

# AFREN WEBINAR: Southern region seasonal update

AUSTRALIAN  
FUNGICIDE RESISTANCE  
EXTENSION NETWORK



**Tara Garrard**  
**SARDI**

**Hari Dadu**      **Josh Fanning**  
**Agriculture Victoria**

Tuesday 3 September 2024

# Australian Fungicide Resistance Extension Network

AUSTRALIAN  
FUNGICIDE RESISTANCE  
EXTENSION NETWORK



*Regionally specific resources and training to help growers and advisors understand the status, risks and management of fungicide resistance in Australian grains.*

## Develop and deliver:

- Fungicide resistance management guide
- Workshops, info sessions & webinars
- Factsheets, updates & email alerts



[afren.com.au](http://afren.com.au)



@theGRDC



[afren@curtin.edu.au](mailto:afren@curtin.edu.au)

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agcommunicators.



- To ask a question:
  - Click on Q&A on the bottom of your screen, open the window and enter your question.
  - Your question will then be posted ready to be answered.
  - You can also tick “send anonymously” if you don’t want your name attached to your question.





# Cereal Diseases

Hari Dadu

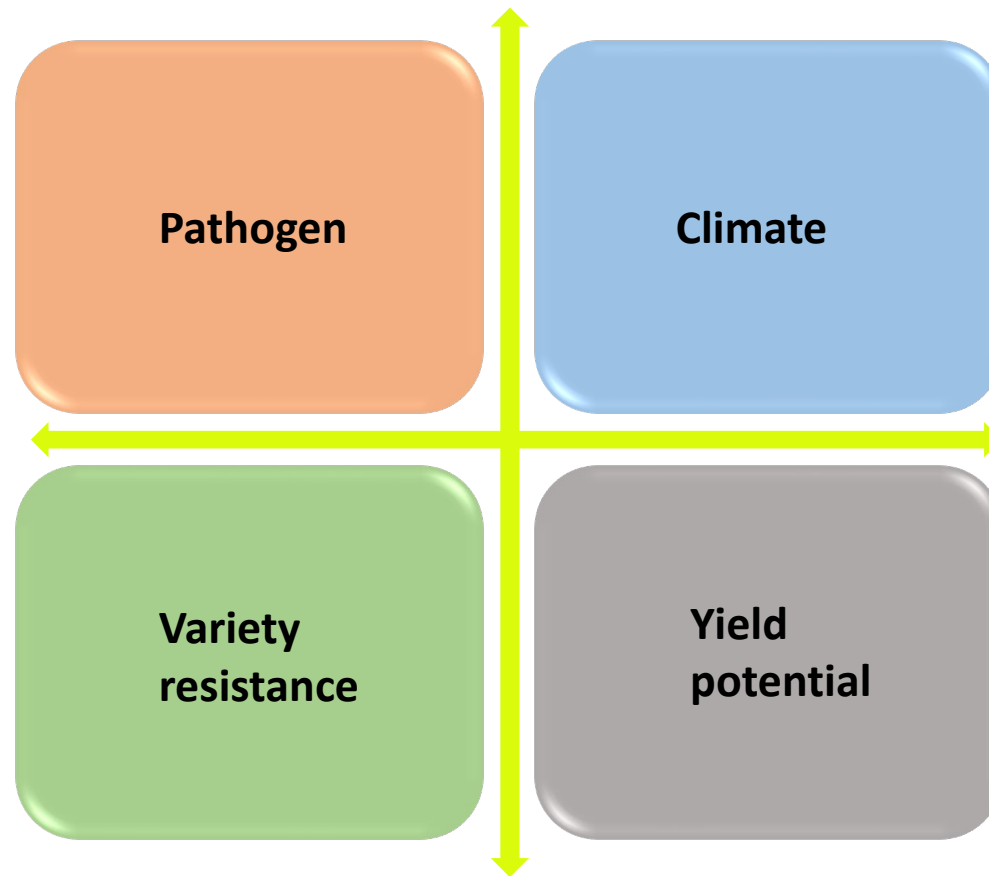


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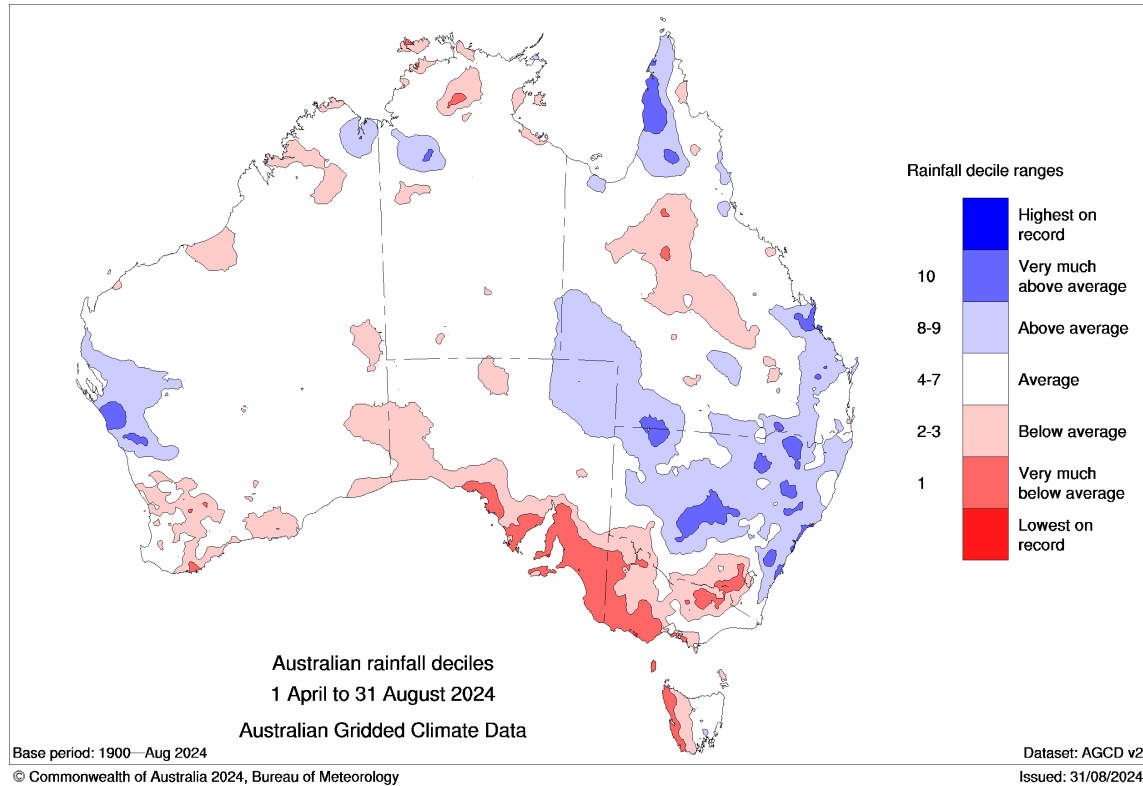


