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GOVERNMENT OF
WESTERN AUSTRALIA

Pests, Weeds and Diseases
- lessons learnt from a wet year

Dusty Severtson, Catherine Borger, Daniel Huberli and Geoff Thomas

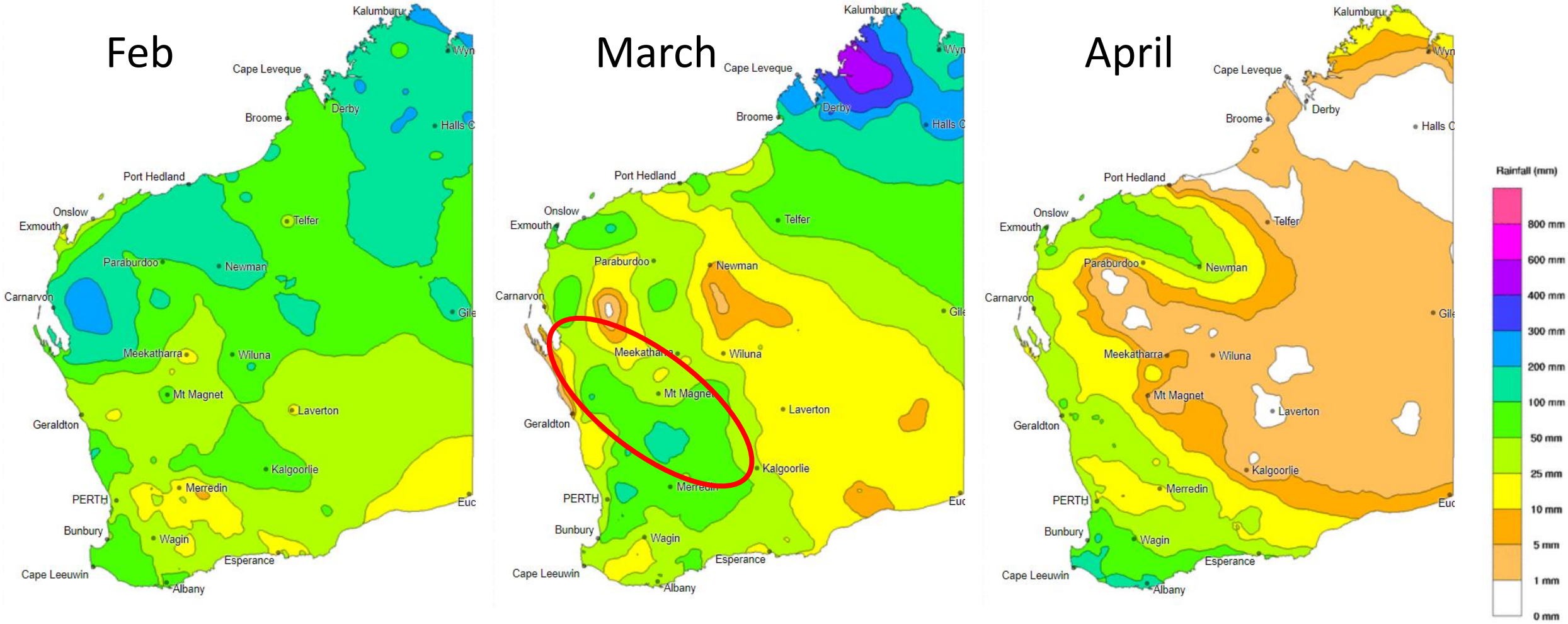
Pests

Diseases

Weeds

Entomology Lessons from a wet year (in-season and out)

Rainfall 2021



Source: BOM

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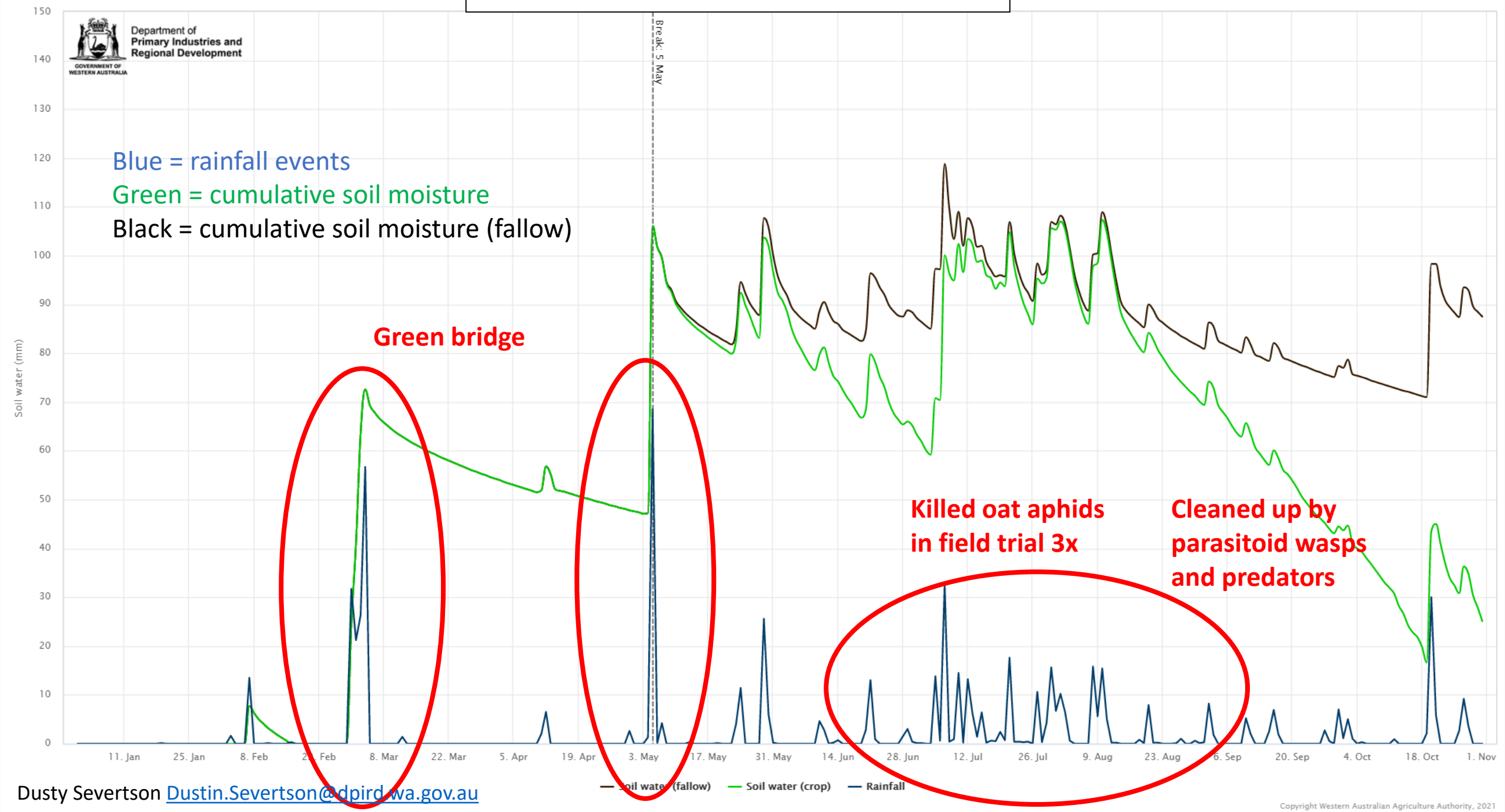
DPIRD's Soil Water Tool – Northam 2021



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Summer rains brought early season…

- Brown pasture loopers (pasture, canola, pulses)
- Cabbage centre grub (brassicas inc. canola, radish)
- Weed web moth (canola & other broadleaves, medics)

Weed web moth (*Achyra affinitalis)* Cabbage centre grub (*Hellula* sp.)

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- Non pest caterpillars e.g. Hawkmoth
- Native budworm, diamondback moth (DBM)

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Green bridge and focus crop DBM surveillance

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Diamondback moth surveillance, WA

Green bridge surveillance sites with and without brassicas in the south-west of WA during **March 2021**.

Brassica's	#sites
canola and unknown cotyledons	1
canola & turnip	1
unknown cotyledons	8
sea rocket (beach)	20
canola	24
radish & turnip	25
radish & canola	27
radish	187

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Diamondback moth surveillance, WA

DBM larvae found in brassica green bridge during March 2021.

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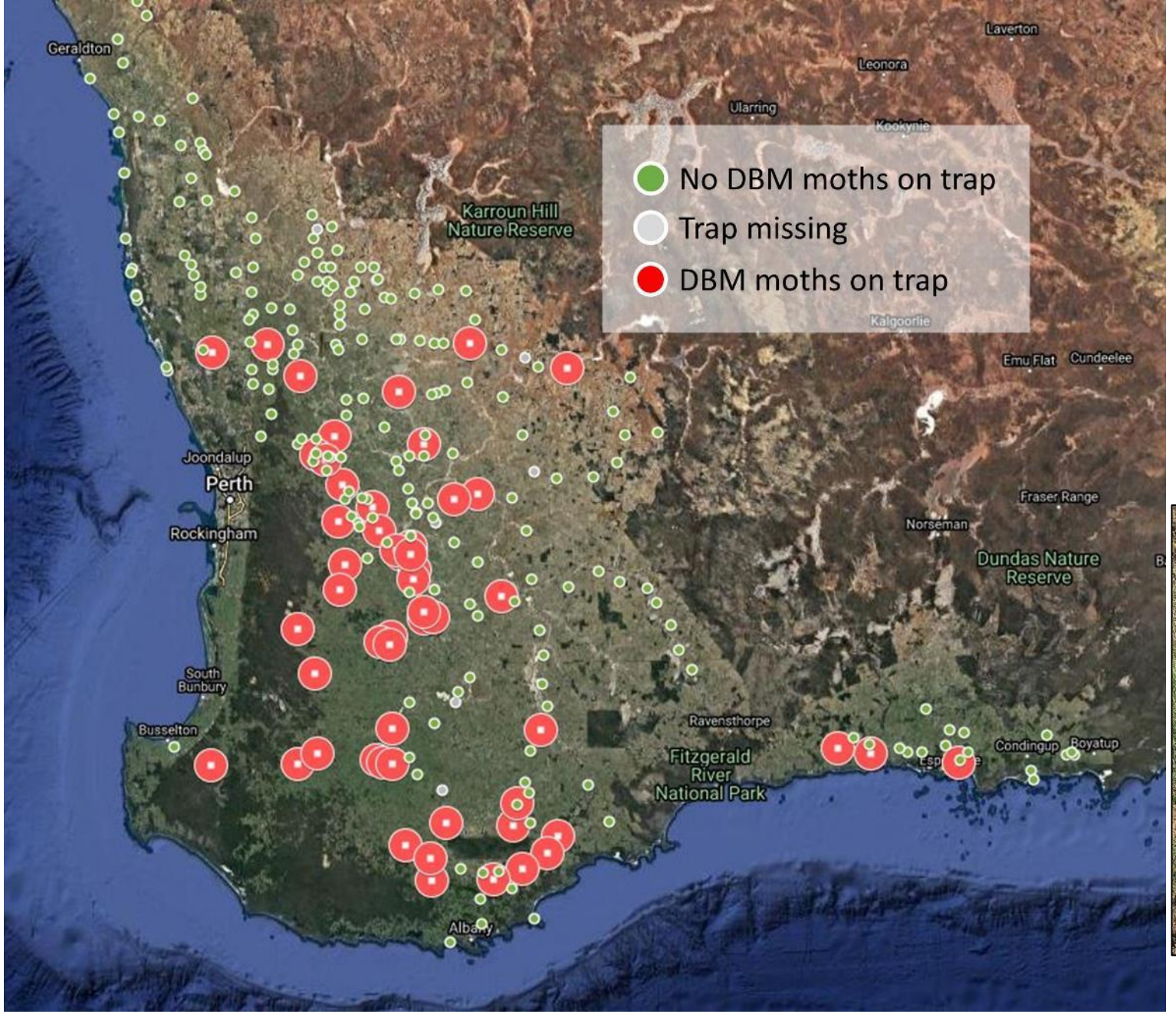
Diamondback moth surveillance, WA



DBM moths found in brassica green bridge during mid-March to mid-April 2021

290 traps, 4 weeks

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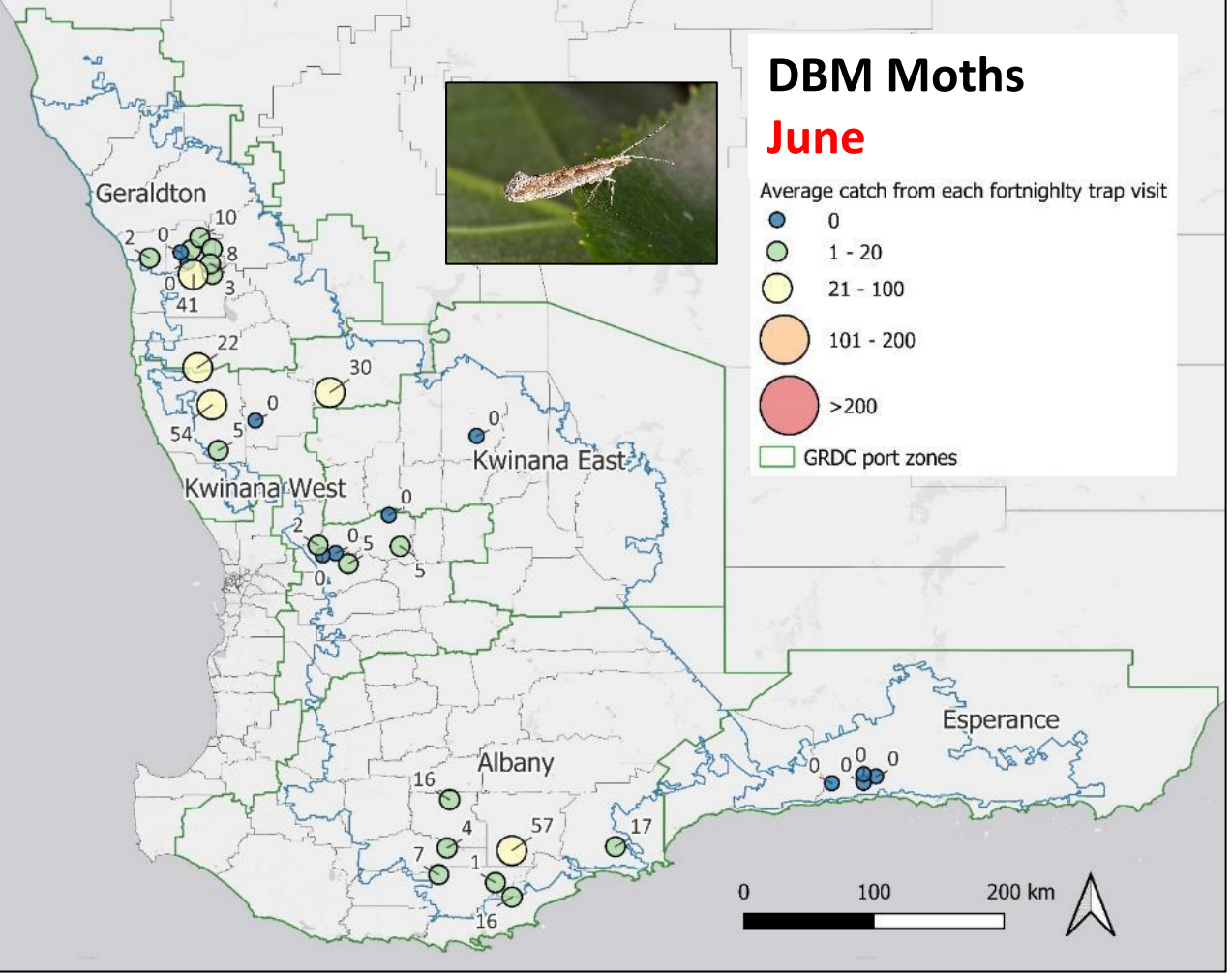

