



What's in the pipeline for new genetic traits and innovations for rapid identification of issues



Department of
Primary Industries and
Regional Development

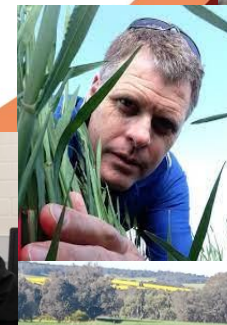
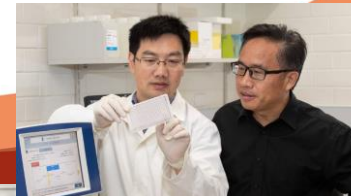


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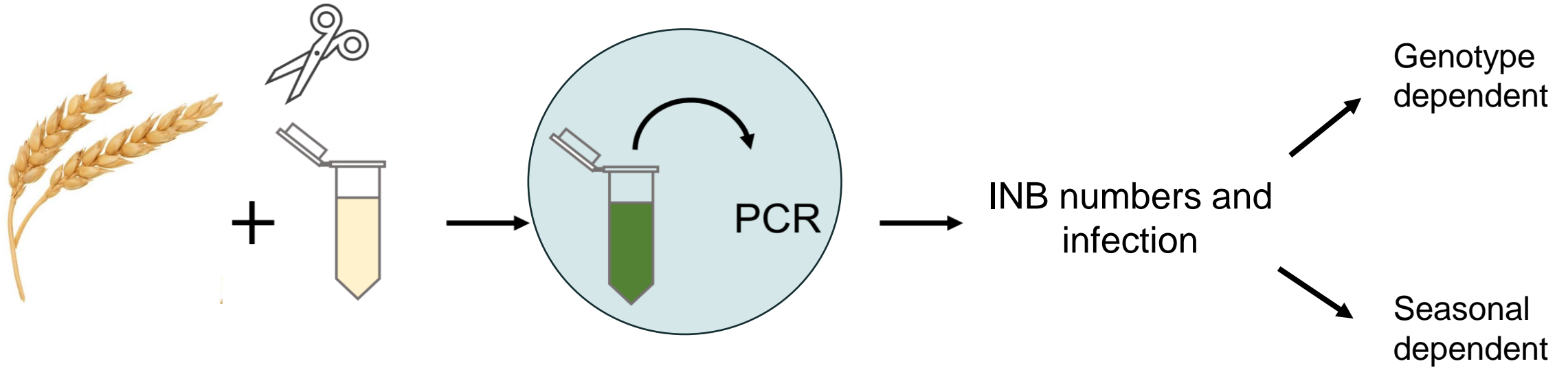
Western Crop Genetics Alliance



Presented by Sharon Westcott



Ice nucleating bacteria



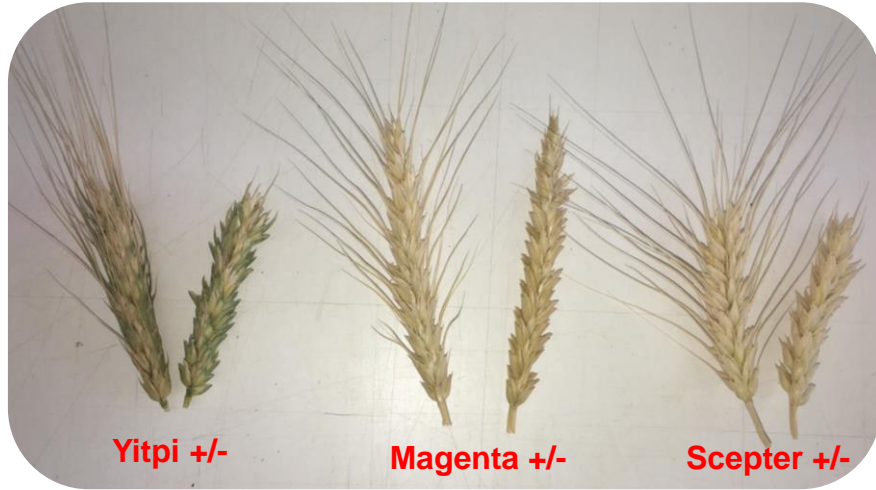
Avoid using frost affected seed as a seed source

