

NATIONAL PHENOLOGY INITIATIVE PHASE 2– NEXT-
GEN FLOWERING CALCULATORS (CSP2206-012RTX),

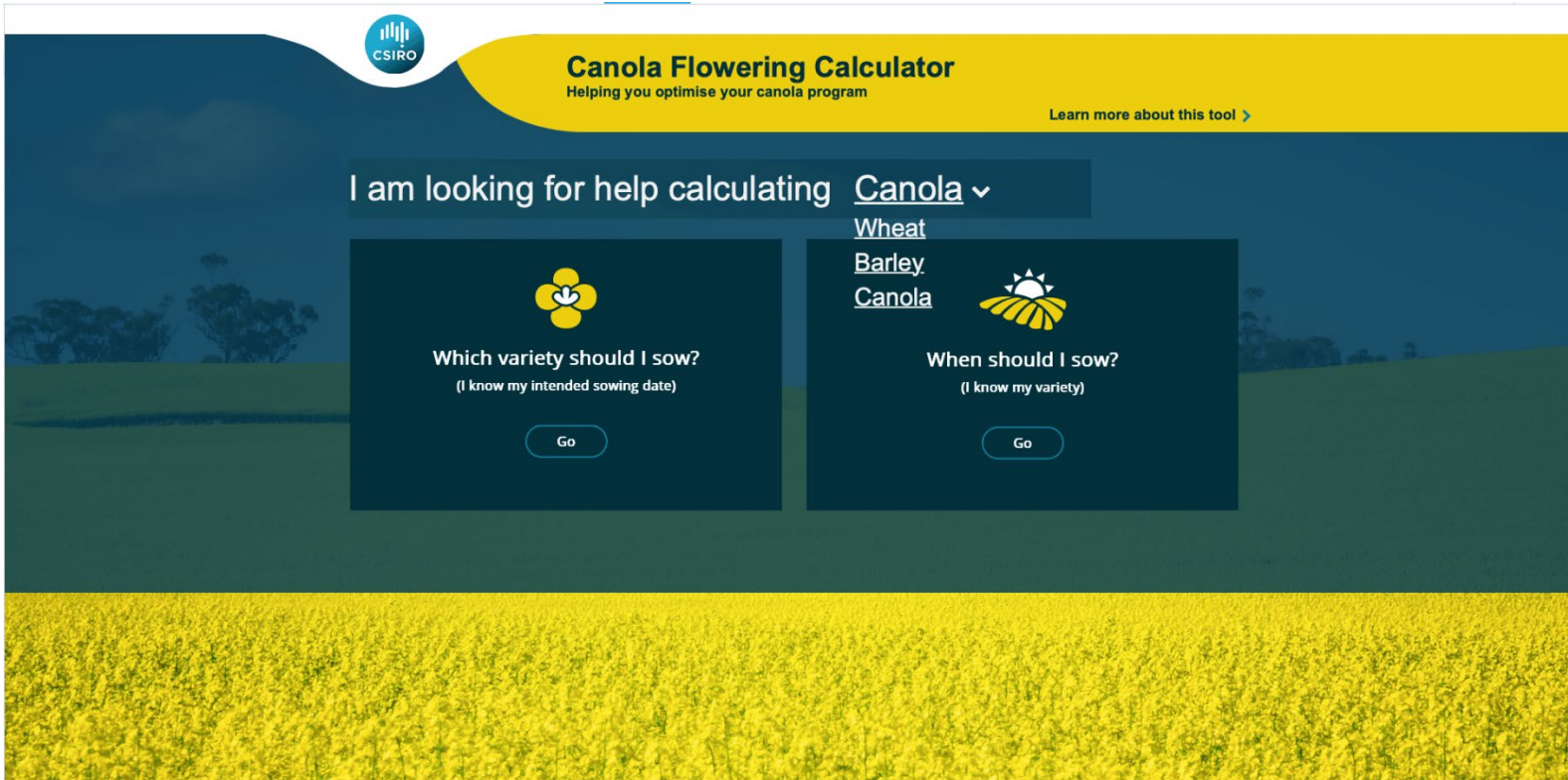
JEREMY WHISH, JULIANNE LILLEY, CSIRO AGRICULTURE AND FOOD



GRDC
GRAINS RESEARCH
& DEVELOPMENT
CORPORATION

CROP FLOWERING PREDICTOR

National Phenology Initiative Phase 2– Next-Gen Flowering Calculators (CSP2206-012RTX),



The screenshot shows the user interface of the 'Canola Flowering Calculator'. At the top left is the CSIRO logo. The main header is yellow and contains the title 'Canola Flowering Calculator' and the subtitle 'Helping you optimise your canola program'. A link 'Learn more about this tool >' is on the right. Below the header, a dark blue section contains the text 'I am looking for help calculating' followed by a dropdown menu with 'Canola' selected. Other options in the dropdown are 'Wheat', 'Barley', and 'Canola'. Below this are two dark blue cards. The left card features a canola flower icon and asks 'Which variety should I sow?' with the subtext '(I know my intended sowing date)' and a 'Go' button. The right card features a sun and field icon and asks 'When should I sow?' with the subtext '(I know my variety)' and a 'Go' button. The bottom of the page shows a field of yellow canola flowers.

CROP FLOWERING PREDICTOR

National Phenology Initiative Phase 2– Next-Gen Flowering Calculators (CSP2206-012RTX),



The screenshot shows the user interface of the 'Wheat Flowering Calculator'. At the top left is the CSIRO logo. The main header is green and contains the title 'Wheat Flowering Calculator' and the subtitle 'Helping you optimise your wheat program'. A link 'Learn more about this tool >' is on the right. Below the header is a dark blue navigation bar with the text 'I am looking for help calculating Wheat ▾'. Two main content cards are displayed: the left one is titled 'Which variety should I sow?' with the subtext '(I know my intended sowing date)' and a yellow flower icon; the right one is titled 'When should I sow?' with the subtext '(I know my variety)' and a yellow sun icon. Both cards have a 'Go' button at the bottom. The background of the interface is a blurred image of a wheat field.

A BRIEF HISTORY

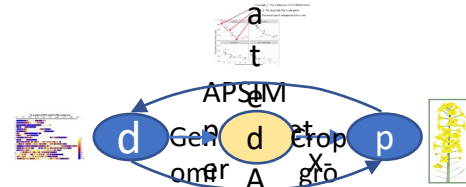
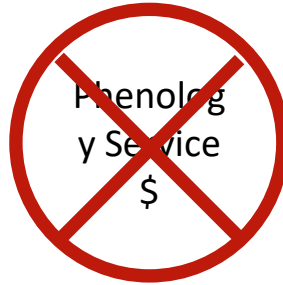
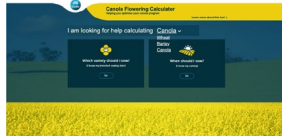
2015