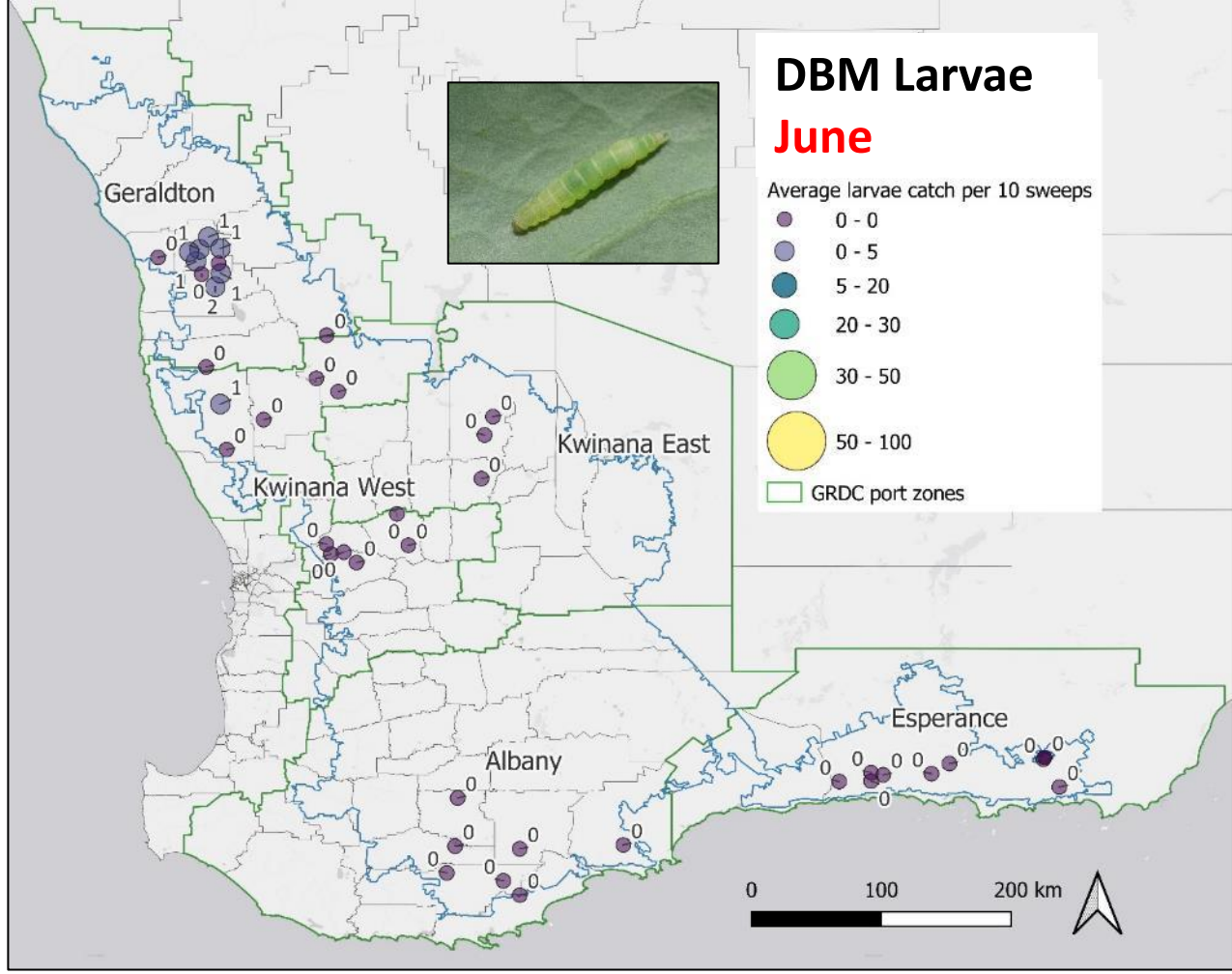

Focus crops: 48 sites

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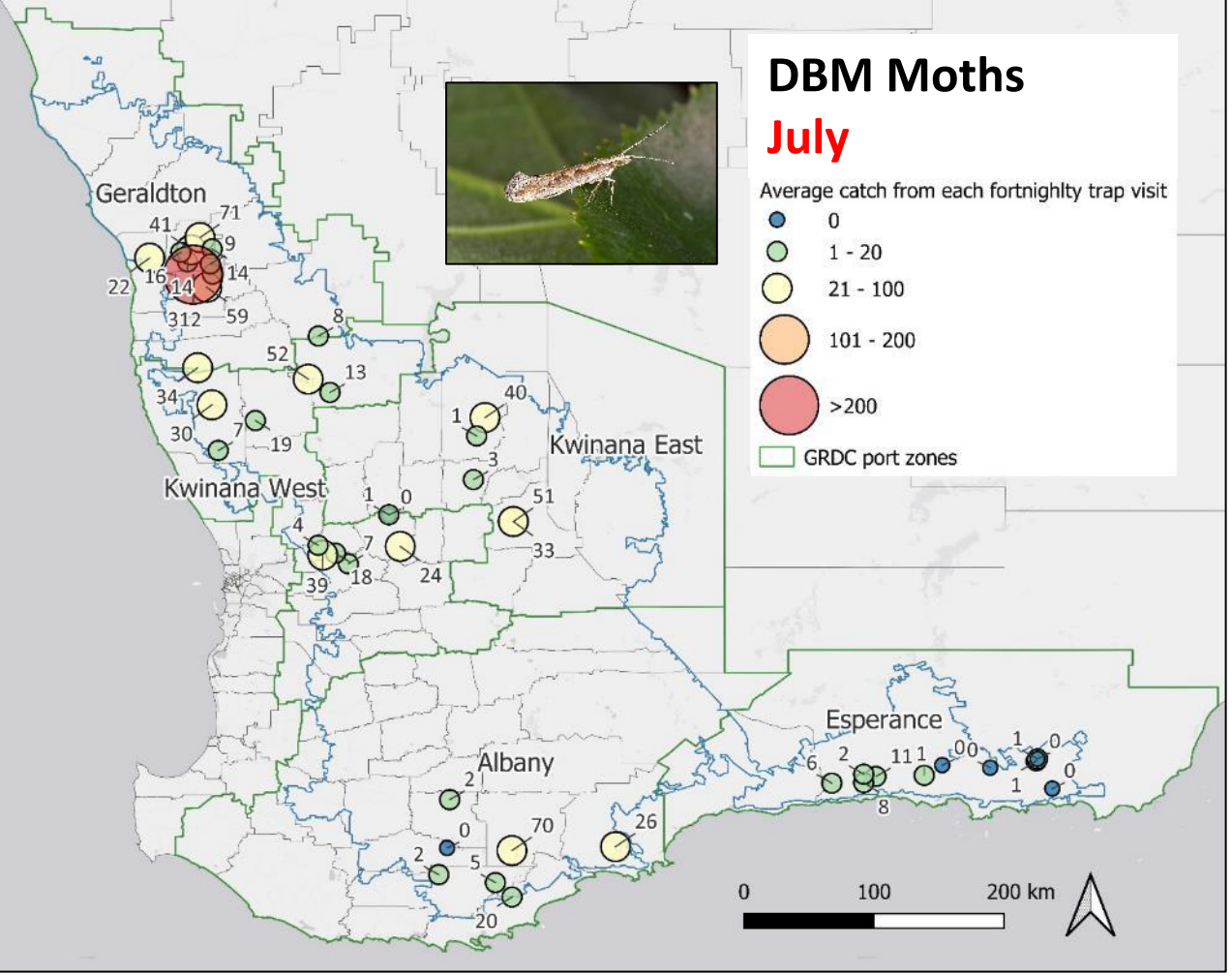

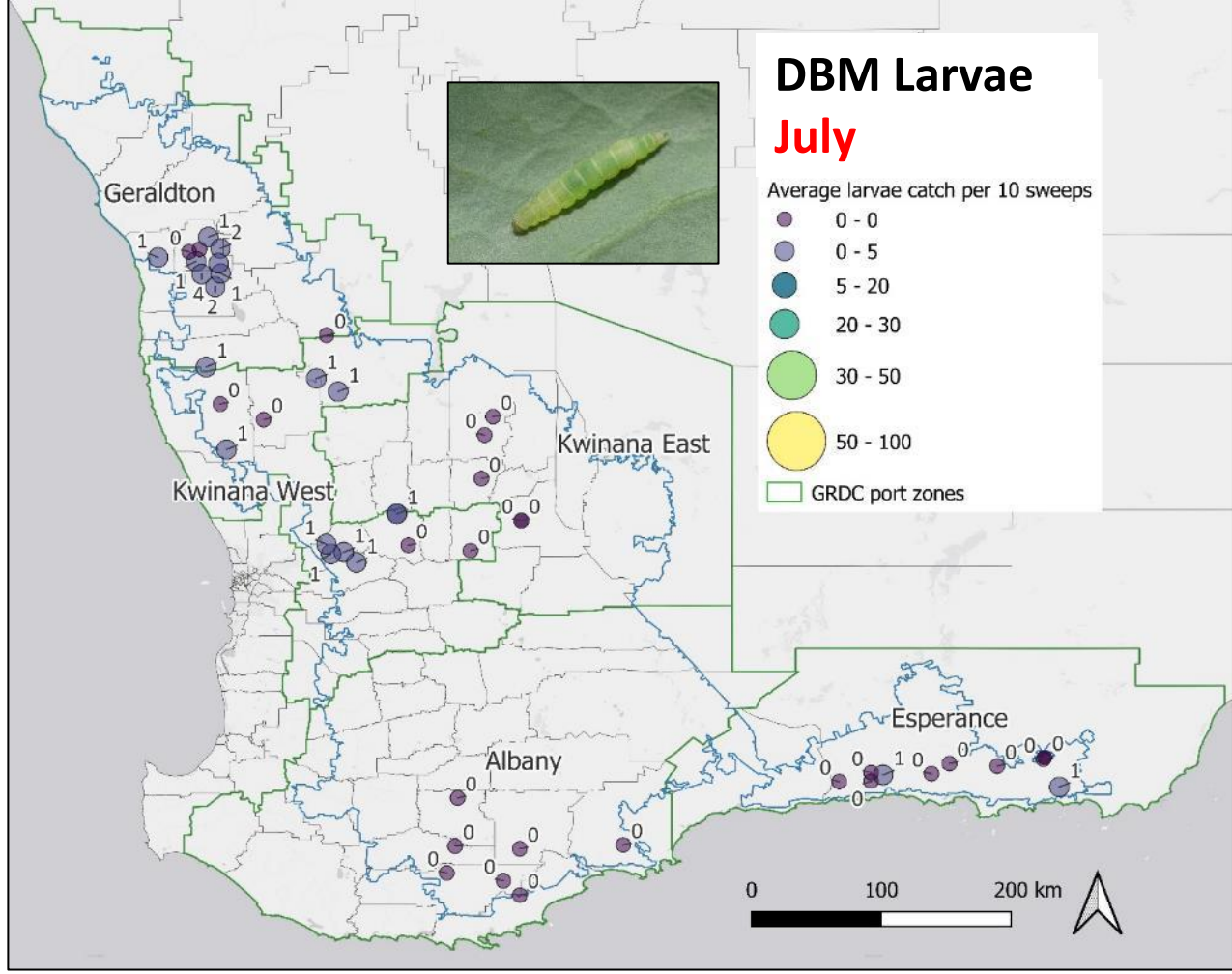

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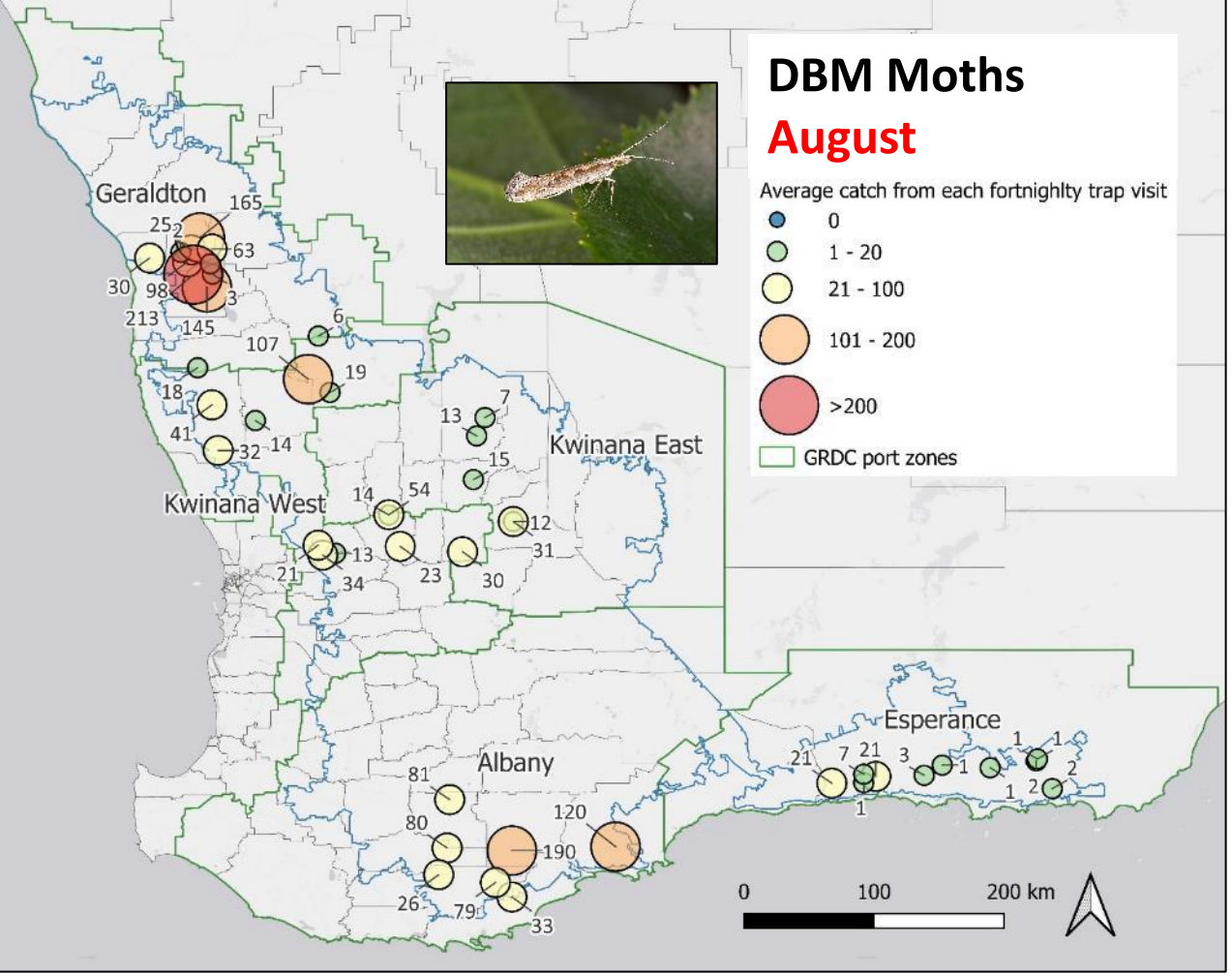

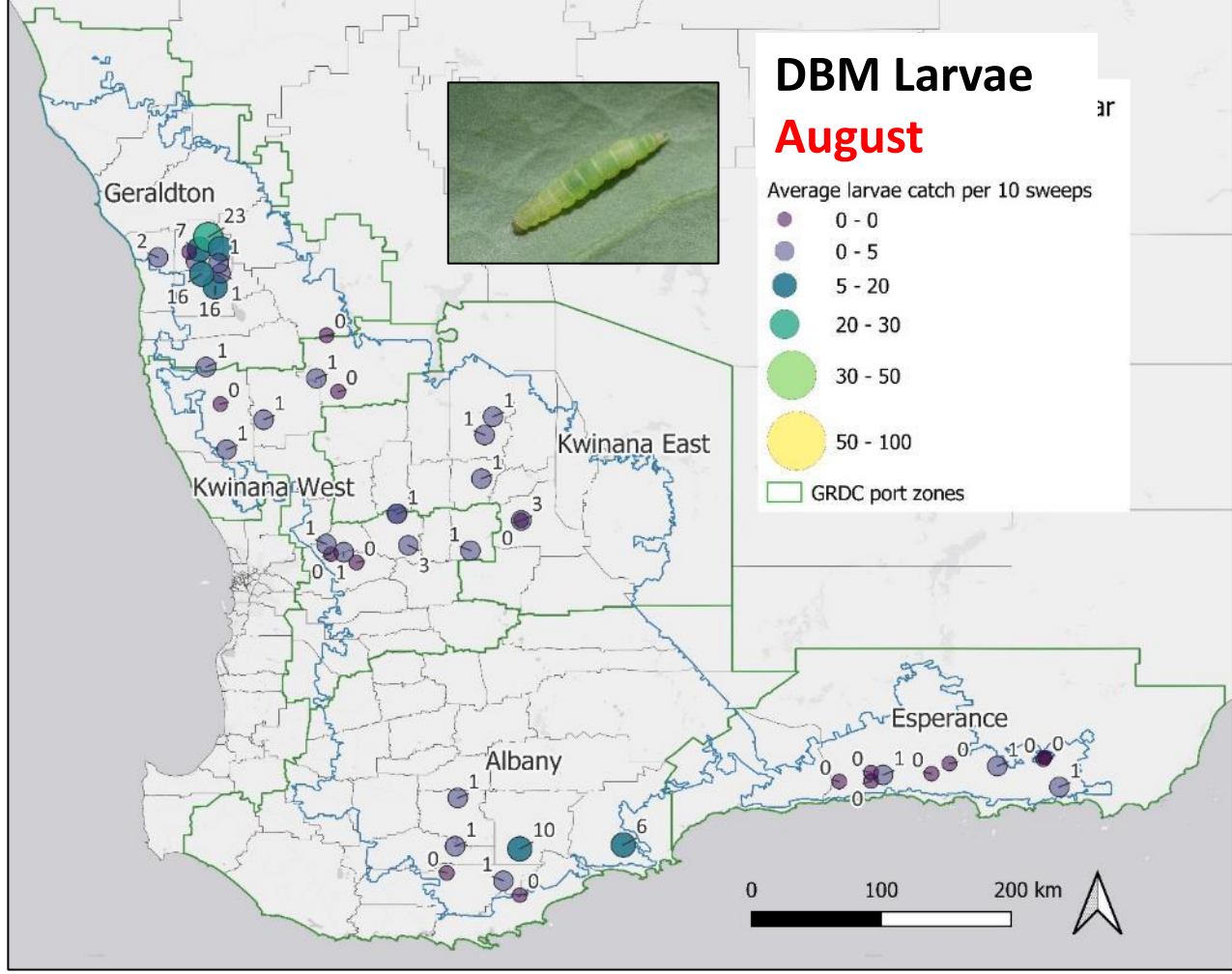

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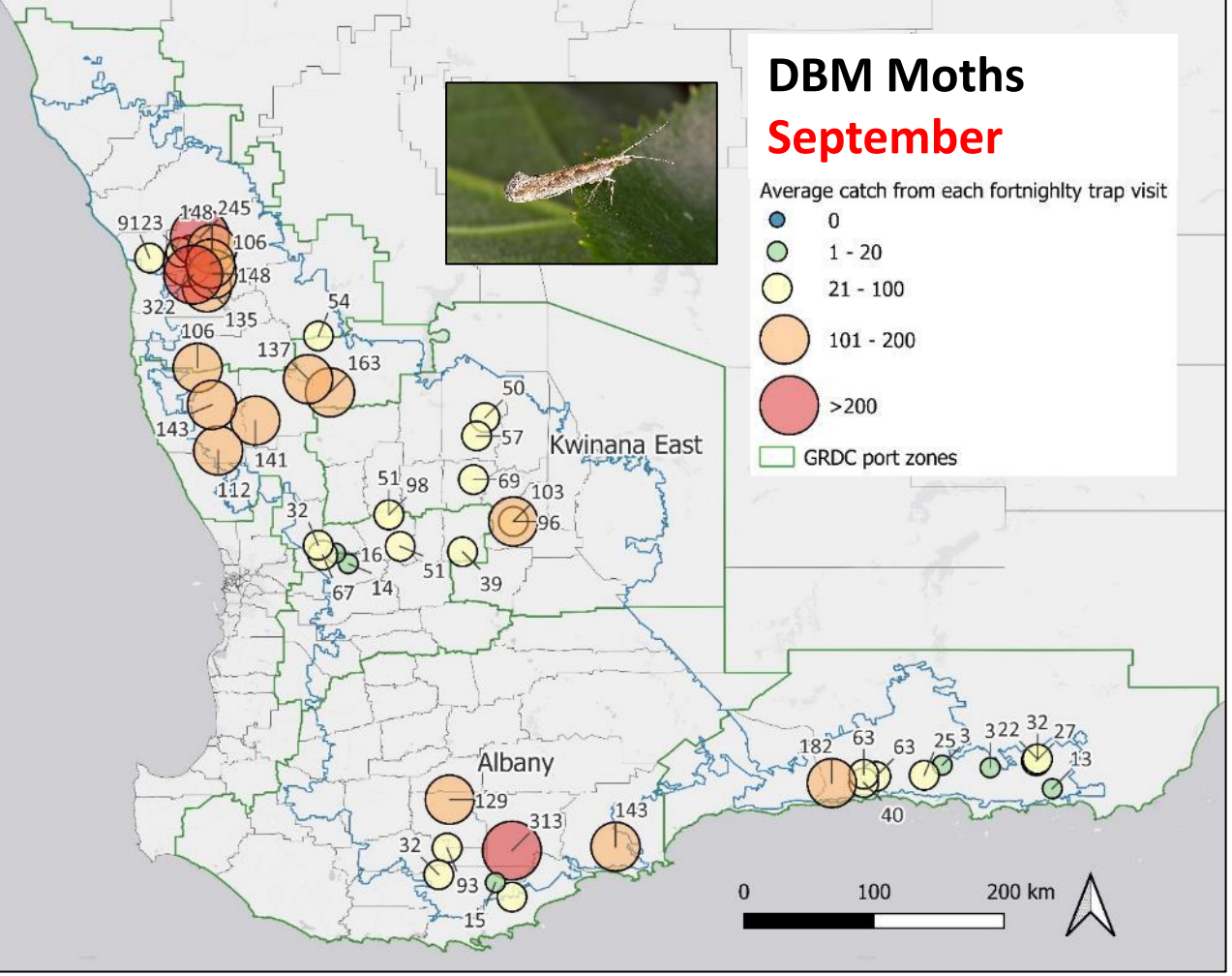

