	84	89	-	95	93	94		
Mako	92	-	96	94	-	-	-		
Stingray	-	89	93	91	97	-	95		
Wahoo	97	-	-	-					100
560TT	100	-	96	99	101	-	101		95
670TT	105	-	103	104	-	-	-		100
la 350TT	-	108	-	100	105	98	95		100
la 559TT	94	108	93	101	-	-	-		95
la 650TT	104	-	94	104	-	-	-		
Tec Trophy	111	127	108	108	114	117	123		100
gor T 4510	113	113	108	108	101	114	102		100
ola 515TT	75	-	-	-	-	-	-		85
eer 44T02 TT	-	115	-	99	101	98	102		
ignite TT	108	-	100	99	-	-	-		100
Turbine TT	105	114	96	96	99	104	98		
mean yield (t/ha)	2.40	1.79	2.38	2.96	2.53	1.29	1.64		2.00
(0.05%)	8	13	7	5	10	13	10		10

# Optimised Canola Profitability



Charles Sturt University



Mallee Sustainable Farming



## South Australian Team

Andrew Ware

Jacob Giles

Christine Walela

Ian Ludwig

Other members of NVA group

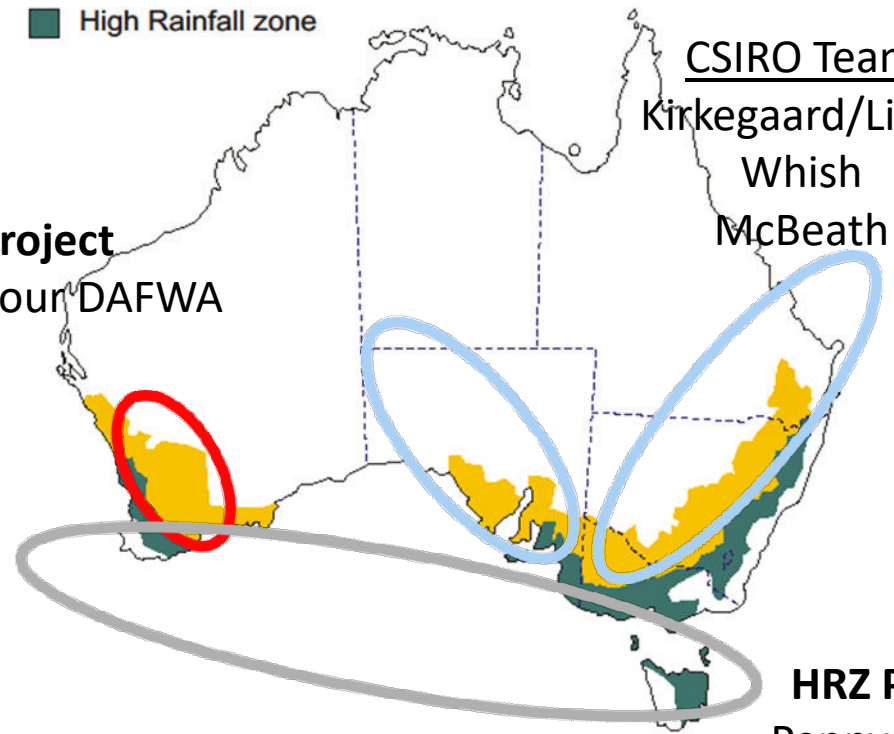
Therese McBeath (CSIRO)

Bill Davoren and Willie Schoobridge

Wheat- Sheep Zone

High Rainfall zone

**WA Project**  
Mark Seymour DAFWA



**HRZ Project**

Penny Riffk

Heping Zha

**Eastern Project**  
NSW/SARDI Team  
McCaffrey/Brill/War  
Regional DPI teams  
MSF, BCG, CSU

CSIRO Team  
Kirkegaard/Lilley  
Whish  
McBeath

SARDI

# Optimised Canola Profitability

Four years of 3 sites x TOS x variety (differing maturity time)

ults in a nutshell

void sowing fast maturing varieties (eg ATR Stingray, Nuseed Diamond, Hyola 575CL) before the first NZAC day in the medium rainfall zone.

sowing early has the potential to maximise yield and water use efficiency

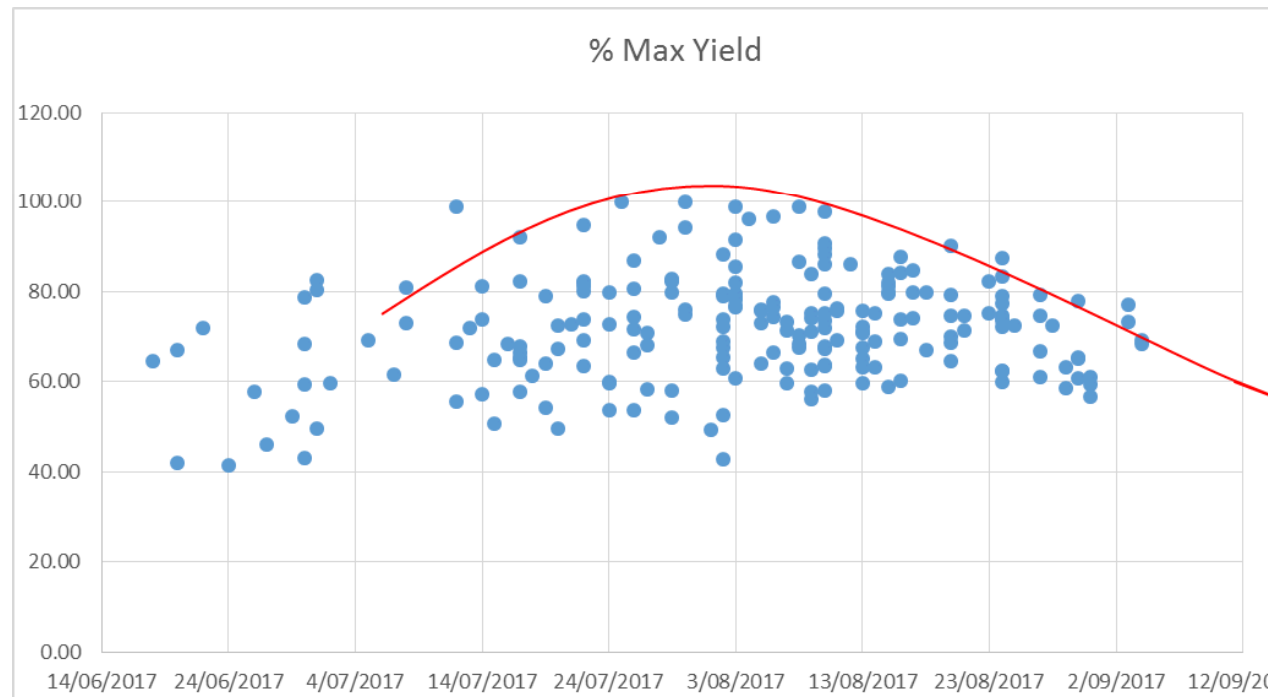
critical to match sowing time and variety up with optimal start of flowering time.