# Factors that will drive disease impacts for the rest of 2024

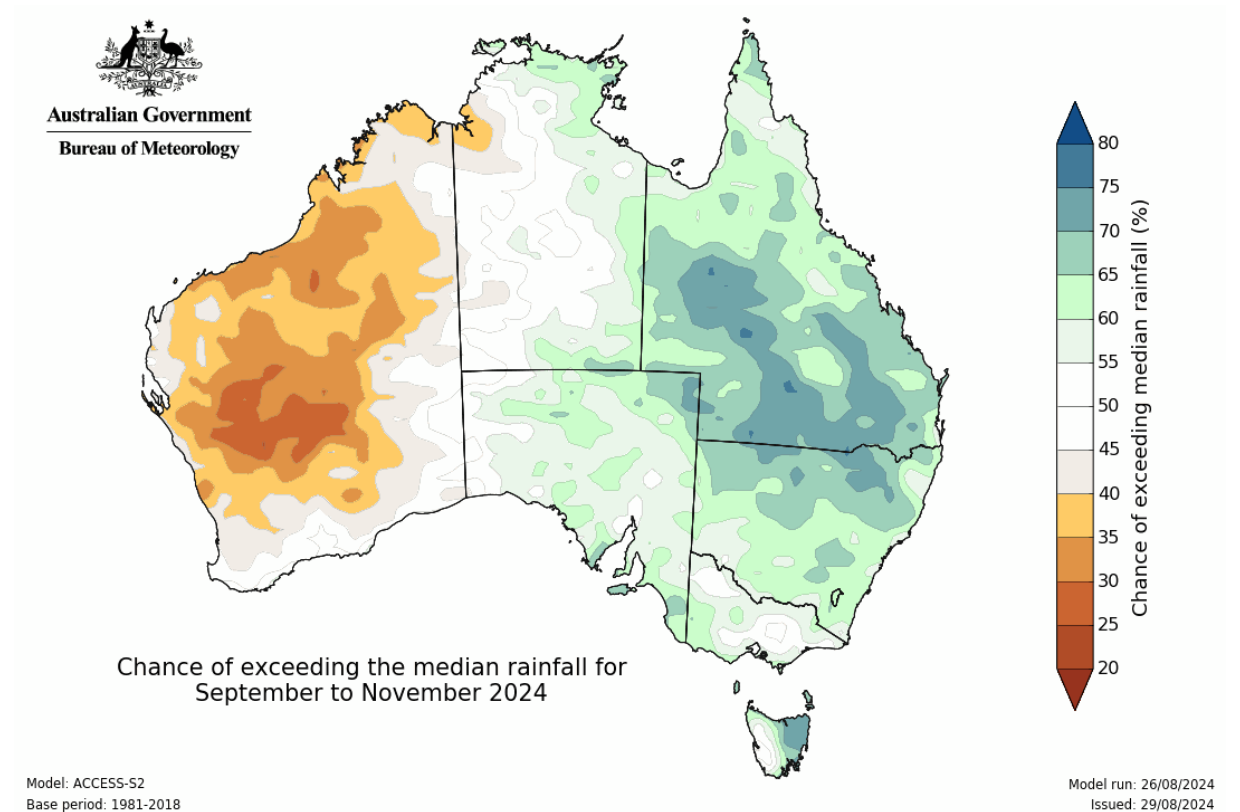


# Rainfall 2024 – short of 50 – 100 mm

## April to August (1 – 3 decile)

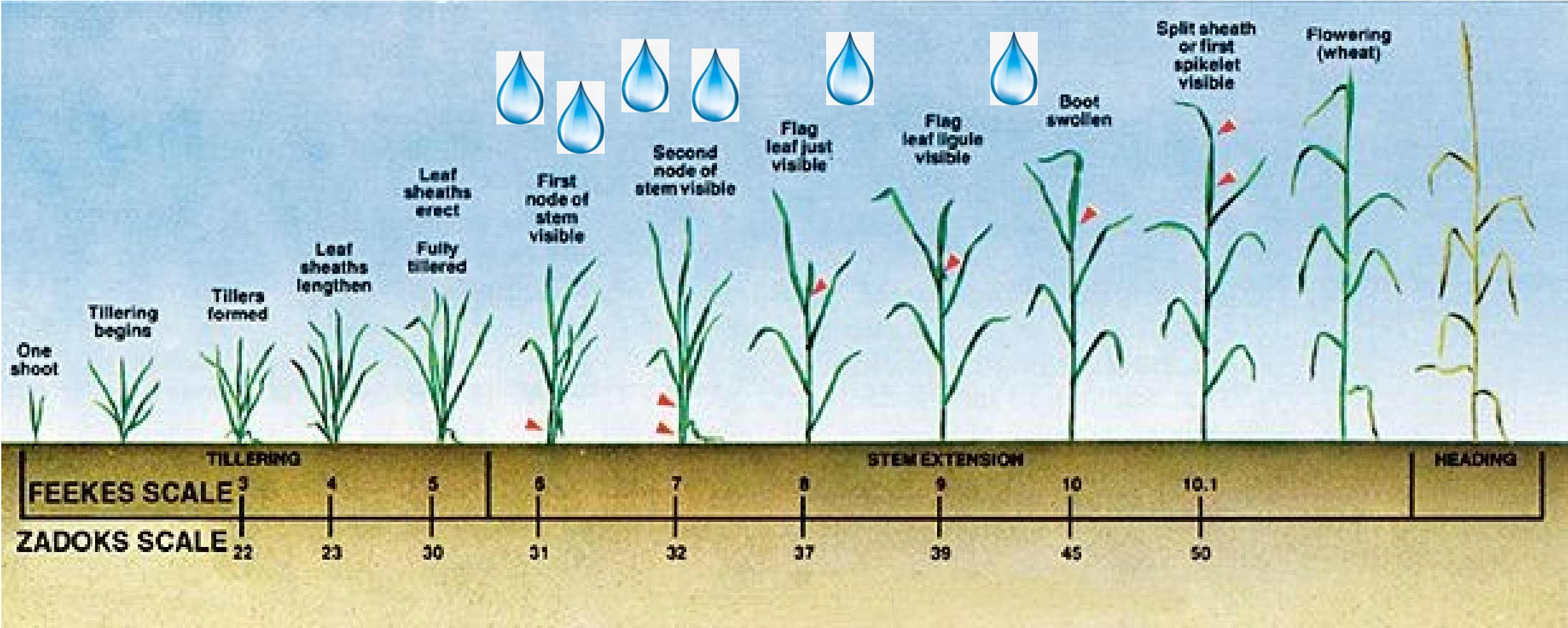


## September to November outlook

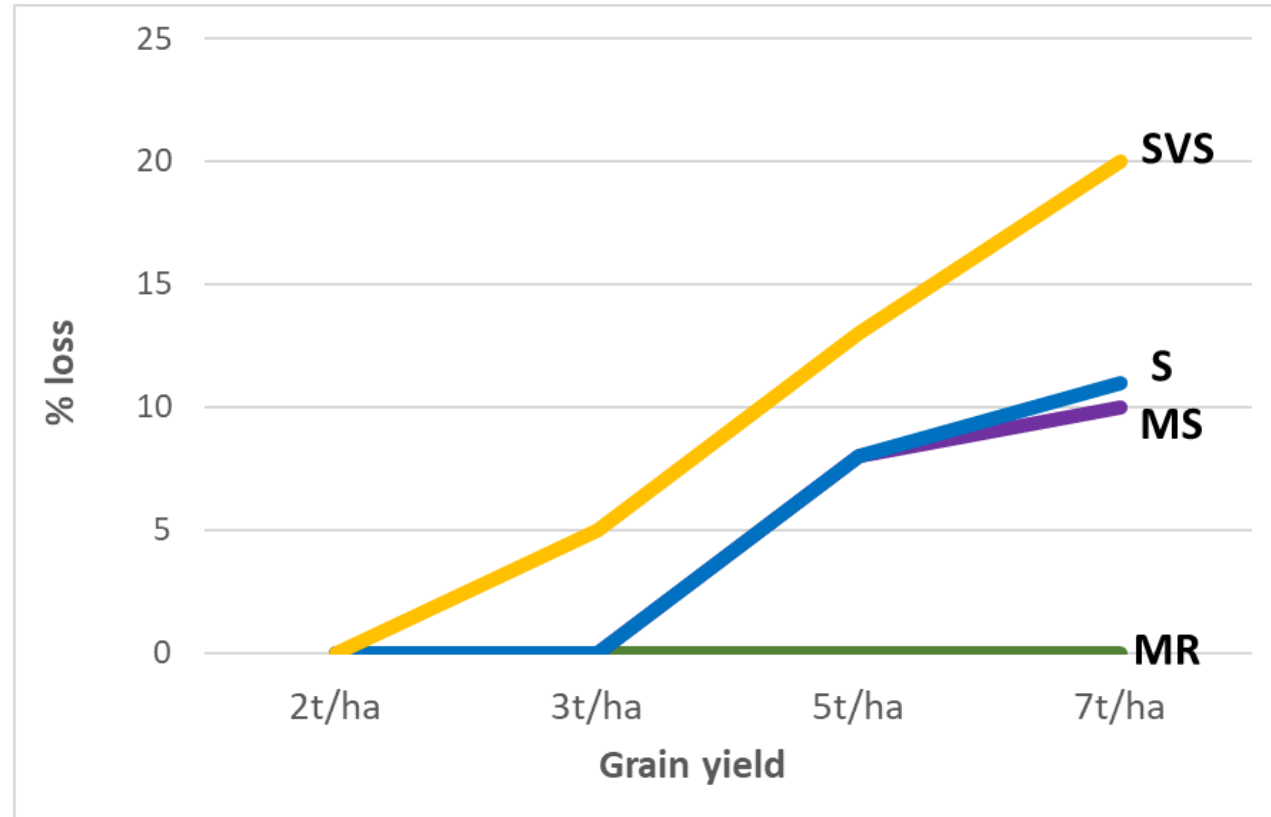




# Losses relate to rainfall during reproductive phase of crop development



# Resistance + yield potential will determine disease impact and fungicide decisions



**SFNB is not a problem at low yields**



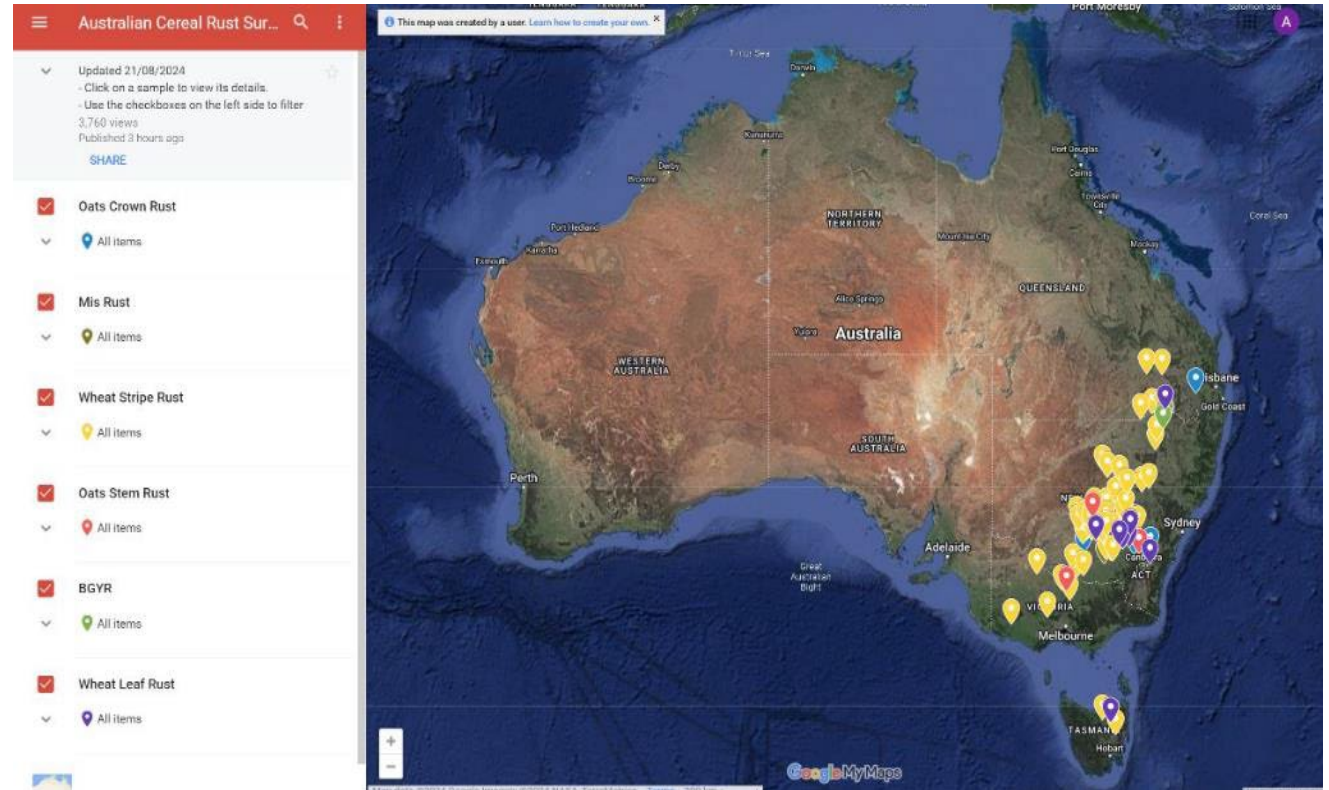
# Diseases in 2024 - Wheat



Stripe rust



Leaf rust



OFFICIAL

# Cereal rust management – rest of the season

- Monitor crops for symptoms
- Know your variety resistance
- Have a fungicide strategy where susceptible varieties are grown
- Use decision support tools such as StriperustWM App