On going work

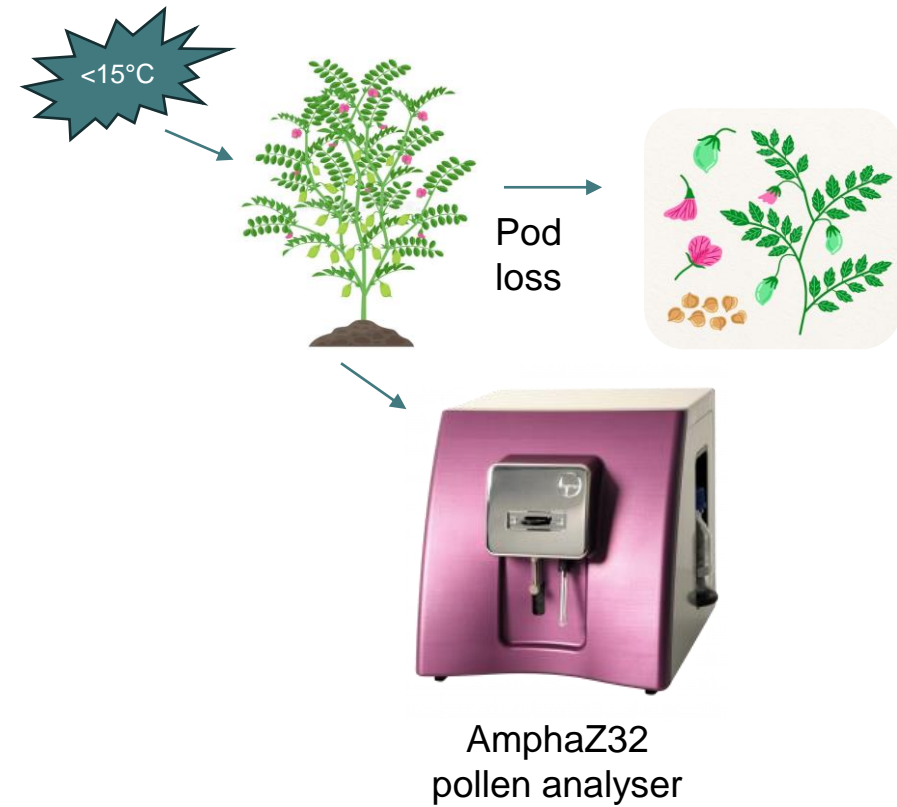
- Screening of biological and chemical surfactants to inhibit ice nucleating proteins
- Develop method for broadacre application

Novel ways to screen for frost tolerance

1) Metabolite and Lipid biomarkers



2) Pollen viability



New germplasm for disease resistance- Wheat

Simultaneous resistance to 3 diseases



Wheat yellow spot



Wheat nodorum blotch



Wheat powdery mildew



7 international lines ★★ ★

Developed DH
populations



Resistance genes

New germplasm for Oat Septoria resistance

POIGP supported project

- ❖ Identify Sources:
 - 468 Global germplasm
 - 575 InterGrain lines
 - 163 other lines
- ❖ Understand pathogen variation
- ❖ Screening tools