# Flowering time and yield

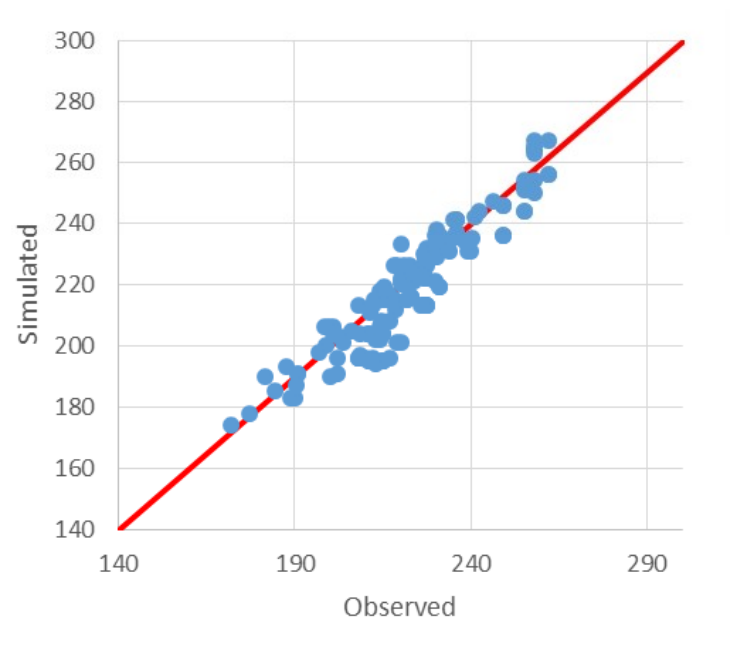
Average flowering date to achieve 90% or higher of maximum yield at site: 2014 - 2017

- Yeelanna – 2 August
- Hart - 6 August
- Lameroo - 26 July

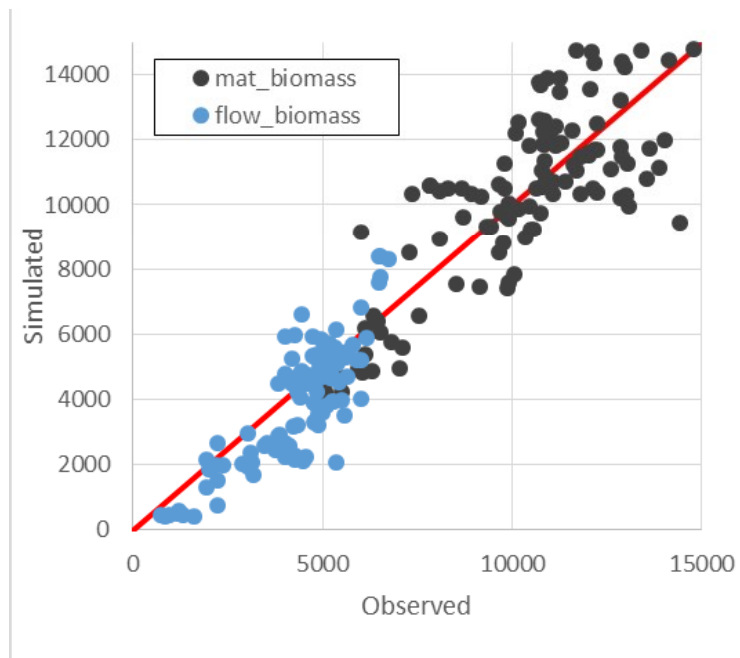


# APSIM simulation of agronomy experiments

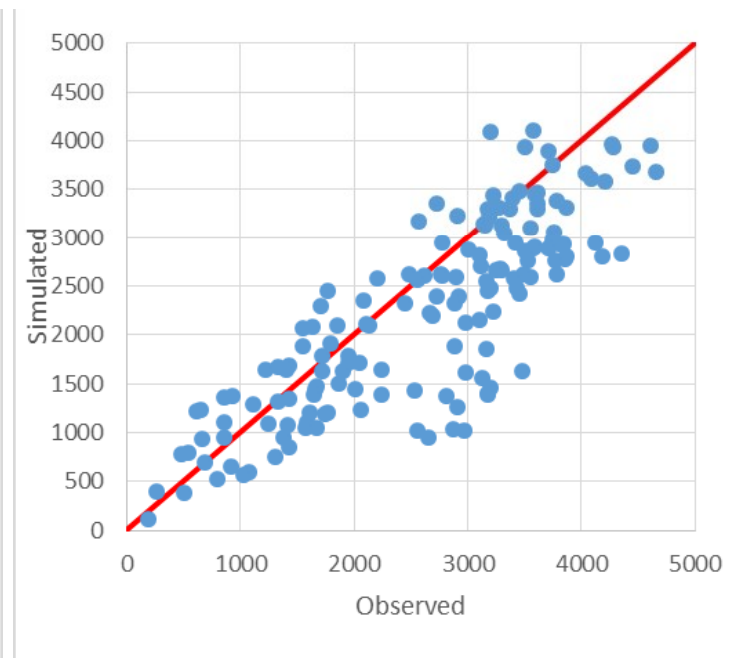
Yre Peninsula sites 2014-16



Flowering date



Total biomass (kg/ha)



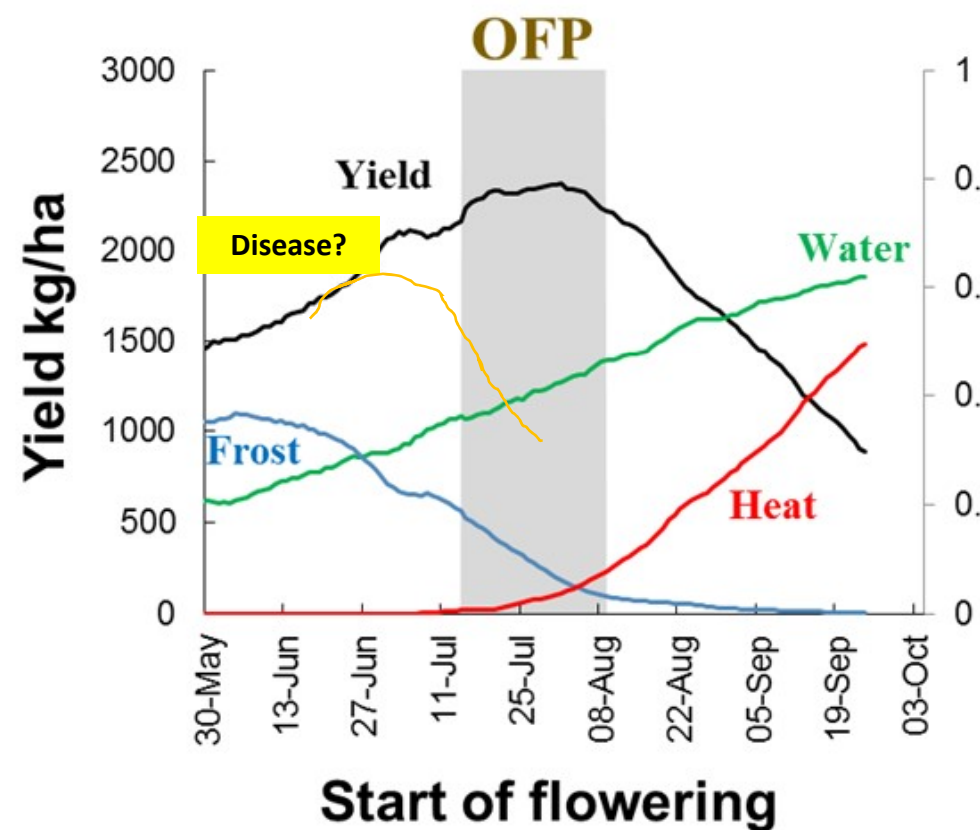
Grain yield (kg/ha)

# Optimal Start of Flowering Window

Determined by;

- Seasonal water availability
- Temperature
- Radiation
- Frost and heat
- Disease?