# Wheat diseases

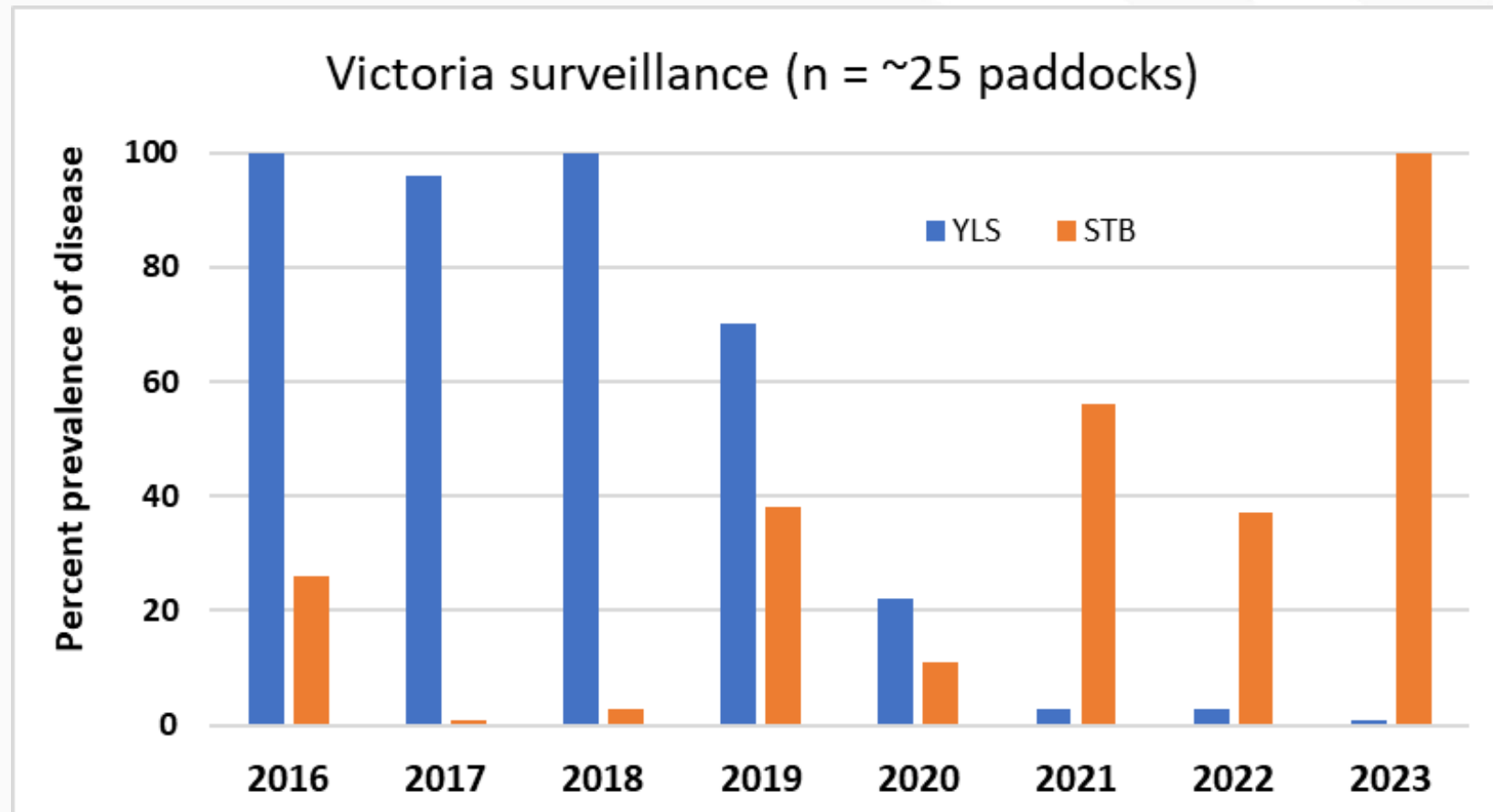


**Septoria tritici blotch**



**Powdery mildew**

# PREVALENCE OF SEPTORIA IN WIMMERA AND MALLEE

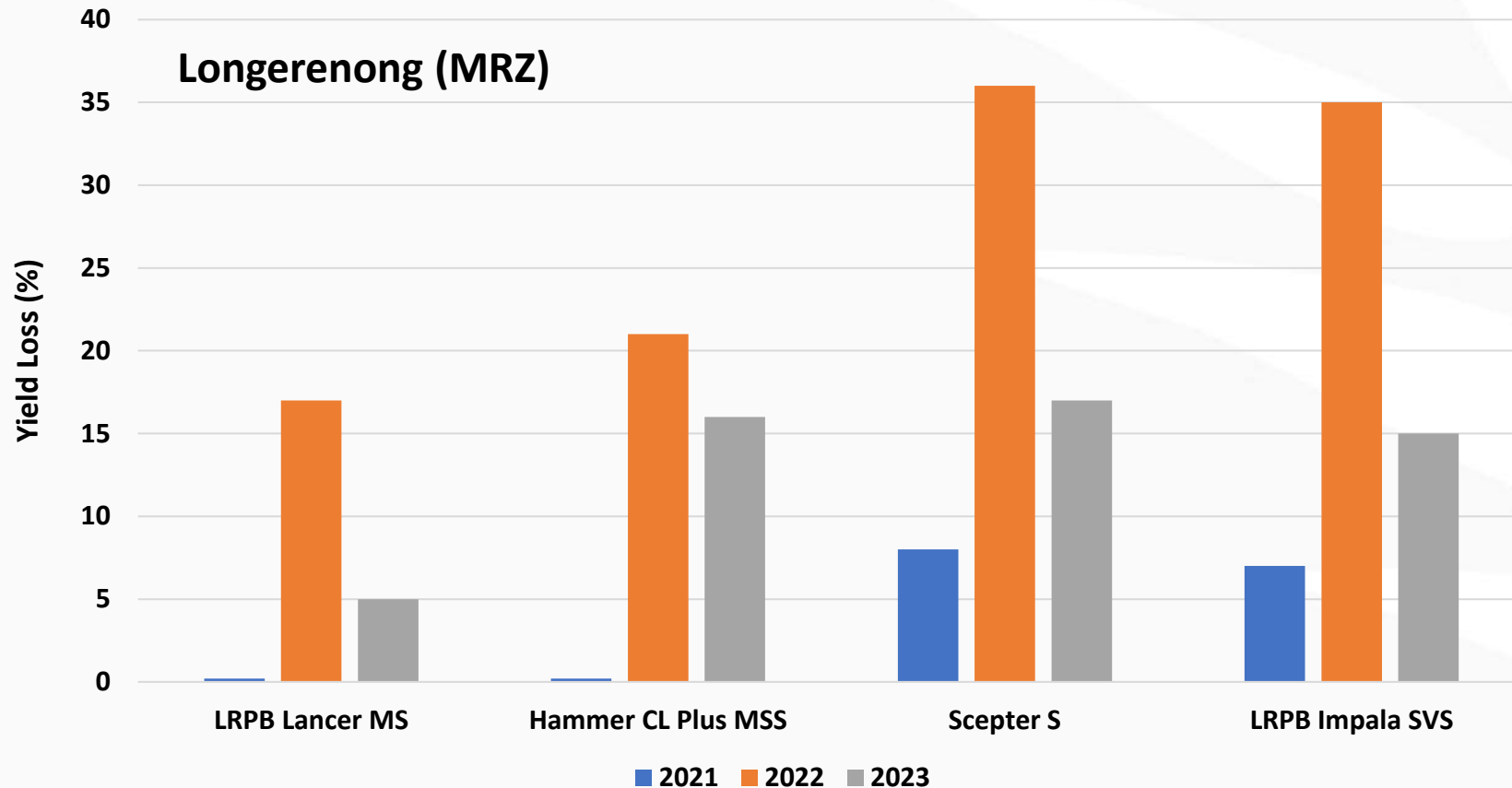


# SUSCEPTIBLE CULTIVARS YIELD LOSS

2021: Losses were only found in susceptible varieties

2022: Larger losses with the rainfall and related to resistance

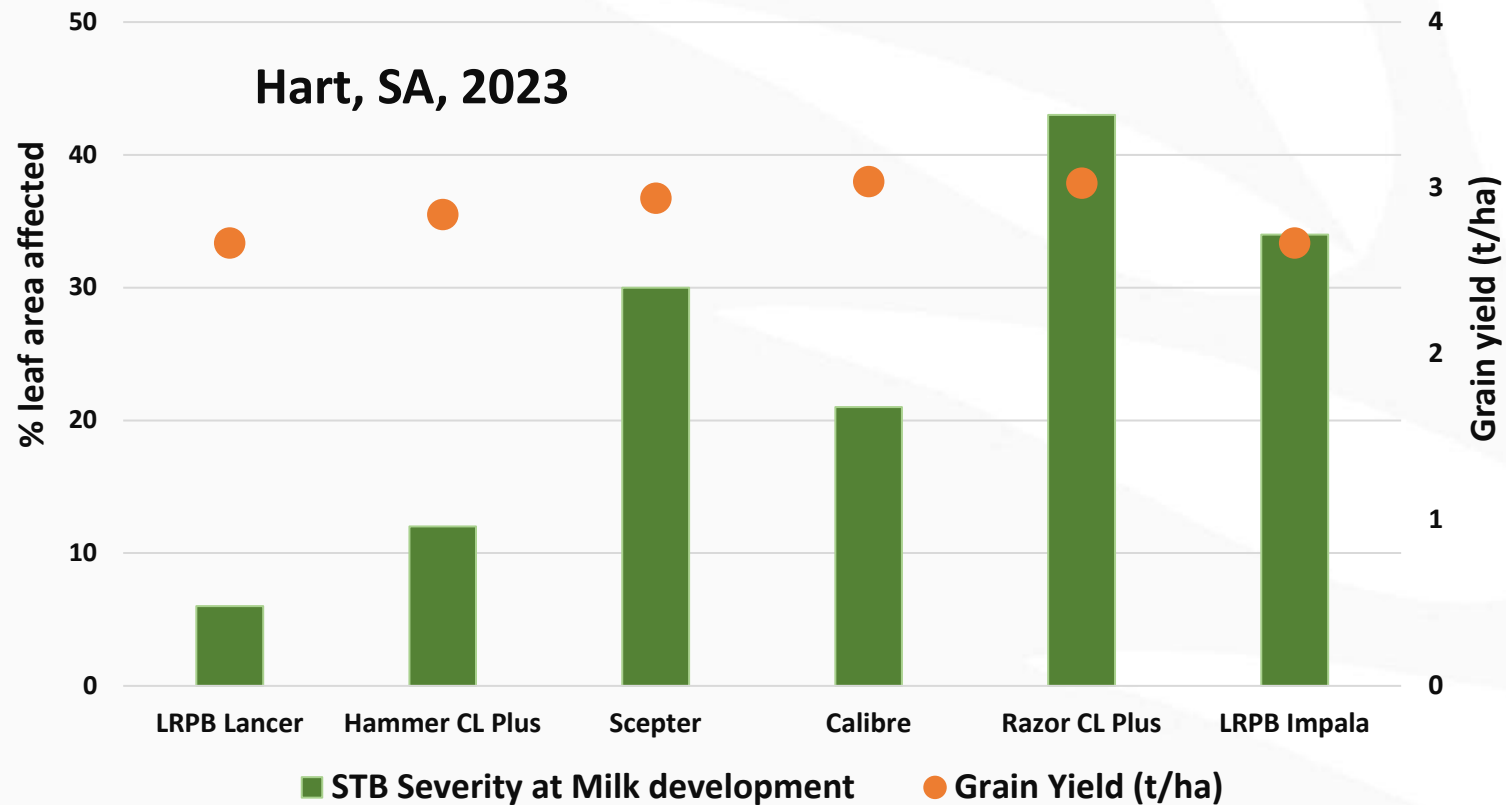
2023: Losses minimised with partial resistance





# YIELD POTENTIAL KEY FOR STB

<3 t/ha = no loss from STB



# FUNGICIDE TIMING FOR STB

Foliar sprays to protect yield in cv. Scepter (S), 2021-2023

	Wimmera (HRZ)			Mallee (LRZ)		
	Yield Gain (%)					
	2021	2022	2023	2021	2022 <sup>#</sup>	2023
Seed	0	7	0	0	-	-
Z31	0	14	0	0	-	7
Z39	0	22	0	0	-	5
<b>Z31+39</b>	0	<b>37</b>	<b>14</b>	0	-	<b>10</b>
Seed + Z31+39	0	39	16	0	-	10

# Trial overrun with stripe rust

Fungicide treatments on seed (Fluquinconazole 167g/L @ 300mL/100kg seed) or foliar (Epoconazole 500g/L @ 125mL/ha at Z31 and Benzovindiflupyr 40g/L + Propiconazole 250g/L @ 500mL/ha at Z39).