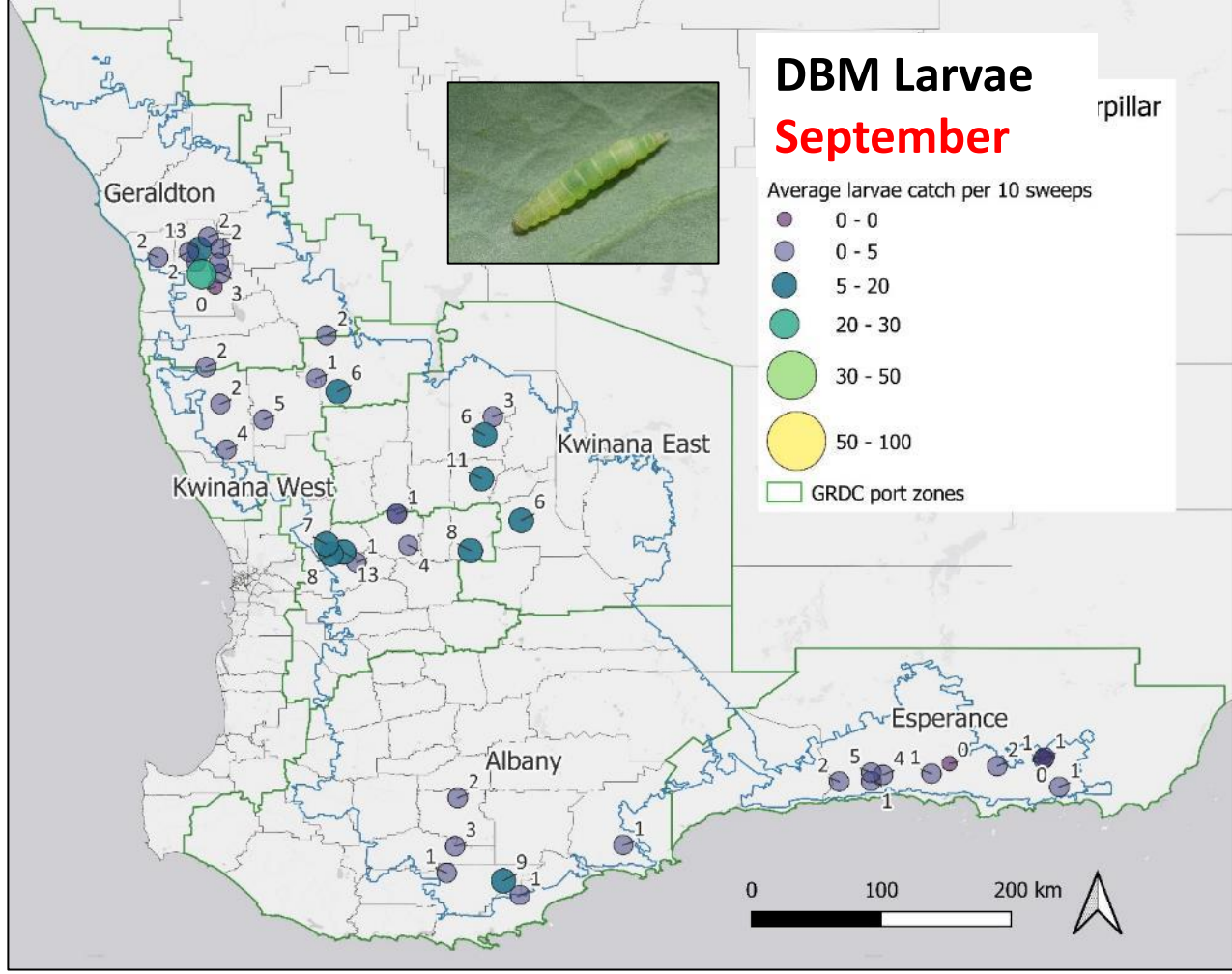

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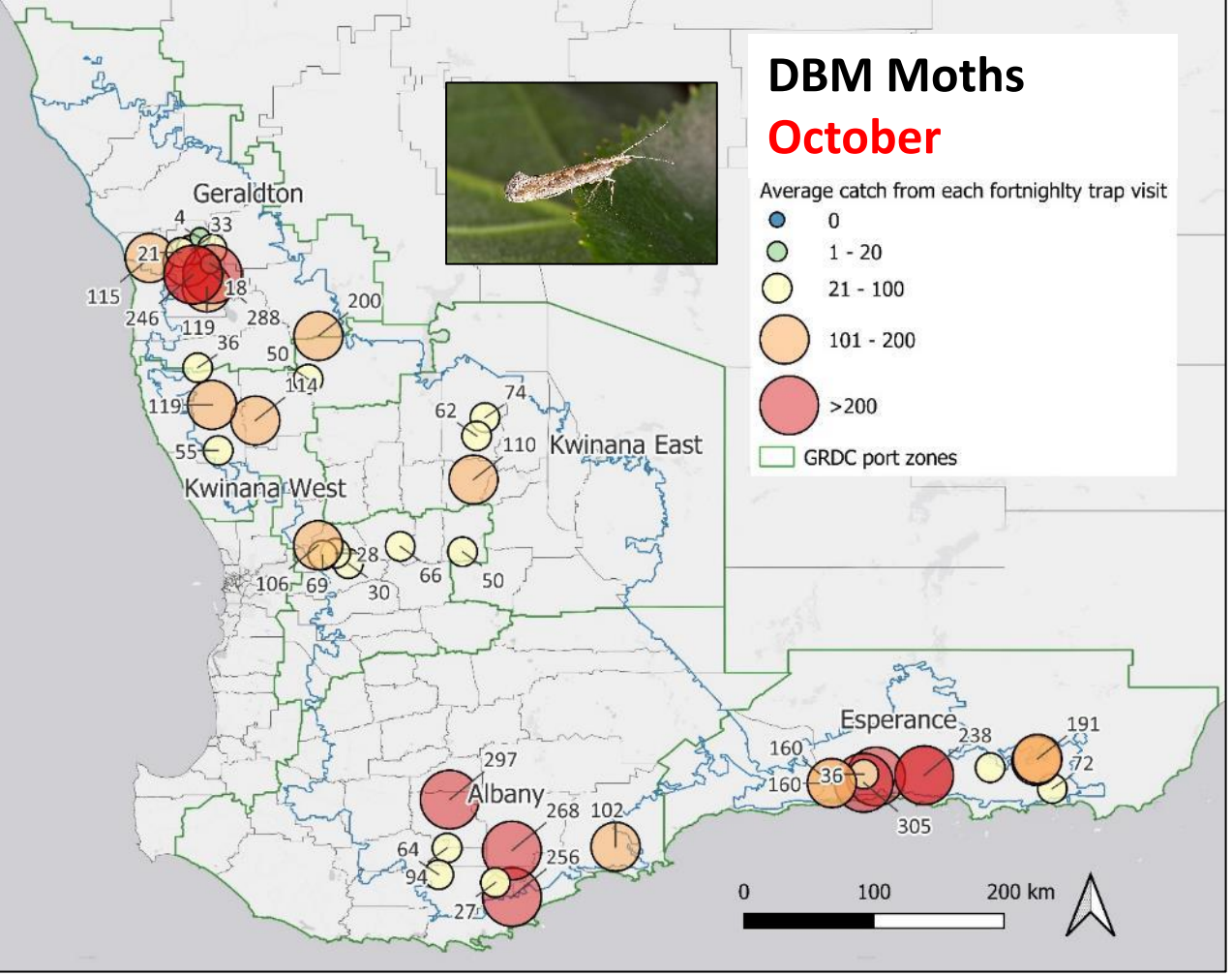

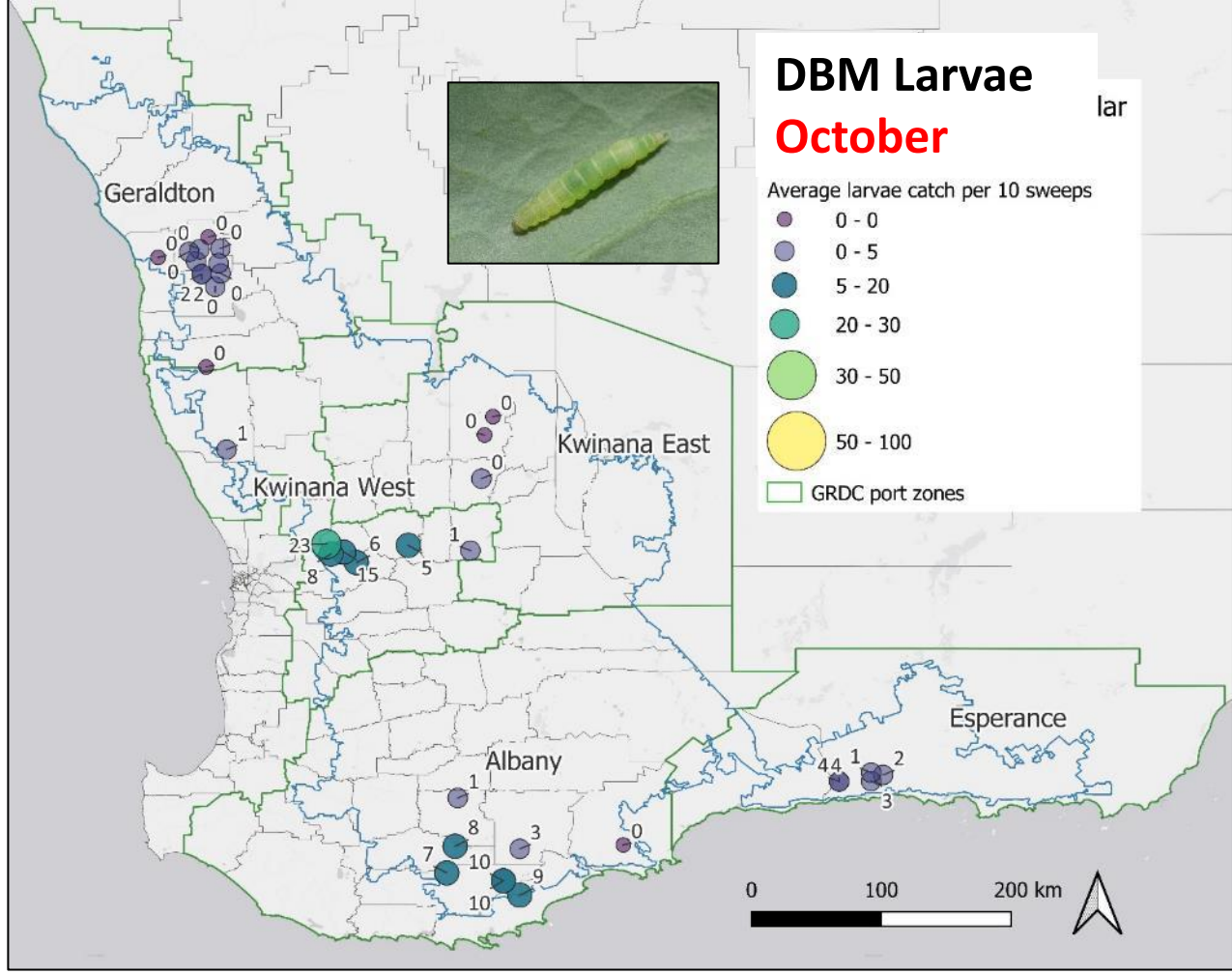

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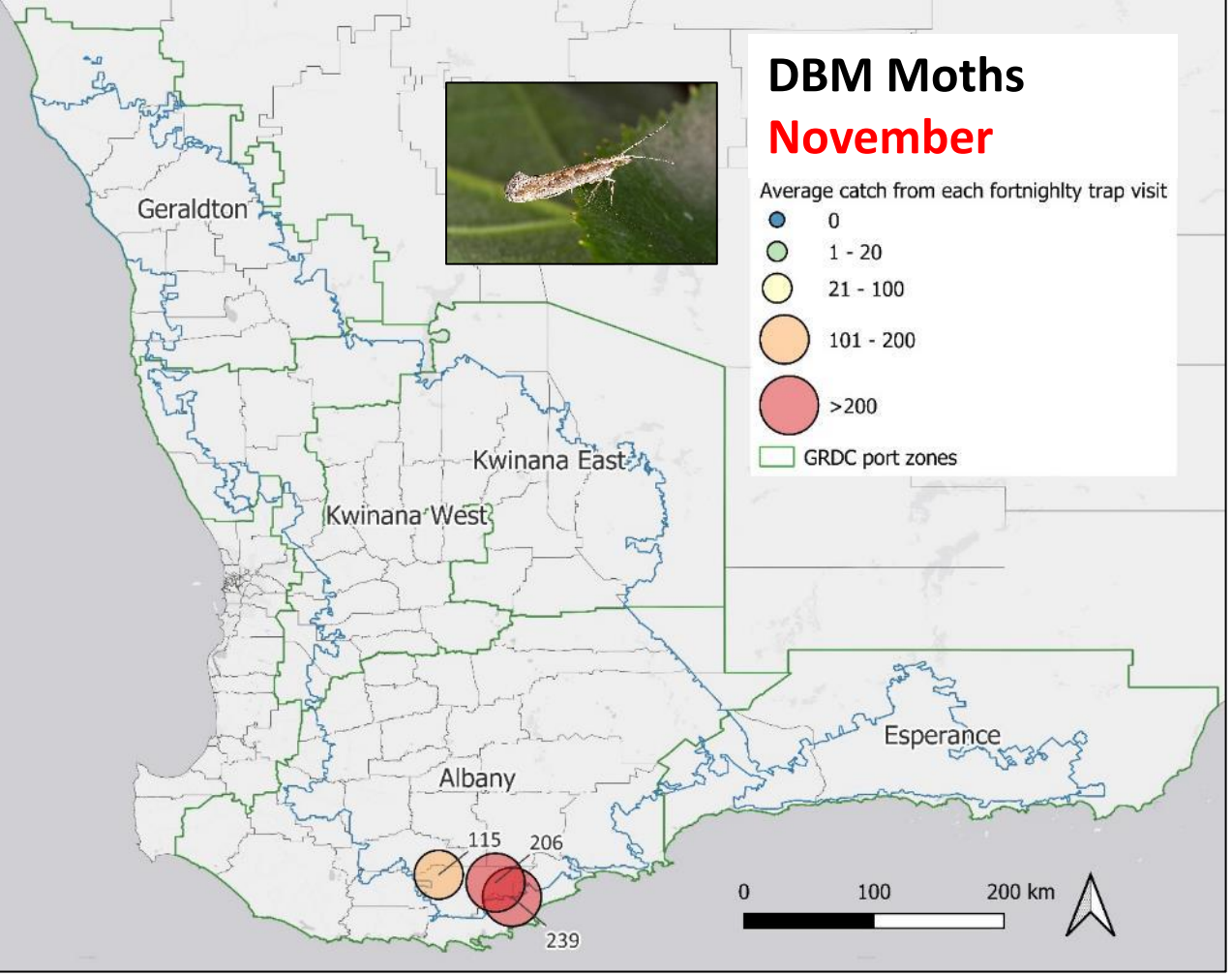

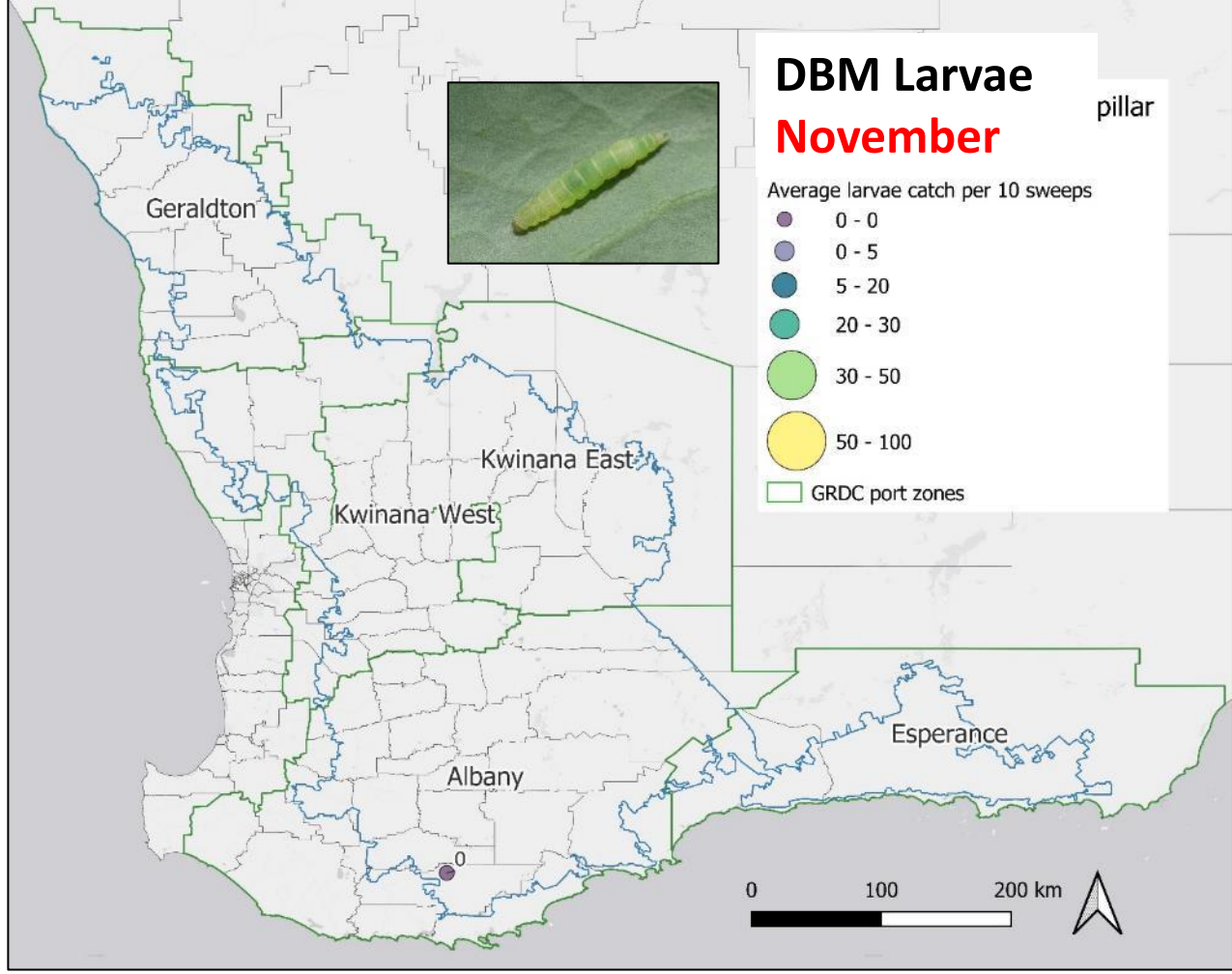

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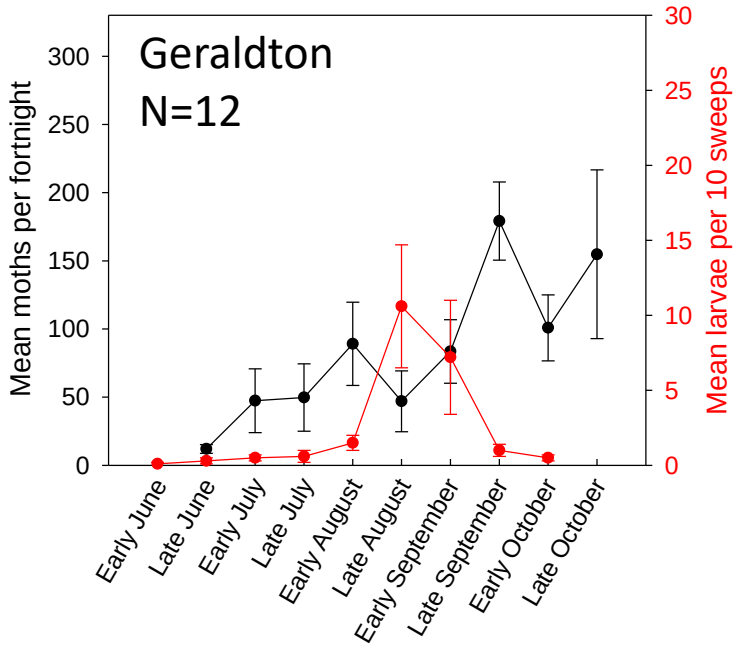

