

# AFREN WEBINAR: Western region seasonal update

AUSTRALIAN  
FUNGICIDE RESISTANCE  
EXTENSION NETWORK



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Monday 9 September 2024

# Australian Fungicide Resistance Extension Network

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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

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agcommunicators.



- To ask a question:
  - Go to the Q&A window in the bottom of your screen.
  - Click on Q&A, 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.

# Today's presentation

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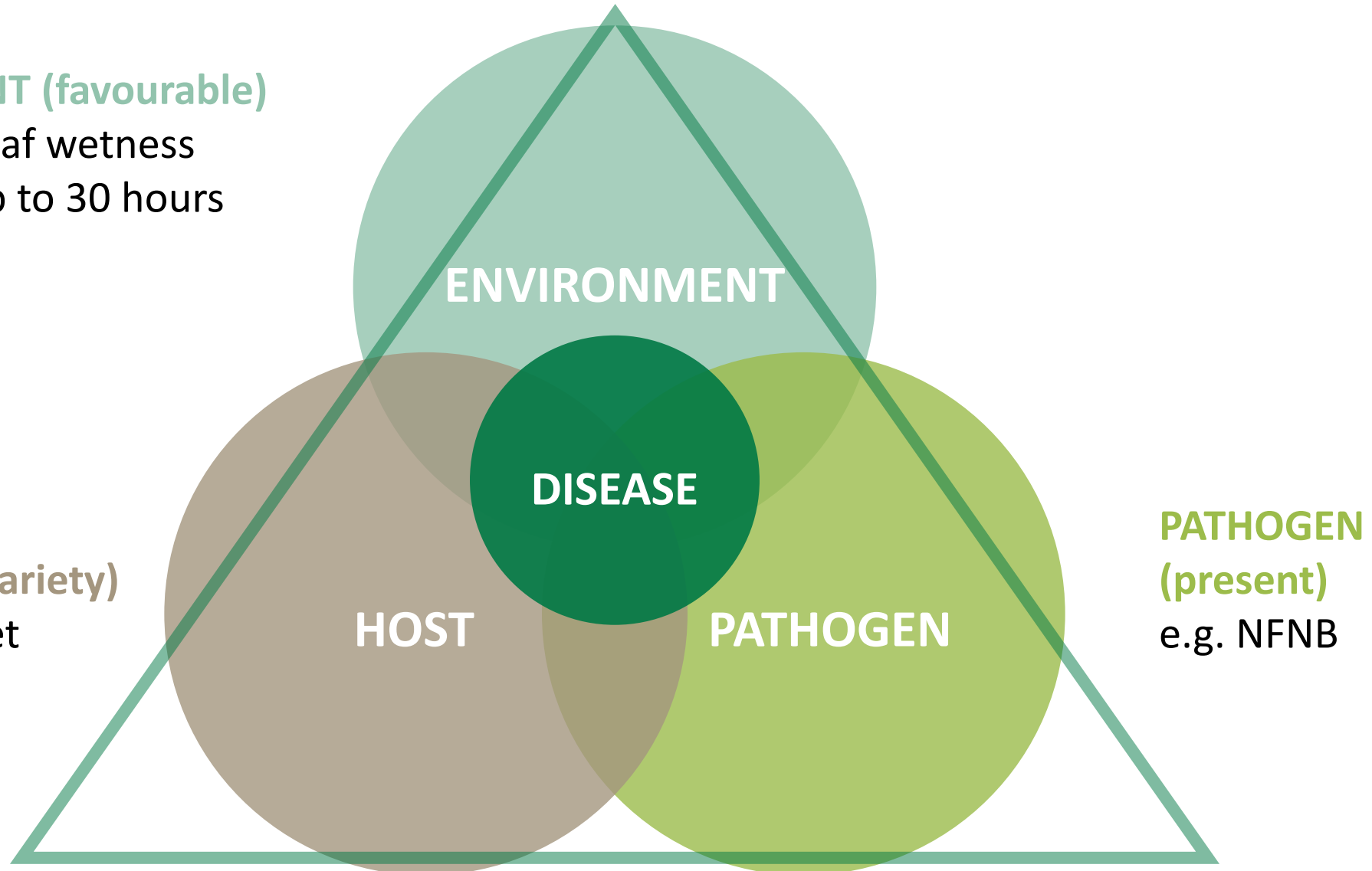
- 2024 season & outlook
- Diseases present in WA this season
- Focus on barley loose smut
- Late season disease management
- WA fungicide resistance update

# Factors in disease impact

## ENVIRONMENT (favourable)

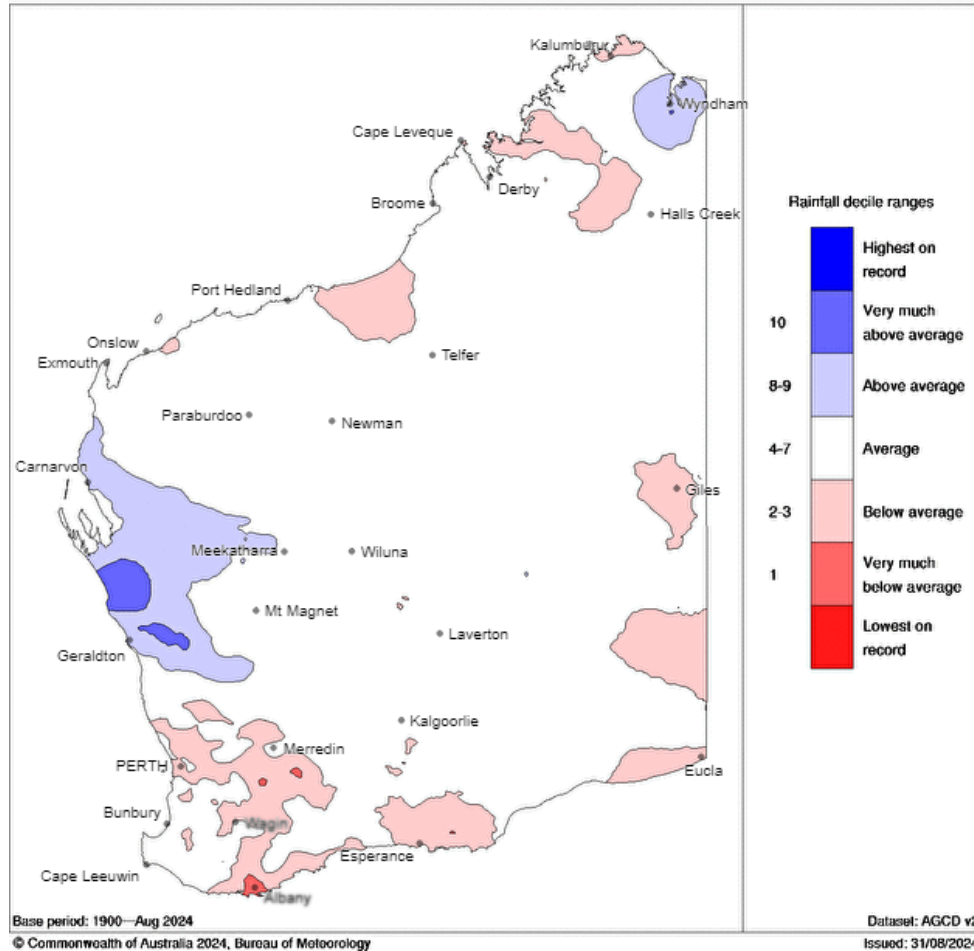
- Prolonged leaf wetness
- High RH% up to 30 hours
- 10 to 25° C