# STB: FUNGICIDE RESISTANCE

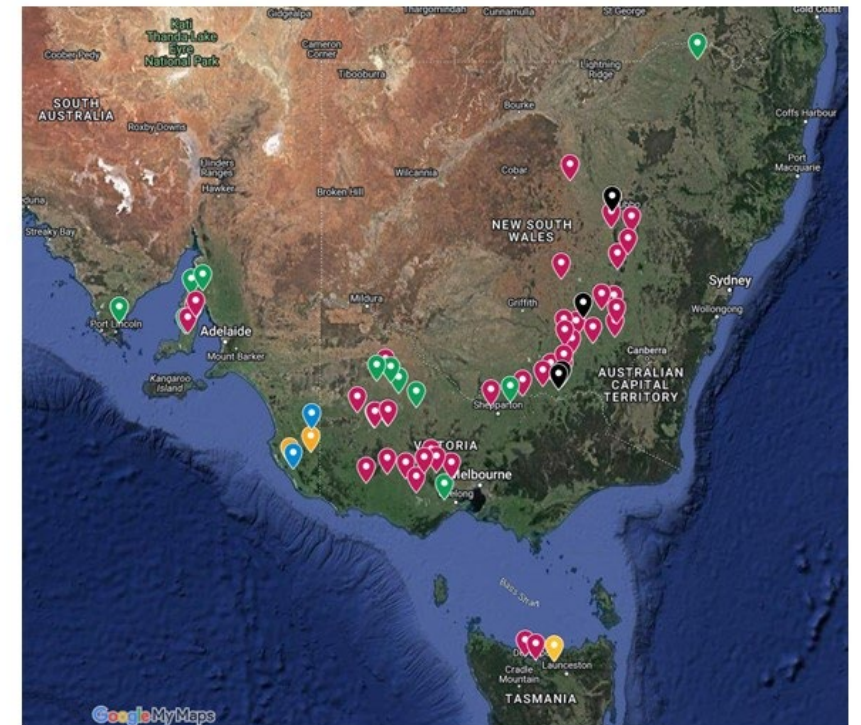
Increase in resistance and reduced sensitivity to DMIs

Flutrifol, tebuconazole, propiconazole and epoxiconazole will show reduced performance

No resistance to Qols (Group 11) detected in Victoria

But the resistance mutation is now detected in TAS in addition to SA

STB resistant and sensitive distribution from 2015 - 2023



Blue: CytB S      Green: Cyp S/Rs      Black: Sdh-C SNP  
Yellow: CytB R      Red: Cyp R