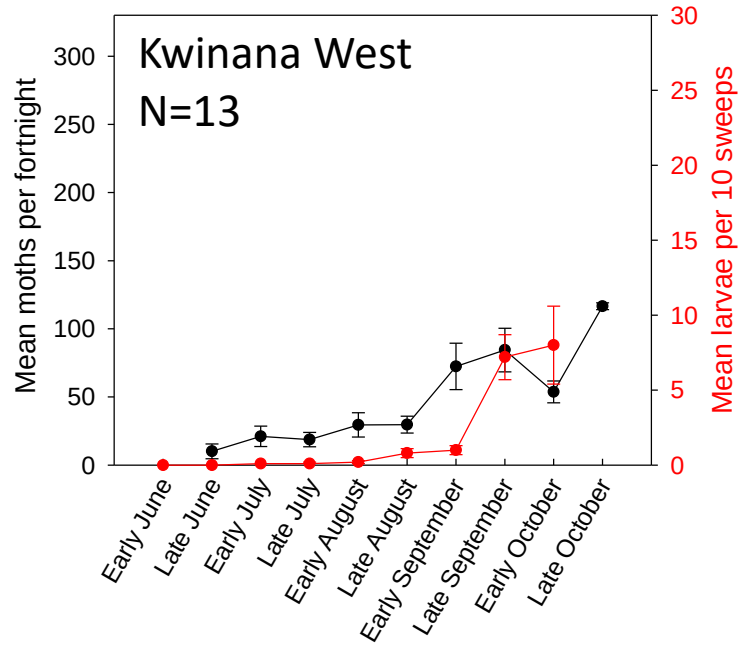

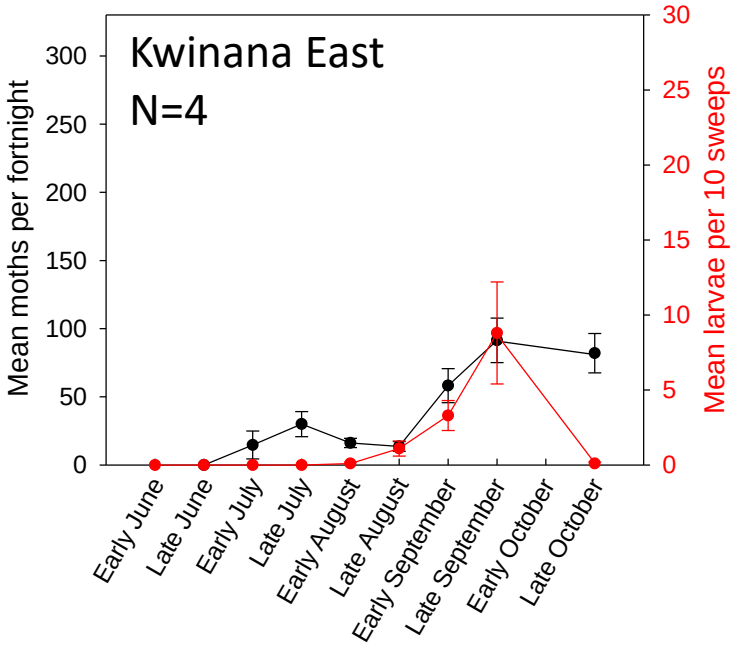

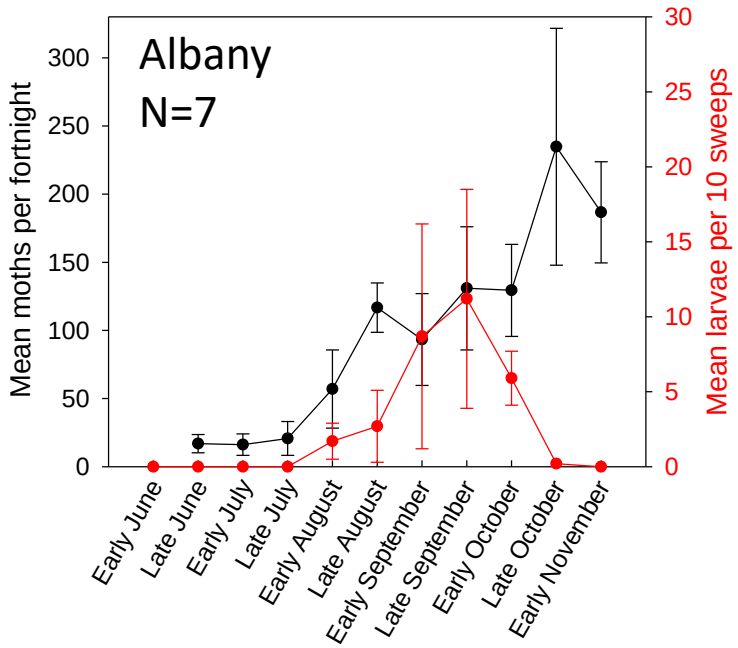

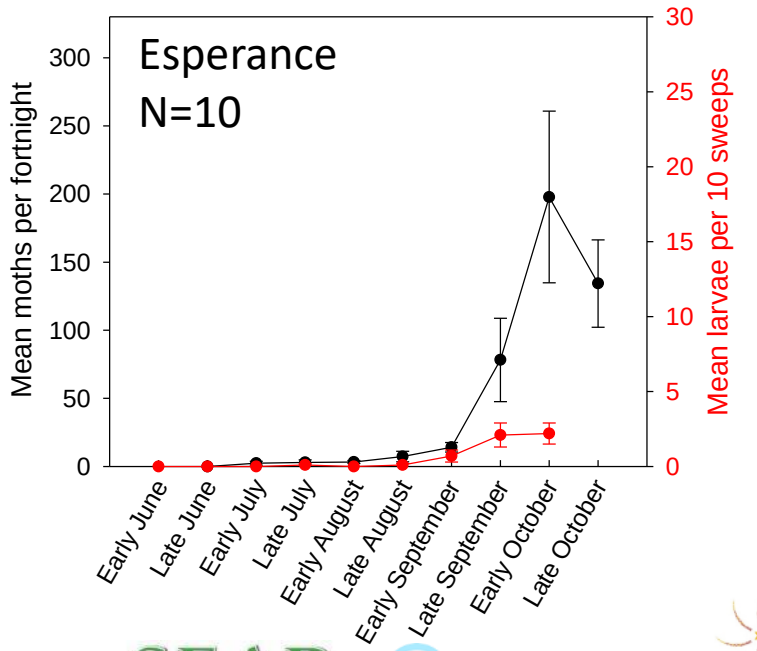

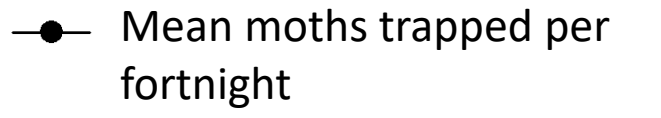

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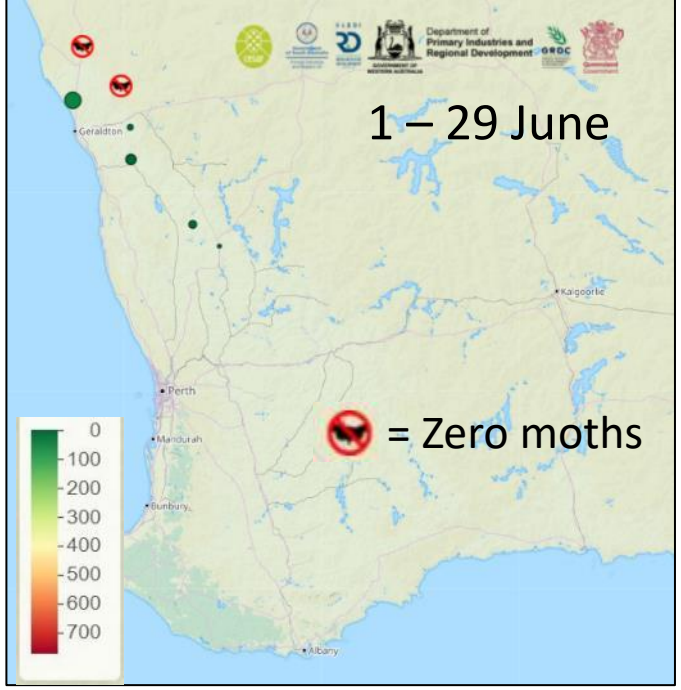
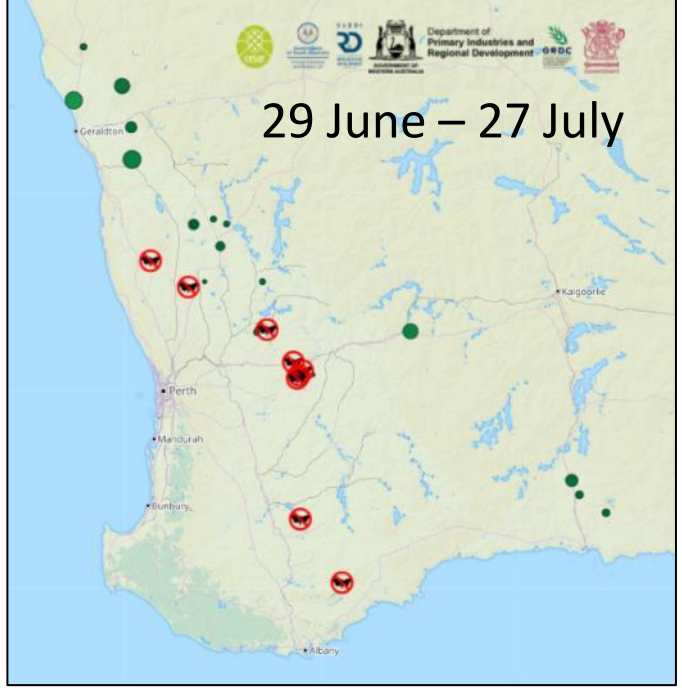
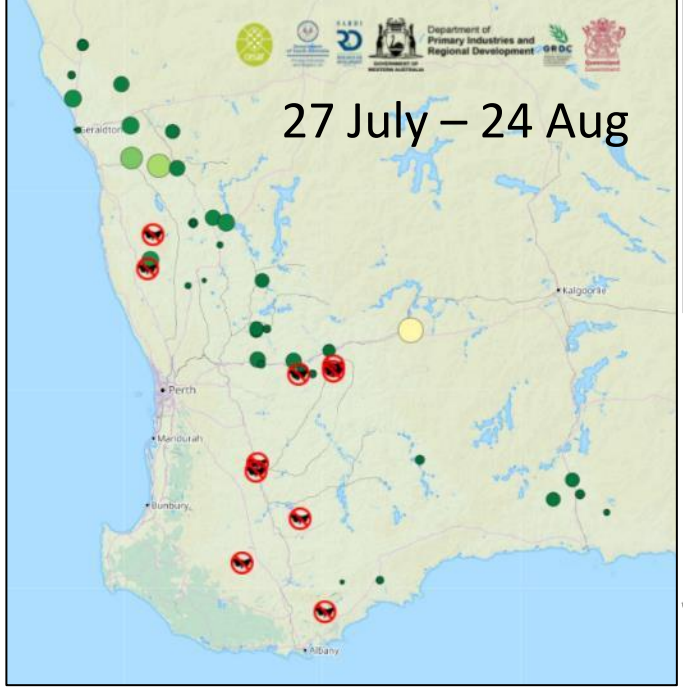
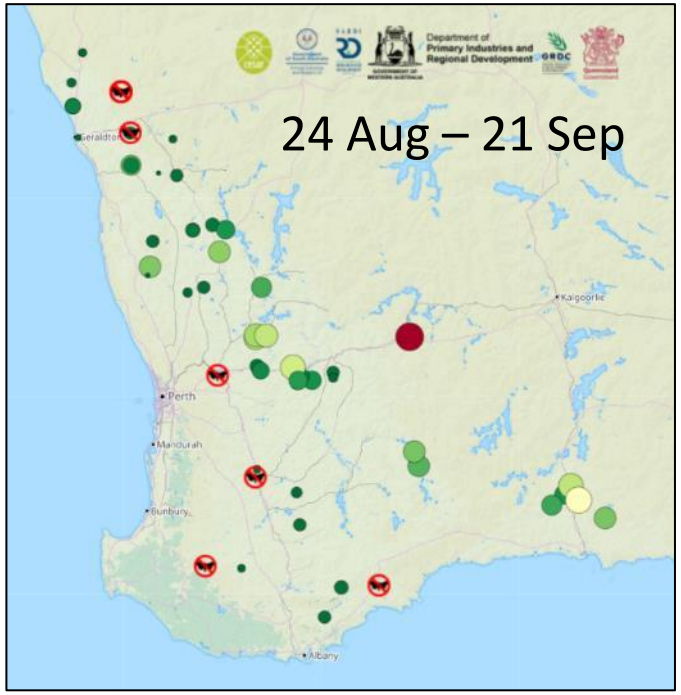
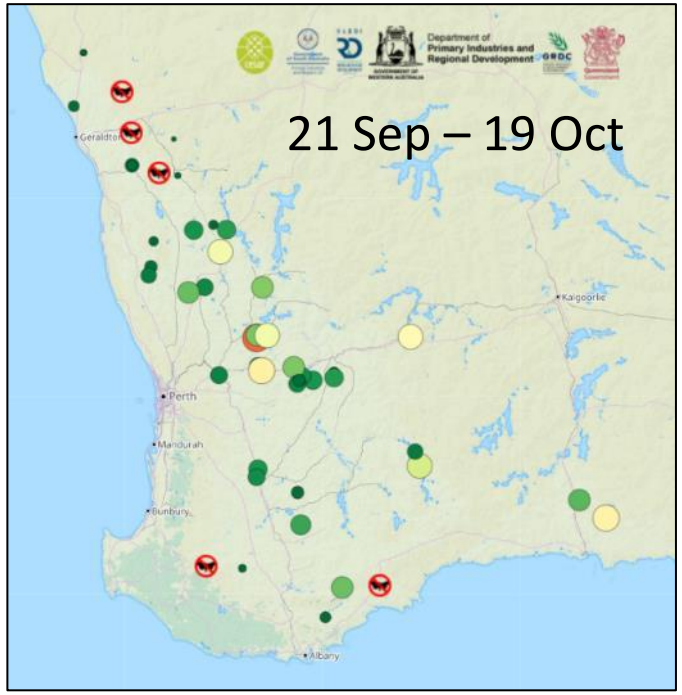
Native budworm

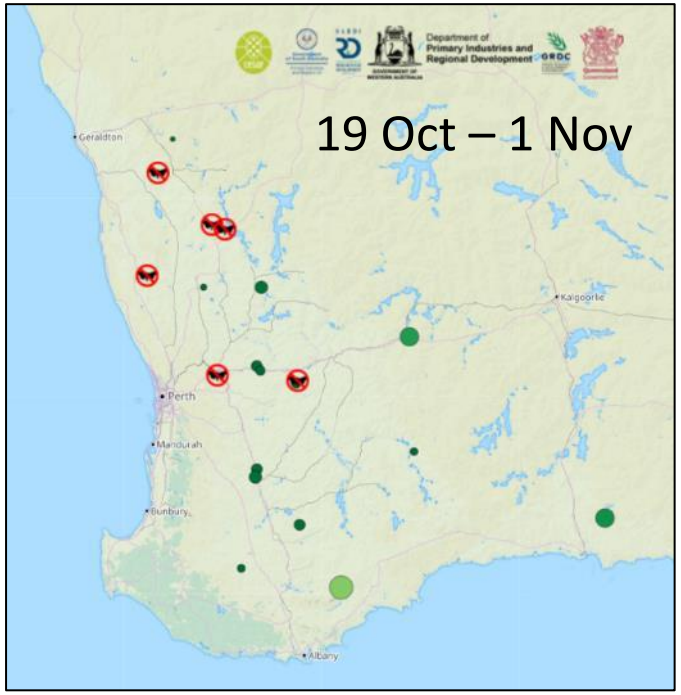












iMapPESTS
SENTINEL SURVEILLANCE FOR AGRICULTURE

Native budworm **moth surveillance 2021**, MothTrapVis

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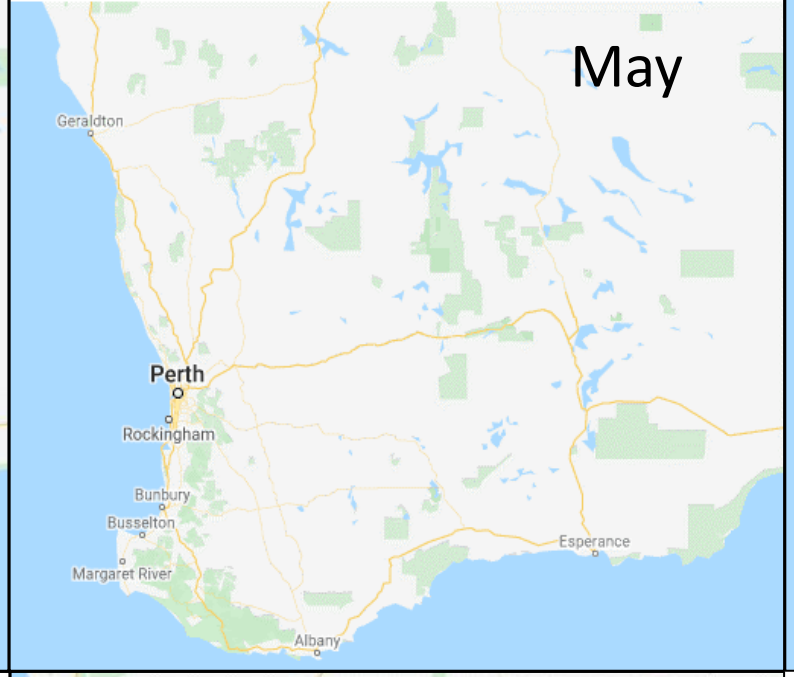