**HOST**  
(susceptible variety)  
e.g. RGT Planet

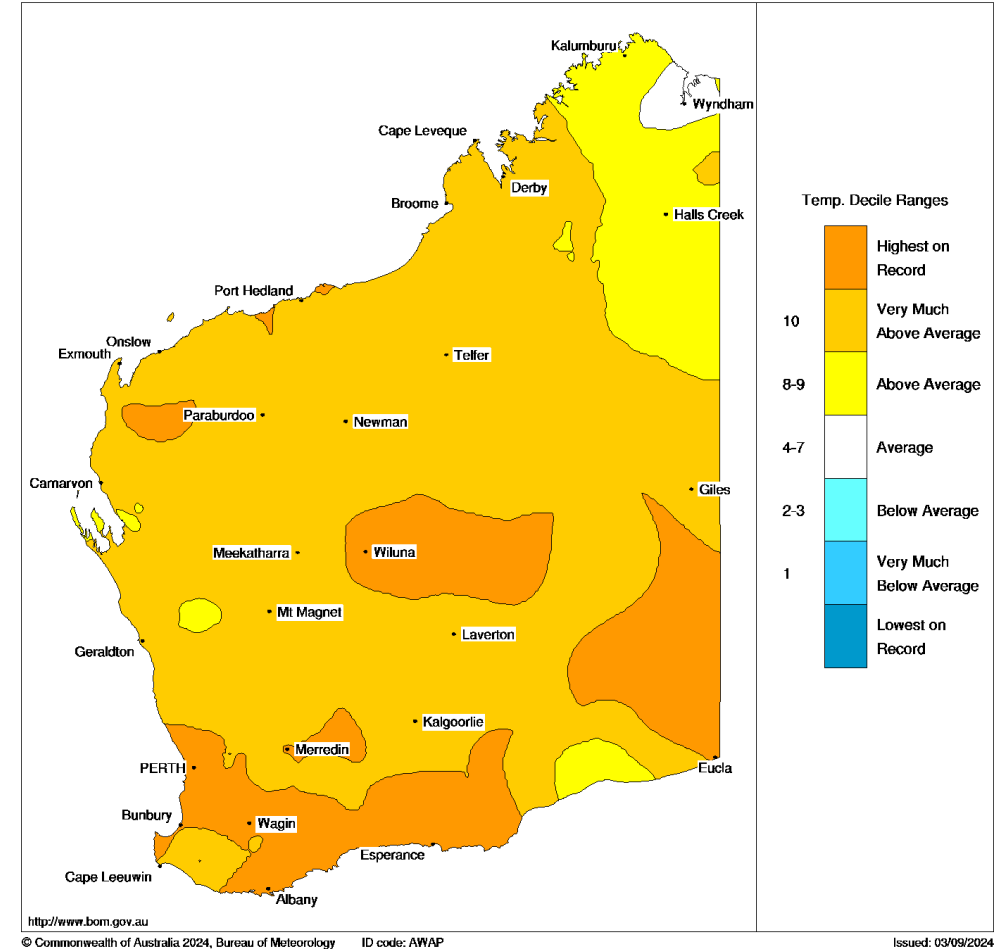


# Seasonal rain and temperatures 2024

Western Australian rainfall deciles 1 April to 31 August 2024  
Australian Gridded Climate Data

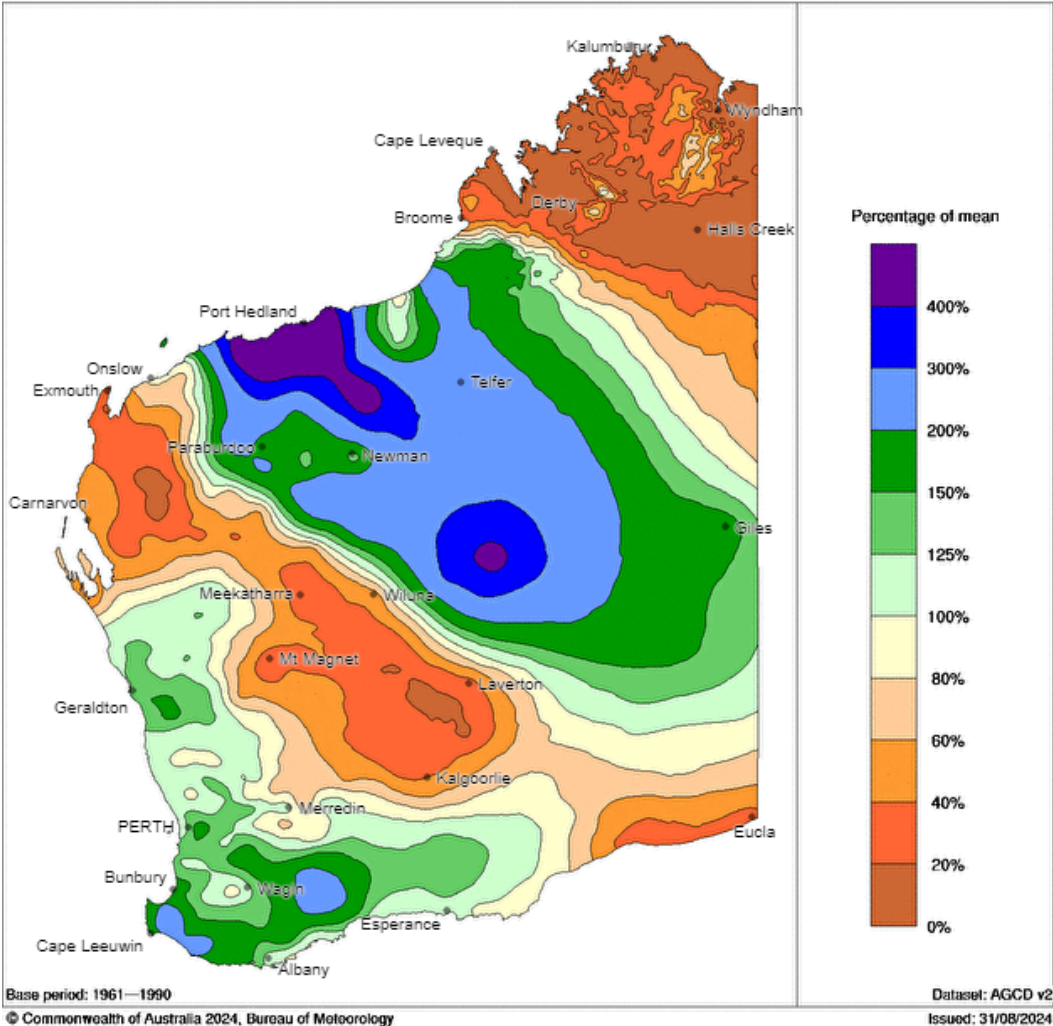


Mean Temperature Deciles 1 June to 31 August 2024  
Distribution Based on Gridded Data  
Australian Bureau of Meteorology



# August rain 2024

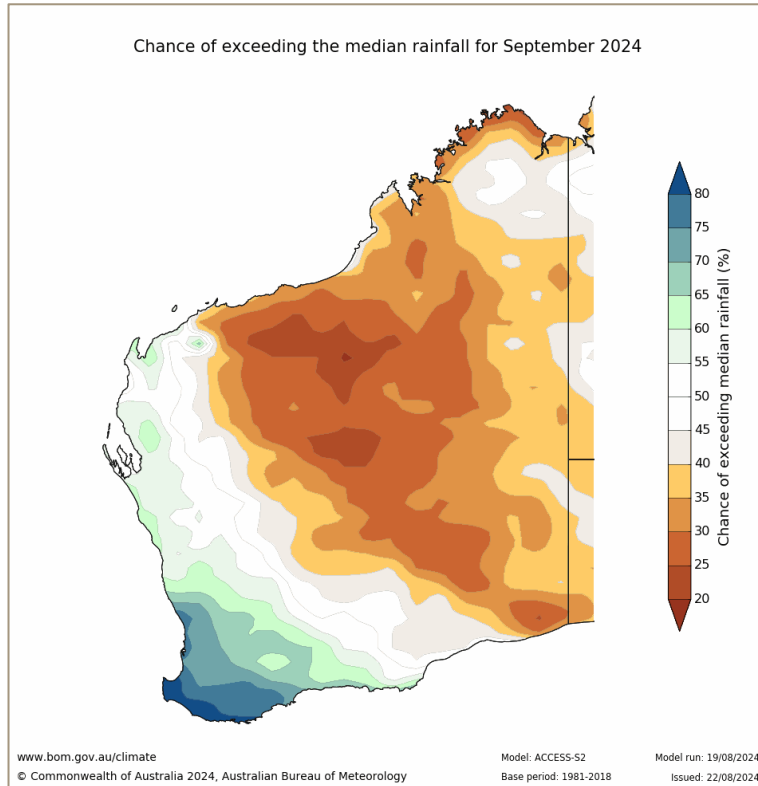
Western Australian rainfall percentages August 2024  
Australian Gridded Climate Data