2017

2019

2022

2023



OCP

Calculator

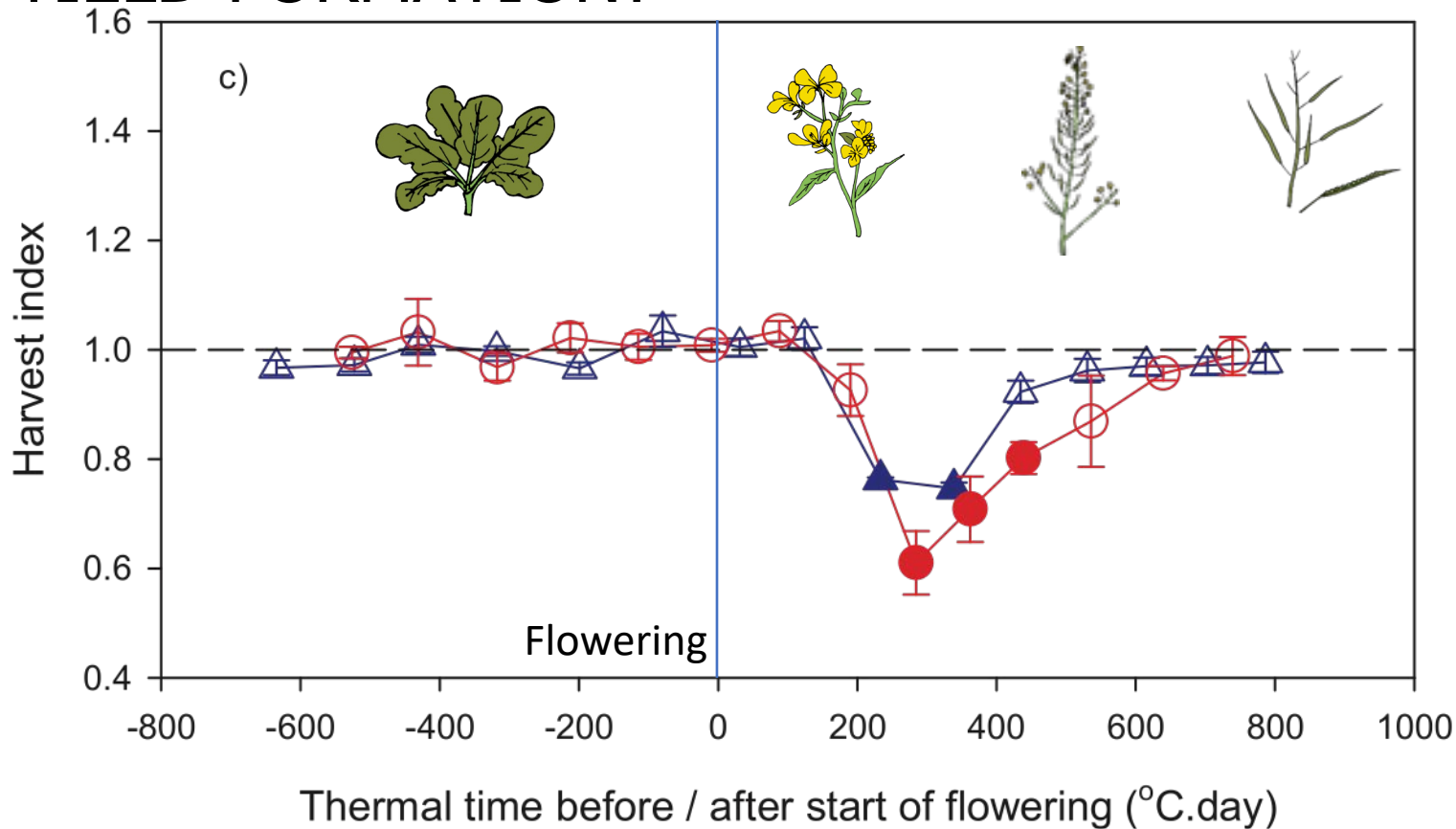
Phenology
Service

Omics
Project

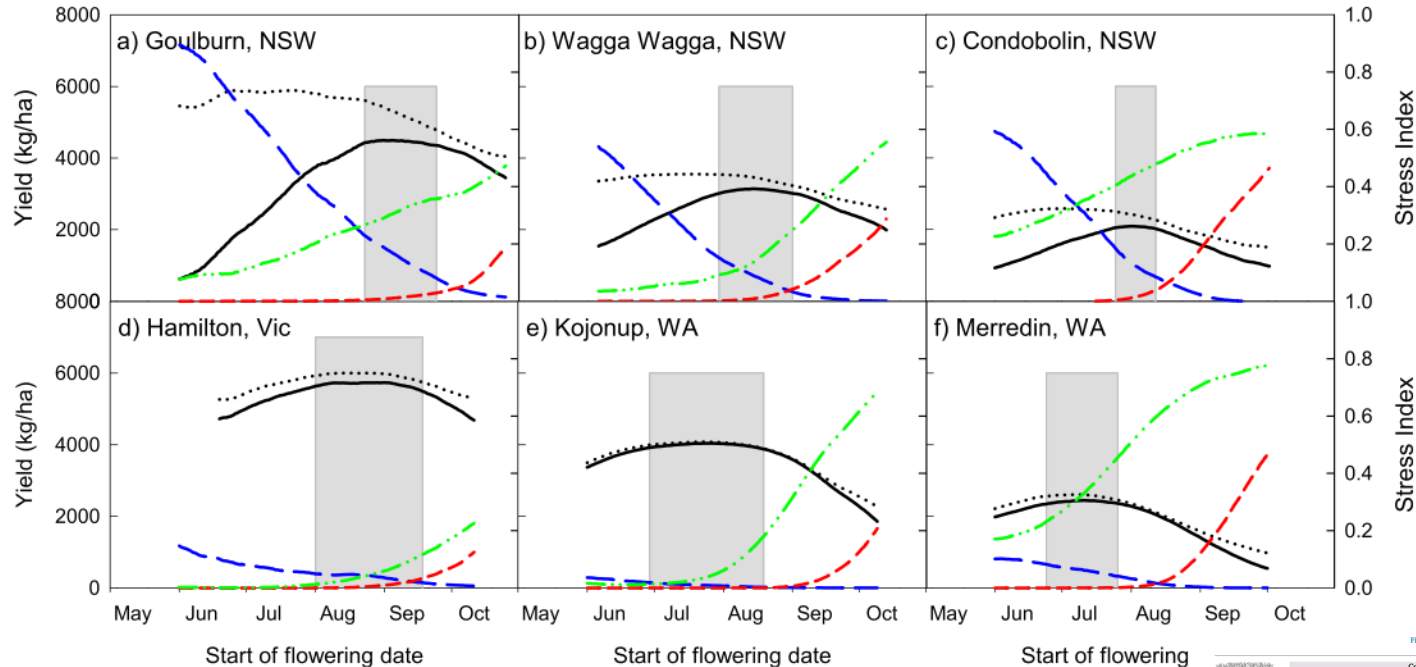
Now

G
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OCP PROJECT CRITICAL PERIOD OF YIELD FORMATION?