- A compromise of all factors



# Optimal Start of Flowering (OSF)

South Australia	Optimal <u>Start</u> of Flowering (OSF)			
	optimum date	acceptable range (days)	based on	with PAW
Minnipa	15-Jul	22	red sandy clay loam	139 mm
Wudinna	16-Jul	9	red sandy clay loam	139 mm
Kadina	16-Jul	27	calcareous loam	102 mm
Lameroo	17-Jul	29	loamy sand	90 mm
Minlaton	17-Jul	40	sand over clay	88 mm
Loxton	19-Jul	9	sand	118 mm
Bute	19-Jul	35	red sandy clay loam	139 mm
Spalding	20-Jul	36	clay loam	143 mm
Karoonda	21-Jul	19	sand over loam	136 mm
Booleroo	22-Jul	28	clay loam	128 mm
Yeelanna	23-Jul	38	clay loam	152 mm
Hart	25-Jul	31	clay loam	183 mm
Tarlee	26-Jul	35	medium clay	225 mm
Naracoorte	7-Aug	14	dark grey clay	80 mm



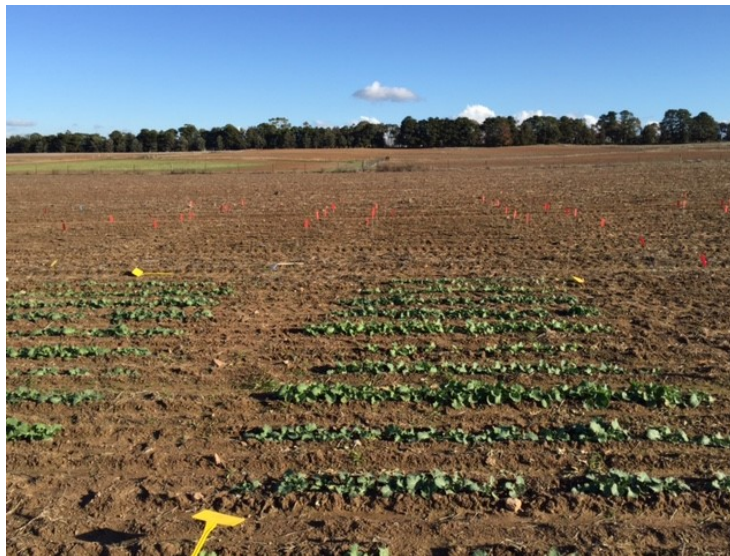
# Canola responds to the environment

All three sites planted within day of each other

All three photos taken within a day or so of each other



Gatton, Qld

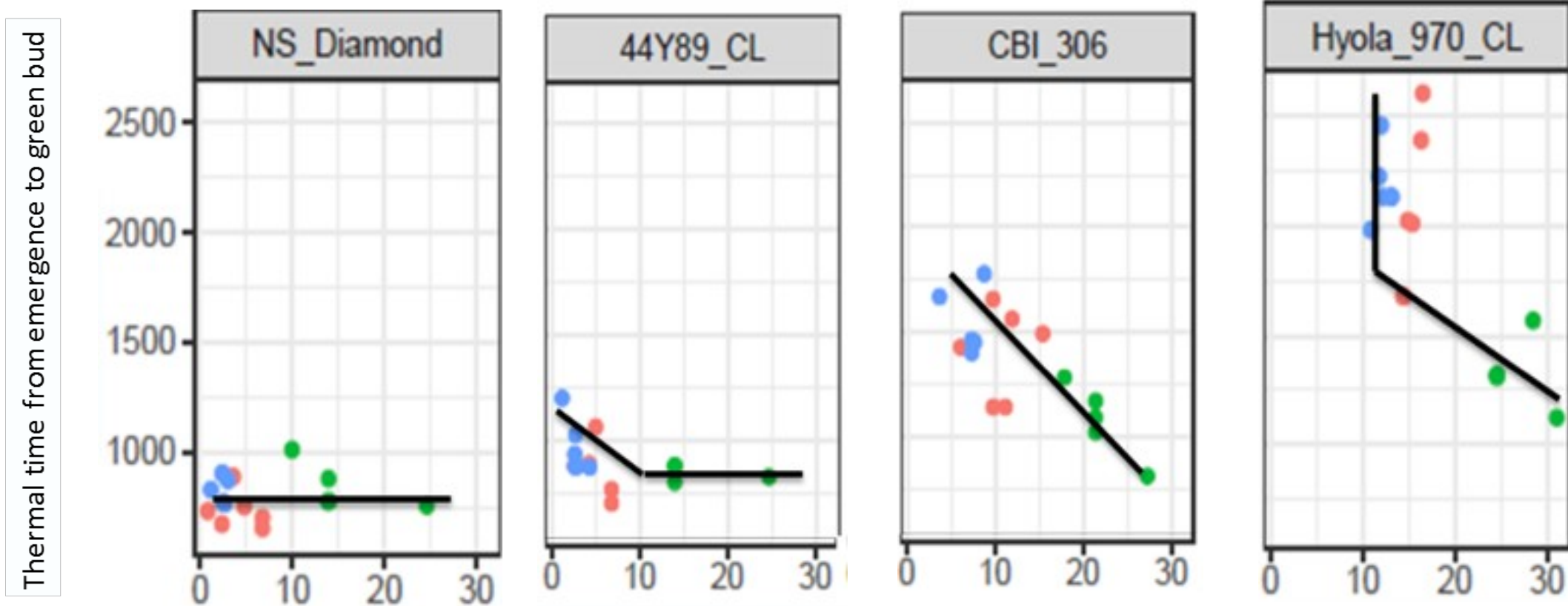


Canberra, ACT



Ottawa, Canada

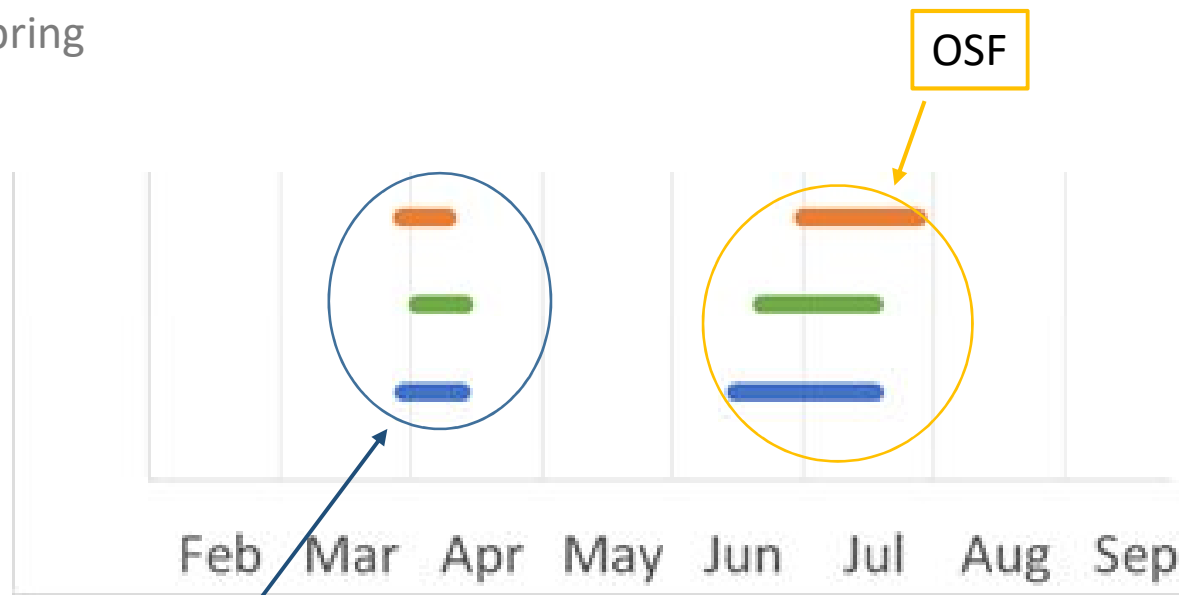
# Examples of triggers to varietal development



Vernal time from sowing to initiation

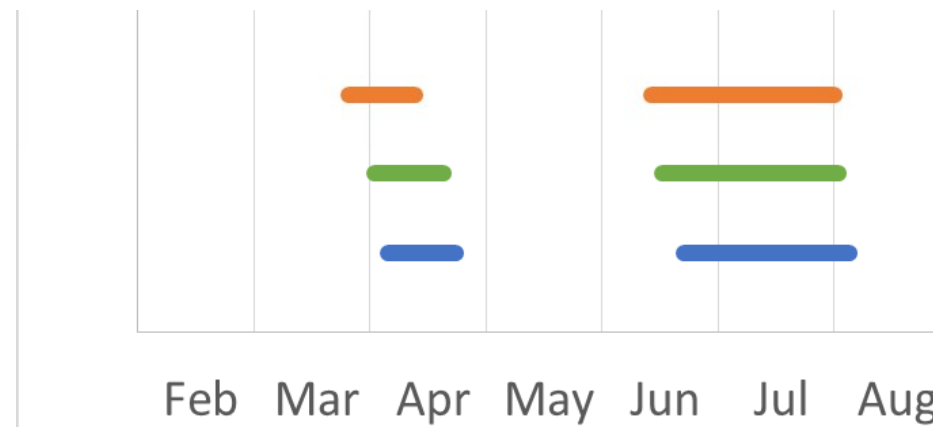
# Matching cultivar choice, sowing date and OSF