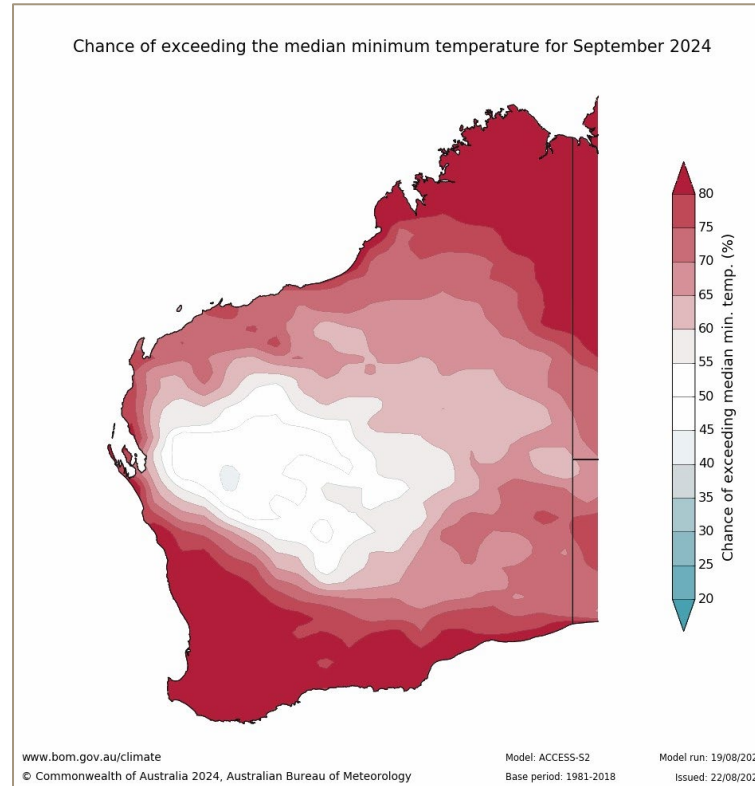
Source: Bureau of Meteorology

# September rain and temperature outlook 24

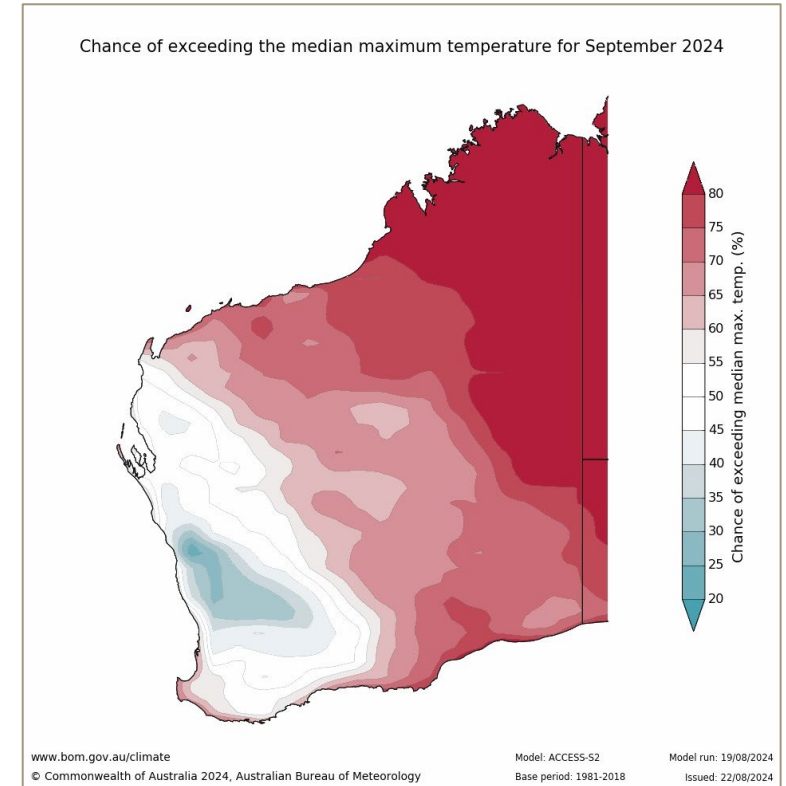
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Rain



Temp min



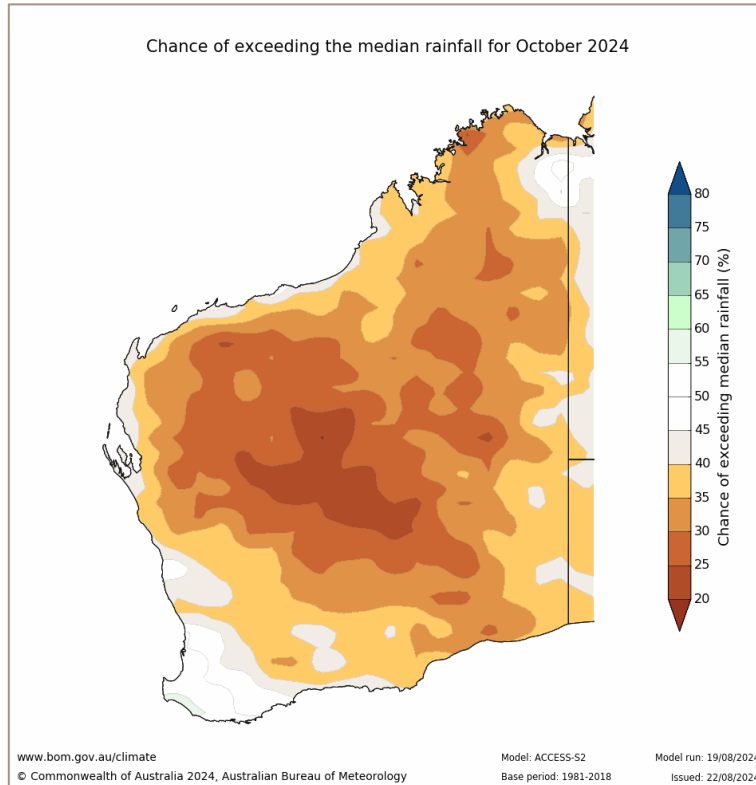
Temp max

Chances of exceeding median

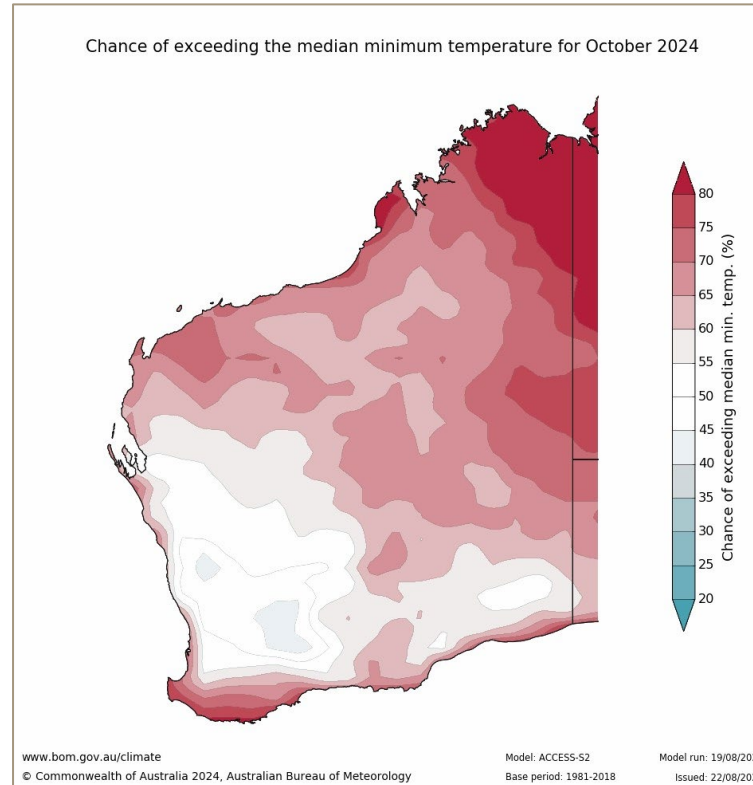
***(expected to be warmer than normal for the whole period)***



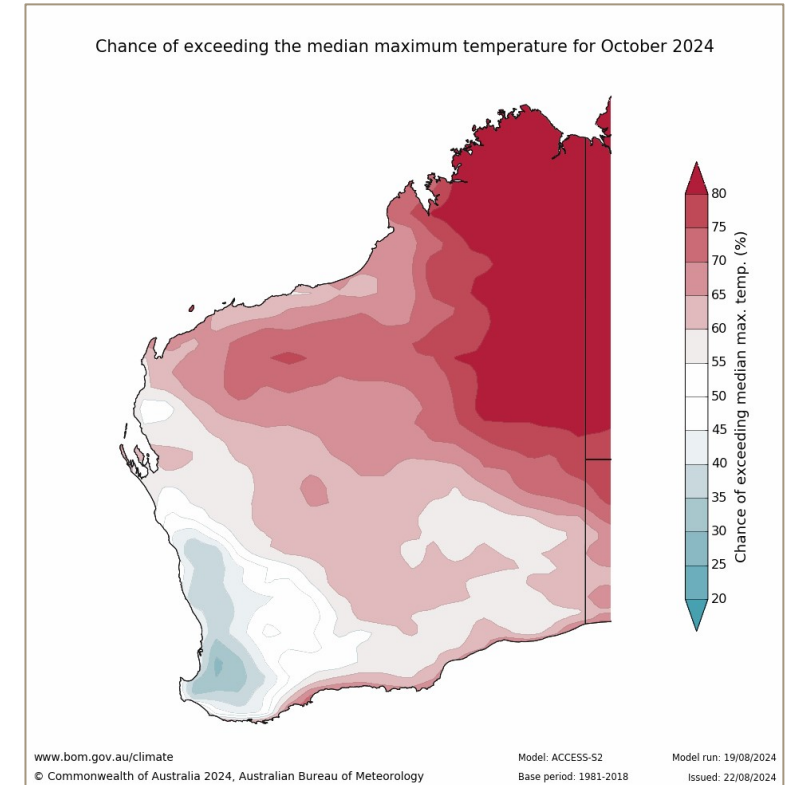
# October rain and temperature outlook 24