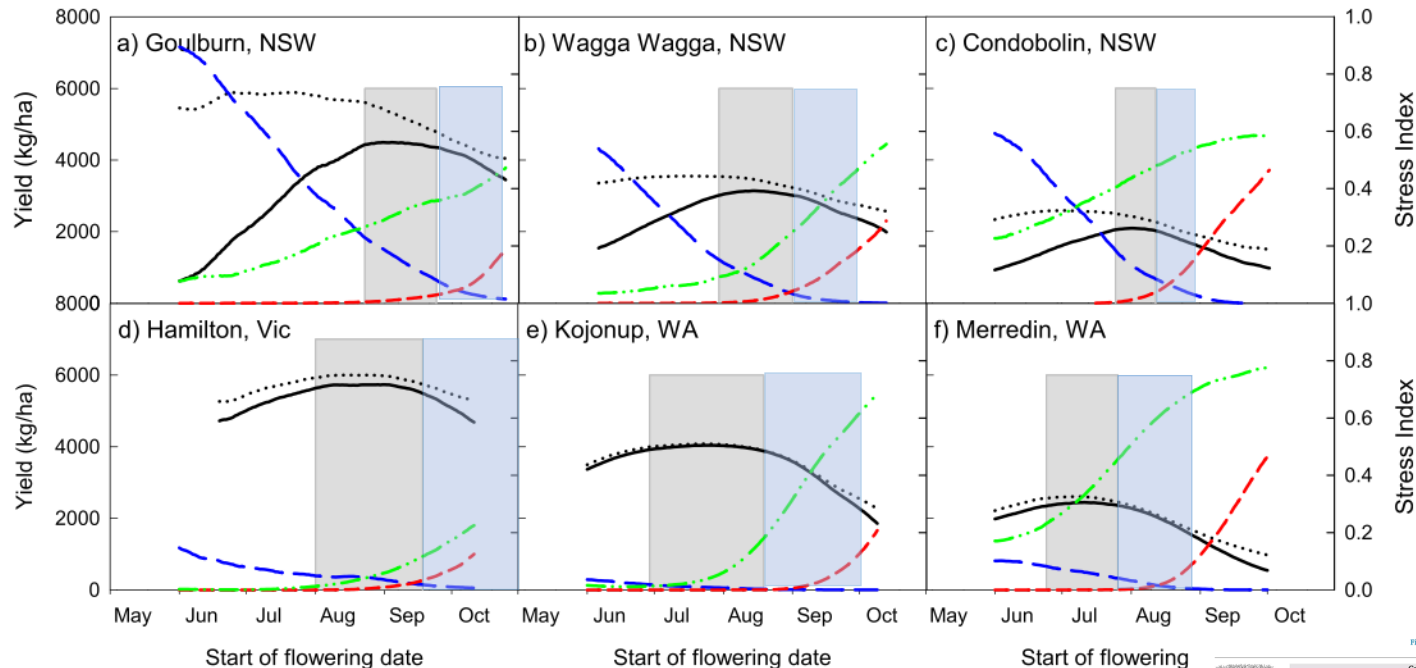


OCP PROJECT OPTIMAL TIME TO START FLOWERING ?



Field Crops Research 235 (2019) 118–128

HOW DO YOU REDUCE STRESS DURING THE CRITICAL PERIOD?



Field Crops Research 235 (2019) 118–128



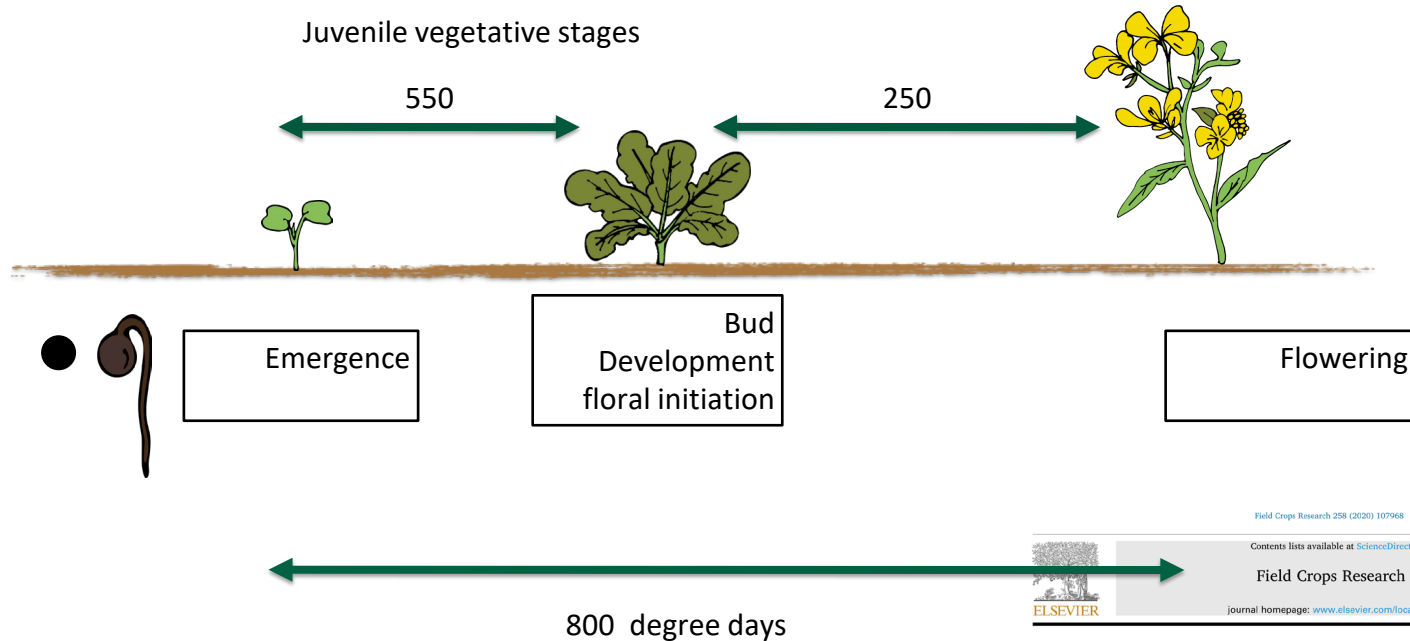
Contents lists available at ScienceDirect

Field Crops Research

journal homepage: www.elsevier.com/locate/fcr



OCP PHENOLOGY OF AUSTRALIAN CANOLA



Field Crops Research 258 (2020) 107968

Contents lists available at [ScienceDirect](https://www.elsevier.com/locate/fcr)

Field Crops Research

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Vernalisation in Australian spring canola explains variable flowering responses

J.P.M. Whish^{a,*}, J.M. Lilley^b, M.J. Morrison^c, B. Cocks^d, M. Bullock^b

^a CSIRO Agriculture and Food, St Lucia, Qld 4067, Australia

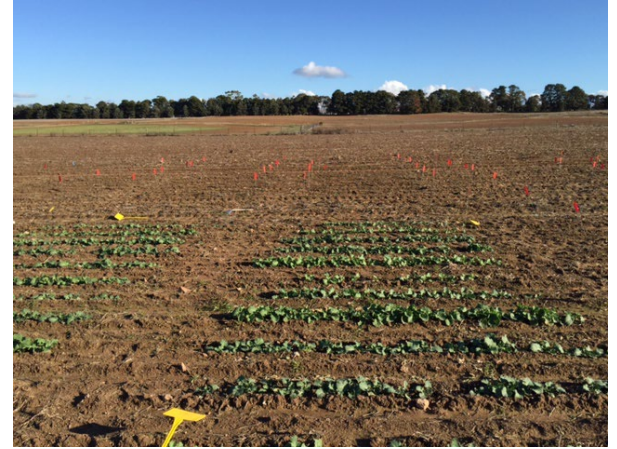
^b CSIRO Agriculture and Food, Canberra, ACT 2601, Australia

^c Agriculture and Agri-Food Canada, Central Experimental Farm, 960 Carling Avenue, Ottawa, ON K1A 0G6, Canada

^d CSIRO Agriculture and Food, Toowoomba, Qld 4350, Australia



CALCULATING PHENOLOGY



Sown on the same day, photos taken on the same day, same cultivars three different environments