# Barley diseases



**NFNB**



**SFNB**



**Scald**



**Leaf rust**



**Loose smut**



**Rhizoctonia**

# SURVEILLANCE OF 39 CROPS IN 2023

## SFNB

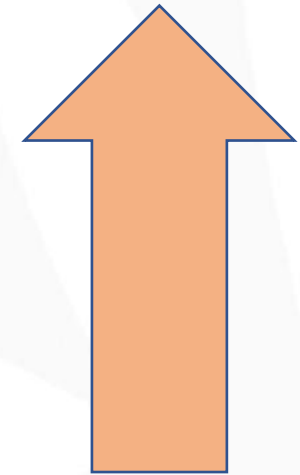


51% of crops  
11% Severity average

## NFNB

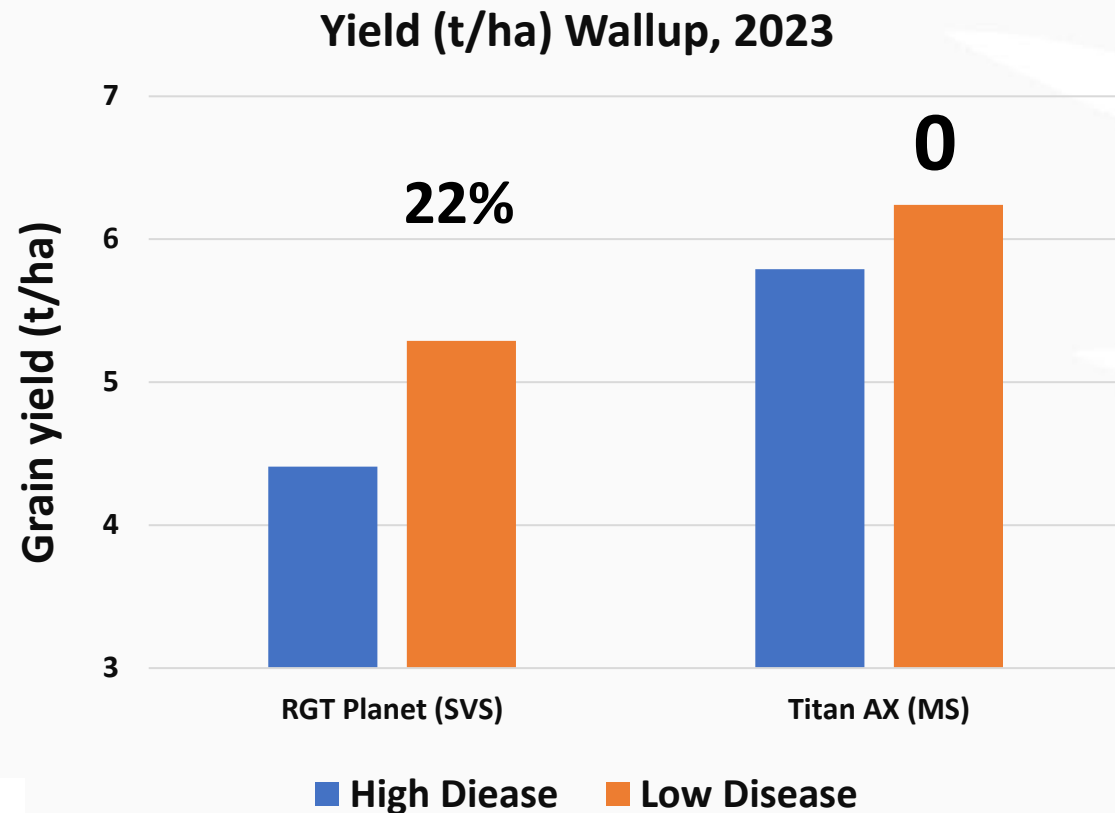


51% of crops  
27% Severity average



# NFNB: YIELD LOSS

Avoid susceptible cultivars

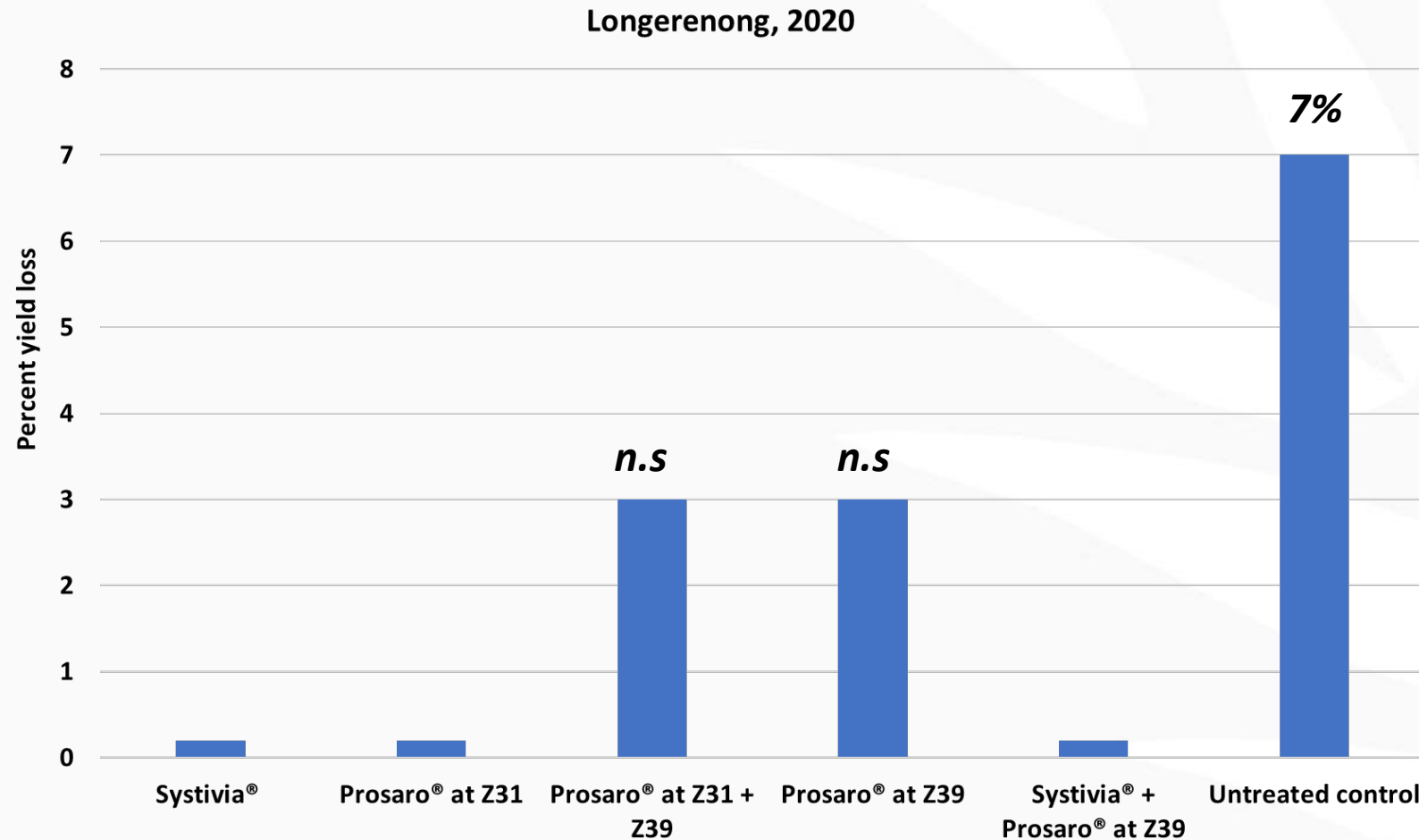


Avoid “sucker” varieties to prevent yield loss



# NFNB: FUNGICIDE TIMING

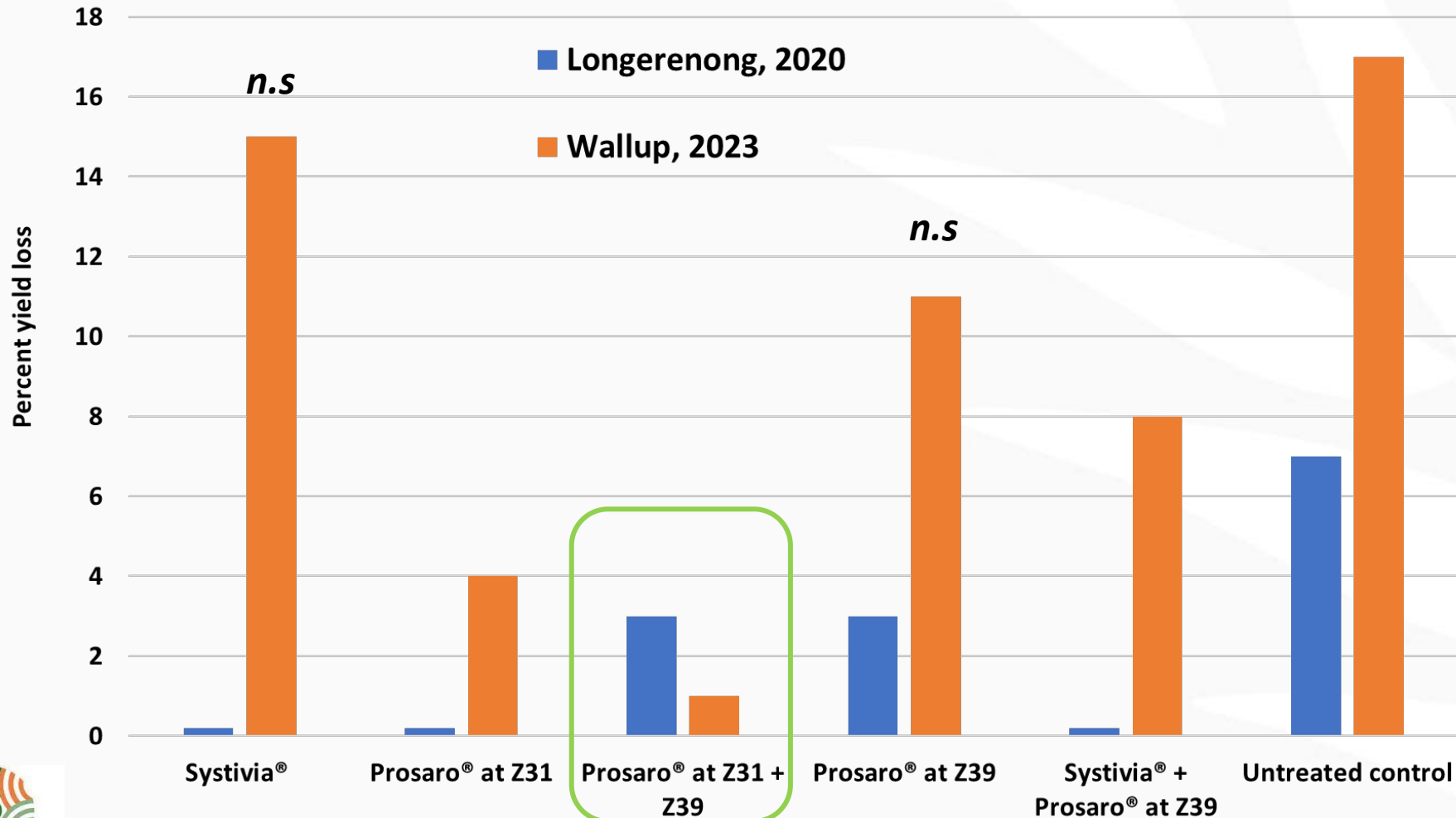
Seed treatment was effective in 2020 to control NFNB



Fungicide treatments on seed (Fluxapyroxad 333g/L @ 150mL/100kg seed) or foliar (Prothioconazole 210g/L +Tebuconazole 210g/L @300mL/ha)

# NFNB: FUNGICIDE TIMING

Foliar spray at Z31 and Z39 were effective in 2023



Reduced performance of seed and foliar treatments is associated with resistance in SDHI and DMI fungicides

# NFNB: FUNGICIDE RESISTANCE

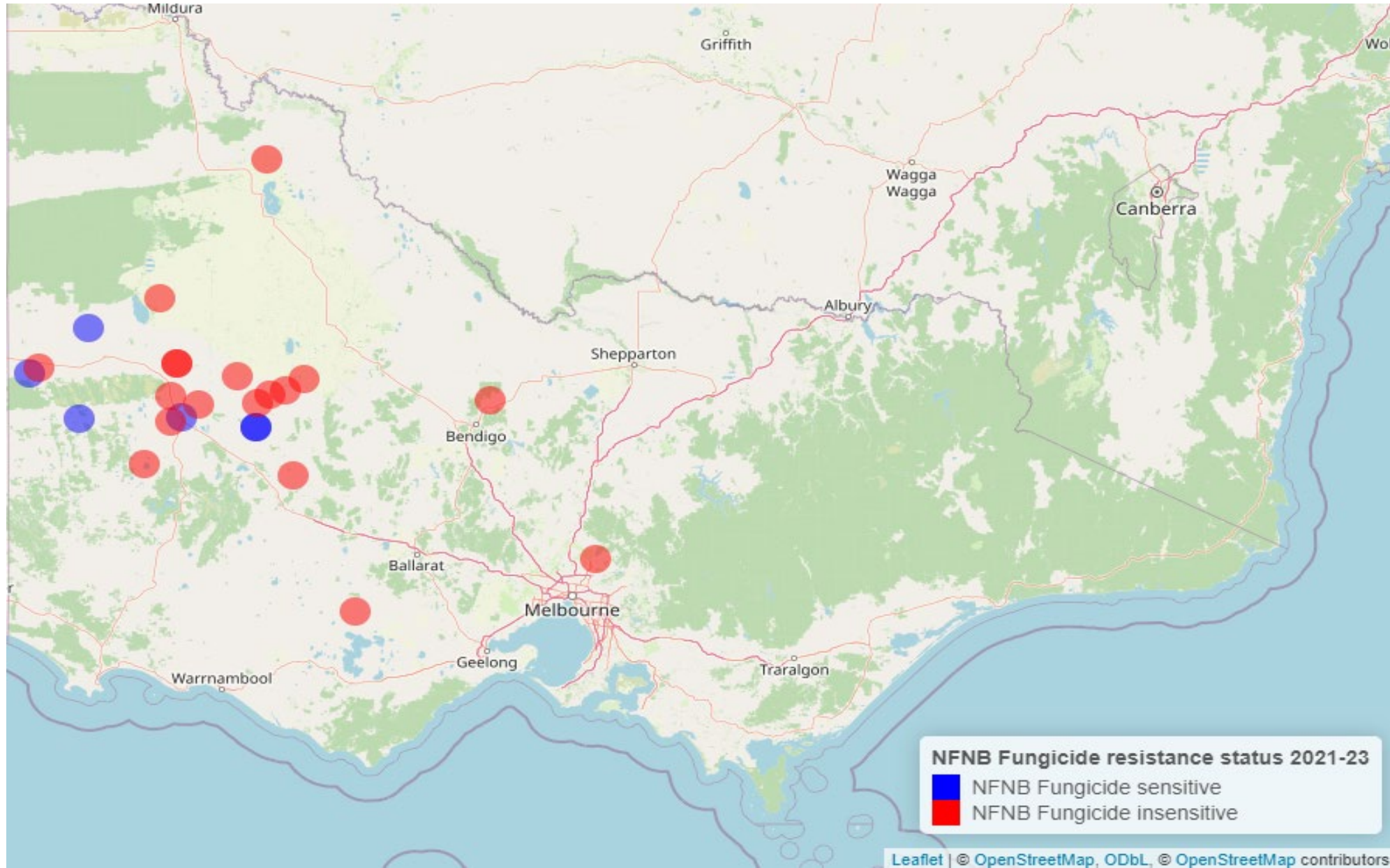
Increase in resistance to DMIs and SDHIs was confirmed in Victoria

Response	DMI (Group 3)	SDHI (Group 7)
Sensitive	54%	41%
Reduced sensitivity	5%	37%
Resistant	41%	22%

**Tebuconazole, propiconazole, prothioconazole, epoxiconazole and Fluxapyroxad will show reduced performance**



# NFNB: Fungicide resistance status, Vic 2021-23





## BASF researchers detect Australia's first known instance of genetic mutation affecting Group 11 fungicides

- BASF researchers detect F129L mutation in barley leaf samples infected by net form of net blotch (NFNB)
- The mutation can reduce the sensitivity of crop diseases to Group 11 (QoI) fungicides and is the first known occurrence in Australia
- The discovery is a reminder of the need to implement integrated disease management strategies to help manage the development of fungicide resistance

BASF researchers have detected Australia's first known instance of genetic mutation affecting Group 11 fungicides. The barley leaf samples infected by net form of net blotch (NFNB) were collected during a product trial in the Yorke Peninsula, South Australia last year. After being sent to Germany for genetic analysis, test results revealed the presence of the F129L mutation, the first known occurrence of the mutation in Australia.