Rain



Temp min

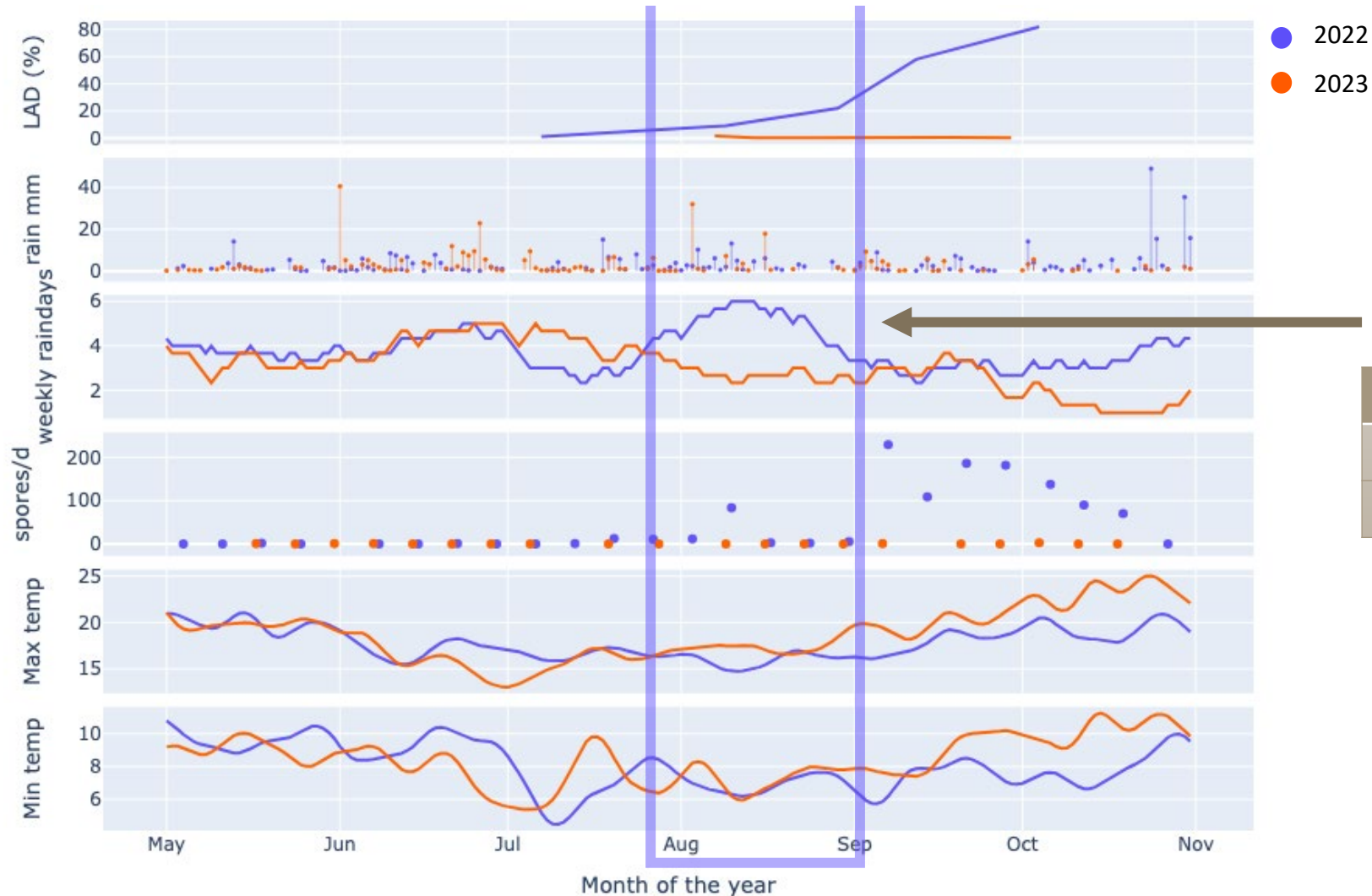


Temp max

Chances of exceeding median

***(expected to be warmer than normal for the whole period)***

# Weather and net form net blotch epidemic severity



← August rainfall similar in both years

August rainfall	mm	days
<b>2022</b>	<b>69.6</b>	<b>20</b>
<b>2023</b>	<b>66.3</b>	<b>12</b>

But in 2022 – many more rain days

Disease epidemiology, modelling and delivery of management decision support tools (DAW2112-002RTX)

Disease data: Kithsiri Jayasena (DPIRD)  
Weather data: SILO data-drill via {WeatherOz}

Figure: Harry Eslick (DPIRD)

Daily weather smoothed using 3-week gaussian convolution. excl rain mm

# Summary

- Weather conditions strongly influence disease severity
- Number of rain days rather than total rainfall
- Temperature + rainfall conditions influence latent periods and infection establishment.

# Barley - what have we seen in 2024?

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Net form net blotch



(RGT Planet)

Spot form net blotch



(Maximus CL/Spartacus /Buff)

Powdery mildew



(Maximus CL/ Rosalind)

Loose smut



(Neo CL)

*Photo credit: Kith Jayasena & Andrea Hills*

# Barley - what have we seen in 2024?

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*Photo credit:  
Kith Jayasena*



*Photo credit: Geoff Thomas*

Maximus/Spartacus

Increasing incidence, keep an eye on "S" varieties but also Maximus CL / Spartacus CL / Commodus CL

# Wheat - what have we seen in 2024?

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Nodorum  
blotch



(Kinsei/Vixen/Scepter/Calibre)

Yellow spot



Powdery  
mildew



(Vixen/Scepter)

Leaf rust



(Brumby)

Flag smut



(Rock Star)

*Photo credit: Ciara Beard / Kith Jayasena / DPIRD*

# Canola / lupin - what have we seen in 2024?

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Canola  
Downy mildew & Blackleg



*Photo credit: Andrea Hills*

Canola  
Sclerotinia leaf infection



*Photo credit: Andrea Hills*

Lupin  
Sclerotinia pod infection



*Photo credit: Ciara Beard*

# Barley loose smut

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# Barley loose smut

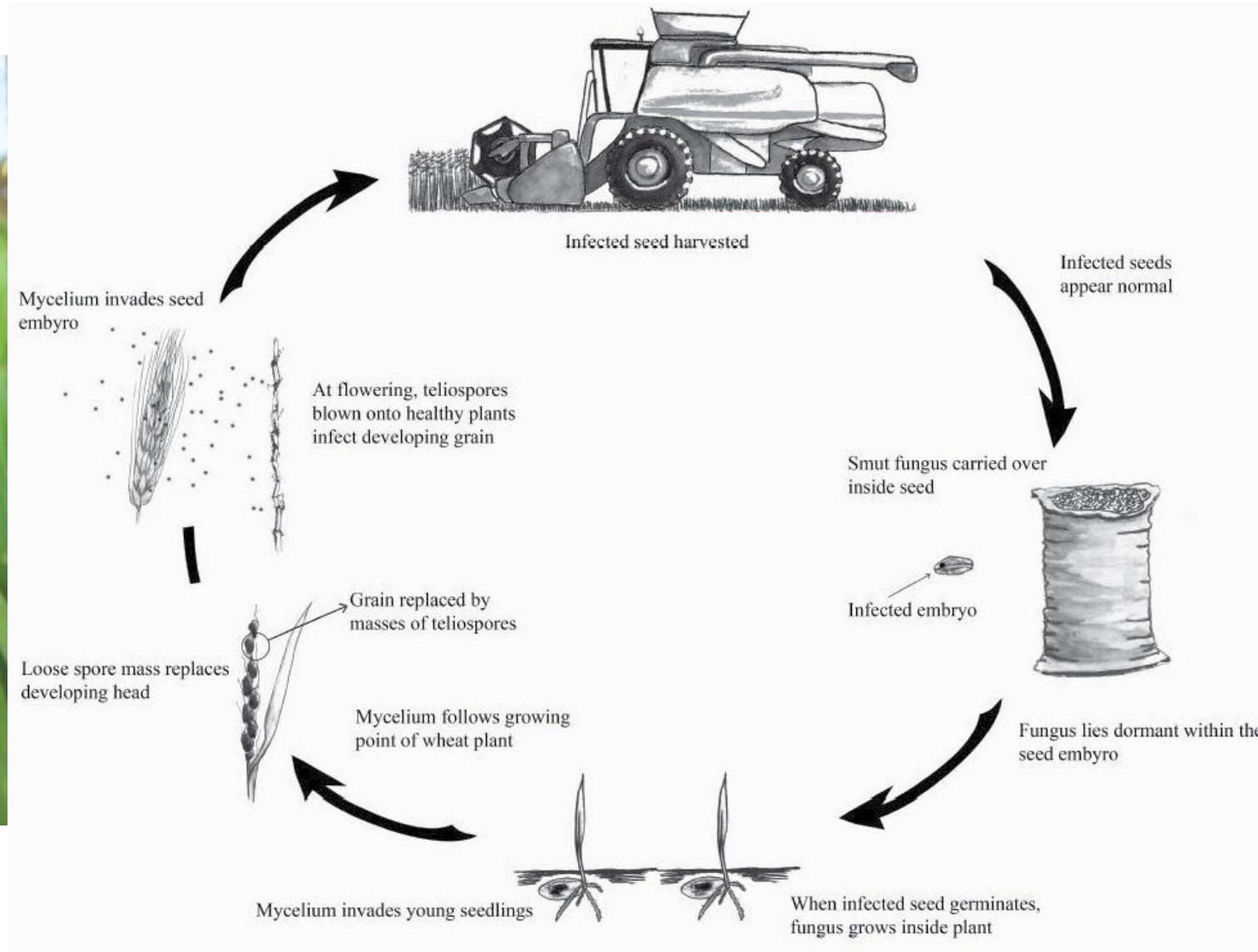
- Prevalent in some varieties this season – susceptibility does vary
- Yield losses are proportional to the percentage of plants infected
- Extremely visual - looks worse than it is
- Affected by seasonal conditions
  - seeding - uptake of seed dressing
  - spring – transmission