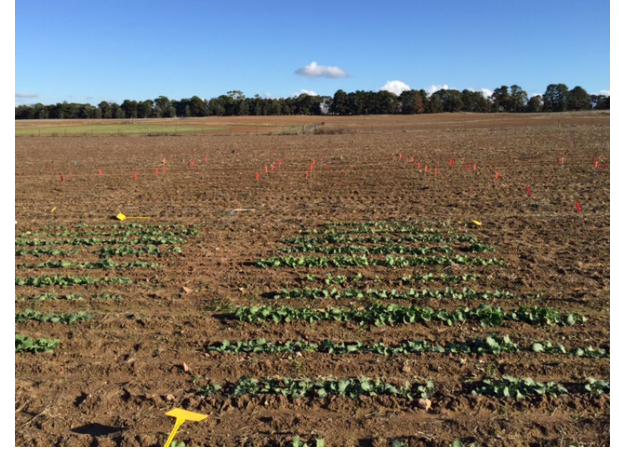
CAN'T WE JUST USE DAYS FROM SOWING



Gatton Qld



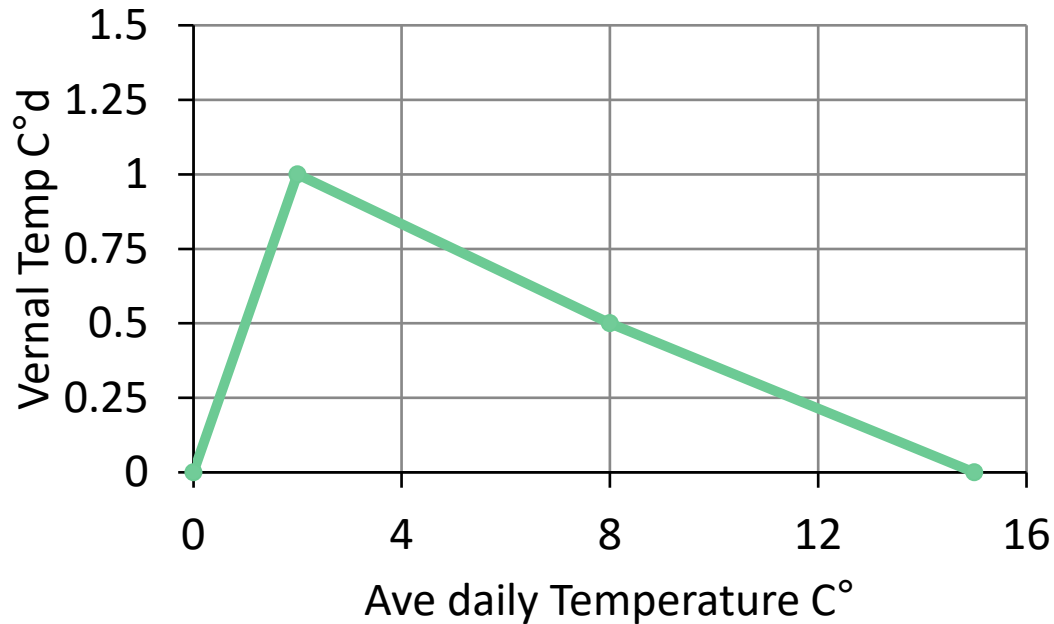
Ottawa Canada



Canberra ACT

Sown on the same day, photos taken on the same day, same cultivars three different environments