spring  
um spring  
spring



Sowing  
window

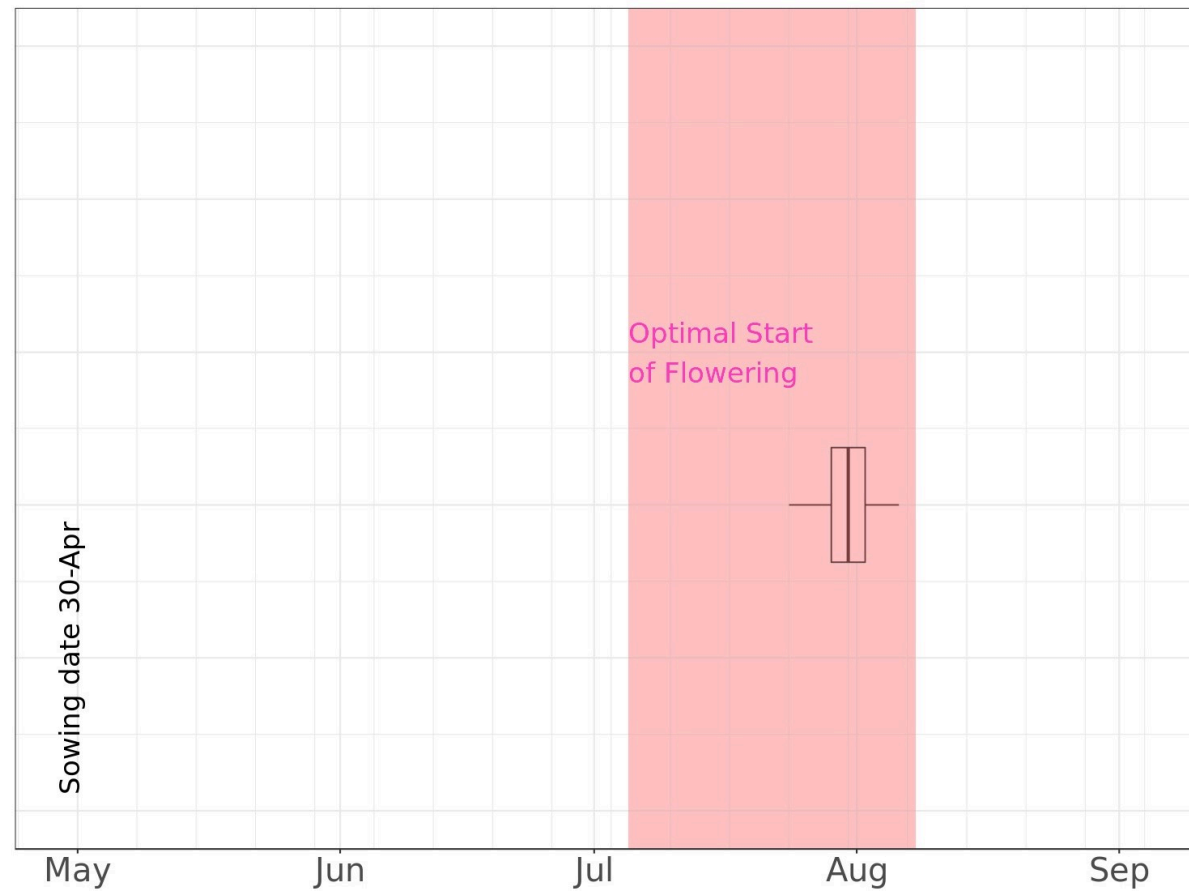
Minnipa, SA



Yeelanna, SA

# Matching cultivar choice, sowing date and OSF

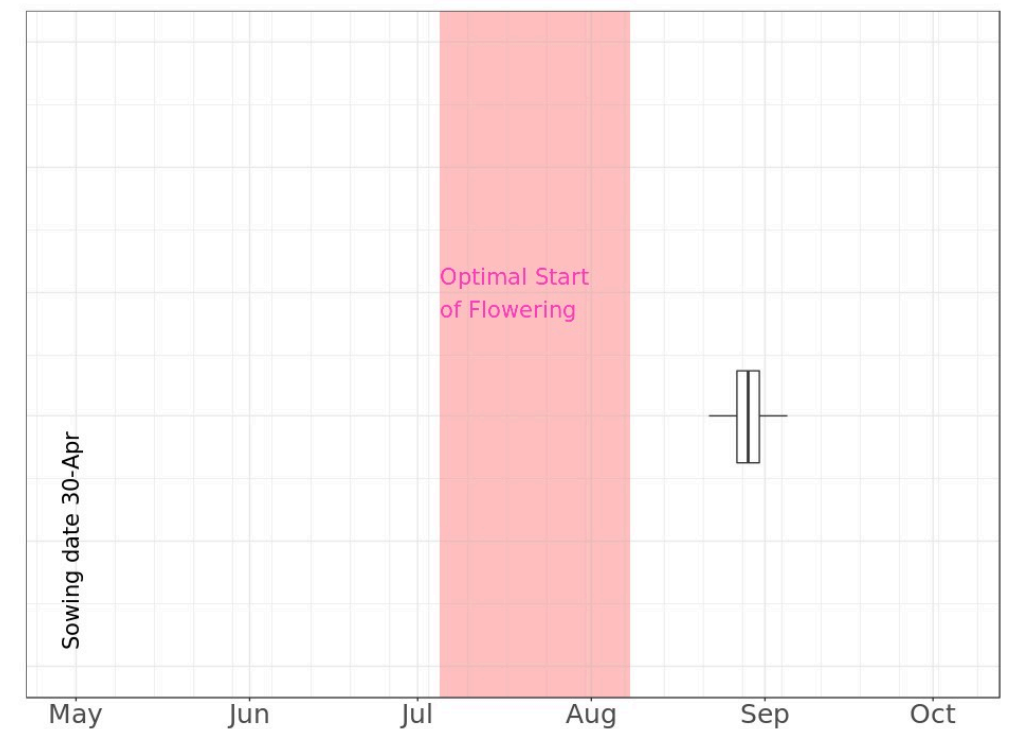
Cummins - AV- Garnet sown 30 April



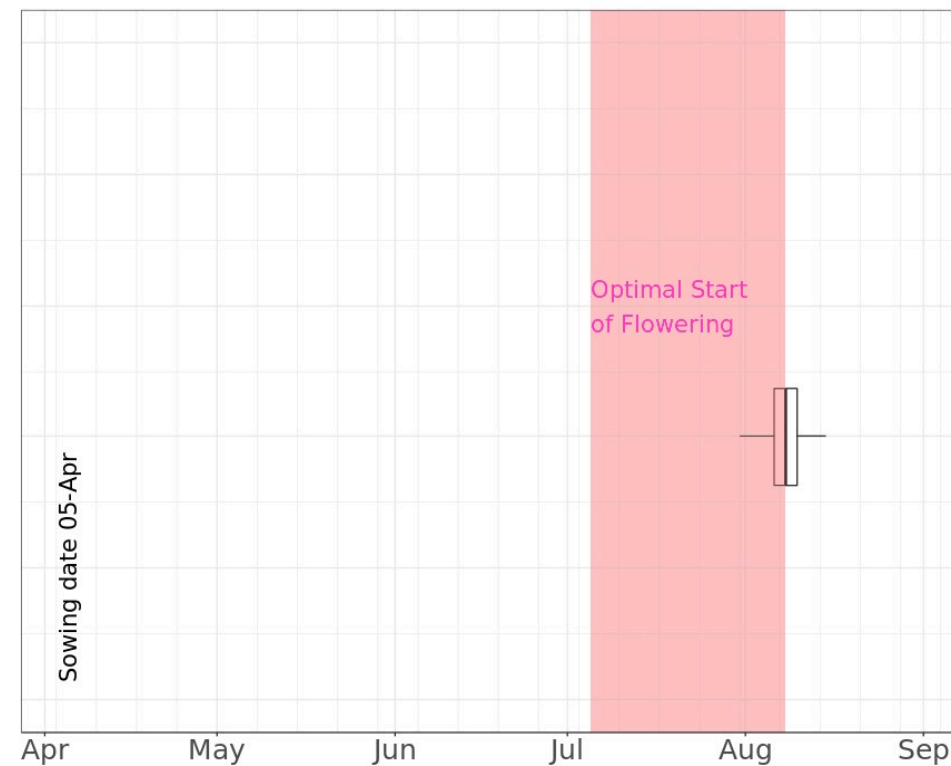


# Matching cultivar choice, sowing date and OSF

Cummins - Archer



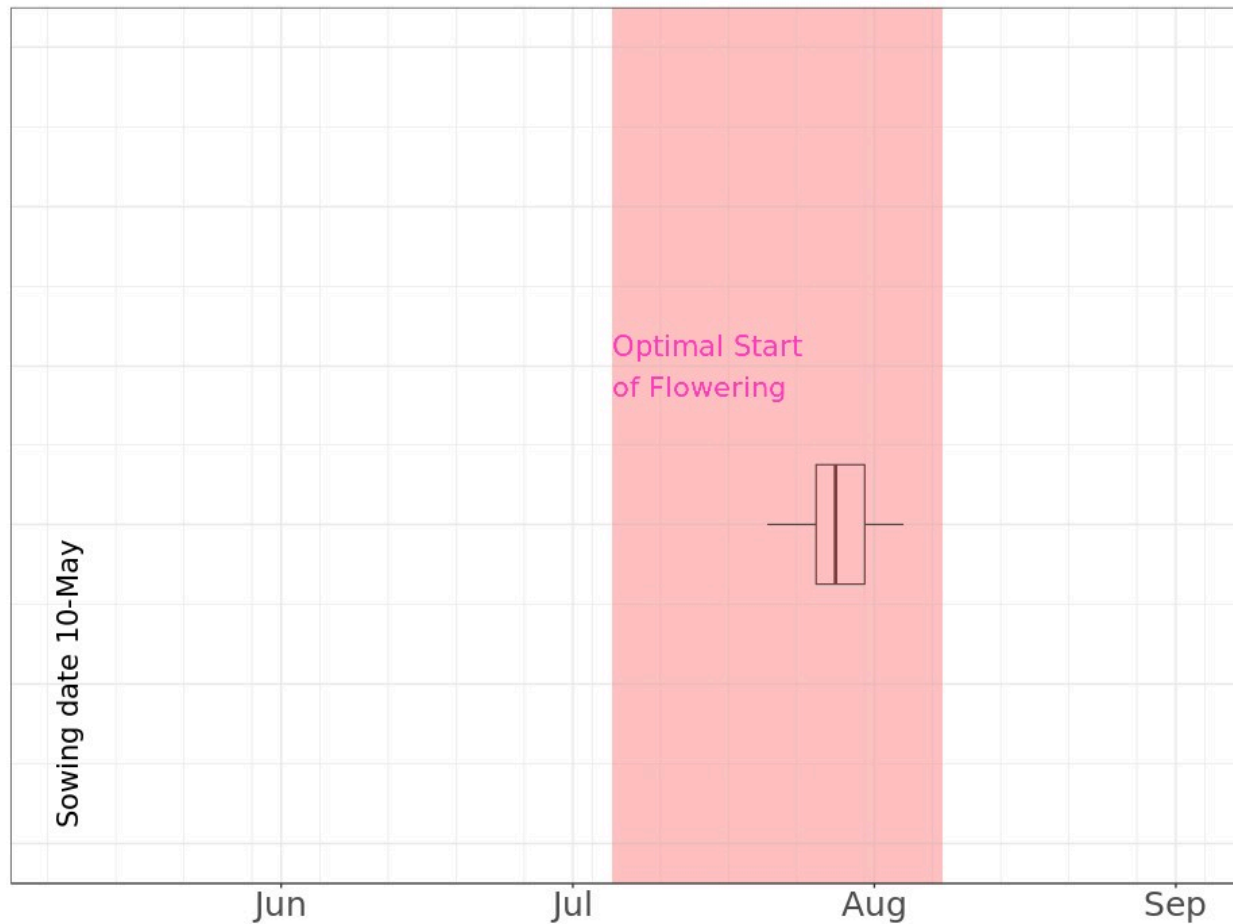
Sown 30 April



Sown 5 April

# Matching cultivar choice, sowing date and OSF

Cummins - Nuseed Diamond sown 10 May



# Can we better define maturity?

Variety	Phenology time from sowing to flowering when sown early	Maturity as supplied by breeding companies	Herbicide tolerance	Hybrid or OP (open pollinated)
Diamond	fast	early	Conv.	hybrid
ATR Stingray	fast	early	TT	OP
Hyola 575CL	fast	mid to mid-early	Imi	hybrid
43C80 CL	mid-fast	early	Imi	OP
44Y89 CL	mid-fast	early-mid	Imi	hybrid
44Y89 CL	mid-fast	early-mid	Imi	hybrid
44Y90 CL	mid-fast	early-mid	Imi	hybrid
ATR Bonito	mid-fast	early to early-mid	TT	OP
45Y86 CL	mid-fast	mid	Imi	hybrid
44Y87 CL	mid	early-mid	Imi	hybrid
ATR Gem	mid	mid-early	TT	OP
Hyola 559TT	mid	mid	TT	hybrid
45Y88 CL	mid	mid	Imi	hybrid
Garnet	mid	mid to mid-early	Conv.	OP
Hyola 577CL	mid-slow	mid	Imi	hybrid
45Y91 CL	mid-slow	mid	Imi	hybrid
ATR Wahoo	mid-slow	mid-late	TT	OP
Hyola 750TT	mid-slow	mid-late	TT	hybrid