# Barley loose smut

- Heads have florets replaced by dark brown, powdery spores
- Registered seed dressings will reduce and manage smut levels
- Lifecycle means seed treatment ***prevents*** infected seed from forming smutted heads



# Lifecycle - barley loose smut



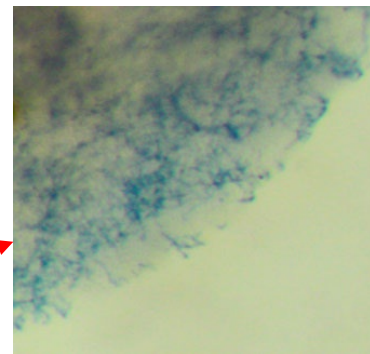
# Other cereal smuts & bunts

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Disease	Transmission	Treatment
Loose smut	inside seed	seed dressing
Covered smut	seed coat, soil/machinery	seed dressing
Wheat flag smut	seed coat, soil/machinery	seed dressing
Common bunt	seed coat, soil/machinery	seed dressing



Wheat flag smut

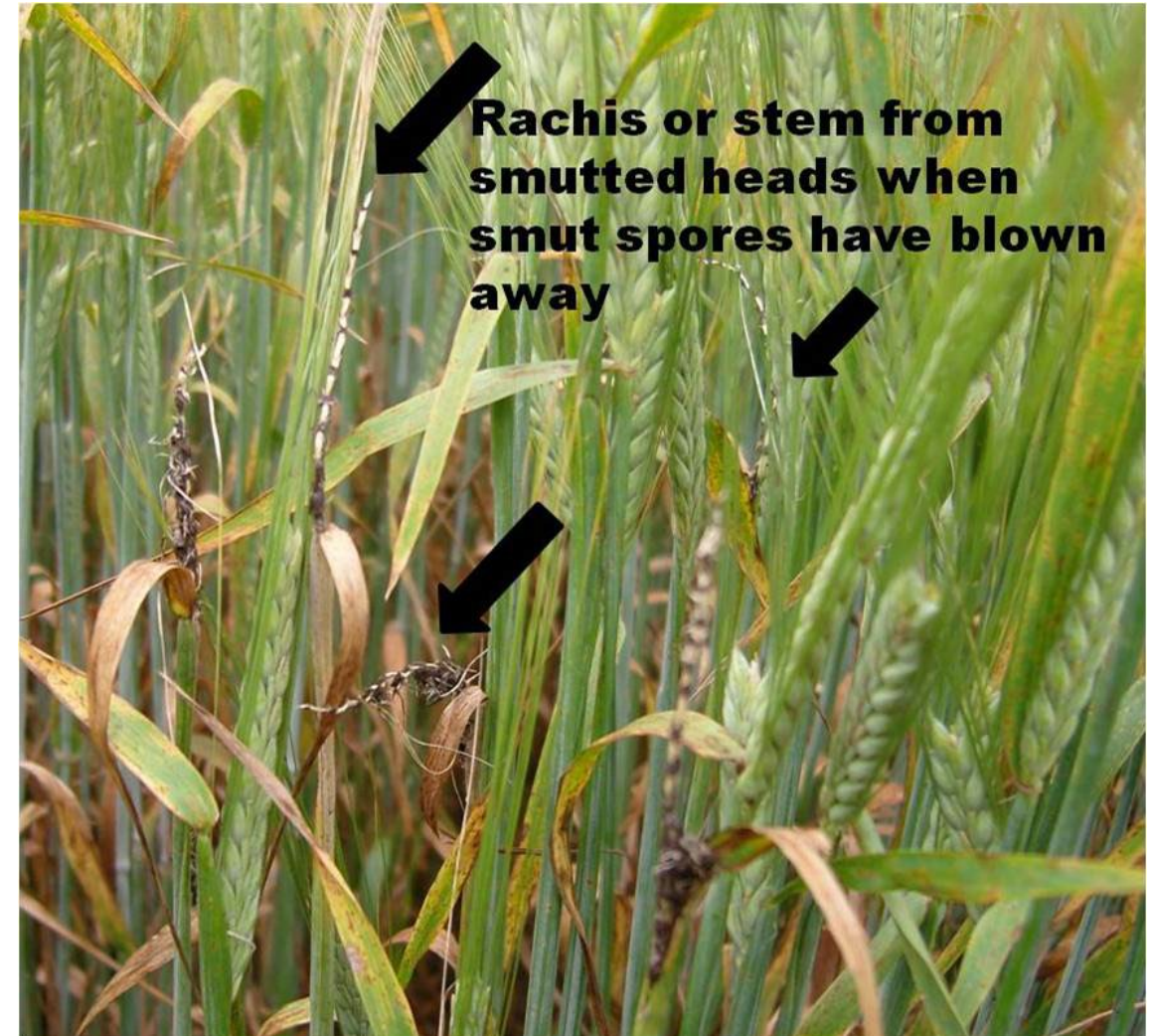


Barley embryo infected with loose smut (blue specs)



# Barley loose smut - actions

- Treat seed with a registered dressing
  - Group 7 (SDHI) treatments are particularly effective
- Seed crops – just as heads emerge, consider applying 290 ml/ha tebuconazole to reduce infection
- With  $>100$  plants/m<sup>2</sup>, even good application of a good product – escapes normal & produce a smutted head in 2025



# Foliar disease management

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# Late season disease management

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- **To apply foliar fungicides or not?.... consider:**
  - Crop yield potential (season started late)
  - Current growth stage and how long is left of the growing season
  - Spring weather outlook (wet and warm)
  - Diseases present (monitor)
    - confirm diagnosis - reports of physiological / false black chaff / nutritional symptoms
  - Prioritise crops to manage – be aware of high disease risk scenarios eg stubble borne diseases in wheat on wheat
  - Follow IDM strategies and use fungicides when necessary.

# Fungicide application for **wheat**

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- Target - protect the top 3 leaves
- Application timing:
  - Best timing is Z39 (flag leaf emergence)
  - Z55 (ear emergence) spray can be important to reduce glume blotch or in very high rainfall environments
  - Read label
- Use [YellowspotWM](#) tool to determine likely economic outcome
- Leaf rust: monitor up until flowering and be ready to apply fungicide if epidemic develops.
  - SVS varieties Brumby, Devil & Vixen





# Fungicide application for **barley**

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- Target - flag-1 and flag-2
- Application timing:
  - Best single application timing – from Z33 through to awn peep (depending on disease pressure)
  - In longer season with high disease pressure environments and susceptible variety, may need two-spray strategy
  - Physiological spotting doesn't respond to fungicide
  - Read label

# Take home messages

- Before fungicide spraying – correct diagnosis necessary
- Outlook - average rainfall and mild temperatures in most areas in September means a fungicide application could be warranted in crops of good yield potential
- Plan now for 2025 based on diseases you observe this year
- Long term - Select varieties with a good disease resistance profile to common diseases will reduce pathogen build up and need for fungicide