VERNALISATION

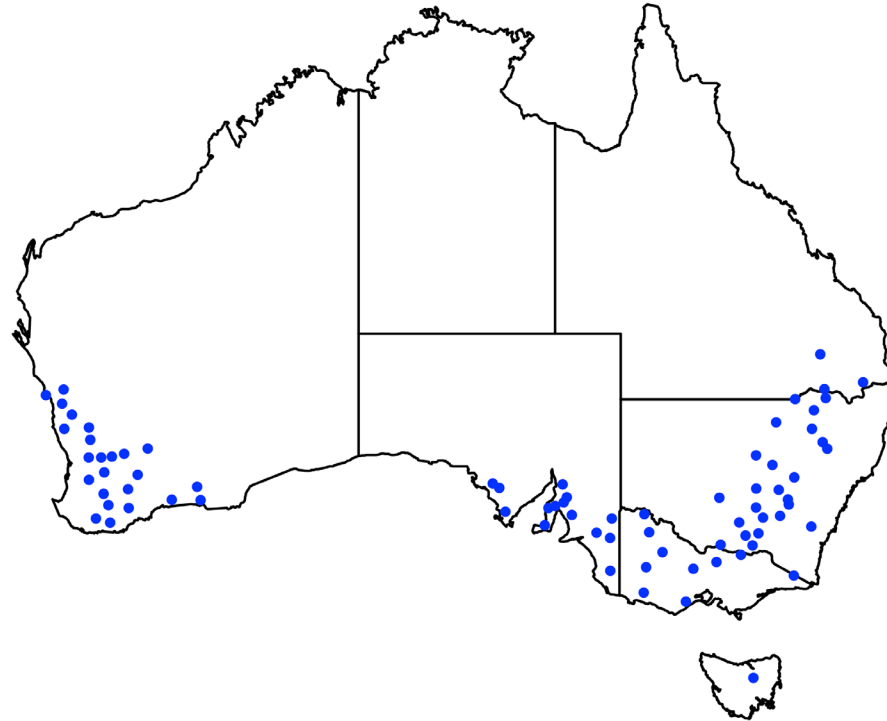


Vernalisation in Australian spring canola explains variable flowering responses

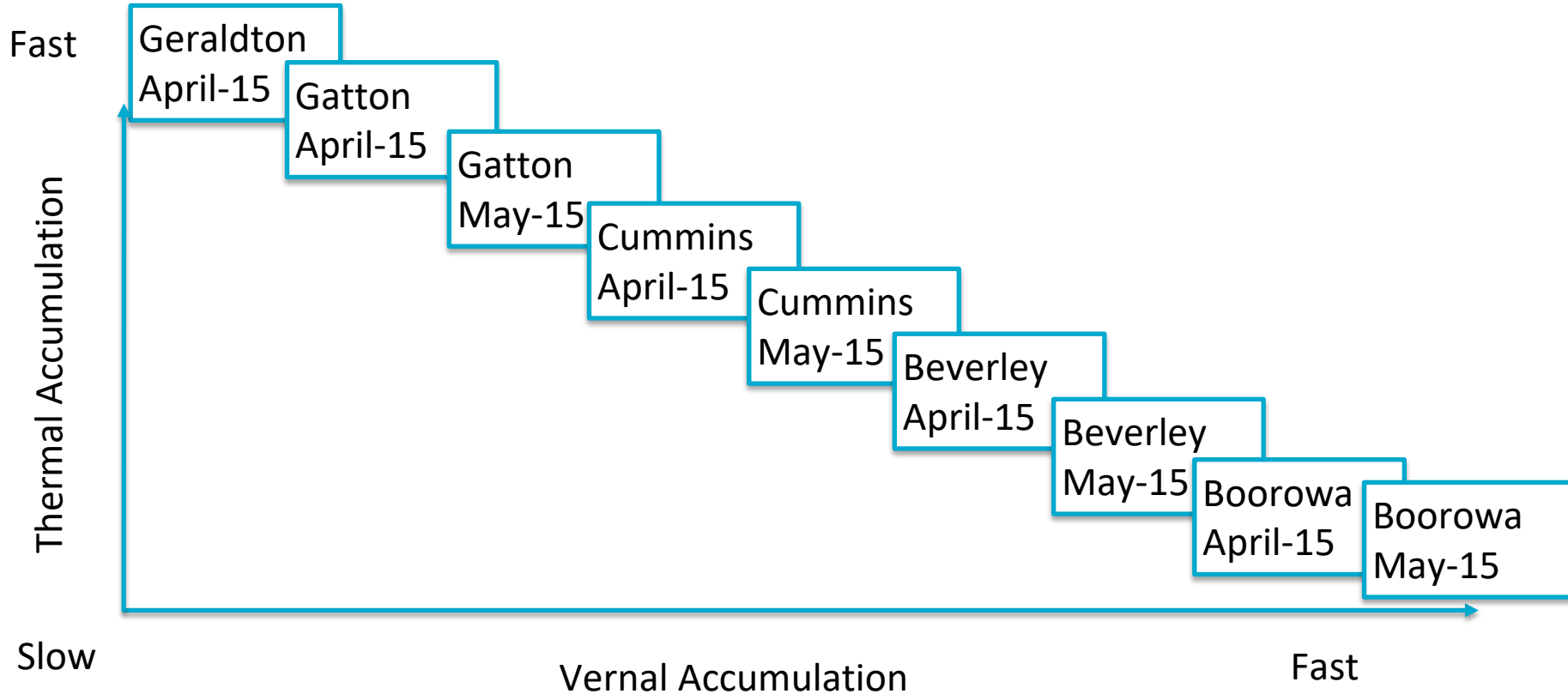
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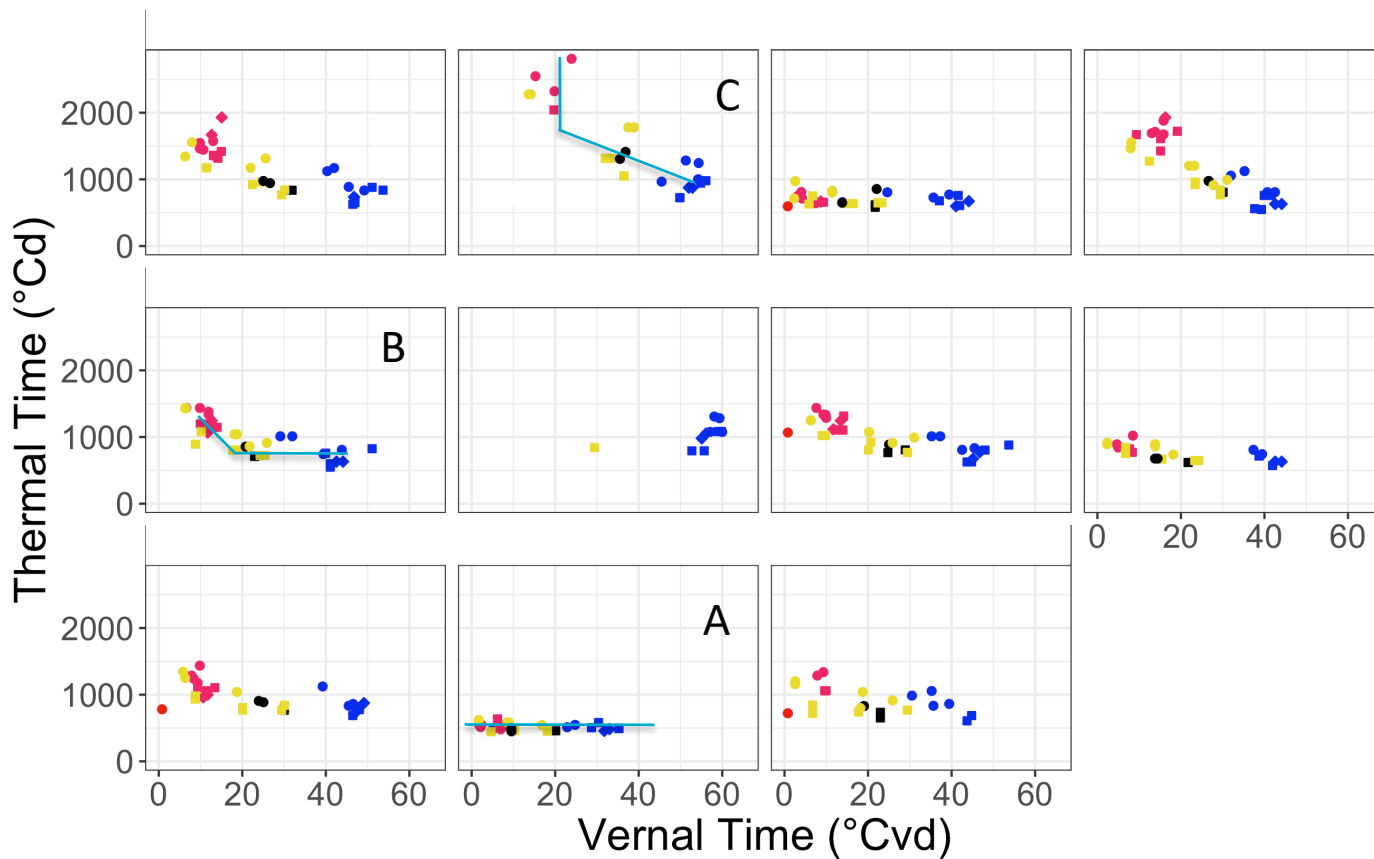
FIND DIFFERENT ENVIRONMENTS



CLIMATE ANALYSIS



PHENOLOGY PROJECT



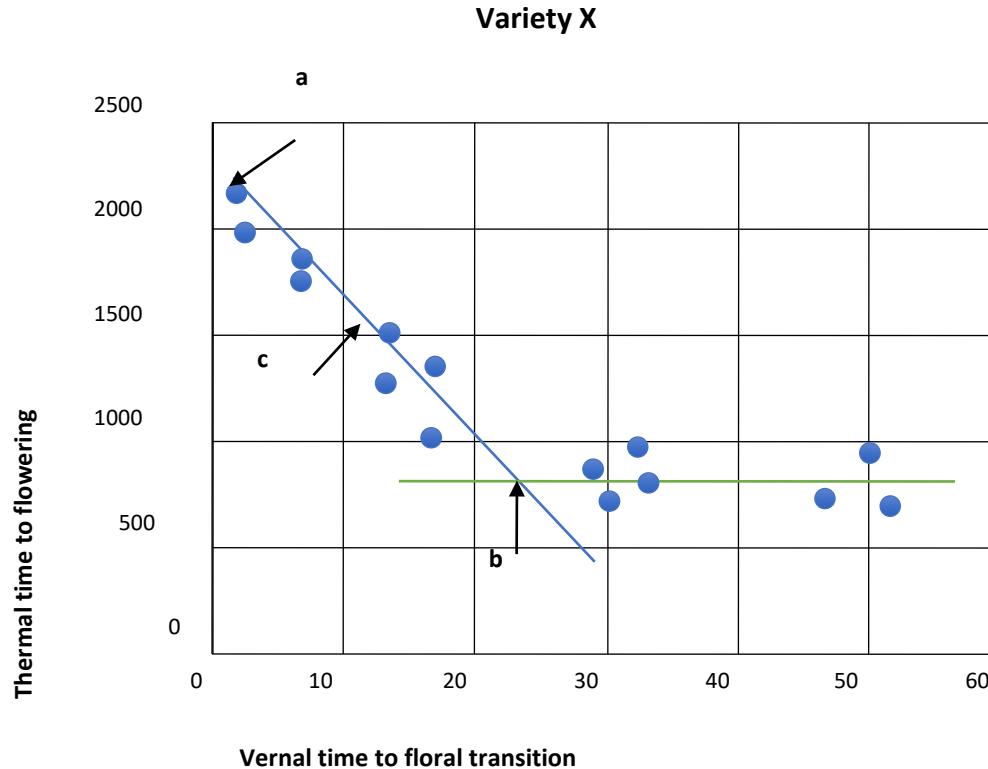
Site

- BARS_2021
- Boorowa_2019
- Canada_2021
- Gatton_2019
- Gatton_2020
- Geraldton_2022
- Kojonup_2022
- SA_2020
- WA_2020