Archer	slow	mid-late	Imi	hybrid
Victory V7001CL	slow	mid-late	Imi	hybrid
Hyola 970CL	very slow (winter)	winter	Imi	hybrid
SF Edimax CL	very slow (winter)	winter	Imi	hybrid

# 10 Tips to Early-Sown Canola

<https://grdc.com.au/10TipsEarlySownCanola>

## Ten Tips to Early-Sown Canola

Changing rainfall patterns, disciplined summer fallow management and improved no-till seeding systems have facilitated a shift to earlier sowing of canola, capitalising on soil moisture opportunities and reducing production risk. The Optimised Canola Profitability project funded through GRDC, investigated the potential for early sowing of canola in regions from northern NSW to the Eyre Peninsula of South Australia, with a focus on tactical agronomic requirements. They found...

**Sowing canola early can increase productivity and profitability by following 10 important guidelines...**

- 1. consider your location**

Early sowing of canola before mid-April can be successful in **most environments of southern and eastern Australia**.

The main exceptions are:

  - South Australia, where low rainfall probabilities in March-April are likely to restrict early sowing to around mid-April; and
  - Northern NSW, where trials show significant yield variability with early April sowing; late April or early May is preferred.

From 2014 to 2016, the Optimised Canola Profitability project team conducted 34 trials looking at the interaction between variety and sowing date. The trials were located at 14 sites, ranging from northern NSW to the Eyre Peninsula in SA.
- 2. select a slower developing variety**

Early sowing amplifies differences in **flowering time (phenology)** between spring canola varieties.

Sow slower developing varieties early to target the Optimal Start of Flowering period, ie. the period when the risk of frost/heat/water stress is minimised and yield potential maximised.

Sowing faster developing varieties early will expose them to greater frost and disease risk at flowering and can reduce yield potential.

A sowing plan that incorporates two different canola phenology types (ie. varieties with different flowering times) can help optimise production across the enterprise.

Select varieties for sowing:  
a) know your Optimal Start of Flowering (OSF)  
b) target your OSF with mid-slow or slow varieties  
#SowSlowEarly



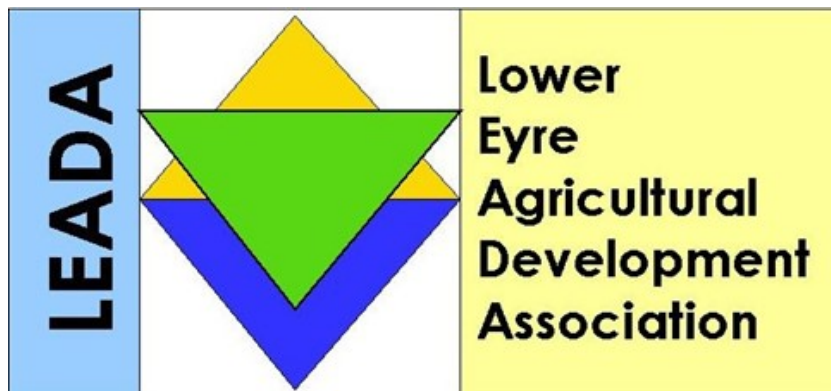
# Thank you

This work is a component of the 'Optimised Canola Profitability' project (CSP00187), a collaboration between, CSIRO, NSW DPI and GRDC, in partnership with SARDI, CSU, MSF and BCG.

Thank you: SARDI NVA technical staff, co-operating growers and the Hart Field Site Group.