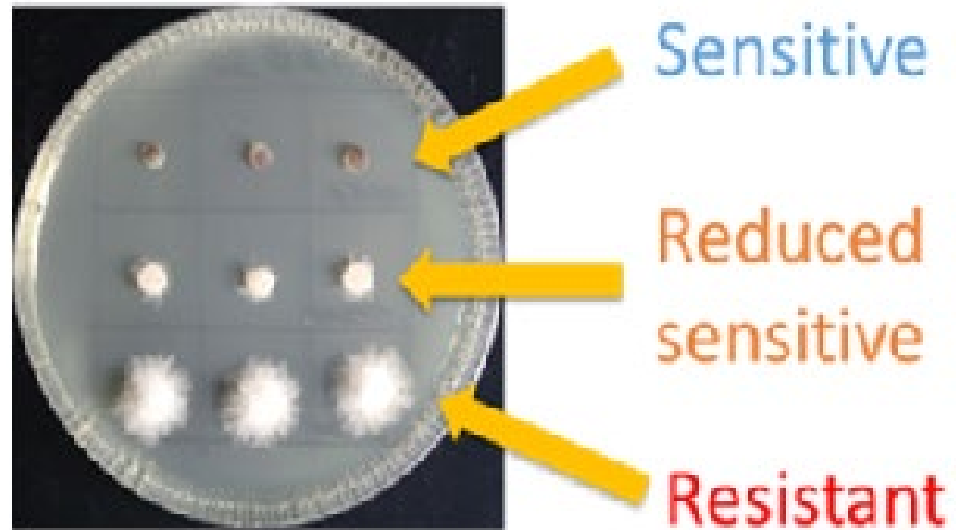
# WA fungicide resistance update

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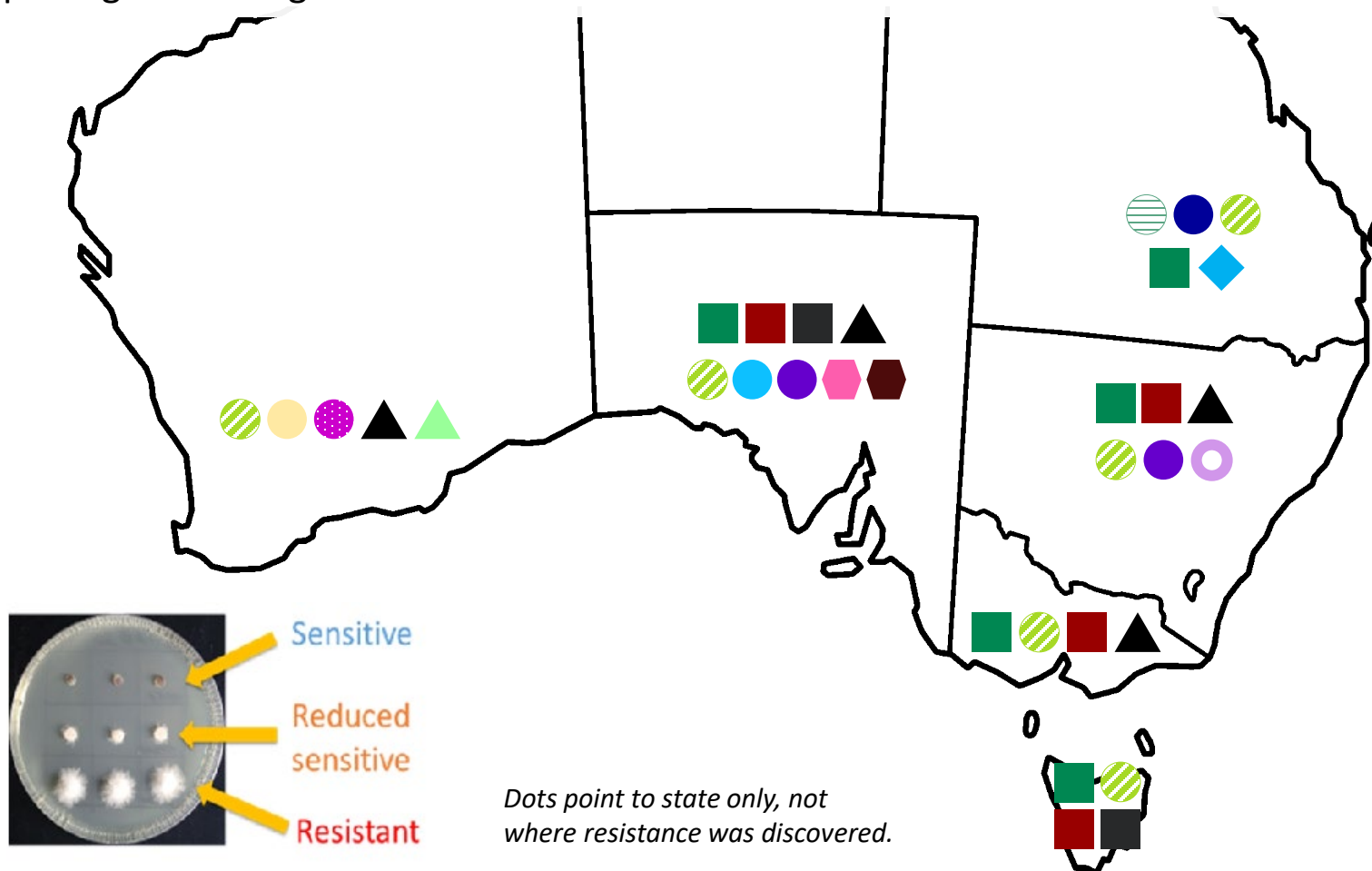
# Fungicide resistance testing

- Disease being grown out on agar plates that contain fungicide



# Fungicide resistance in Australian grain crops

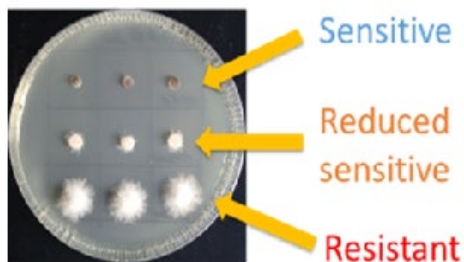
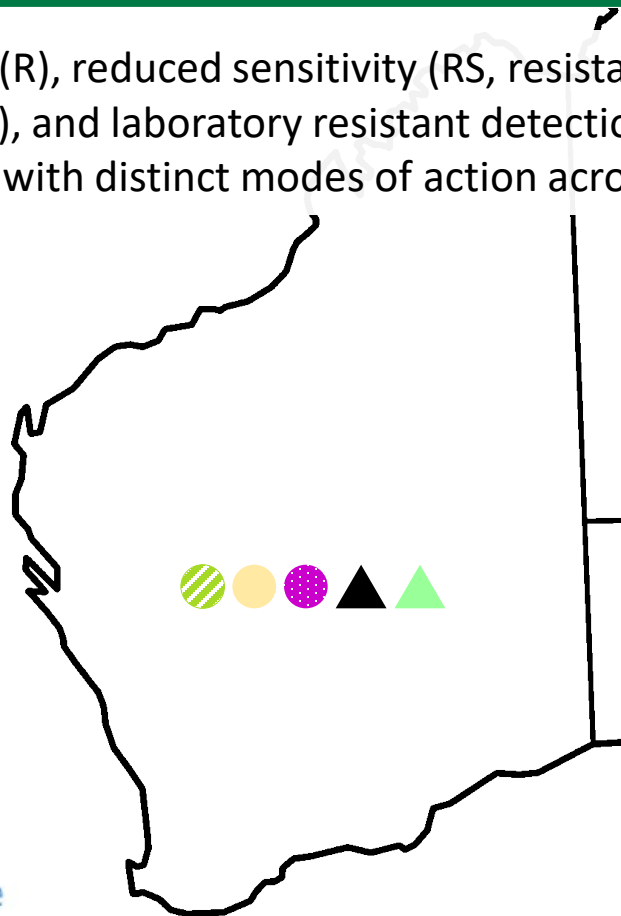
Distribution of resistant (R), reduced sensitivity (RS, resistance below the threshold of field failure), and laboratory resistant detections (L) in fungal pathogens to fungicides with distinct modes of action across Australia.



















	Wheat powdery mildew	R - Group 11 Qol; Group 3 DMI
	Septoria tritici blotch	RS - Group 3 DMI
	Septoria tritici blotch	L mutation R - Group 11 Qol
	Barley powdery mildew	R, RS - Group 3 DMI; L - mutations
	Barley net form of net blotch	R - Group 3 DMI; L mutations R, RS - Group 7 SDHI
	Barley net form of net blotch	L mutations R, RS - Group 7 SDHI
	Barley net form of net blotch	R, RS - Group 3 DMI; R - Group 7 SDHI; L mutations RS - Group 11 Qol
	Barley net form of net blotch	R, RS - Group 3 DMI; R - Group 7 SDHI
	Barley spot form net blotch	L mutations R, RS - Group 3 DMI; L mutations R, RS - Group 7 SDHI
	Barley spot form net blotch	RS - Group 3 DMI
	Barley spot form net blotch	R, RS - Group 3 DMI; R, RS - Group 7 SDHI
	Blackleg of canola	RS - Group 3 DMI
	Blackleg of canola	L mutations R - Group 2
	Botrytis grey mould of chickpea	L mutation R - Group 1 (MBC)
	Ascochyta blight of lentil	L mutation R - Group 1 (MBC)
	Mung bean powdery mildew	RS - Group 3 DMI; L mutations R - Group 11 Qol

# Fungicide resistance in Australian grain crops

Distribution of resistant (R), reduced sensitivity (RS, resistance below the threshold of field failure), and laboratory resistant detections (L) in fungal pathogens to fungicides with distinct modes of action across WA.