Native budworm **caterpillar reports 2021**, PestFax Map

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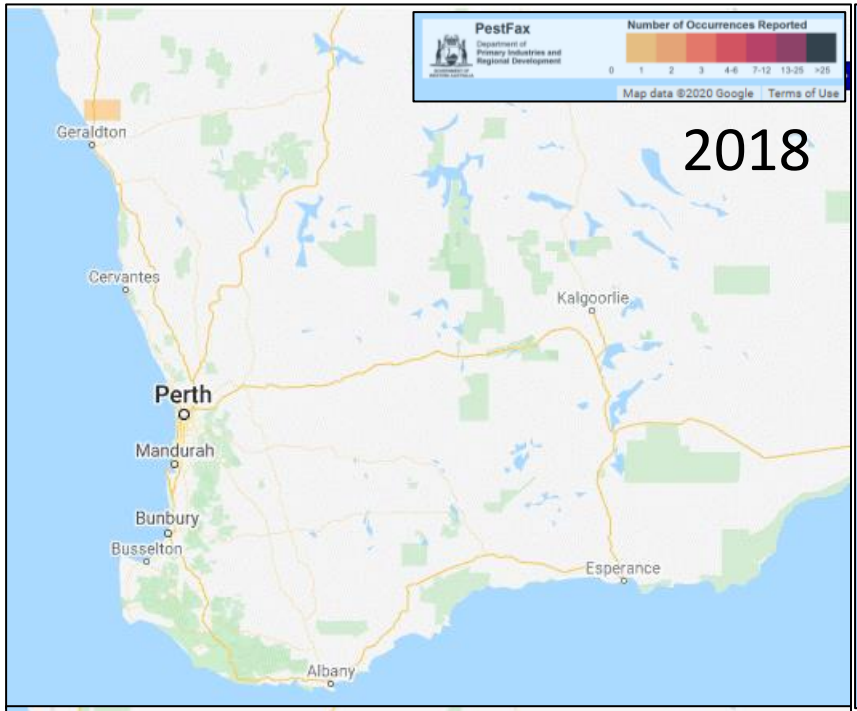
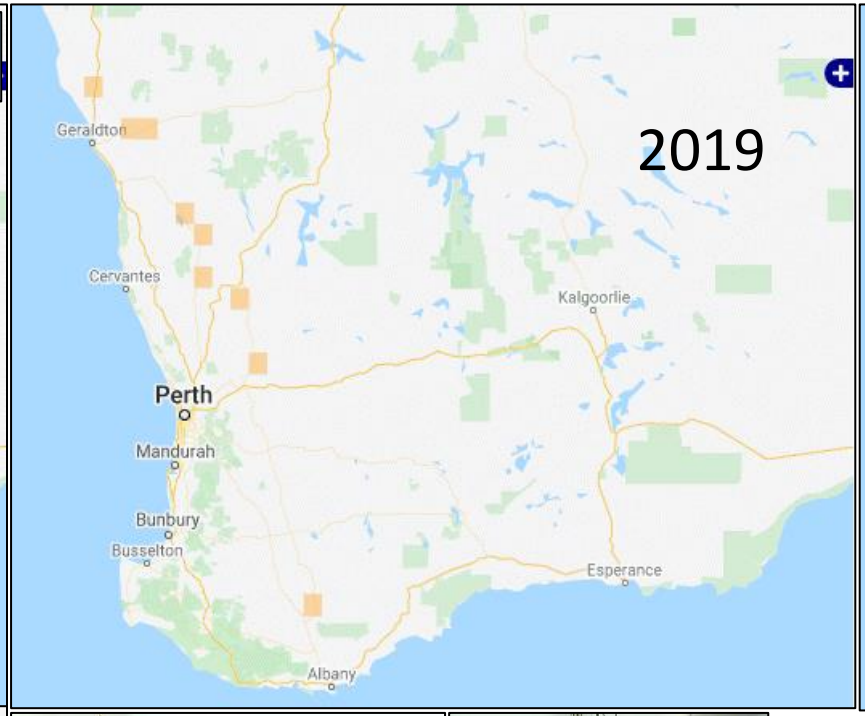
Native budworm on wheat





Native budworm **caterpillar reports on wheat only**, PestFax Map

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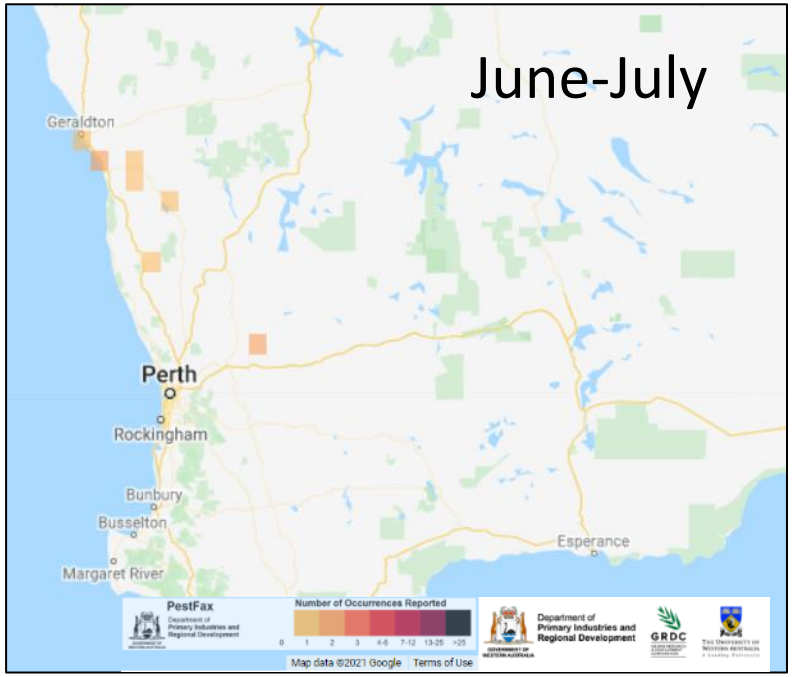
Locusts

Locusts – autumn hatching

- Good rains caused autumn locust egg hatchings
- Risk coinciding with germinating crops
- Egg development in these populations is encouraged by warm/moist conditions
- Eggs laid in autumn diapause over winter

Locust/grasshopper reports to PestFax



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Locusts – autumn egg laying

Autumn

Winter

Spring

Photos: awe.gov.au

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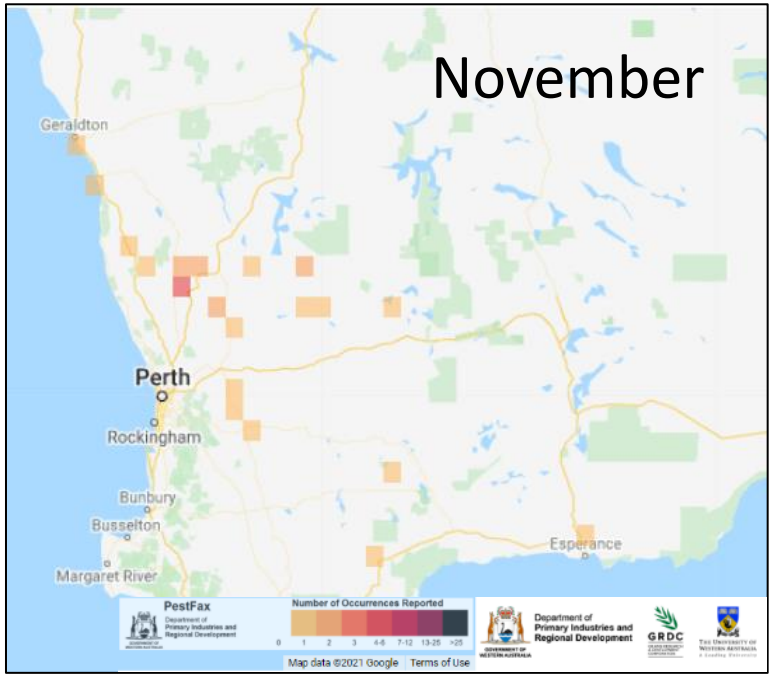
Locusts - spring

- Spring hatching from winter diapause eggs (warm/moist)
- Any falls >15mm rain in Aug/Sep can accelerate development of eggs and emergence of nymphs
- Risk to crops before harvest, mostly pastures

Locust/grasshopper reports to PestFax



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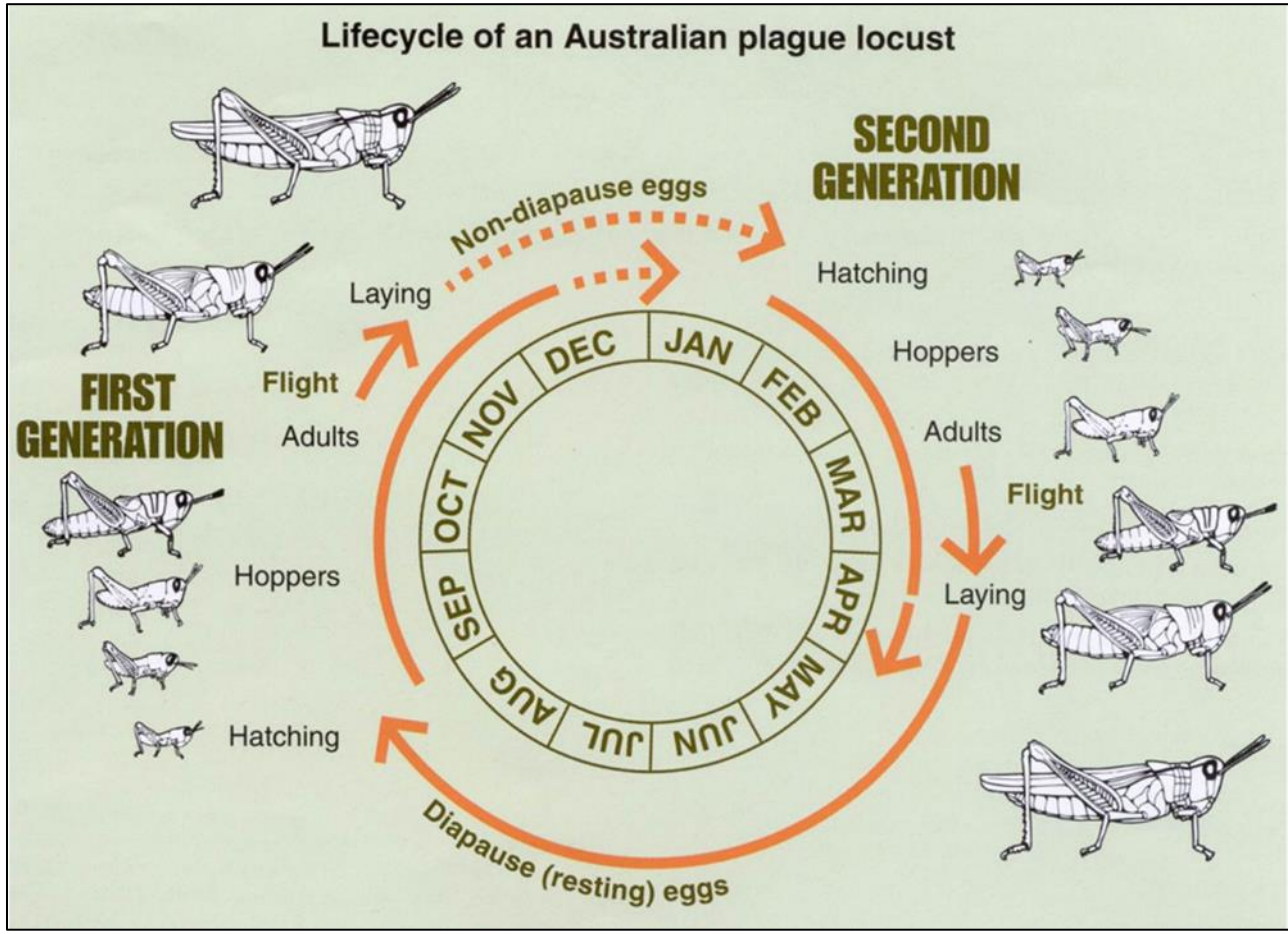
Locusts – what to expect in 2022

- ✓ Green vegetation is necessary for nymph and adult survival, adult migration and egg development
- ✓ Depends on feed availability in lead up to egg laying now
- ✓ Egg (and embryo) development is halted by dry spells
- ✓ DPIRD staff across the grainbelt will be undertaking targeted surveillance towards autumn 2022, logging and reporting APL findings



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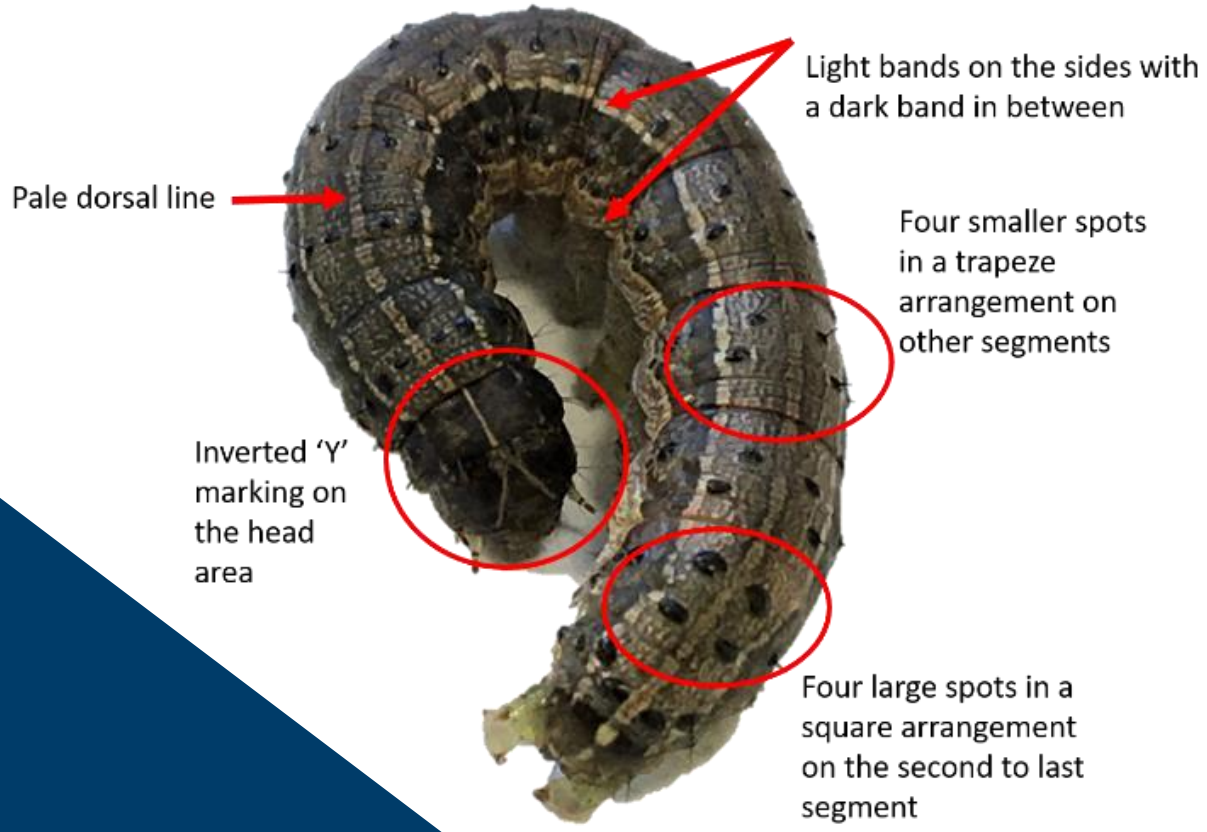
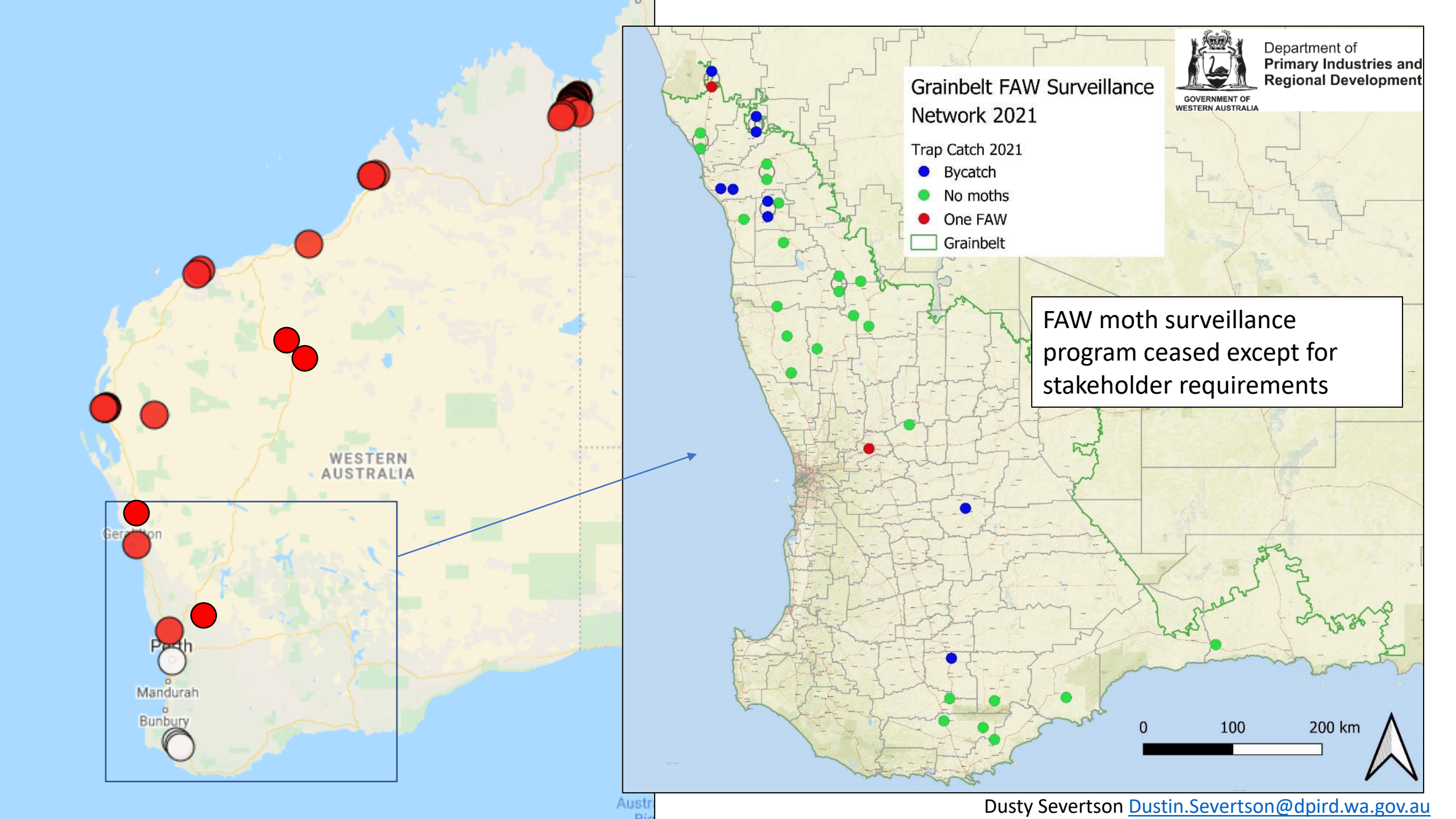
Fall armyworm





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Thank you

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Weed control in a wet year

Catherine Borger



Weed control issues in 2021

What were the issues

- Knockdowns or double knock – lots of people were not prepared for early emergence.
- Difficult to spray if you're bogged.
- Not enough aerial spraying available.
- Weeds recover from water logging and increased pests more gracefully than crops.
- Unusual species.

Catherine Borger catherine.borger@dpird.wa.gov.au

Weed control issues in 2021

Double knock

- A double knock was still an expensive choice.
- Late crops were too cold and wet to emerge well.