# Fungicide Resistance Update

Tara Garrard

Barley NFNB in SA

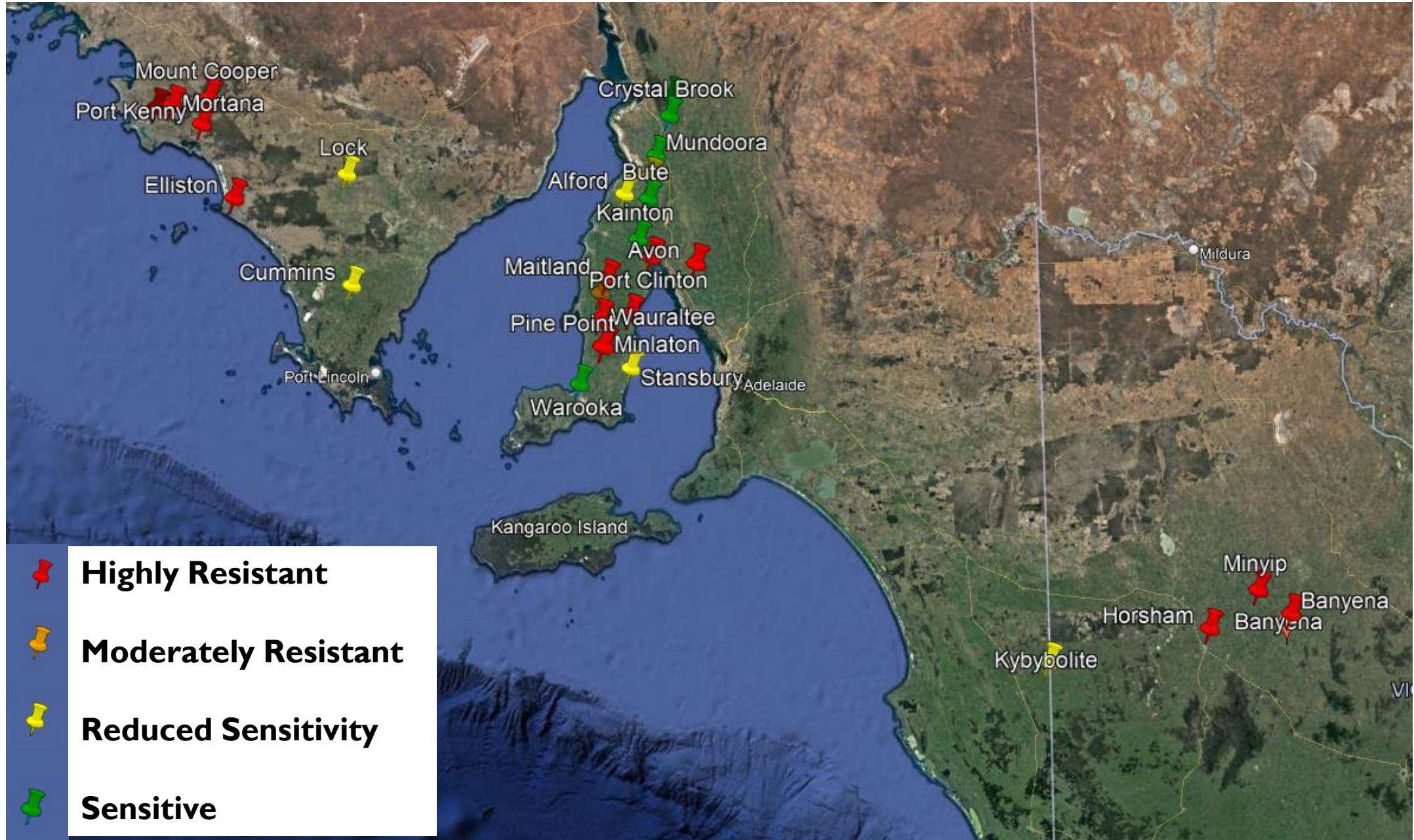
Barley Leaf Rust

Wheat Powdery Mildew



# NFNB resistance and reduced sensitivity to SDHI SA 2019-2021

## Group 7 - Fluxapyroxad





# Barley leaf rust

- Sexual stage of pathogen in SA – more diverse pathotypes
- Fungicide reduced sensitivity detected in DMIs
- Fungicide-insensitive pathotypes trace their origins back to the 5453 P clonal lineage identified in Western Australia in 2001

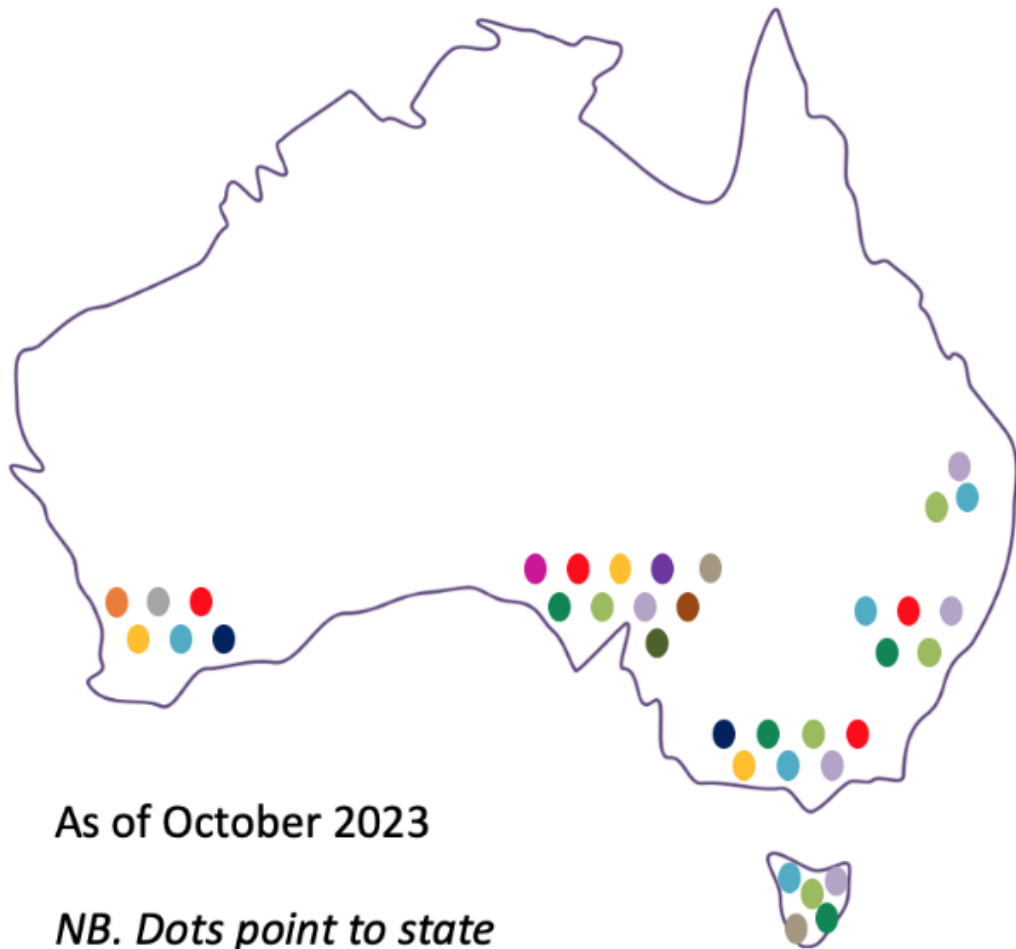


# Barley leaf rust

- Prevalent across all Australian barley-growing regions, exhibiting increased insensitivity.
- Display resistance to all eight DMIs at high field-rate concentrations
- Compound fungicides like Amistar Xtra (DMI + QoI), Aviator Xpro (DMI + SDHI), and Radial (DMI + QoI) effectively control insensitivity at high field rates with combined modes of action.
- Caution advised in extensive use of compound fungicides due to the potential for fungal adaptation to mixed modes of action.



# Fungicide Resistance in Australian Grains



As of October 2023

*NB. Dots point to state only, not area where resistance was discovered.*

## Disease and fungicide group

- L, RS, R ● Barley Powdery Mildew – Group 3 (DMI)
- L, RS, R ● Barley Net Form Net Blotch – Group 3
- RS, R ● Barley Net Form Net Blotch – Group 7 (SDHI)
- RS ● Barley Net Form Net Blotch – Group 11 (Qol)
- RS, R ● Barley Spot Form Net Blotch – Group 3
- L, RS, R ● Barley Spot Form Net Blotch – Group 7
- L, R ● Wheat Powdery Mildew – Group 3
- L, R ● Wheat Powdery Mildew – Group 11 (strobilurins)
- RS ● Wheat Septoria tritici blotch – Group 3
- L, R ● Wheat Septoria tritici blotch – Group 11
- L ● Canola Blackleg – Group 2 (MAP-kinase)
- RS ● Canola Blackleg – Group 3
- L ● Ascochyta Blight of Lentil – Group 1 (MBC)
- L ● Botrytis Grey Mould of Chickpea – Group 1

L = Lab detection

RS = Reduced sensitive

R = Resistant





# Powdery Mildew

## Fungicide resistance status

- Resistance Group 11
- Reduced sensitivity Group 3

## Management

- Variety resistance
- Disease traits
- Chemical control



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Industries and Regions

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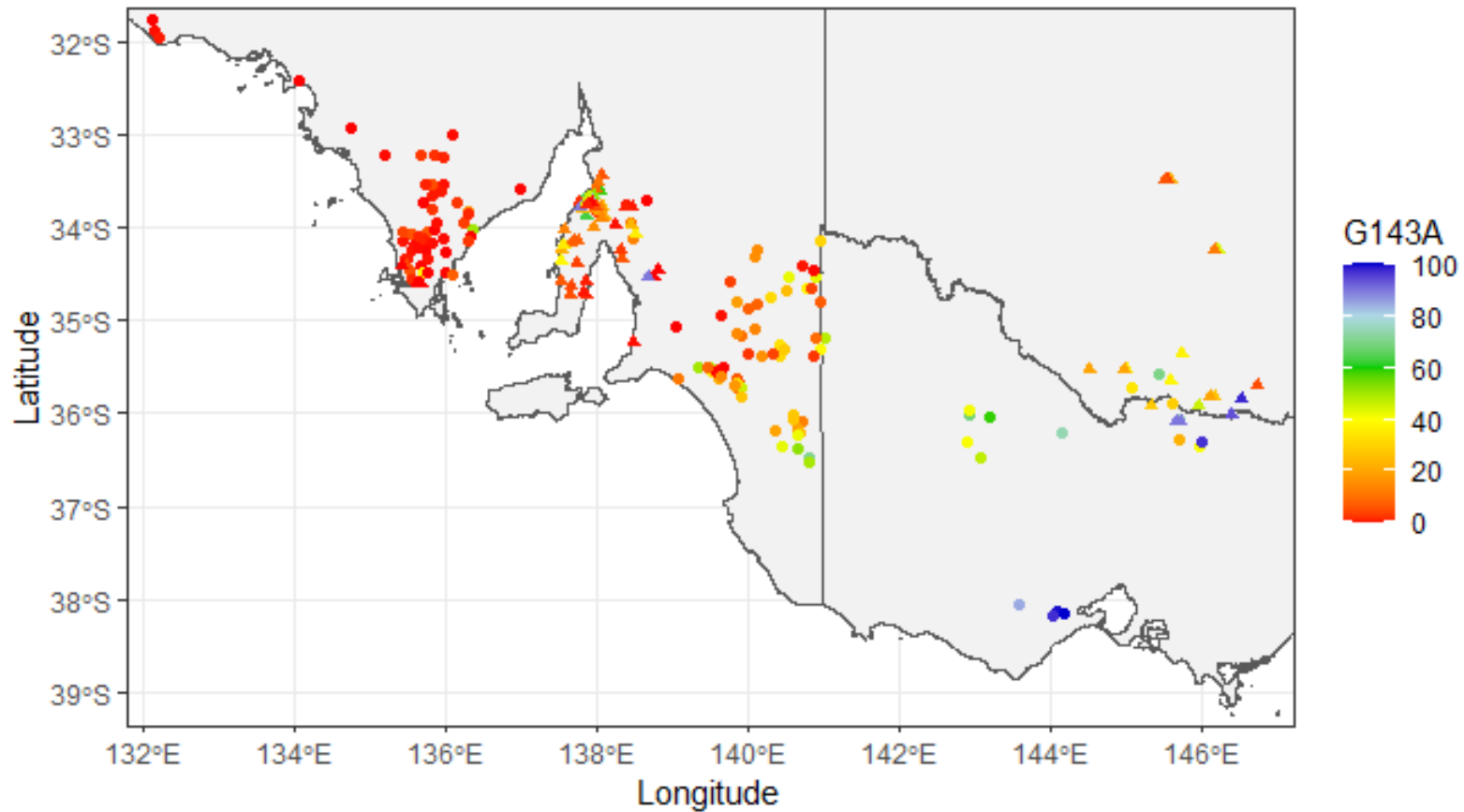


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INSTITUTE





# Powdery Mildew strobilurin resistance *Group 11*



Frequency (%) of  
G143A mutation  
(Qol/strobilurin  
resistance), from 220  
commercial paddocks  
2020-2022





# Powdery Mildew DMI reduced sensitivity *Group 3*

- High prevalence in SA
- Level of efficacy can vary by region and chemical active