	Wheat powdery mildew	R - Group 11 Qol; Group 3 DMI
	Septoria tritici blotch	RS - Group 3 DMI
	Septoria tritici blotch	L mutation R - Group 11 Qol
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# Pathogens detected for fungicide resistance in broadacre cropping, WA

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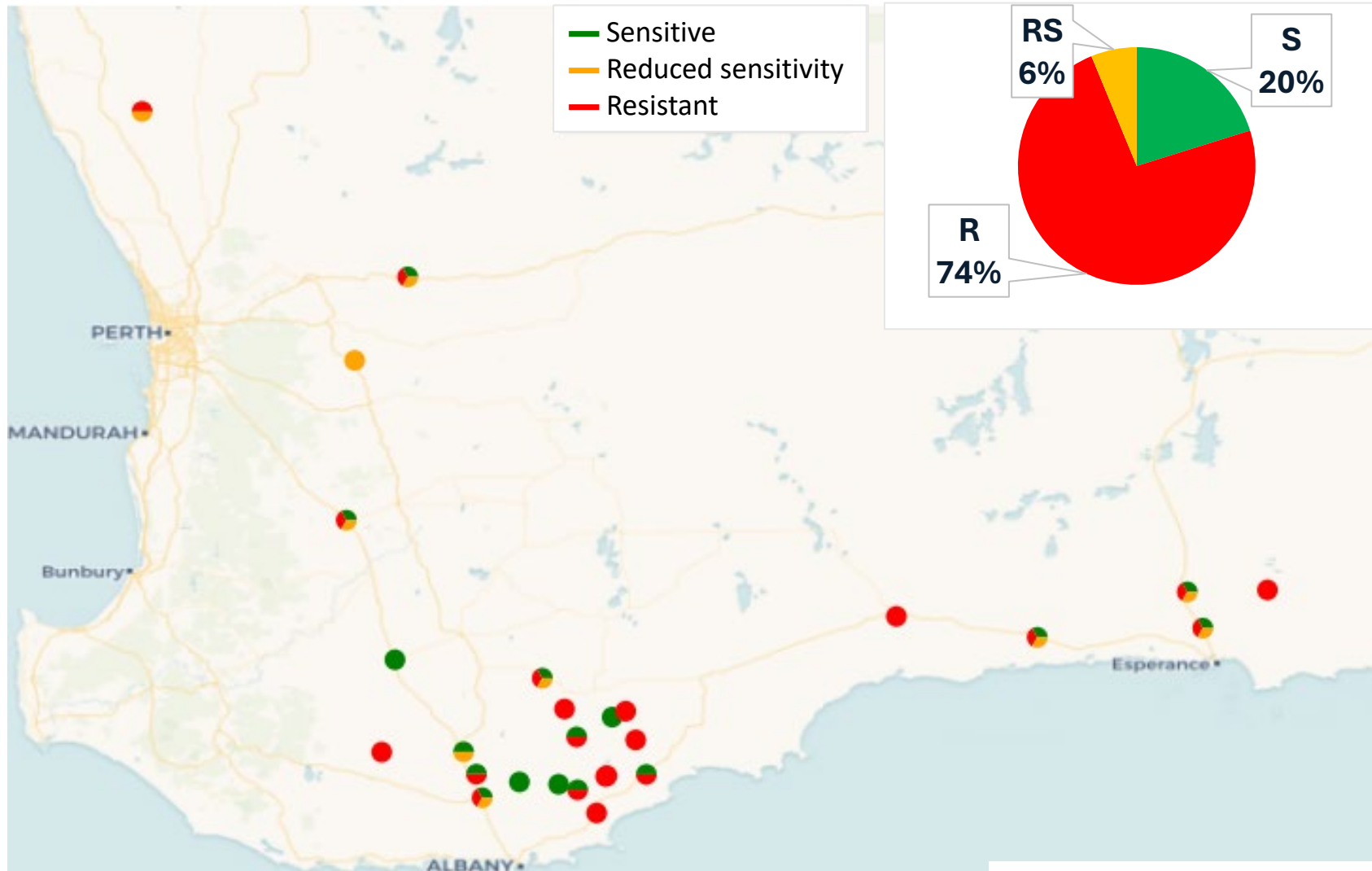


Fungicide group	Compound effected	Disease	Populations	Industry implications
<b>3 (DMI)</b>	Tebuconazole, propiconazole, flutriafol	Barley powdery mildew	<b>R</b> <b>RS</b>	Field resistance & reduced sensitivity for some DMI
	Tebuconazole, propiconazole, prothioconazole, epoxiconazole	Net form net blotch	<b>R</b> <b>RS</b>	
	Tebuconazole, propiconazole, prothioconazole, epoxiconazole	Spot form net blotch	<b>R</b> <b>RS</b>	
	Flutriafol, fluquinconazole, prothioconazole, tebuconazole	Blackleg	<b>RS</b>	Field implications unknown
<b>7 (SDHI)</b>	Fluxapyroxad	Net form net blotch	<b>R</b> <b>RS</b>	Mainly limited locations “R” population and mostly “RS”
	Fluxapyroxad	Spot form net blotch	<b>R</b> <b>RS</b>	Field resistance & reduced sensitivity SDHI

Source: adapted from Anna-Sheree Krige, CCDM, Curtin

# NFNB - DMI resistance in WA (2014-2023) (n=337)

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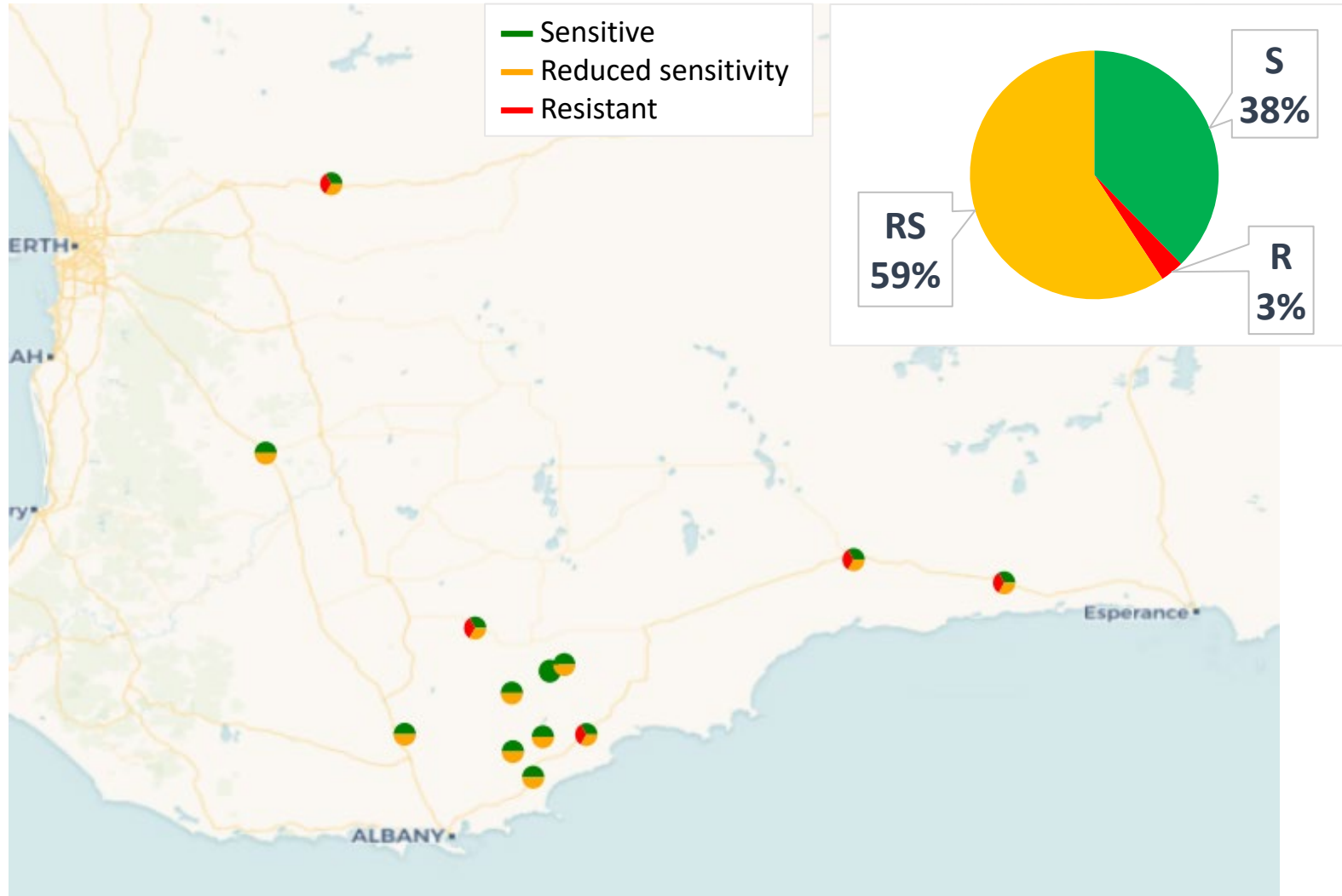
OpenStreetMap contributors (C) CARTO