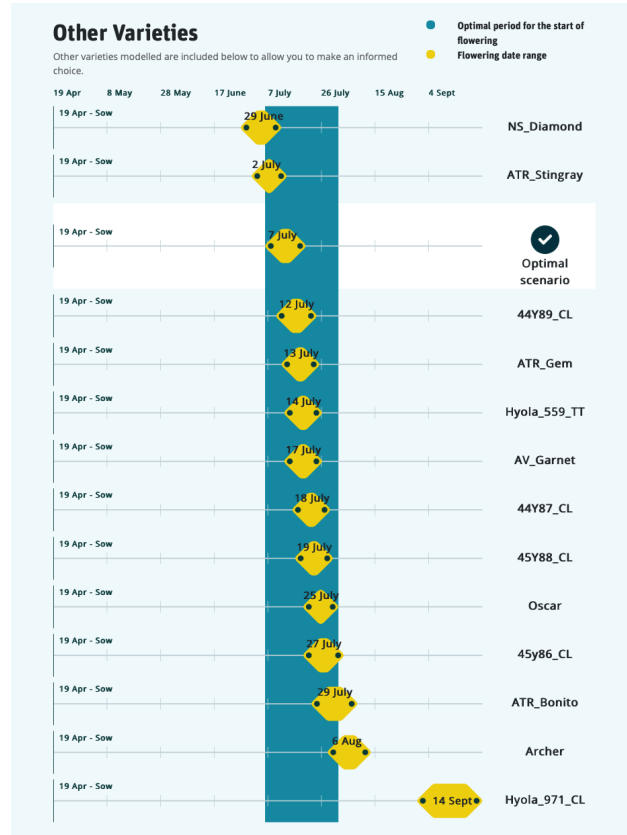
Time of Sowing

- 1
- 2
- ◇ 3

APSIM PARAMETERS



PUTTING IT ALL TOGETHER



Goondiwindi for a 19 April sowing

Aust. J. Agric. Res., 2002, 53, 1155-1164

Simulating phenology and yield response of canola to sowing date in Western Australia using the APSIM model

I. Farré^{AD}, M. J. Robertson^B, G. H. Walton^C, and S. Asseng^A

Field Crops Research 235 (2019) 118-128

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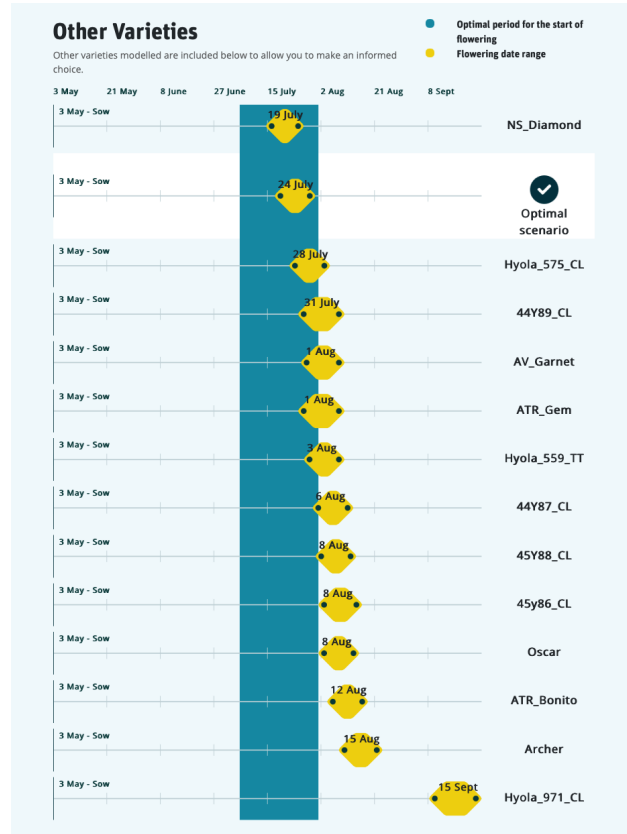
Defining optimal sowing and flowering periods for canola in Australia

Julianne M. Lilley^{a,*}, Bonnie M. Flohr^a, Jeremy P.M. Whish^b, Imma Farre^c, John A. Kirkegaard^d



<https://www.canolaflowering.com.au>

PUTTING IT ALL TOGETHER



Goondiwindi for a 19 April sowing

Aust. J. Agric. Res., 2002, 53, 1155-1164

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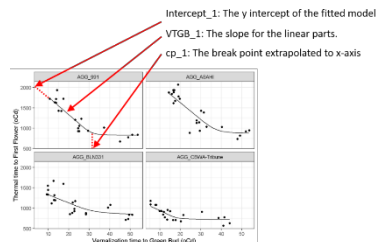
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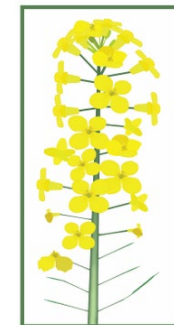
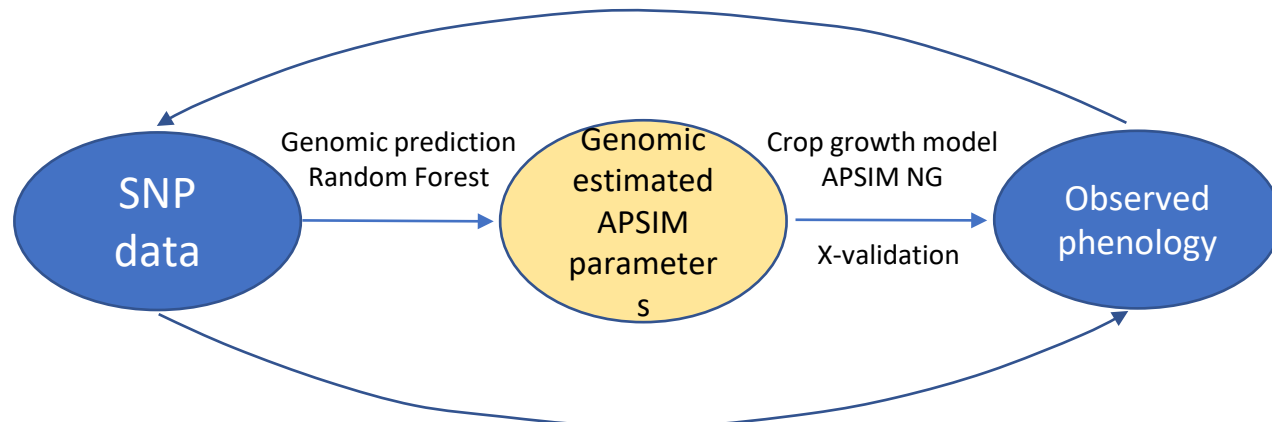
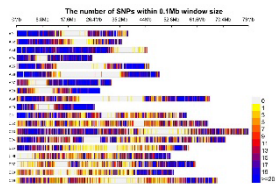