Propiconazole at 70 mL/ha  
Wild type isolate



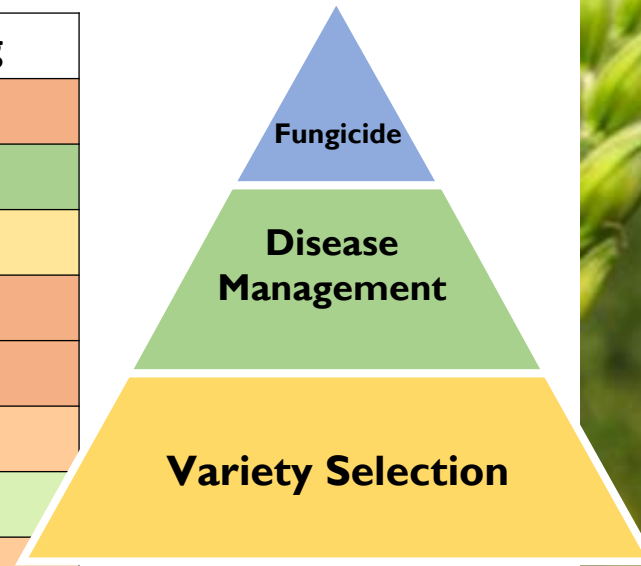
Propiconazole at 70 mL/ha  
DMI-resistant isolate



Propiconazole at 140 mL/ha  
DMI-resistant isolate

## Powdery Mildew Resistance

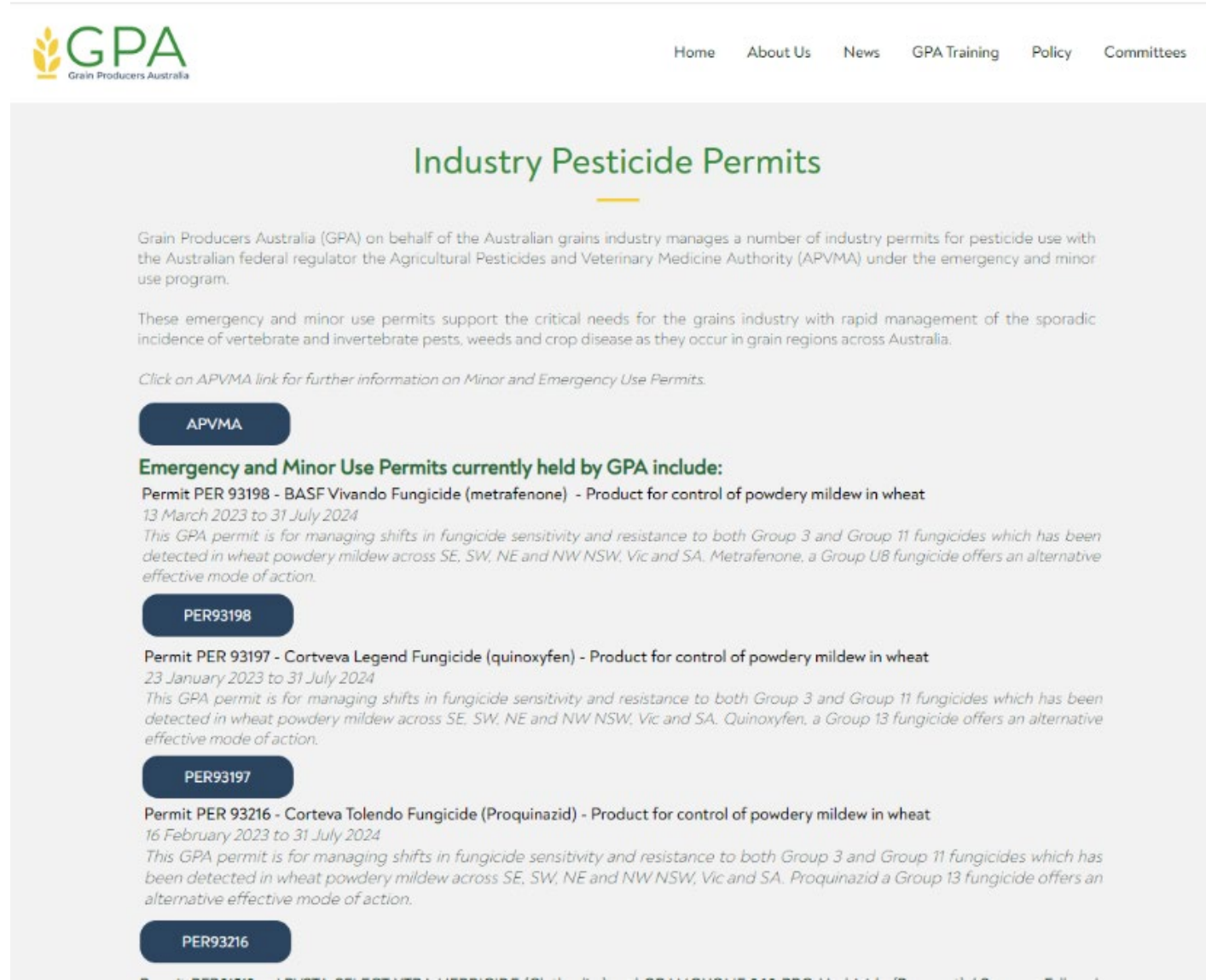
Variety	2023 Rating
Ballista	SVS
Brumby	MR/S
Calibre	MSS
Chief CL Plus	SVS
LRPB Anvil CL Plus	SVS
Dozer CL Plus	S
LRPB Matador	MS
LRPB Trojan	S
Mace	MSS
Razor CL Plus	MSS
RockStar	SVS
Scepter	SVS
Sheriff CL Plus	SVS
Soaker	Sp
Stockade	SVS
Tomahawk CL Plus	SVS
Valiant CL Plus	VS
Vixen	SVS
Willaura	SVS





# APVMA Emergency Permits

- Group U8 – Vivando (*Metrafenone 500 g/L*)
- Group 13 – Legend (*Quinoxifen 250 g/L*)
- Group 13 – Talendo (*Proquinazid 200 g/L*)



The screenshot shows the GPA website's 'Industry Pesticide Permits' page. At the top left is the GPA logo (Grain Producers Australia). To the right is a navigation menu with links for Home, About Us, News, GPA Training, Policy, and Committees. The main heading is 'Industry Pesticide Permits'. Below this, there is introductory text about GPA's role in managing industry permits for pesticide use. A button labeled 'APVMA' is present. The page lists three permits currently held by GPA, each with a title, product name, and a brief description of its purpose in managing fungicide resistance.

**GPA**  
Grain Producers Australia

Home About Us News GPA Training Policy Committees

## Industry Pesticide Permits

Grain Producers Australia (GPA) on behalf of the Australian grains industry manages a number of industry permits for pesticide use with the Australian federal regulator the Agricultural Pesticides and Veterinary Medicine Authority (APVMA) under the emergency and minor use program.

These emergency and minor use permits support the critical needs for the grains industry with rapid management of the sporadic incidence of vertebrate and invertebrate pests, weeds and crop disease as they occur in grain regions across Australia.

*Click on APVMA link for further information on Minor and Emergency Use Permits.*

[APVMA](#)

**Emergency and Minor Use Permits currently held by GPA include:**

**Permit PER 93198 - BASF Vivando Fungicide (metrafenone) - Product for control of powdery mildew in wheat**  
*13 March 2023 to 31 July 2024*  
*This GPA permit is for managing shifts in fungicide sensitivity and resistance to both Group 3 and Group 11 fungicides which has been detected in wheat powdery mildew across SE, SW, NE and NW NSW, Vic and SA. Metrafenone, a Group U8 fungicide offers an alternative effective mode of action.*

[PER93198](#)

**Permit PER 93197 - Cortveva Legend Fungicide (quinoxifen) - Product for control of powdery mildew in wheat**  
*23 January 2023 to 31 July 2024*  
*This GPA permit is for managing shifts in fungicide sensitivity and resistance to both Group 3 and Group 11 fungicides which has been detected in wheat powdery mildew across SE, SW, NE and NW NSW, Vic and SA. Quinoxifen, a Group 13 fungicide offers an alternative effective mode of action.*

[PER93197](#)

**Permit PER 93216 - Corteva Tolendo Fungicide (Proquinazid) - Product for control of powdery mildew in wheat**  
*16 February 2023 to 31 July 2024*  
*This GPA permit is for managing shifts in fungicide sensitivity and resistance to both Group 3 and Group 11 fungicides which has been detected in wheat powdery mildew across SE, SW, NE and NW NSW, Vic and SA. Proquinazid a Group 13 fungicide offers an alternative effective mode of action.*

[PER93216](#)





# So how do we manage WPM?

- Variety selection
  - Don't expect complete control in S-VS varieties!
- Paddock selection
  - Stubble retention and disease risk
- Prepare a fungicide strategy
  - Rotate modes of action & Combine actives
  - Target key timings – canopy closure, head wash efficacy
  - Application type – water rates

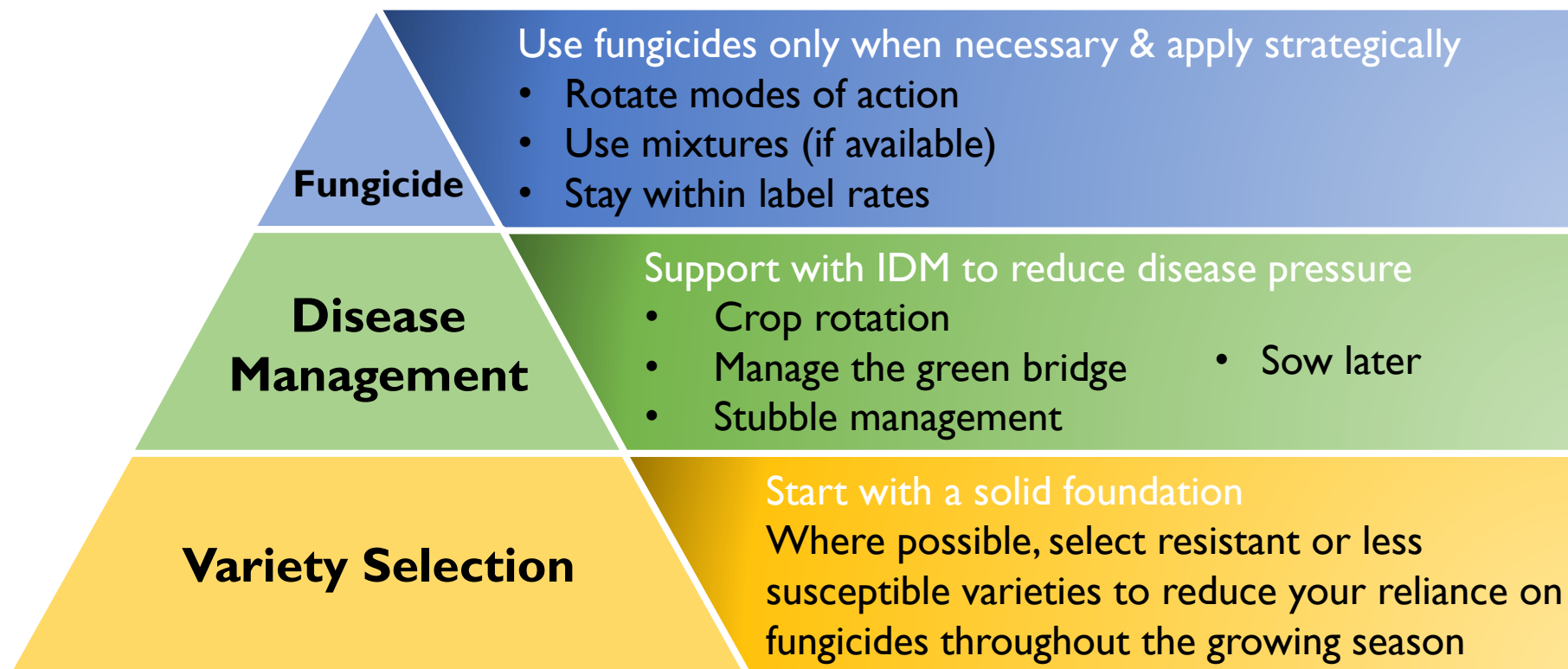


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# Fungicide Resistance Management