O - omics - Plant pathogen omics initiative



Anthracnose



Phomopsis



Crown rot



Root rot



Wheat powdery mildew



Wheat nordorum blotch



Barley Spot form net blotch

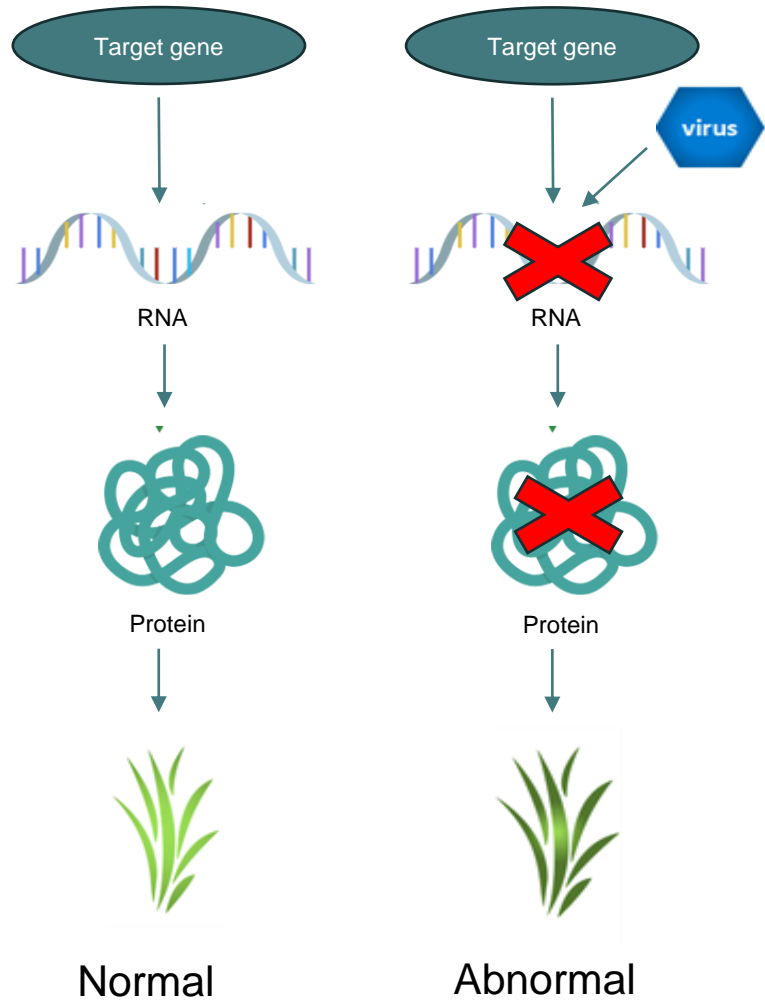


Oat Septoria blotch

To generate high-quality molecular reference data for the eight common pathogens across Australia

Virus induced gene silencing

Have established a platform



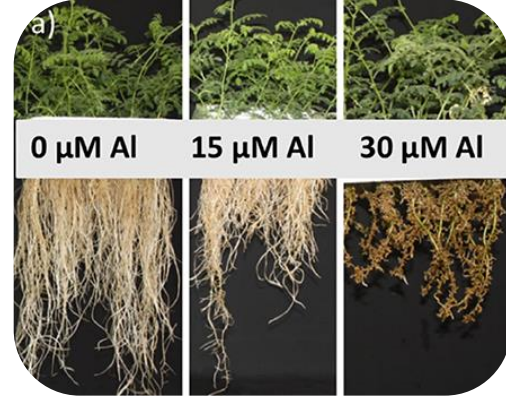
- Can use for any crop
- Broadacre application
- Non-GM

Aluminium tolerance

Wheat



Chickpea



Canola



Lentils



- Identify Genes for tolerance to Al, Acidity \longrightarrow Tolerant variety
- Improve yield
- Expand production areas of pulses on to low pH soils

Time saving through Doubled Haploids

- Doubled haploid production is an important tool!!
- Rapidly generate fixed lines in one year