<https://www.canolaflowering.com.au>

Hybrid genomics-APSIM-NG model

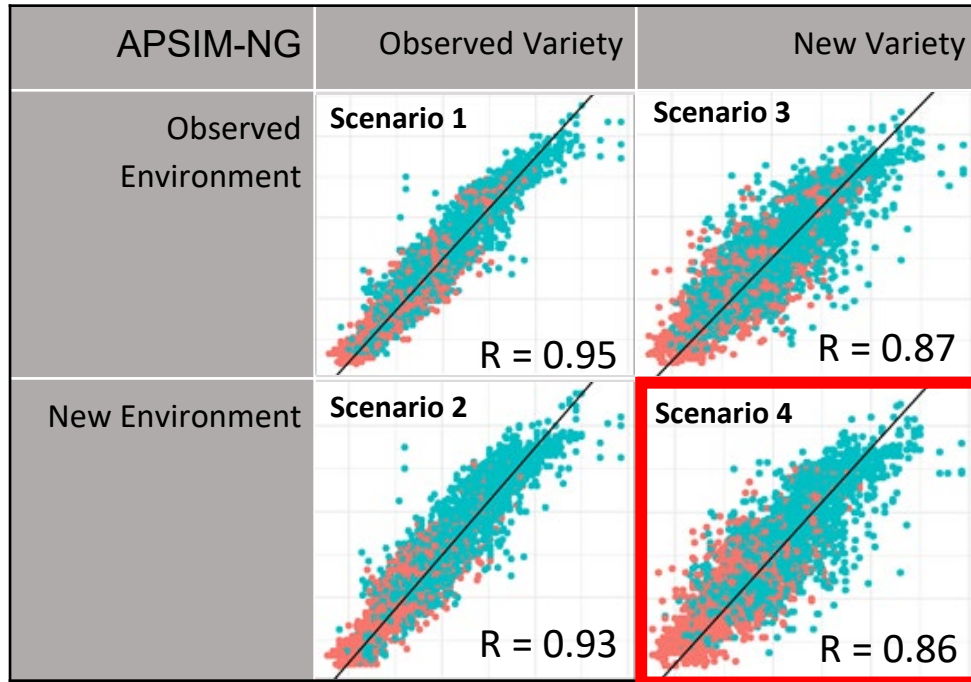


APSIM parameter optimisation



Flowering time prediction

Performance of the genomic model



Scenario 4

R = 0.87 and 0.82 AUS and international varieties

Error within < 10 days on for AUS lines

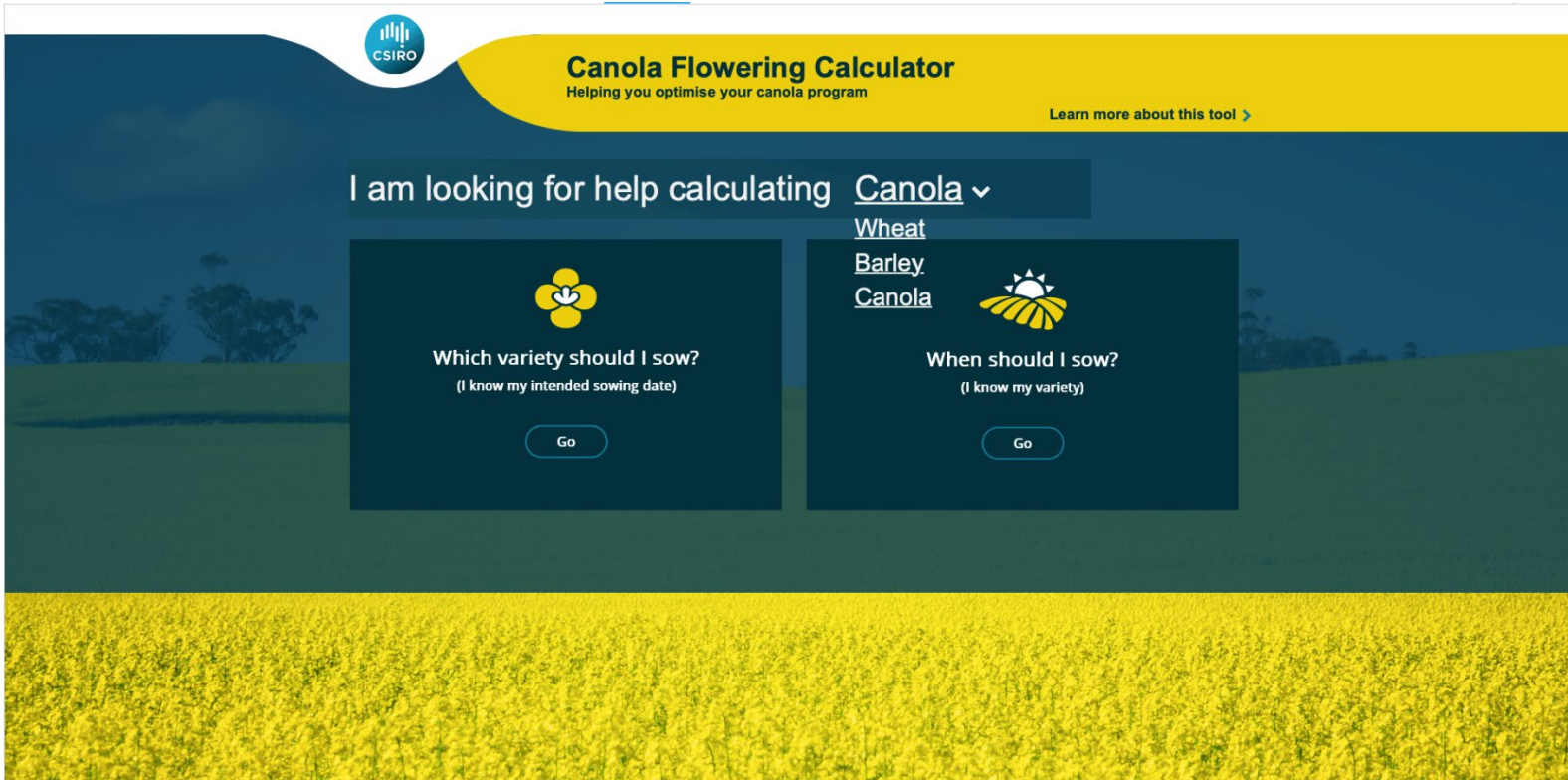
WHAT DO WE WANT

- A useful tool for flowering prediction.
- APSIM phenology parameters for new cultivars
- Expanding database that captures the genetic diversity of canola in Australia
- Strong honest relationship with breeding companies.

HOW WILL THIS HELP YOU ?

CROP FLOWERING PREDICTOR

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PUTTING IT ALL TOGETHER

Bendigo 3550

From 15th March

The closer the gold boxes are to the blue bar the better chances you have reaching the most optimal temperatures.
Check up to 3 varieties to compare across the year

Modelled flowering dates

Earliest start of flowering: **6 July**

Average start of flowering: **16 July**

Latest start of flowering: **1 August**

- **Optimal period for the start of flowering**
- **Flowering date range**

Filter by

Week starting 15 February

Canola Type

All Herbicides

All Companies

Displaying the 10 newest varieties



MORE ACCURATE INDEPENDENT FLOWERING INFORMATION CAN BE PROVIDED TO COMPANIES, STATE DEPARTMENTS AND GROWERS. SITE AND CULTIVAR SPECIFIC.