# SARDI Disease Diagnostics

## And disease samples supporting research

### Pulse and canola diagnostics:

Research samples: *Ascochyta* blight and sclerotinia

For a reply paid sample kit:

Email [mohsen.khani@sa.gov.au](mailto:mohsen.khani@sa.gov.au)

Phone: 08 8429 2285

### Express post to:

Mohsen Khani

SARDI Pulse Pathology

Locked Bag 100

Glen Osmond SA 5064



### Cereal diagnostics:

Research samples: Net and spot form net blotch, and oat septoria

Please send 2-10 diseased leaves in a paper envelope

\*Remove all root and soil material\*

Please include the location and variety

@TaraGarrard

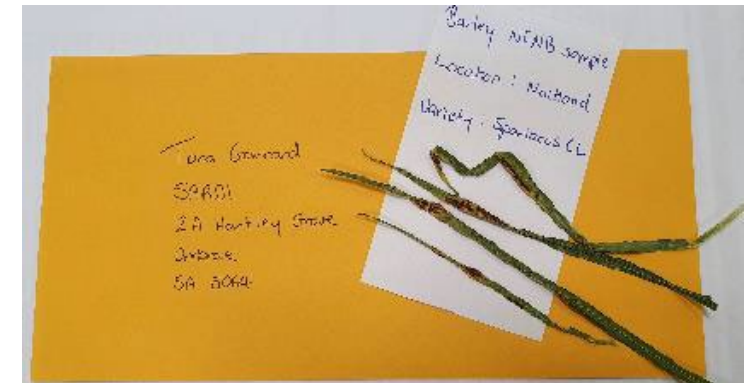
### Post to:

Tara Garrard

2A Hartley Grove

Urrbrae

SA 5064





# Thanks!



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Department of Primary Industries  
and Regions



*SA's premier cropping field site*



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Centre for Crop and  
Disease Management



Curtin University

AGRICULTURE VICTORIA



Department of  
Primary Industries





# Pulse Disease Management

Joshua Fanning



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# Correct Disease Identification

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- Is it Disease?
- Virus
- Abiotic?
- Water stress
- Nutrition
- Herbicide



# Soil-borne Diseases

- Fusarium spp.
- Didymella spp.
- Root Lesion Nematode
- Pythium
- Rhizoctonia
- Phytophthora spp.





# Ascochyta Blight

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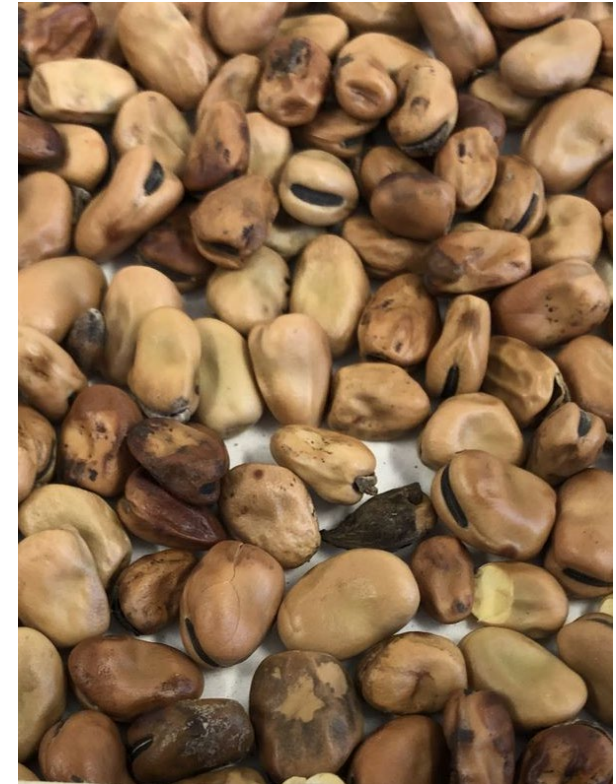
# Botrytis Grey Mould





# Chocolate Spot

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# Botrytis Grey Mould

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Crop	Disease	Pathogen
Lentil	Botrytis grey mould (BGM)	<i>Botrytis cinerea</i> <i>Botrytis fabae</i>
Chickpea		<i>Botrytis cinerea</i>
Vetch	Botrytis grey mould (BGM) Chocolate Spot	<i>Botrytis cinerea</i> <i>Botrytis fabae</i>
Faba bean	Chocolate Spot	

# Integrated Disease Management

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- Sow Clean Seed
- Crop rotations
- Choose resistant varieties
- Monitor for disease
- Understand the seasonal risk
- Optimise the fungicide strategy – Follow the product label
- Spray before rainfall events
- Remember plant growth post spray is unprotected
- Sprays are preventative not curative
- Protect the seed

## Pulse Disease Guide 2024

Joshua Fanning, Chloe Findlay, Dharushana Thanabalasingam - Pulse Pathologists February 2024

### 2023 in review

The 2023 season had variable severity for pulse diseases across Victoria. Early Ascochyta blight was observed in lentils which required fungicides to prevent yield losses. Severe disease occurred where lentils were grown in close rotations. Proactive disease management and below average spring rainfall meant that disease was of isolated concern across most of Victoria. Low levels of disease were still present in many paddocks, which will contribute to the carryover of disease into the 2024 season.

### 2024 pulse disease management

There is a risk of disease carryover into the 2024 season from infected seed and stubble of crops that had disease during 2023. To minimise the risk of disease during 2024, a proactive integrated disease management strategy will be required. This should include:

- avoiding susceptible varieties where possible
- avoiding planting pulse crops into or adjacent to paddocks where there was disease during 2023,
- sowing healthy vigorous seed,
- using fungicidal seed dressings where applicable,
- implementing a fungicide management plan.

Summer rainfall and the growth of weeds will increase the risk of soil-borne diseases including root lesion nematodes and Pythium. A PREDICTA<sup>®</sup>B test will identify paddocks at risk from some important soil-borne diseases of pulses.

There have been no major disease rating changes for most pulses for 2024.

**Beans:** Chocolate spot was observed at very low disease severity in Victoria during 2023. It is important to avoid susceptible varieties where Chocolate spot is common or a high risk. Minimising disease early in the season will reduce the inoculum load later in the season. Reliance on fungicides is not recommended and cannot provide adequate control in a susceptible variety in a high-risk season and/or environment.

**Chickpeas:** Disease was not of major importance during 2023 in chickpeas due to proactive management.

Currently, there is limited varietal resistance to Ascochyta blight but breeding lines with improved resistance are expected in coming years. A moderately susceptible (MS) variety in an average season should require minimal fungicide applications in low rainfall zones. In the medium to high rainfall zones, it is likely multiple fungicide applications will be required to prevent Ascochyta blight.

**Lentils:** Ascochyta blight was severe early in the season causing seedling death or stem breakages, and fungicides were required to minimise yield losses. This occurred in paddocks where lentils were grown on a tight rotation, therefore, avoiding tight rotations will minimise disease risk. Sclerotinia white mould (SWM) was not observed during 2023, with conditions not conducive to the disease. However, it is important to monitor paddocks with a history of SWM as the sclerotia (fruiting bodies/survival structures) can survive many seasons. Botrytis grey mould (BGM) was observed at very low levels towards the end of the season, due to dry and mild Spring conditions.

**Vetch:** BGM and Ascochyta blight are the main causes of yield loss in vetch. BGM in Vetch is caused by the same pathogens that cause BGM in lentil and Chocolate spot in faba bean. Therefore, avoid growing vetch, lentil or faba bean in close rotations or in adjacent paddocks where disease was observed in 2023. The disease management strategy should be matched to the crop's end use (hay, fodder, grain, and manure).

**Field peas:** Bacterial blight is the most significant threat to field pea production. There are no in-crop control options, so where possible avoid susceptible varieties, paddocks prone to frost, residual herbicides, or planting into pea stubble.

**Lupins:** Minimal disease was observed in lupins in 2023. Avoid growing lupins in rotation with other pulses and canola to avoid SWM. Monitor crops for disease to ensure disease severity remains low.

**Seed quality:** The quality of seed and the potential for diseases infecting seed is often neglected. Disease (e.g., BGM and SWM) carryover may be through infected seed or sclerotia contamination in seed lots. Seed infection can not only carry the disease between seasons but reduce plant establishment. Testing seed for germination, vigour, and seed-borne diseases before sowing will ensure good plant establishment. Testing can be completed by specialist laboratories (see back page). Seed treatments are effective at suppressing many fungal diseases; however, seed treatments don't combine well with rhizobium used for inoculation. Read labels for compatibilities.

**If you see something different, or high levels of disease in any crop,** please send a sample to Agriculture Victoria. If you suspect an exotic pest or disease contact CropSafe or the Emergency Plant Pest Hotline (see back page).





# Pulse Disease Management - Fungicides

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- Depends on Multiple Risk Factors (as presented prior)

## General Management

- Fungicides if risk factors present
- Canopy Closure Fungicide – in most varieties and seasons
- Follow up if risk requires

# Fungicide Options

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**FIELD CROP DISEASES VICTORIA** Q

HOME ▾ ENDEMIC ▾ EXOTIC ▾ RESOURCES ▾ ASK AN EXPERT ▾ EVENTS ▾ CONTACT US ▾ COMMUNITIES

## Fungicide options in Pulses

Published - 3 May 2024 By Joshua Fanning, Chloe Findley And Dharushana Thanabalasingam (Agriculture Victoria)



To protect pulses, there are several registered fungicides available with varying efficacy and use patterns. When selecting products, it is important to consider products within an integrated disease management (IDM) strategy (see below), the potential of the disease-causing pathogen to develop fungicide resistance,

SEARCH... Q



# Fungicide Resistance Management

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## Fungicide

Use fungicides only when necessary & apply strategically

- Rotate modes of action
- Use mixtures (if available)
- Stay within label rates

## Non-Chemical Farm Management

Support with non-chem IDM to reduce disease pressure

- Stubble management
- Crop rotation
- Good hygiene
- Sow at the best time to avoid or tolerate disease
- Manage the green bridge

## Variety Selection

Start with a solid foundation

Where possible, select resistant or less susceptible varieties to reduce your reliance on fungicides throughout the growing season



# Discussion

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