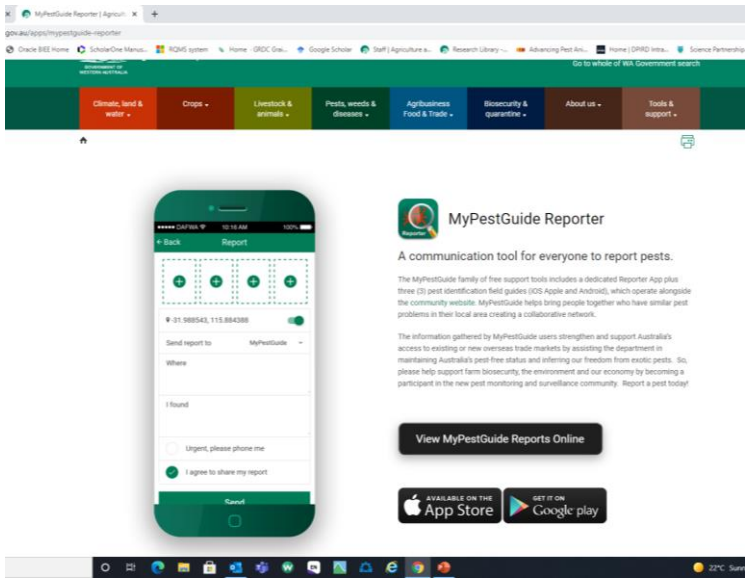
Catherine Borger catherine.borger@dpird.wa.gov.au

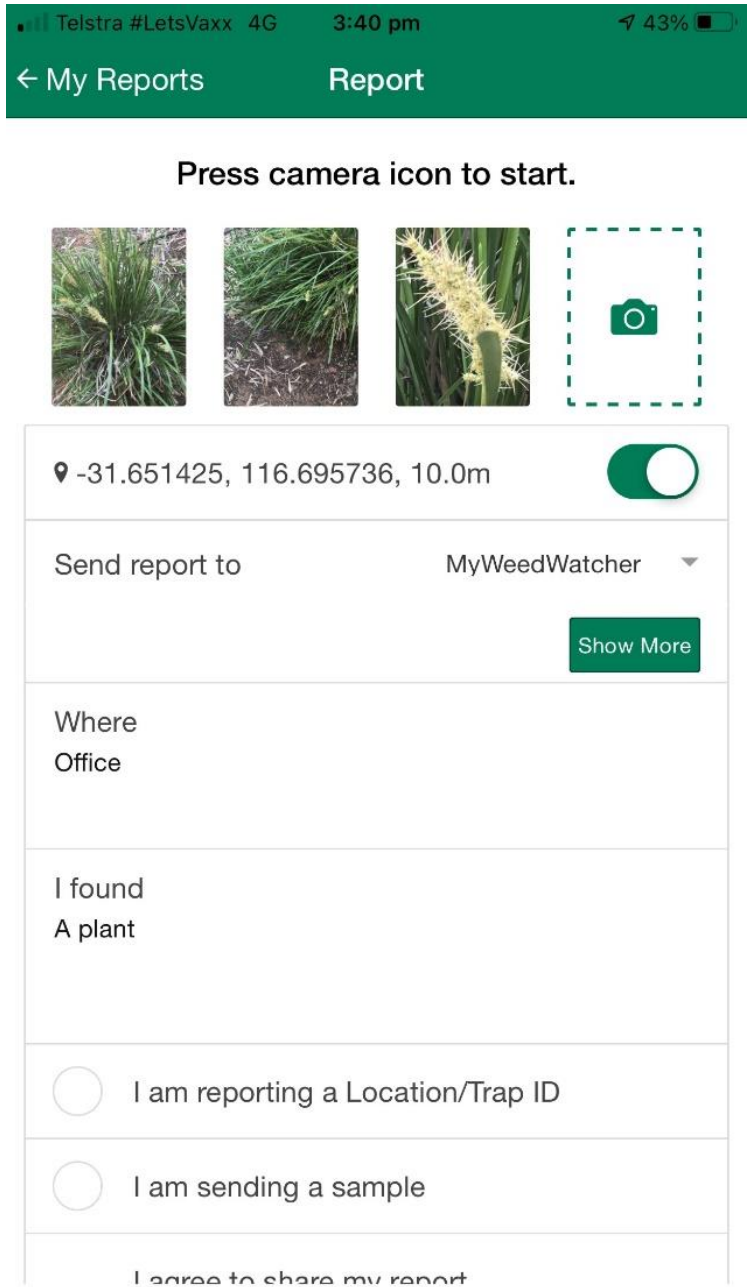
Weed control issues in 2021

Unusual species

Lots of unusual weed species.

Often the management message is:
‘Have you considered ignoring it for 12 months?’





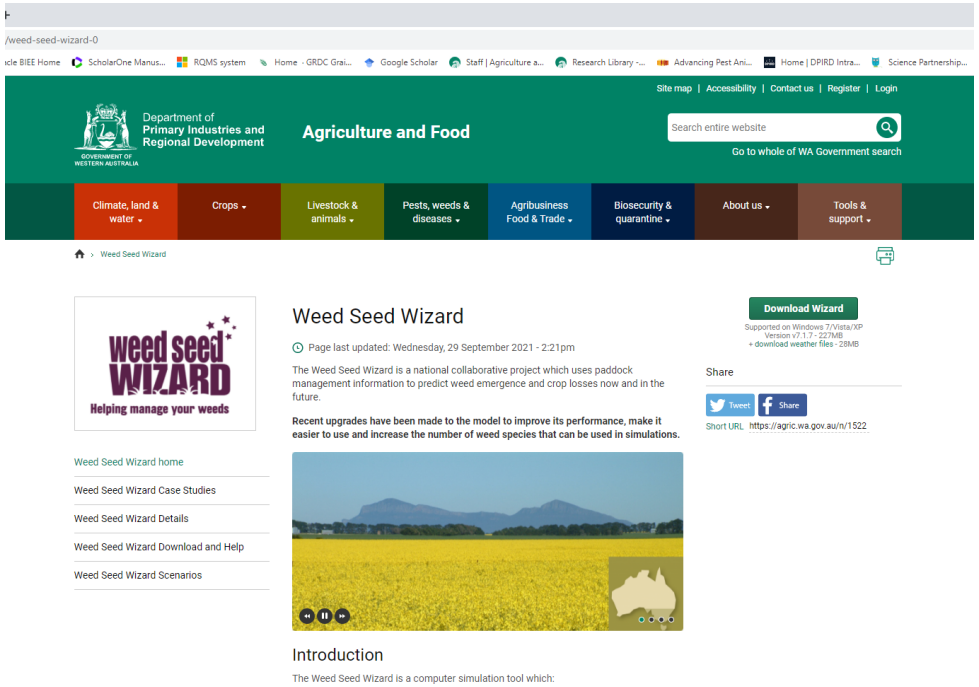
Catherine Borger catherine.borger@dpird.wa.gov.au

Weed control issues in 2022

What are the next issues?

1. Winter weed seed production – what will we need to manage in 2022?

2. How will seasonal conditions in 2021 influence the seed in 2022?



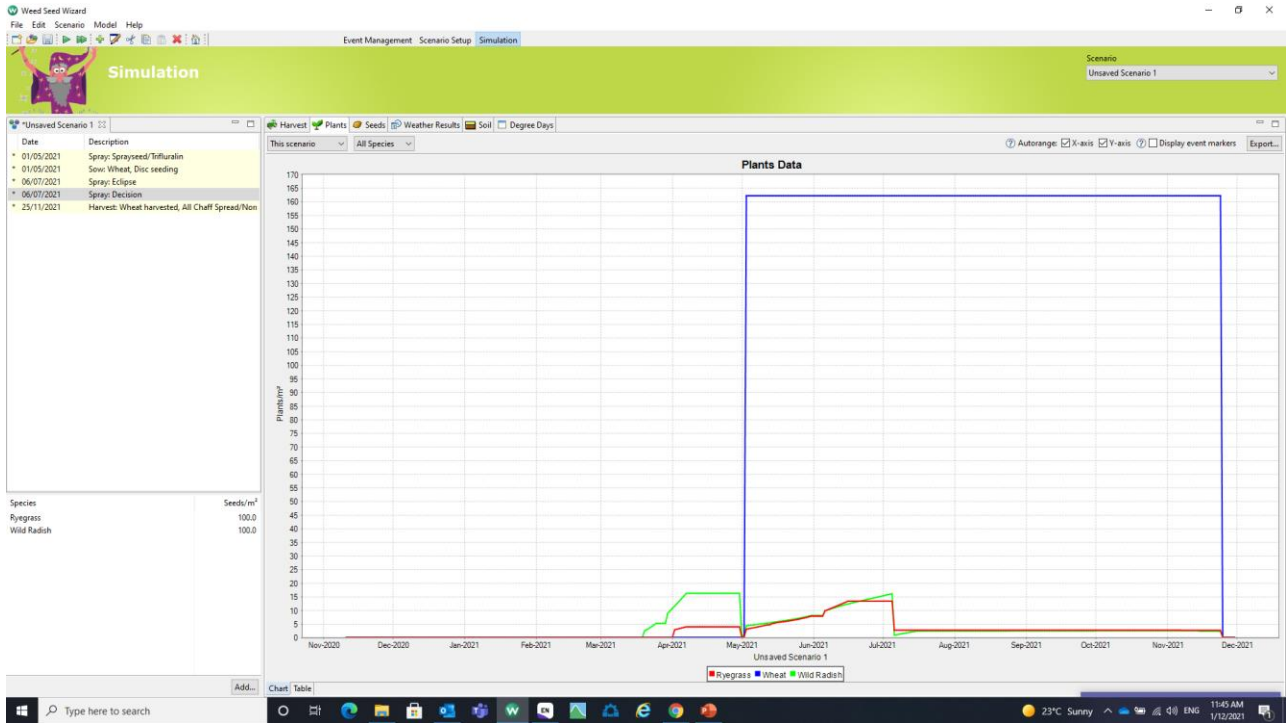
On the bright side, we have an updated Weed Seed Wizard, which can help with that planning.

Catherine Borger catherine.borger@dpird.wa.gov.au

1. Winter weed seed production

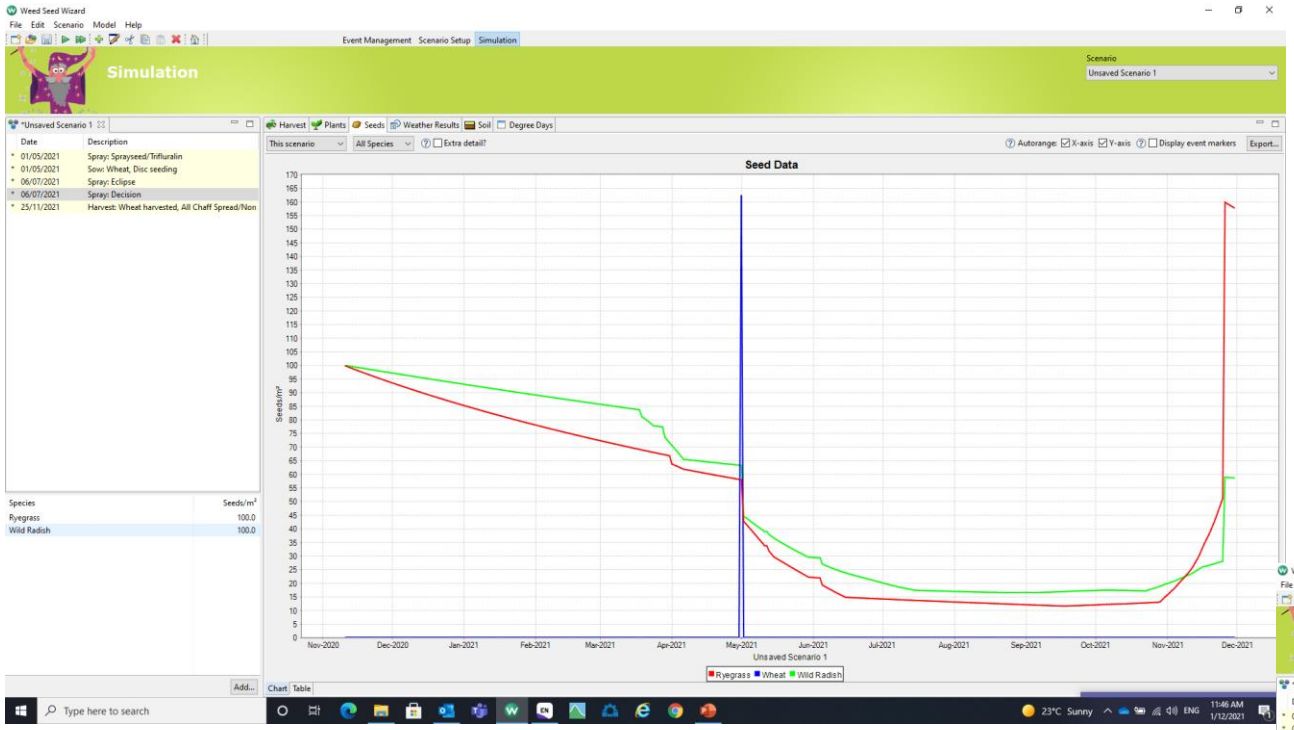
- Weed Seed Wizard.

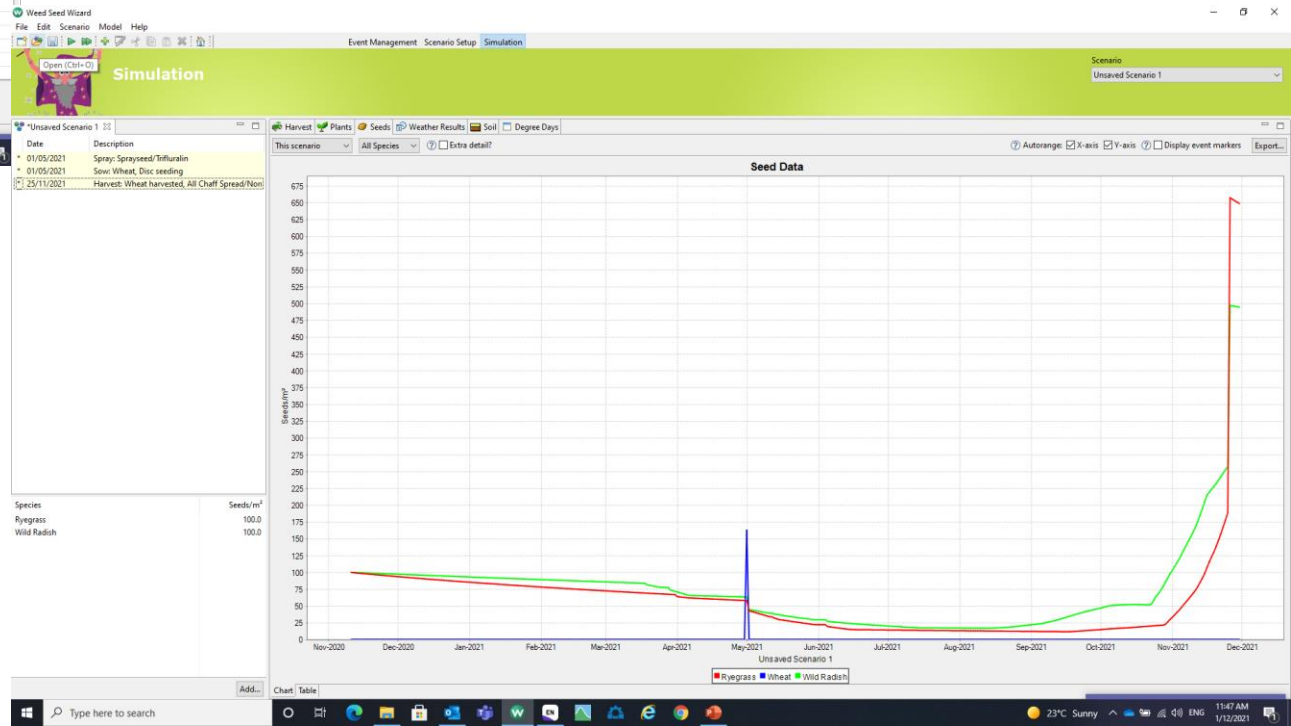
- Base scenario for WA.
  - Katanning weather
  - Wheat in 2021
  - Annual ryegrass and wild radish



Catherine Borger catherine.borger@dpird.wa.gov.au

1. Winter weed seed production





Catherine Borger catherine.borger@dpird.wa.gov.au

2. How will seasonal conditions influence the seed?

Rules of thumb

Increase number and size of seeds.

- Low temperature.
- More rainfall.

This has been observed in other grass species.

Catherine Borger catherine.borger@dpird.wa.gov.au

2. How will seasonal conditions influence the seed?

Rules of thumb

Higher dormancy.

- Low temperature during seed maturation.
- More rainfall during seed maturation.

2022 – late, staggered emergence.

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Thank you

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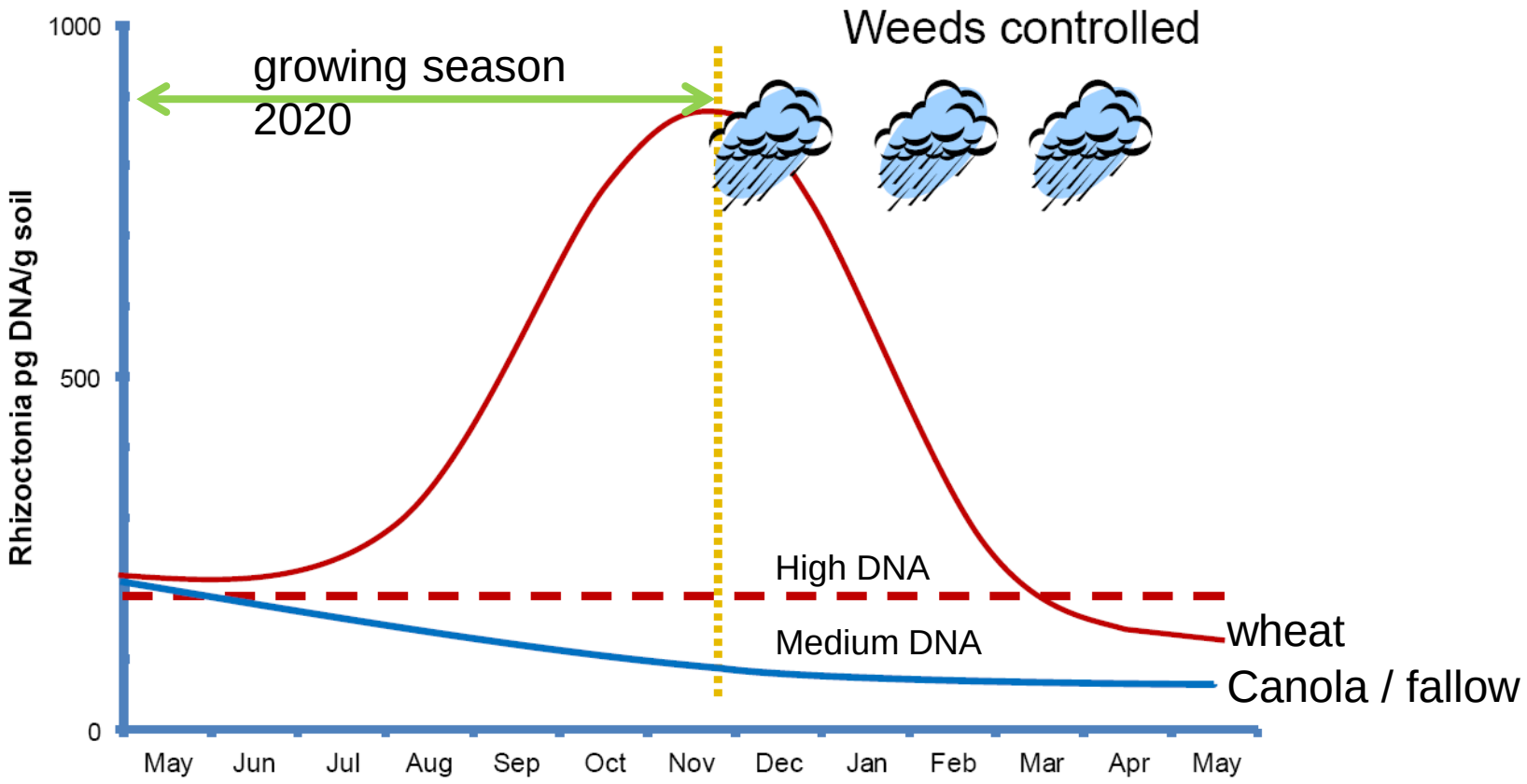
Too much of a good thing:
Soilborne pathogens in 2021 and next year?

Dr Daniel Hüberli

Early 2021 rain – what does it mean for soilborne pathogens?