## **SARDI Agronomy**

- Kenton Porker
- Jacob Giles
- Blake Gontar
- Ashley Flint
- David Holmes
- Fabio Arsego
- Sue Buderick
- Brenton Spriggs



S A R D I

# How often can we sow early in South Australia

Location	Chance of > 15mm over three days in April	Chance of >10mm over three days in April
Cummins	40%	60%
Minnipa	25%	44%
Lock	38%	53%
Snowtown	37%	54%
Riverton	54%	65%



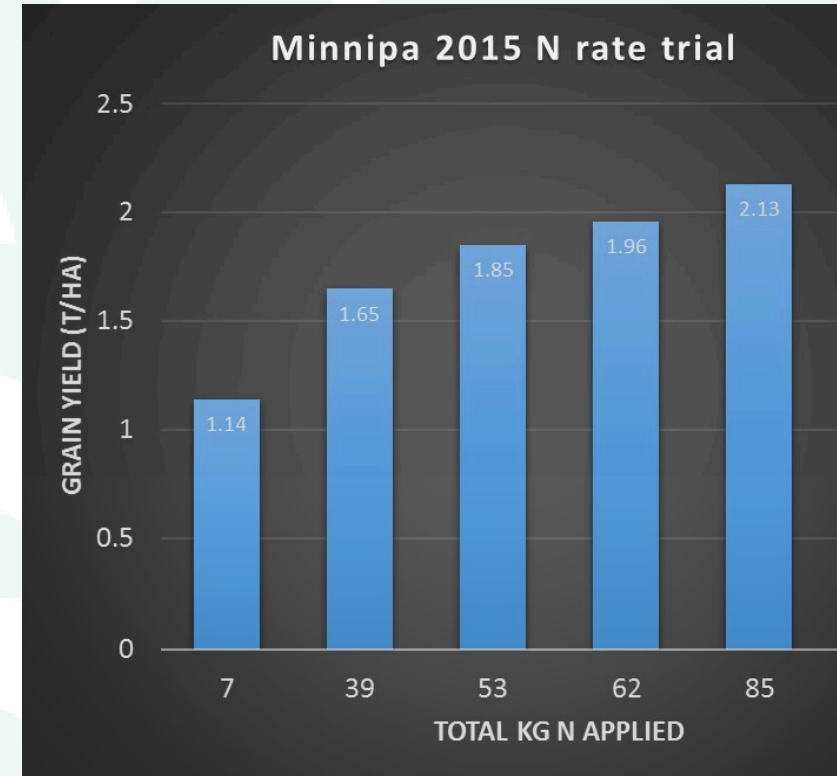
© Commonwealth of Australia 2018



# Setting nitrogen right – the next challenge

Canola needs access to 80kg/ha Nitrogen per tonne of grain produced

Setting targeting yield with the right variety  
flowering in the right window



PAW 235mm     $Isd (5\%) = 0.14$

# Blackleg monitoring - South Australia 2017

Sites	Resistance group							
	Group A	Group B	Group C	Group AD	Group ABD	Group ABDF	Group BF	Group AS
<b>SA</b>								
Arthurton								
Bordertown								
Cummins								
Frances								
Mt Hope								
Riverton								
Spalding								
Turretfield								
Wangary								
Yeelanna								




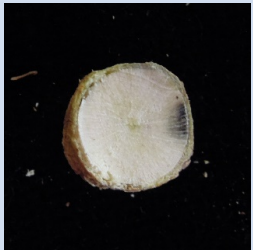

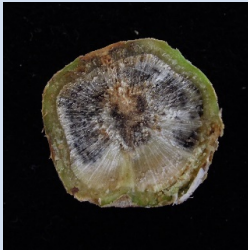

# Group ABDF Cultivar – Artherton SA 2017



# Group AD Cultivar – Cummins SA 2017







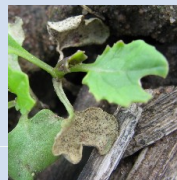











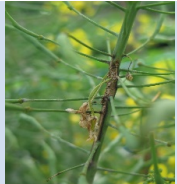



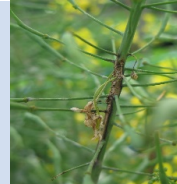











# Quantitative gene resistance








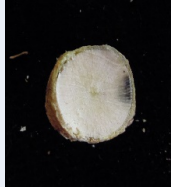







R	R-MR	MR	MR-MS	MS
				



















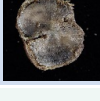


# Major gene + quantitative resistance

	Only major gene resistance - <b>Effective</b>	Only major gene resistance - <b>Overcome</b>	Major gene resistance <b>Effective</b> + quantitative resistance	Major gene resistance <b>Overcome</b> + quantitative resistance
Leaf lesions	 	 	 	 
Stem canker	 	 	 	 
Upper stem & branch infections	 	 	 	 
Seed infection	 	 	 	 

# Quantitative gene resistance

Disease pressure	R	R-MR	MR	MR-MS	MS
<b>High</b> <ul style="list-style-type: none"> <li>Wet year</li> <li>canola/wheat/canola</li> <li>next to canola stubble</li> </ul>					
<b>Moderate</b> <ul style="list-style-type: none"> <li>Average rainfall</li> <li>1 in 3 rotation</li> <li>200m stubble isolation</li> </ul>					
<b>Low</b> <ol style="list-style-type: none"> <li>Below average rainfall</li> <li>Mallee environment</li> </ol> <p>Opportunistic canola plantings</p>					

# Quantitative resistance - erosion

	ATR-Gem		ATR-Bonito ATR-Wahoo		ATR-Mako		ATR-Stingray	
Resistance Grp	A		A		A		C	
2012	MR						MR	
2013	MR						MR	
2014	MR		MR				MR	
2015	MR		MR		MR		MR	
2016	MR-MS		MR-MS		MR		MR	
2017	MS		MS		MR		MR	

**CHECK THE BLACKLEG RATING EACH YEAR**

# 2017 Newly released wheat varieties

- **Longsword** – released by AGT, quality pending, winter wheat for very early sowing.
- **LRPB Havoc** – released by LongReach, Mace like yields and adaptation, AH classification in WA.
- **DS Pascal** – released by Dow Seeds, longer season maturity with sprouting tolerance. APW quality.

## Recent releases now widely evaluated

- LRPB Arrow, Chief CL Plus, Scepter, and Cutlass

ety Name	Cummins	Rudall	Wanilla
oter	122	118	110
B Havoc	115	94	112
e	111	114	96
kom	110	105	110
ass	107	103	112
ack	104	102	115
B Arrow	102	98	100
ld	101	104	98
B Scout	101	100	96
mick	100	100	107
lkatchem	97	98	101
B Trojan	97	95	104
	94	88	95
arwin	94	85	87
f CL Plus	92	99	100
het CL Plus	88	97	88
nade CL Plus	87	100	76
Rock	87	96	98
	83	95	95
pascal	81	82	76
lius	77	99	85
Mean (t/ha)	3.11	2.42	3.28
(%)	4.23	3.45	3.25
ability	<0.001	<0.001	<0.001
(%)	7	6	6
ing Date	20-Jun-2017	19-Jun-2017	02-Jun-2017