December 2019

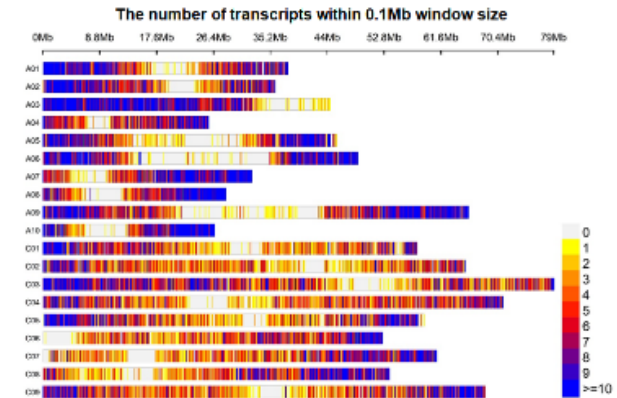
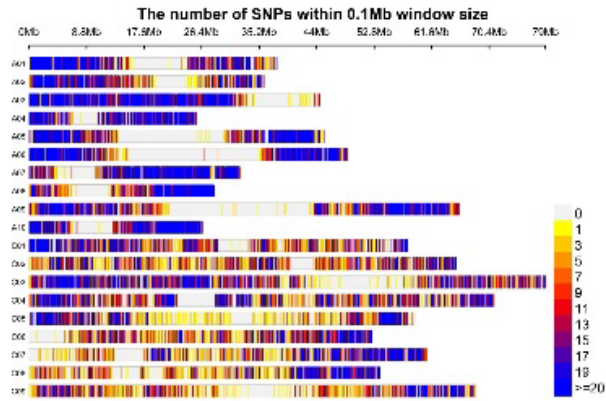
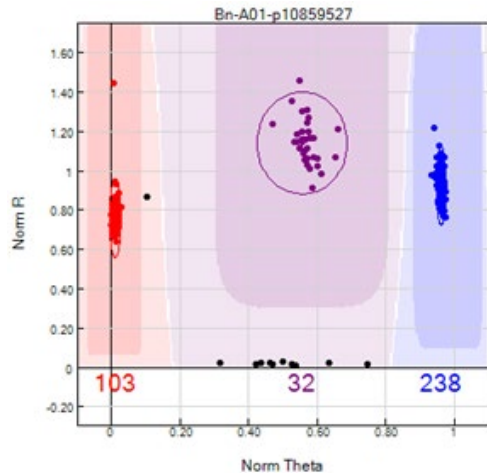
NORTH EAST	March				April				May			
Slow		Yellow	Yellow	Green	Green	Green	Red					
Mid					Yellow	Green	Green		Red			
Fast							Yellow	Green	Green	Red		
MALLEE	March				April				May			
Slow			Yellow	Yellow	Green	Green	Red					
Mid					Yellow	Green	Green	Red				
Fast						Yellow	Green	Green	Red			
WIMMERA	March				April				May			
Slow			Yellow	Yellow	Green	Green	Green	Red				
Mid					Yellow	Green	Green	Green	Red			
Fast						Yellow	Green	Green	Green	Red		
SOUTH WEST	March				April				May			
Slow			Yellow	Yellow	Green	Green	Green	Green	Red	Red		
Mid					Yellow	Green	Green	Green	Green	Red	Red	
Fast							Yellow	Green	Green	Green	Red	

Yellow = risk of frost, disease infection and lower yield potential.

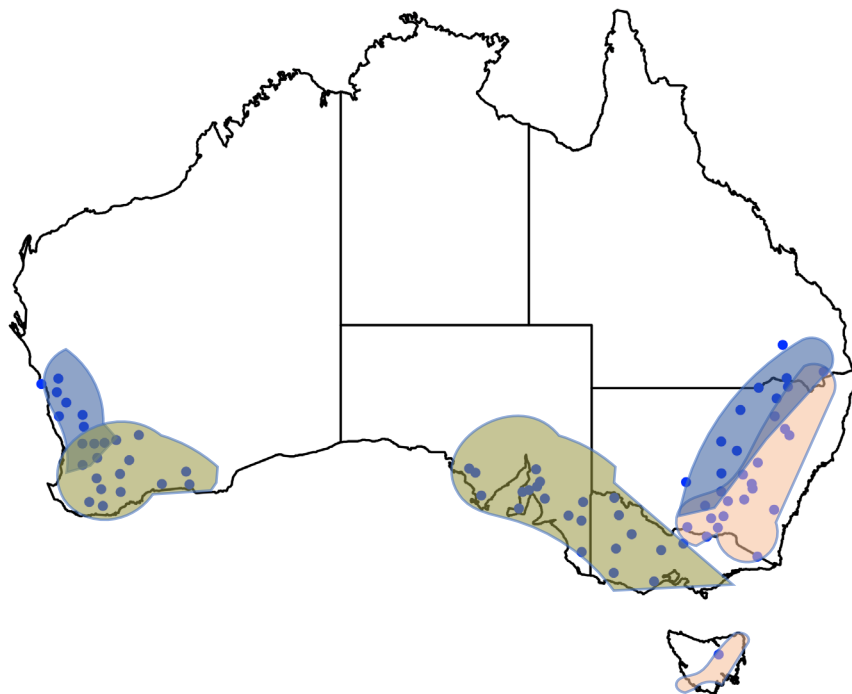
Green = on time.

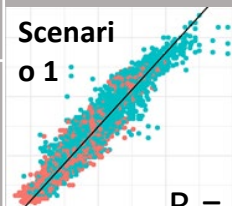
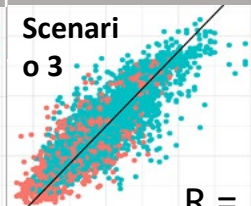
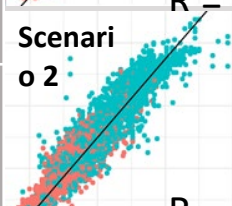
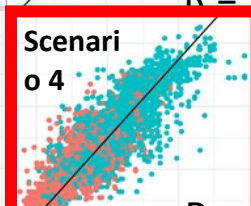
Red = risk of drought and high temperature stress.

GENETIC DATA CAN BE RETURNED TO THE COMPANIES FOR USE WITHIN THEIR BREEDING PROGRAM



PRE-RELEASE DATA CAN BE PROVIDED SPECIFICALLY TO INDIVIDUAL COMPANIES ON A PERSONALISED ACCOUNT TO ASSESS THE ADAPTABILITY OF NEW MATERIAL



APSIM-NG	Observed	New Variety
Observed Environment	Scenari o 1  R =	Scenari o 3  R =
	Scenari o 2  R =	Scenari o 4  R =
New Environment	0.93	0.86

DO YOU SEE VALUE IN THIS PROJECT ?

THIS PROJECT NEEDS YOUR SUPPORT?

WHAT ADDITIONAL INFORMATION OR WHAT ASSURANCES WOULD YOU REQUIRE, TO GET INVOLVED IN THIS FLOWERING PREDICTOR PROJECT

WHAT WOULD AN MTA LOOK LIKE ?

Jeremy Whish

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0428763426