Gupta Vadakattu *et al*., Adelaide CSIRO



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Good season rain in 2021
= large biomass

Photo credit: University of Queensland

Daniel Huberli | DPIRD

Crown rot disease cycle

EXPRESSION
(yield loss)

LOW — **HIGH**

Water stress

No water stress

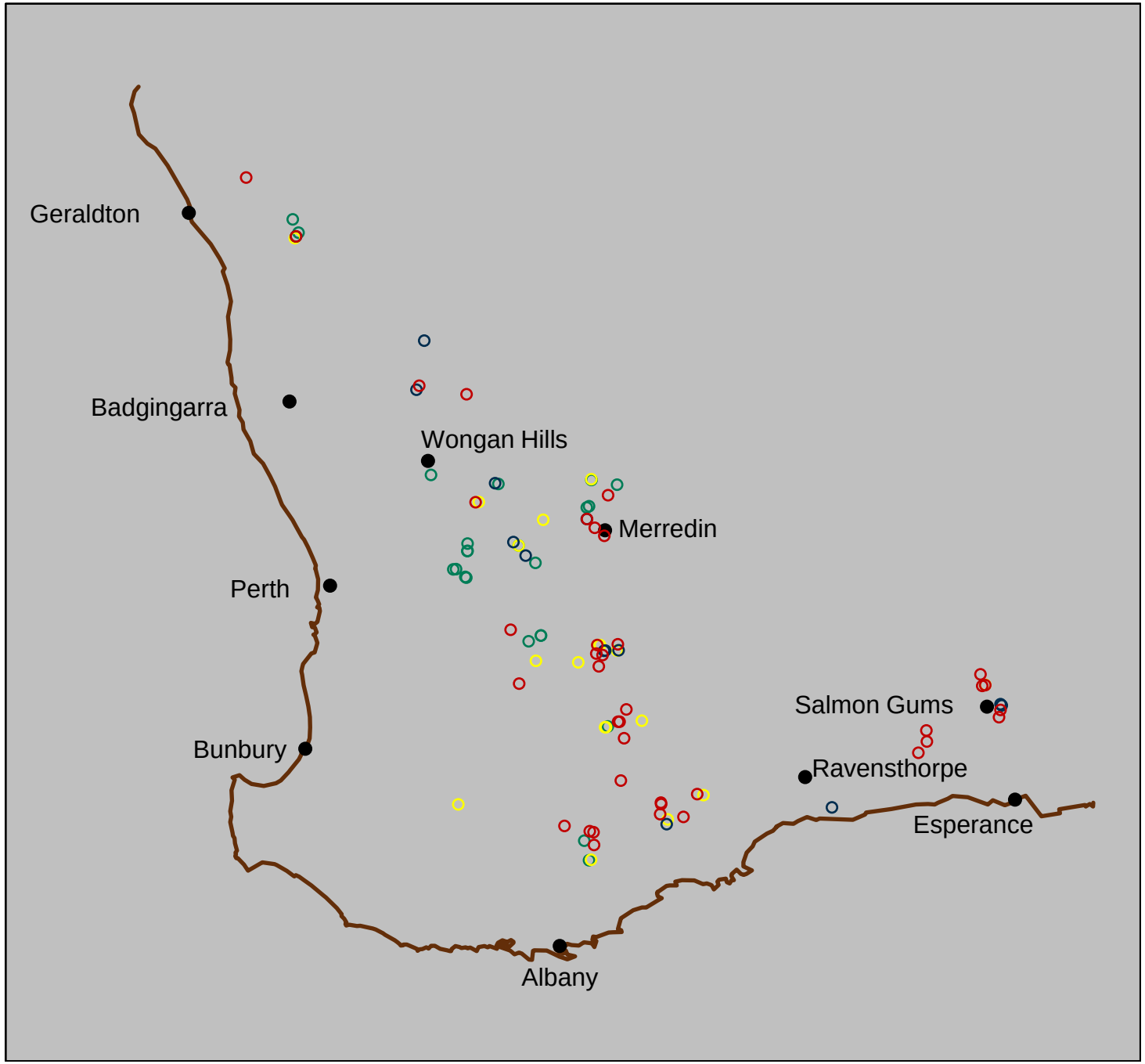
Moist Soil

Favoured wet seasons

SURVIVAL

INFECTION

Daniel Huberli | DPIRD



Where is crown rot found?

Crown rot incidence in paddocks:

- Nil (0-2%)
- Low (3-10%)
- Medium (11-24%)
- High (>25%)

Daniel Huberli | DPIRD

GRDC
GRAINS RESEARCH & DEVELOPMENT CORPORATION

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Too much water?

Daniel Huberli | DPIRD

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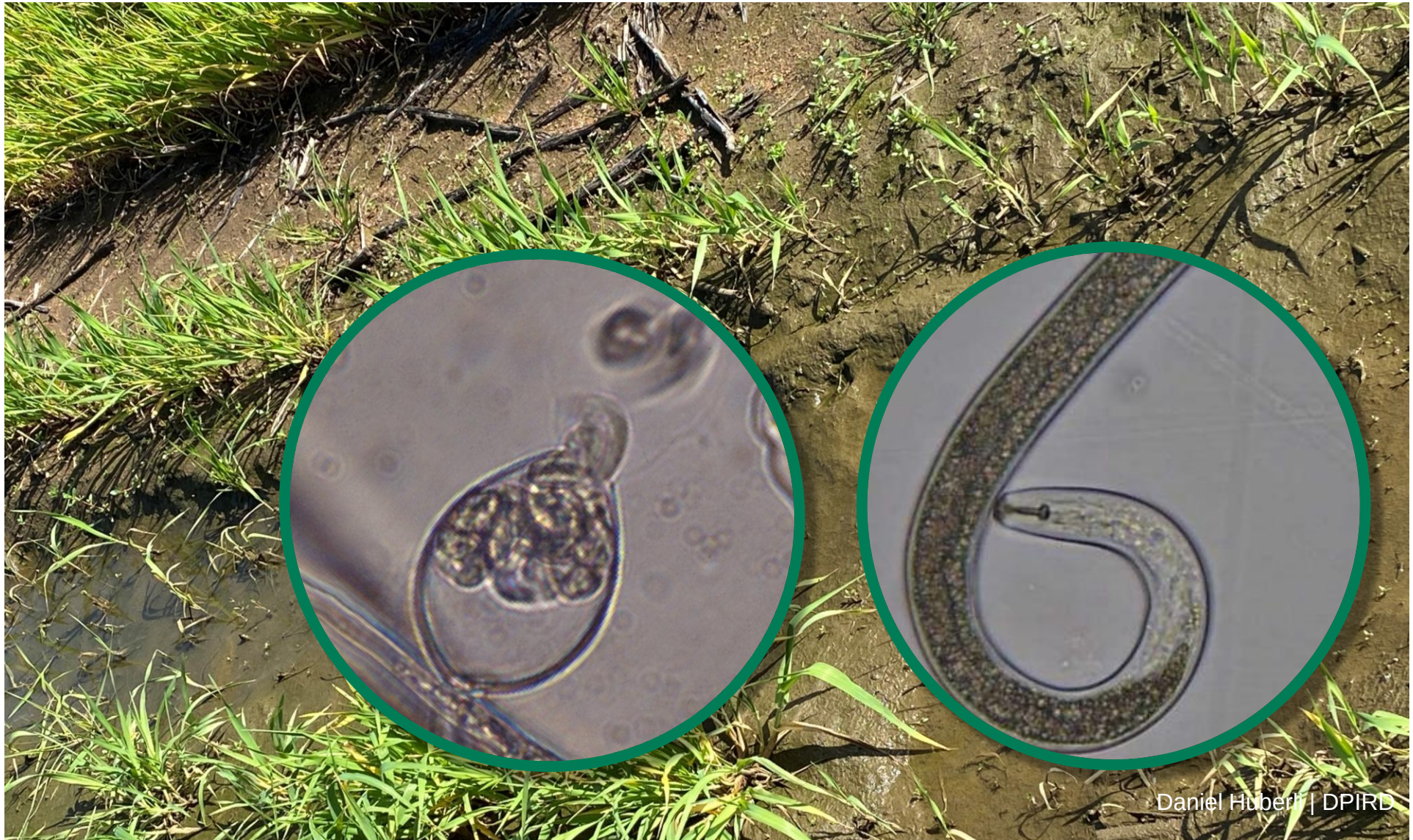
Too much water? – Movement of pathogens and nematode pests



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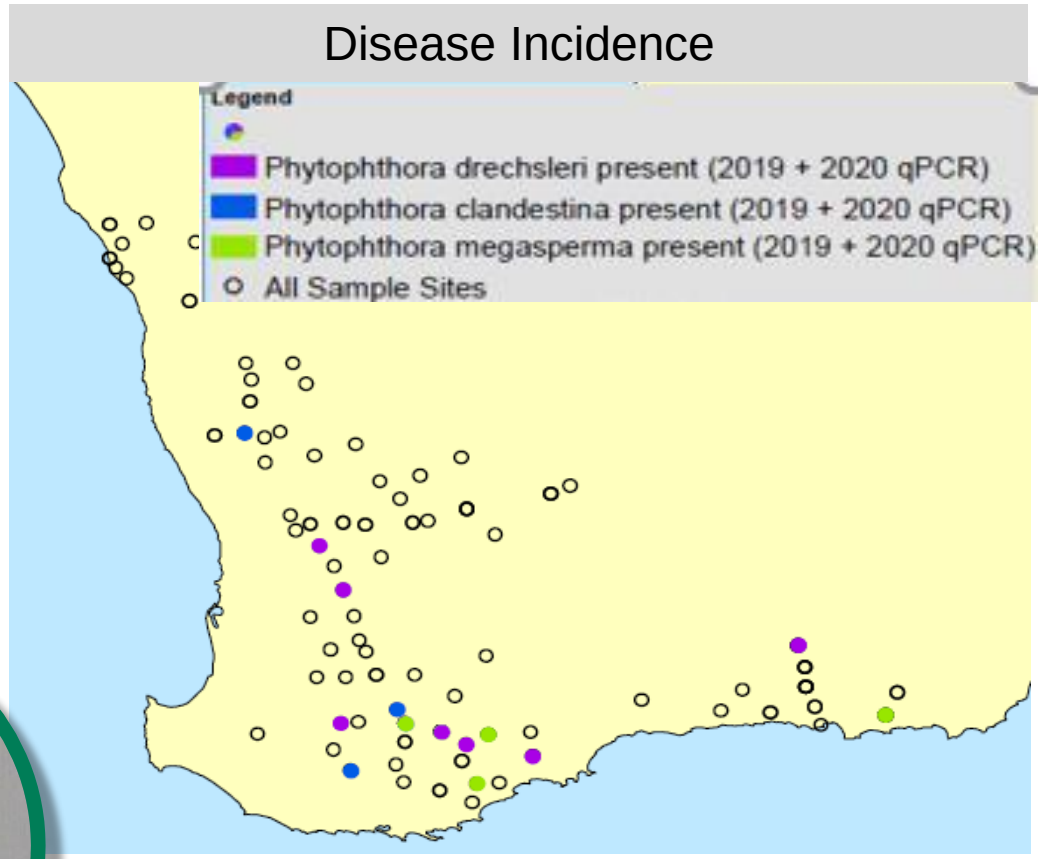
Phytophthora species

- Field survey 2019 – 2020 led by Carla Wilkinson, DPIRD
- Survives as thick walled oospores
- Produces zoospores to spread
- Can have a big impact

Fred Brooks - bugwood.org



Lupin paddock without ripping

Daniel Huberli | DPIRD

Same paddock with ripping

Daniel Huberli | DPIRD

For soilborne diseases – A break isn’t a break when there’s lots of weeds!

Daniel Huberli | DPIRD

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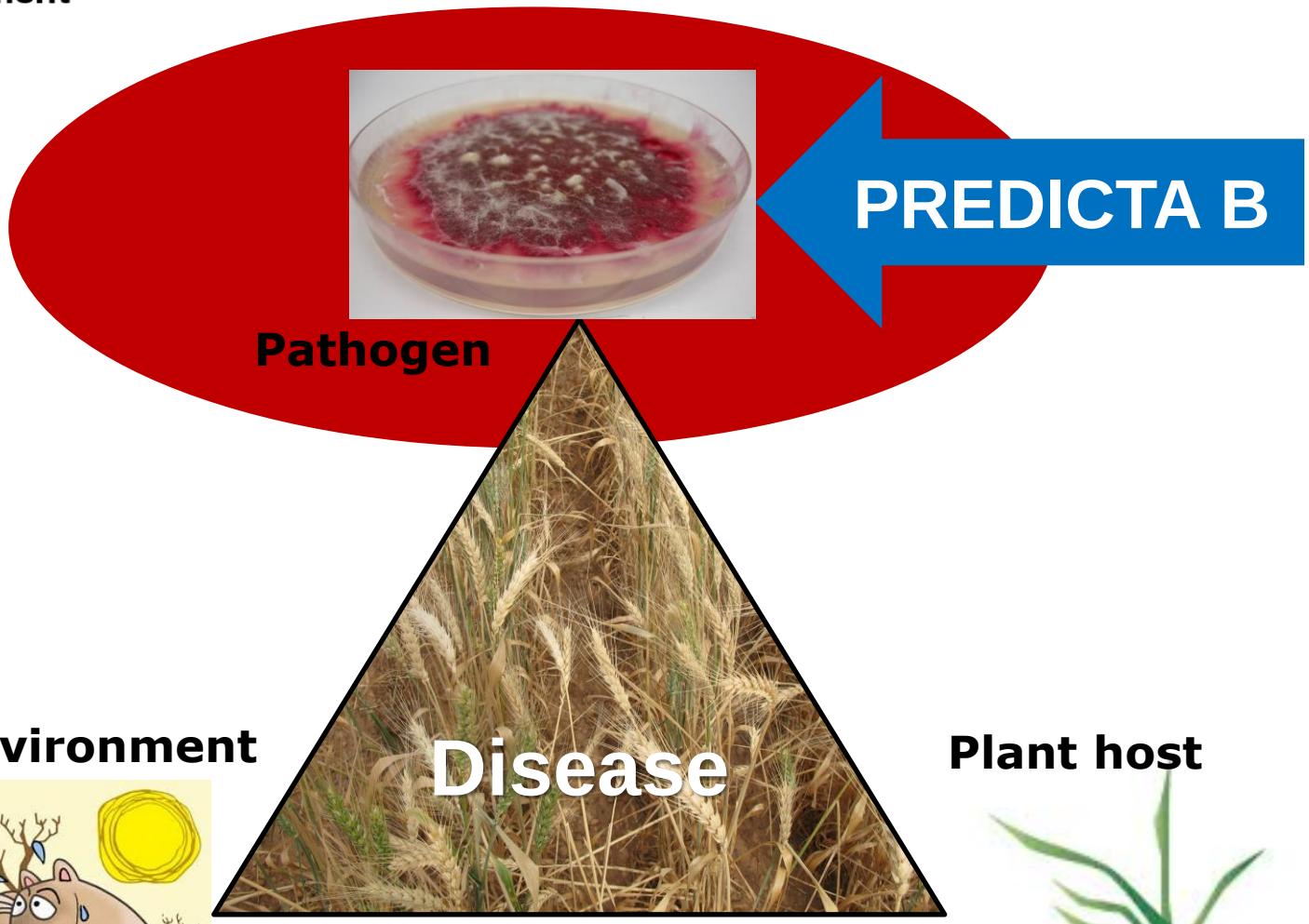
Soilborne diseases in 2022?



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Crown rot disease cycle

(© 2015 S. SIMPFENDORFER)

2022

EXPRESSION
(yield loss)

LOW — HIGH

No water stress

Water stress

2021

SURVIVAL

Moist Soil

Favoured wet seasons

INFECTION

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We been here before, so what?

Wet 2013 spring, followed by a big crown rot year in 2014, dry spring

16 NEWS

countryman.com.au
Thursday, October 23, 2014

Farmers urged to watch for crown rot

Graingrowers have been urged to keep watch in wheat and barley crops for the soil-borne disease fusarium crown rot after an increase in detections this year — particularly in the eastern Wheatbelt.

The Department of Agriculture and Food WA has received reports from around Merredin of fusarium crown rot affecting between 30 to 50 per cent of wheat paddocks.

The reports are consistent with a constant demand on DAFWA's diagnostic service, AGWEST Plant Laboratories, to identify root diseases in samples from the central and northern region.

Soil-borne diseases cost WA grain growers an estimated average of A$105 million per year in

DAFWA research officer Daniel Huberli said the lead-up to harvest was an important time to monitor crops and identify these diseases to assist planning to minimise their impact next year.

Crown rot predominantly affects wheat and barley.

It is caused by fusarium, a soil-borne fungus, infecting plants at the crown and reducing water supply to the stem.

Affected plants show white head formation and failure to fill grain.

The disease also shows distinctive honey-brown discolouration of the stem base or lower node when leaf sheaths are removed.

Direct signs of the fungus may also be present as pink colouration.

year is likely the result of intensive cereal production, in combination with 2013 and 2014 seasonal factors," Dr Huberli said.

In 2013, wet spring conditions probably contributed to disease's spread but with few white heads due to the soft finish.

This year, the drier spring in many areas has resulted in a high expression of white head formation.

"Crop rotation to non-cereals is the key to management of affected paddocks as there are currently no fungicides registered to address crown rot," Dr Huberli said.

"So paddock management decisions based on this year's observations will be critical to next year's

"Growers with white heads or other patchy, poor growth in paddocks are advised to check for the presence of the disease and confirm suspected infections by taking plant samples now or a soil sample after harvest.

"Samples can be dispatched to the AGWEST Plant Laboratories to confirm what soil-borne disease they may be dealing with. Armed with this information they can then make informed decisions about how to best plan their 2015 crops."

Dr Huberli said there was no single strategy to minimise the impact of soil-borne diseases, so integrated paddock management was essential.

crown rot in their 2015 crop, they may choose to sow a non-cereal break crop or in low infestations sow a less susceptible variety, such as Emu Rock, and use inter-row sowing," he said.

With the support of the Grains Research and Development Corporation, the department has established research to assess management options and examine commonly grown wheat and barley varieties for their susceptibility to crown rot.

Further information about crop disease management is available on the department's website, agric.wa.gov.au/n/2131, including testing services with AGWEST Plant Laboratories at agric.wa.