## 2017 NVT Lower EP Wheat Results (% site mean)

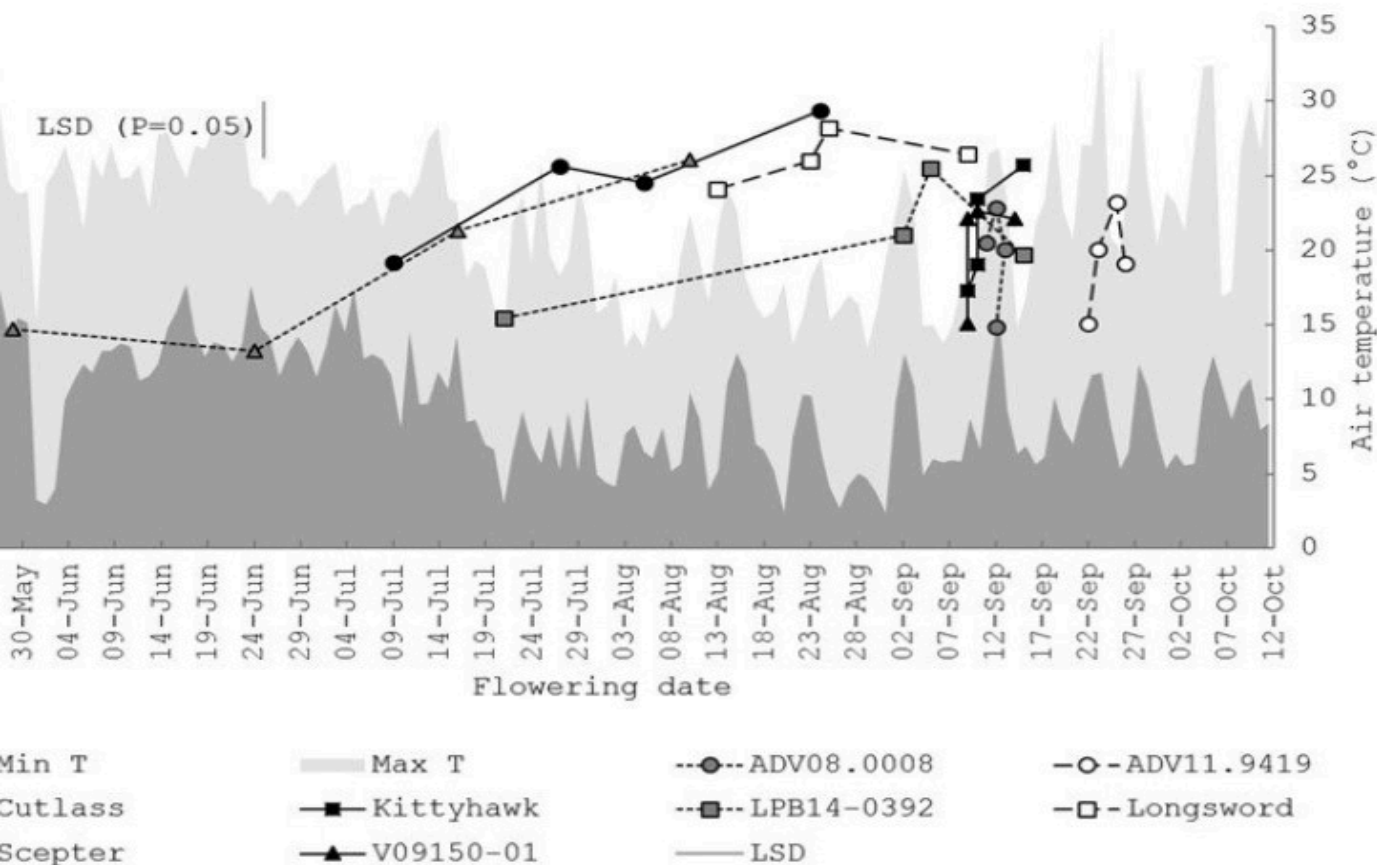


# EP Long Term (2012-17) - % site mean

Variety	No Trials	Yield Group						
		2.5	3	3.5	4	4.5	5.5	6
cepterAH	9	116		116	114	112		108
eckomAH	15	109	116	109	111	107	109	108
orackAPW	15	109	109	112	108	109	105	101
RPB HavocAH	5	108		113	110			100
RPB ArrowAH	9	107		110	109	107		106
aceAH	15	108	109	110	107	106	104	101
RPB TrojanAPW	15	101	111	105	105	109	113	111
osmickAH	15	105	109	105	108	105	107	107
RPB CobraAH	15	97	109	104	108	106	111	108
yalatchemAPW	15	104	108	106	104	102	103	101
mu RockAH	15	104	99	103	107	102	98	99
chief CL PlusAPW	8	107		109	101	102		98
RPB ScoutAH	15	97	99	98	105	102	105	106
utlassAPW	9	101		98	98	100		104
S DarwinAH	14	94		95	96	98	98	98
renade CL PlusAH	15	97	87	93	96	95	91	95
ustica CL PlusAPW	12	97	92	92	96	93	93	97
atchet CL PlusAH	15	96	84	93	97	94	89	92
ord CL PlusAH	15	97	86	92	92	94	89	93
S PascalAPW	5	84		82	91			100

# ME SW

## Minnipa Experiment 1 2017 preliminary yield results



**Times of sowing:** 21Mar 3Apr 18Apr 5May  
(irrigated up with 10mm)

**Water supply:** 141 mm Mar-Oct rainfall

Frost-free site with severe May and Jun  
drought with only 25% of the Mar-Oct  
rainfall falling in the Mar - Jul period

### The take home

- **Cutlass & Longsword** flowering late-  
August produced highest yields
- **Longsword** was the highest yielding  
winter line
- **ADV11.9419** achieved comparable yield  
other winter types despite flowering  
later
- Winter types produced highest yield  
when sown early to mid April, the  
start reduced yield and biomass in  
sown winters despite similar flower  
dates as later sowing times

Managed by: SARDI Project partners: GRDC La Trobe University SARDI Hart Field Site Group  
Agronomy BCG Agriculture Victoria FAR Australia In collaboration with: NSW DPI



SARDI

## 2017 Newly released barley varieties

- **RGT Planet** – released by Seed Force, high yielding European introduction, undergoing malt accreditation.

## Just passed malt accreditation

- Spartacus CL, Compass

## High yielding feed varieties

- Rosalind

Post Town	Cummins	Wanilla	Wharminda
Field Name	%	%	%
Planet	111	104	84
Marsh	109	90	132
Ind	109	116	117
ass	106	106	131
obe	106	102	134
acus CL	104	101	129
d	103	98	61
ander	101	80	138
m	99	107	127
	99	102	125
rs	97	105	100
	96	103	66
r	95	104	88
ir	91	96	73
minster	90	92	74
	88	88	106
e	88	92	120
lean (t/ha)	4.73	3.87	1.25
)	4.71	9.2	10.73
bility	<0.001	0.0041	<0.001
/ha)	8	15	17
g Date	20-Jun-2017	02-Jun-2017	10-Jul-2017

## 2017 NVT Lower EP Barley Results (% site mean)

# 2017 SA NVT Barley Quality

Variety	Screenings (%)	Test Weight (kg/hl)	Protein (%)	Retention (%)
Commander	2.9	67.4	12.0	81.7
Compass	1.9	66.7	11.6	86.9
Fathom	1.9	67.2	12.4	85.1
Fleet	1.5	66.7	12.4	83.1
Hindmarsh	4.2	69.3	12.0	76.6
Keel	2.5	68.1	12.2	83.3
La Trobe	4.4	69.9	11.8	73.3
RGT Planet	5.8	65.4	11.5	71.7
Rosalind	3.8	67.8	11.5	76.3
Scope	4.6	68.0	12.1	72.1
Spartacus CL	3.1	69.8	12.1	79.8