Have you heard of
Neo barley, **Major** wheat, **Tracer** wheat



Triticale DH



Canola DH



Opportunities for disease resistance in lupins



Anthrachnose



Phomopsis



Cucumber mosaic virus



Sclerotinia



New phenotyping methods and tools

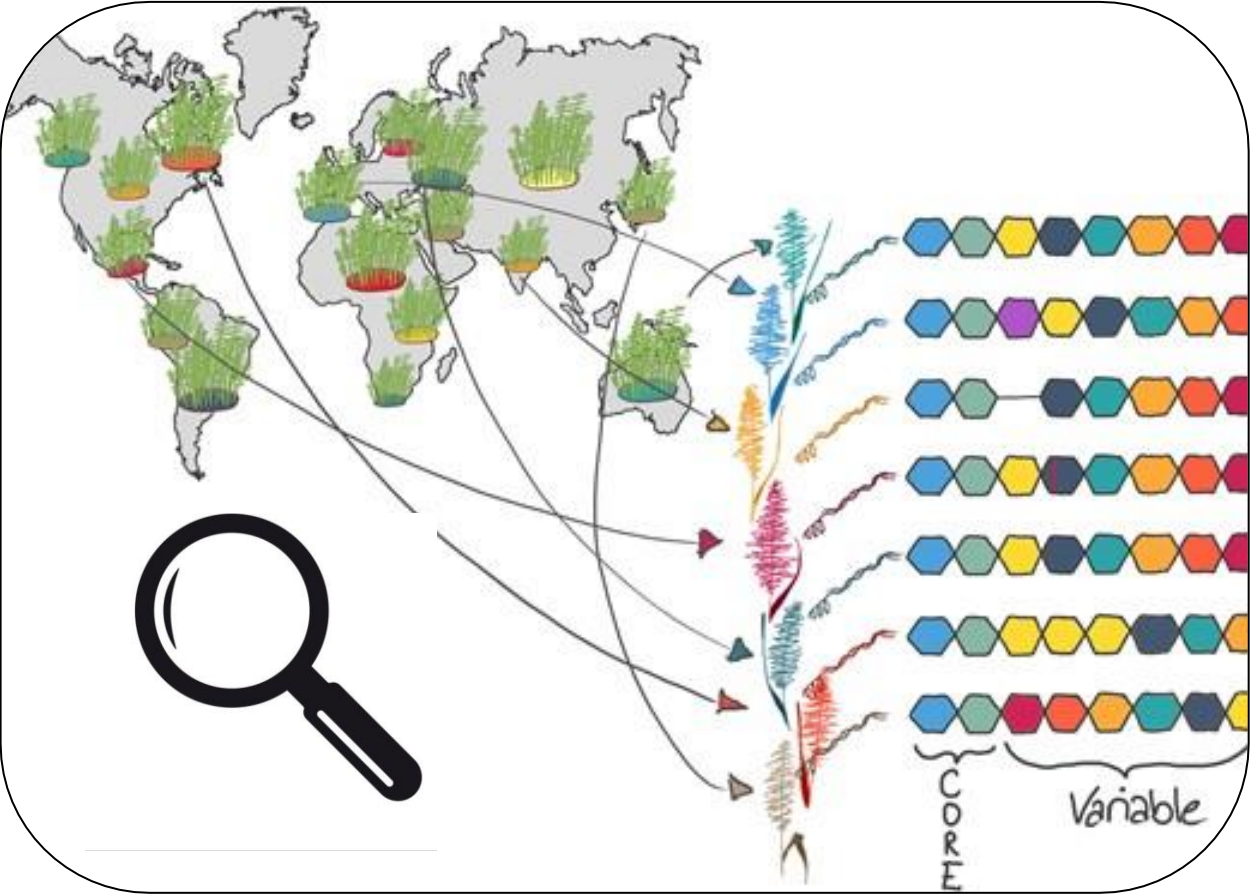
New genes identified

New tolerant germplasm



Breeding companies

International collaborations– Pangenomics



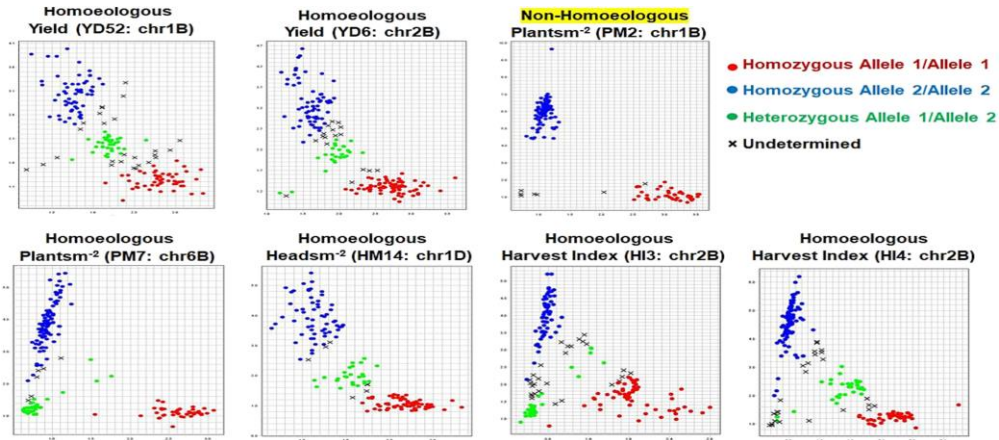
WIDE GENETIC VARIATION

Always looking for diversity

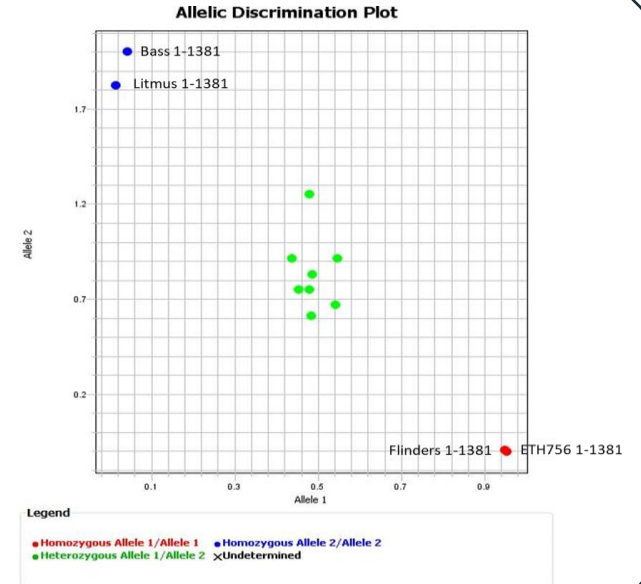
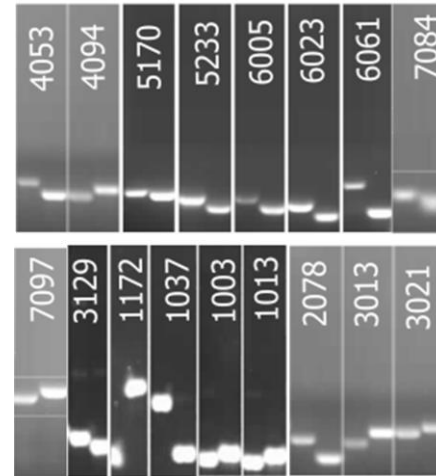


New markers

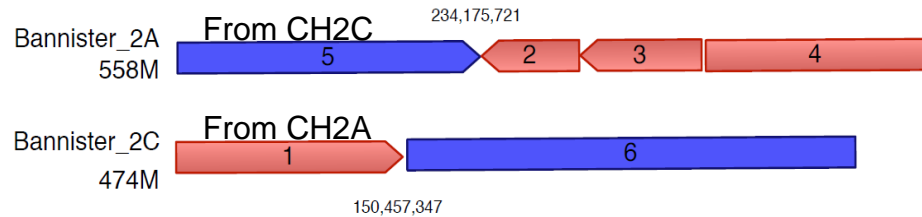
Sodicity markers in wheat



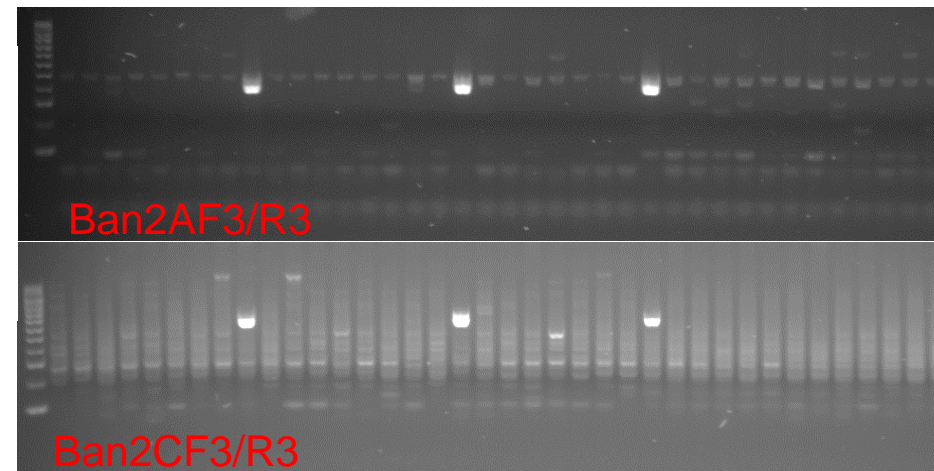
Barley- fingerprinting




2A/2C translocation in Bannister



Related to yield improvement



In summary, innovations within the Genetics Portfolio

- I** ice nucleating bacteria
 - N** novel ways to deal with frost
 - N** new germplasm
 - O** omics studies – pathogen omics
 - V** virus induced gene silencing
 - A** aluminium tolerance
 - T** time saving through Doubled Haploids
 - I** international collaborations – pan genomics
 - O** opportunities for disease resistance in lupins
 - N** new markers for germplasm improvement
- 

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Western Crop Genetics Alliance



Thank you

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