Daniel Huberli | DPIRD

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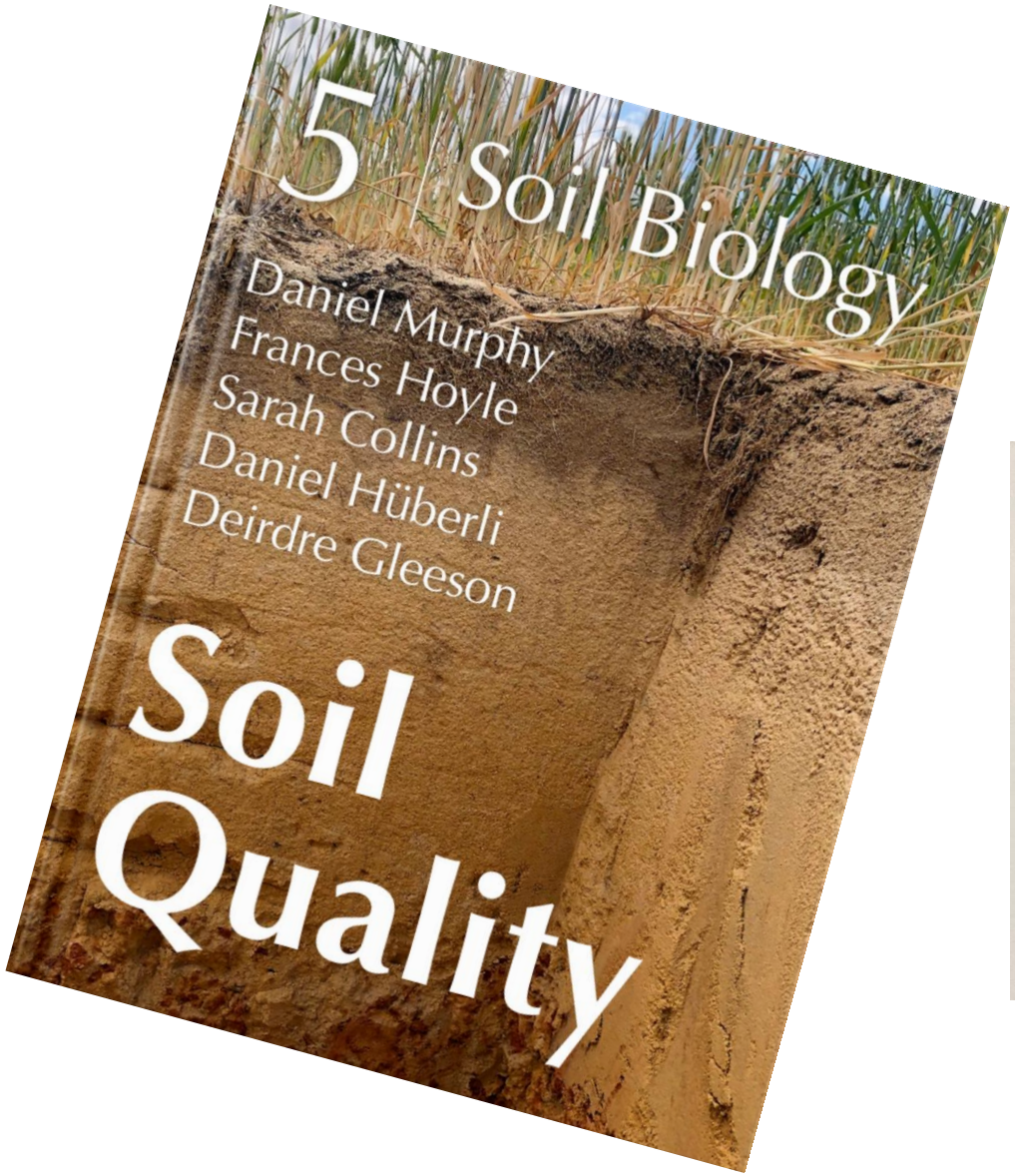
More information



SOILSWEST

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Thank you

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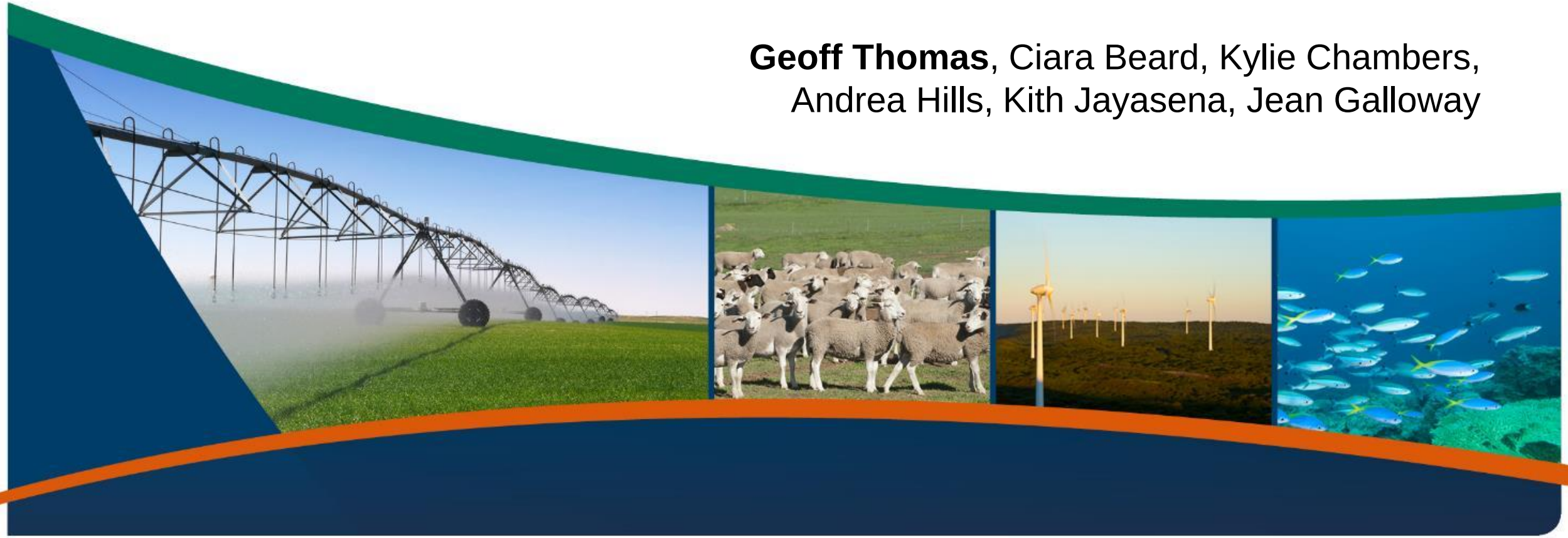
Above ground diseases in a wet year

Geoff Thomas, Ciara Beard, Kylie Chambers,
Andrea Hills, Kith Jayasena, Jean Galloway



Sclerotinia management for narrow leaf lupin crops in WA farming systems

GRDC and DPIRD funded project with subcontractors CCDM and MIG (DAW2104-002RTX)

Project leader: Ciara Beard, ciara.beard@dpird.wa.gov.au

Industry collaboration in 2021 through:

David Cameron, Chris Robinson, Nick McKenna,
Rob Campbell, Peter Eliott-Lockhart

Lupins in 2021

- Wet growing season with early start, early canopy closure in crops
- Dense good yield potential lupin crops across all soil types (bit wet in some areas)
- Basal sclerotinia infection evident in crops through northern growing regions extending further into eastern wheatbelt than expected

Sclerotinia incidence in crops

In Geraldton port zone in a survey of 26 commercial lupin crops

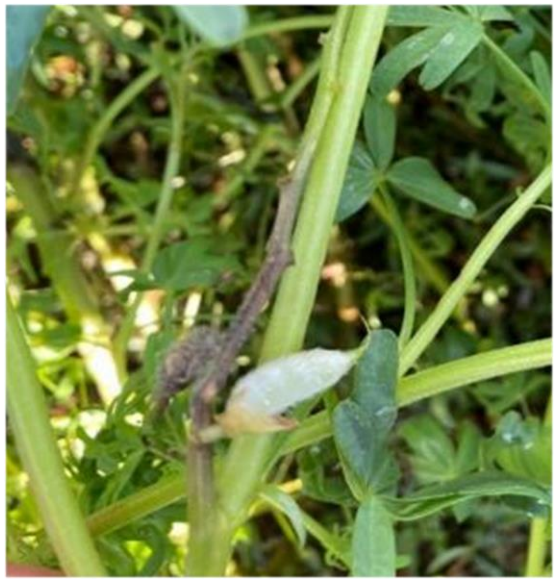
- *S. sclerotiorum* infection present in **100%** paddocks
- 85% paddocks had basal (ground level) infection
- 88% paddocks had main spike pod infection

Data: Ciara Beard, Anne Smith, DPIRD

Sclerotinia incidence in crops

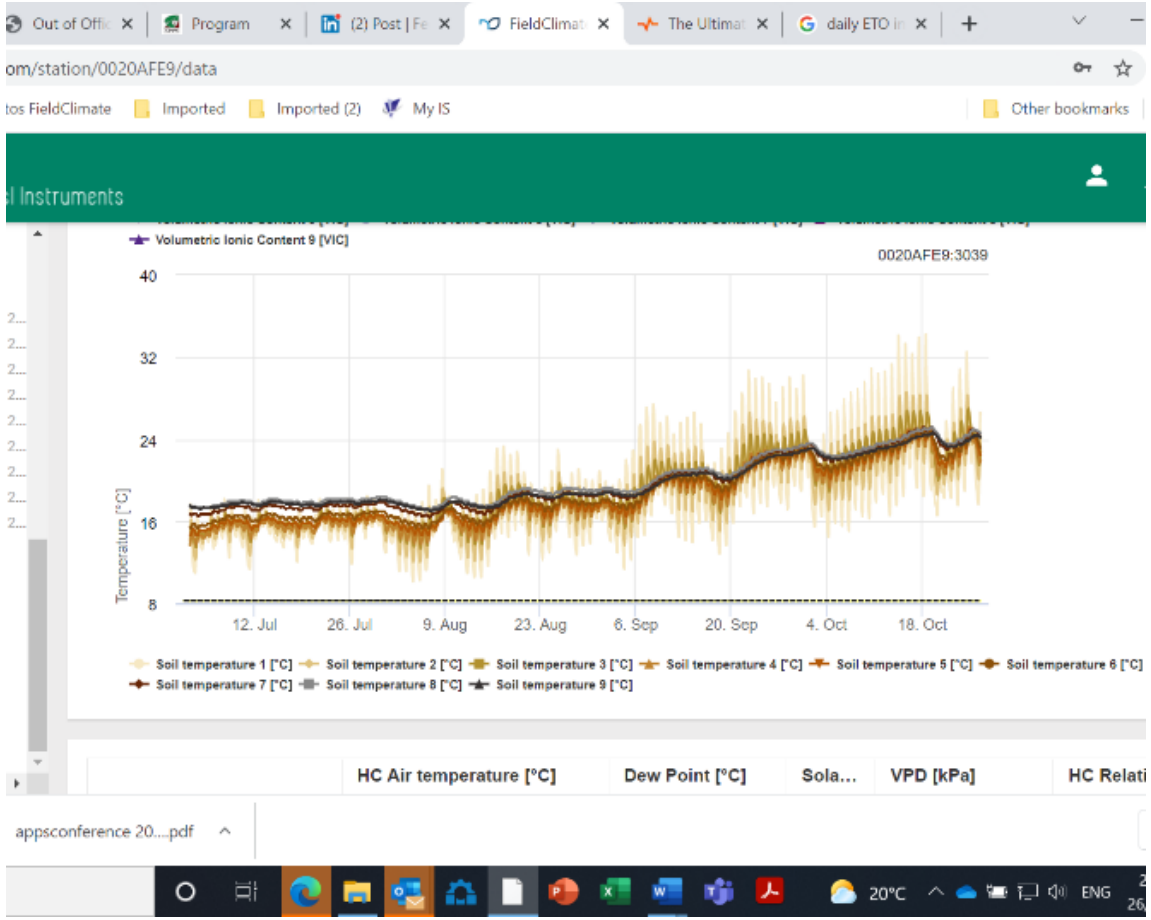
In Albany port zone in a survey of 10 commercial lupin crops

- *S. sclerotiorum* infection present in **70%** paddocks
- Incidence and severity of sclerotinia infection generally low
- Botrytis grey mould present in dense crops

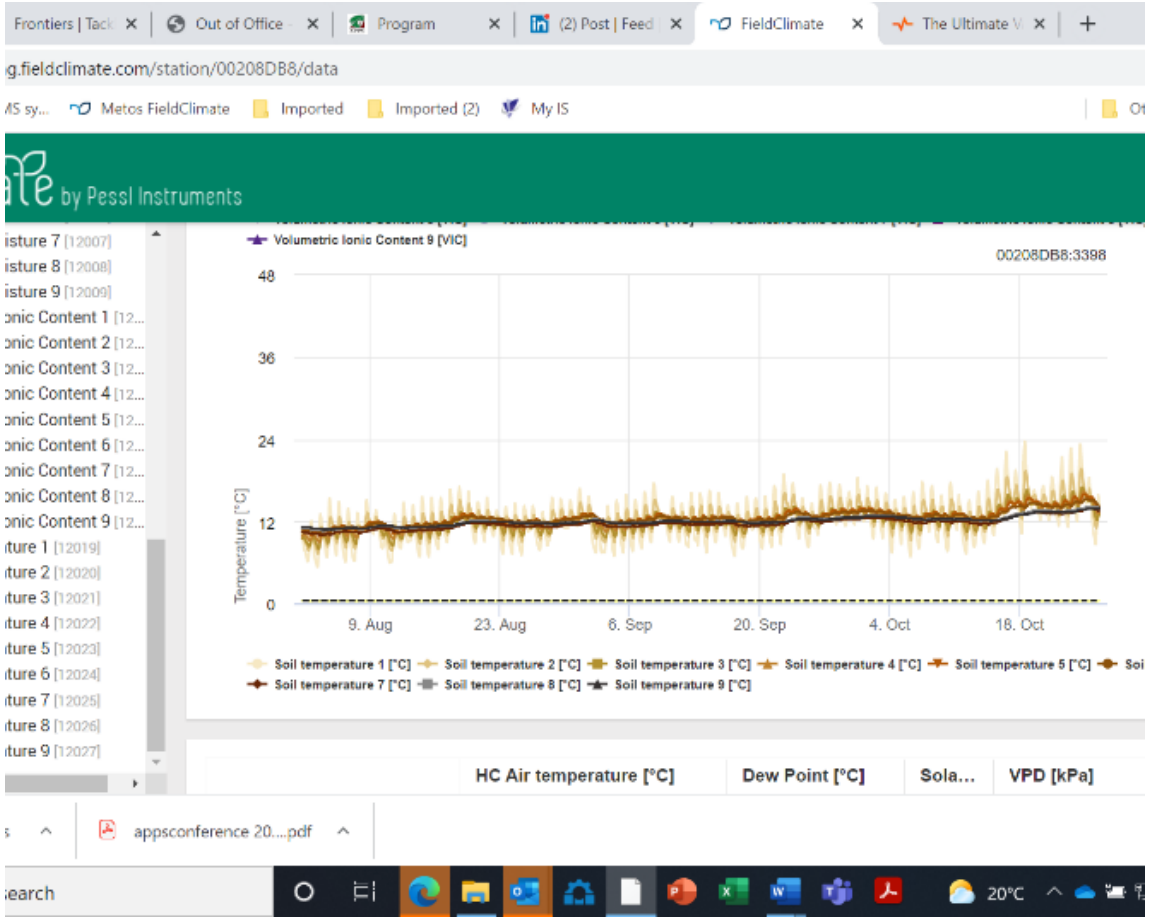


Temperature a driver of disease?

Geraldton



Kojonup



Pessl weather stations with ADAMA Australia

Wongan Hills district

Geoff Thomas_DPIRD_December 2021

Wongan Hills district

Incidence of infection (%)		
Uninfected	Basal	Stem & canopy
46	15	39

Pod yield (pods / plant)	
Uninfected	Infected
25.9	11.5

Yield response to fungicide application in 2020? Was it profitable?

	Yield (t/ha)		
	Mingenew Narrow-leaf	**Chap. Valley** Narrow-leaf	**Chap. Valley** Albus
Untreated	3.02	3.67	2.55
Fungicide spray at early pod emergence	3.10 ↑3%	3.81 ↑4%	2.70 ↑6%
LSD (10%)	0.07		

+ increased 1000 grain weight

+ reduced sclerote contamination

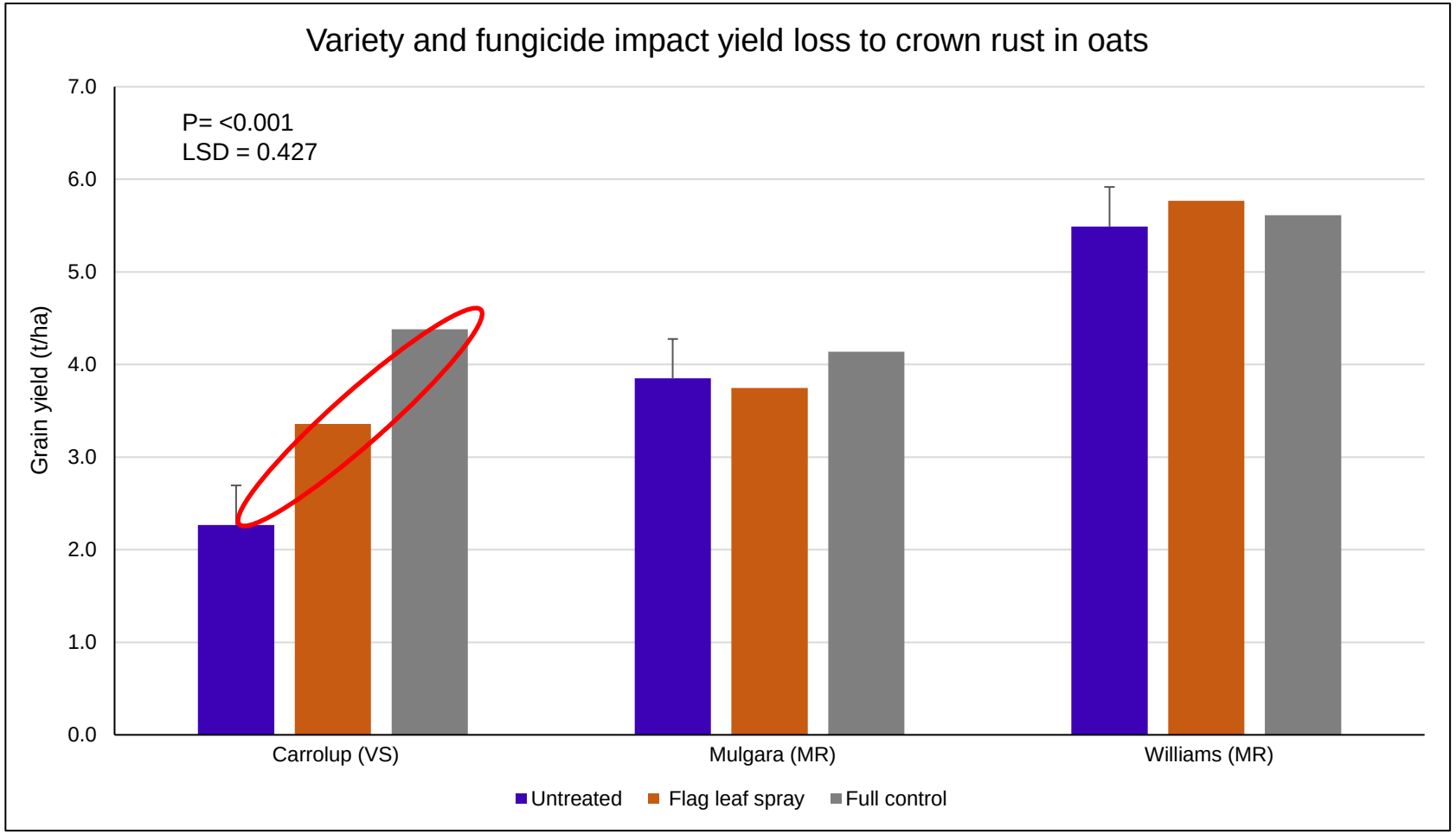
Data: Ciara Beard, DPIRD

Cereal rusts

Green bridge survey

- Unsprayed paddock Dandaragan region

Leaf (crown) rust in oats – it can hurt



Data: Kylie Chambers, DPIRD

Stem rust – don’t wait (or miss a bit)

Mid-September

Mid-October

- Bannister oats
- Lake Grace

Photo: Trent Butcher, ConsultAg

Stripe rust – an old foe returns

- First reports to Pestfax since 2015
- Eastern wheatbelt
- Calingiri and Chief
- Pathotype: 134 E16 A+

StripeRustWM

Regrowth in November

- Late rain providing enduring green tissue
- Frosted paddocks cut for hay
- Shortening the period between seasons

Photo: Sarah Collins, DPIRD

Thank you

Visit dpird.wa.gov.au

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kylie.chambers@dpird.wa.gov.au (oat pathology)
jean.galloway@dpird.wa.gov.au (disease modelling)