Source: W. Mair, S. Krige & F. Lopez-Ruiz, CCDM, Curtin



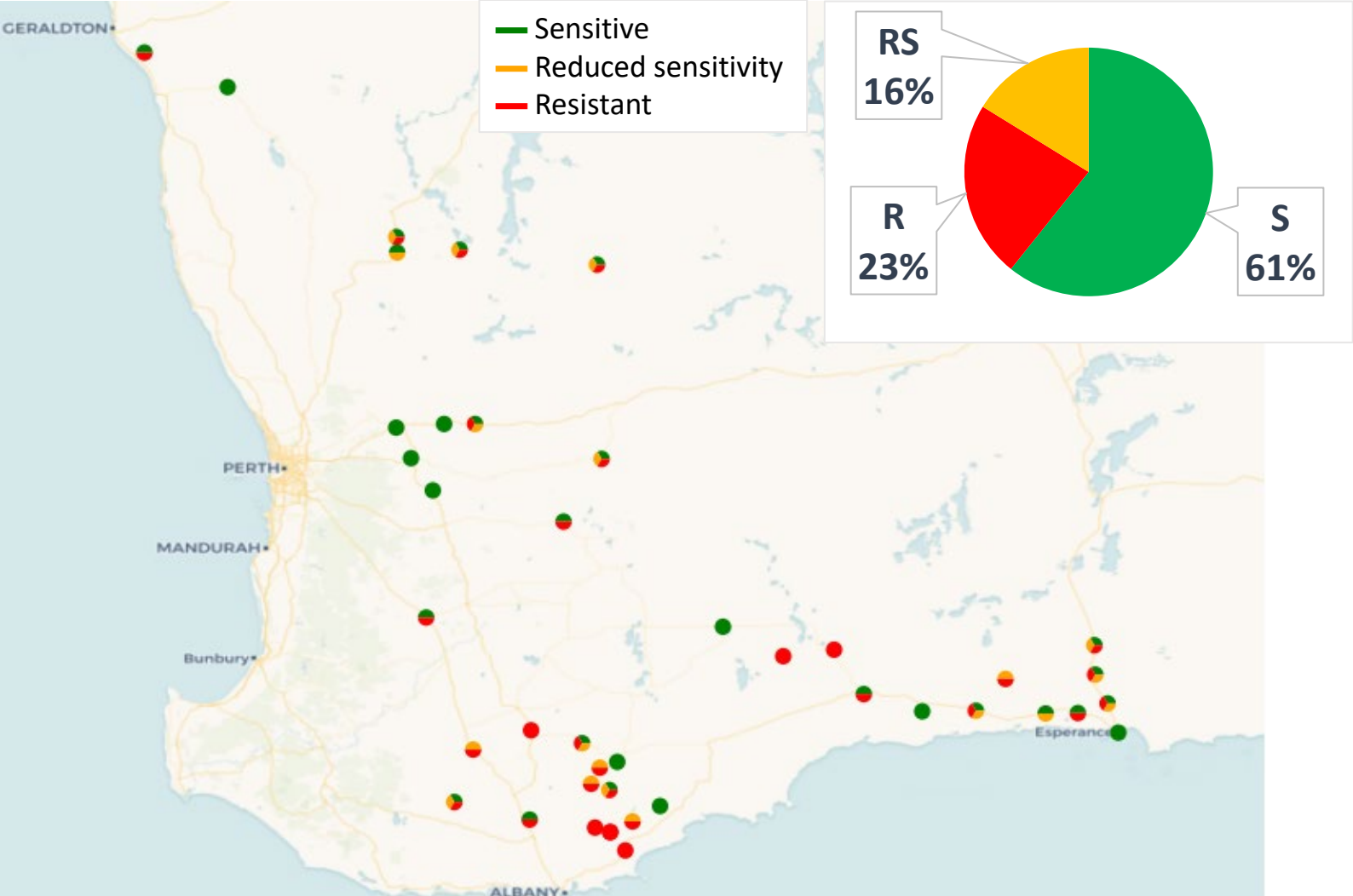
# NFNB - SDHI resistance in WA (2014-2023) (n=260)

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Source: W. Mair, S. Krige & F. Lopez-Ruiz, CCDM, Curtin

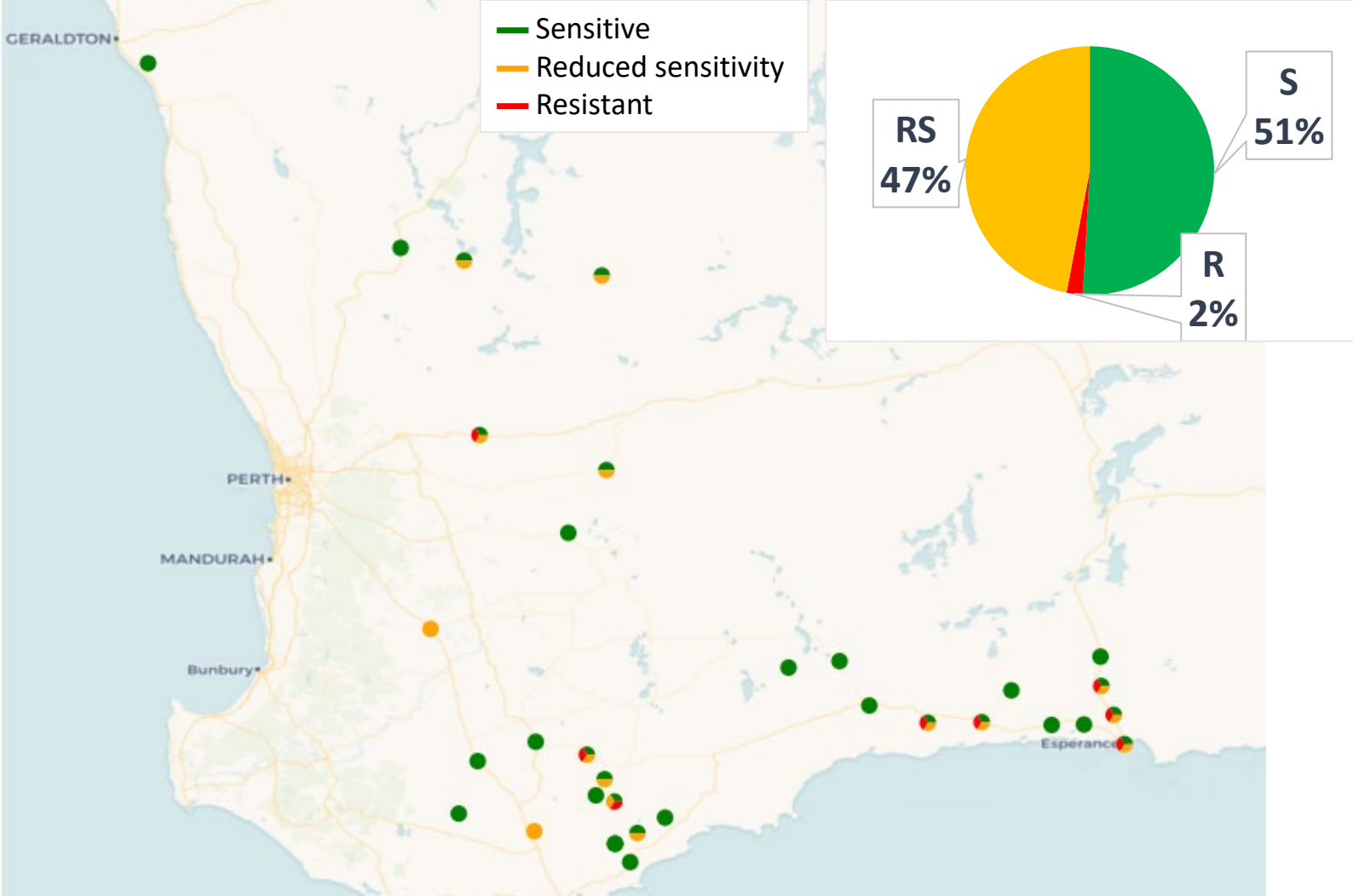
# SFNB - DMI resistance in WA (2014-2023) (n=512)



(C) OpenStreetMap contributors (C) CARTO

Source: W. Mair, S. Krige & F. Lopez-Ruiz, CCDM, Curtin

# SFNB - SDHI resistance in WA (2014-2023) (n=334)



Source: W. Mair, S. Krige & F. Lopez-Ruiz, CCDM, Curtin

# Fungicide Resistance Management

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## Fungicide

Reduce pathogen populations on plant

### Use fungicides only when necessary and apply strategically

- Early protection- use seed dressing or in-furrow fungicides
- Apply foliar only when necessary
- Rotate modes of action (MOA)
- Use mixtures (if available)
- Stay within label rates

## Cultural / non-chemical

Reduce pathogens in the environment

### Support with IDM to reduce disease pressure

- Stubble management
- Crop rotation
- Good hygiene
- Avoid early sowing
- Green bridge management
- Plant nutrition, e.g. K

## Variety selection

Reduce infection potential

### Start with a solid foundation

- Select varieties with good resistance profile
- Avoid using VS or S varieties

# The Fungicide Resistance Five

- 1. Avoid susceptible crop varieties**
- 2. Rotate crops – use time and distance to reduce disease carry-over**
- 3. Use non-chemical control methods to reduce disease pressure**
- 4. Spray only if necessary and apply strategically**
- 5. Rotate & mix fungicides / MoA groups**



**The Fungicide Resistance 5**

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**Thank you**

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- Workshops, info sessions & webinars
- Factsheets, updates & email alerts



If you suspect fungicide resistance, let us know what's happening & send us a sample!