BWYV in canola

SOUTH AUSTRALIAN RESEARCH & DEVELOPMENT INSTITUTE **PIRSA**

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Beet Western Yellows Virus

- Leaves turn yellow and purple, starting from older leaves
- Leaves may become thickened and cup inwards
- Virus infects phloem and so symptoms resemble nutrient disorders, herbicide damage, physiological stress etc.
- Premature bolting



Beet Western Yellows Virus

- Canola is most susceptible if infected at the rosette stage (high yield loss)
- Infections at a later stage lead to lower yield loss
- Infections after mid podding should result in minimal yield loss but oil quality may still be affected
- BWYV is not seed borne. Harvest as per normal.



BWYV – Where is it and impact

<u>Affected</u> <u>regions (5th</u> <u>September</u> 2014) – 618 <u>crops tested,</u> 57% affected



http://www.extensionaus.com.au/wp-content/uploads/2014/07/BWYV-map-2014-0804-SE-Aust-600pi-plain.jpg

BWYV – Where is it and impact

Affected regions

Worst affected crops (90-100% plants infected) in LN/MN

(Tarlee, Riverton, Eudunda, Marrabel region)

Some crops re-sown, other crops have less damage

Also heavily infected crops in upper north eg. Spalding

and Upper Mallee and Victorian Mallee

Subsequent reports of damage -

Eyre Peninsula -

(Wharminda, Pt Neill, Tumby Bay, Cummins)

Yorke Peninsula-

(Kadina, Arthurton, Minlaton)

Bordertown - one crop tested

Virus test results SA 82/87 positives Vic 50/65 positives

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BWYV – agronomic influences

Varieties

Varietal differences exist, but there is no tabulated data on current variety reactions. (eg. Stingray)

Leaf symptoms differ between IMI and TT varieties



BWYV – agronomic influences

Standing stubble

Damage is less in crops sown into standing stubble vs bare earth

(typical aphid behaviour)

Bare patches in paddock are affected first, then aphids spread to the remainder of paddock

Sowing date

Worse in early sown crops likely linked to aphid flight timing



BWYV – Host Range

<u>Green bridge</u> – heavy rains Feb/March promoted weeds

Weed hosts Possible pasture hosts Wild radish Lucerne Marshmallow Medics **Clovers** Fleabane Nightshade Stinkweed **Bedstraw** Muskweed Thistles



Aphid Build-up – why did it happen?

Weather conditions-

Summer rain + Mild conditions late Feb/March to June

Impact on aphid numbers

- Conditions optimal for aphid increase
- Greater than normal number of generations
- Higher fecundity and survival
- Increased flight activity



Mean monthly rainfall anomalies (mm)



Mean monthly rainfall deciles (mm)



Mean monthly temperature anomalies °C





Mean monthly temperature anomalies °C

The Vector: Green Peach Aphid

- Transmitted at 97% efficiency by GPA
- Lower efficiency by cabbage aphid (14%) and perhaps turnip aphid
- Persistently transmitted i.e. an infected aphid will contain the virus as longs as it survives

Turnip aphid



Cabbage aphid



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Green peach aphid

Agriculture Western Australia

GPA – insecticide treatment observations

Seed dressings

Gaucho (imidacloprid) initially reduced infestation

Cruiser Opti (thiamethoxam) – also has aphicide action

Cosmos (fipronil) – no protection against aphid infestation

Foliar Insecticides – too late to protect seedling crops

SP's – widespread resistance

OP's and Pirimor – GPA resistance, geographically variable (Pirimor less effective at <20°C)

Transform – effective against GPA, but applied too late



GPA – Immediate risk

No further spread likely in cold winter conditions

Aphids have stopped flying and are now difficult to find in some areas

Some winged aphids reported in warmer regions

eg. Eyre Peninsula

Further spread may occur following build up of winged aphids in late winter / spring



GPA – Where to from here?

Aphid flights in spring

Virus: Insecticides may be necessary to limit new BWYV infection if winged aphids appear before mid podding.

Spray decision:

- entire crop is infected with virus = NO
- crop patches are virus infected = YES.. Consider options
- uninfected crop (incl. pulses) adjacent to infected = YES .. Consider

options

Monitor flight activity using yellow sticky traps

Direct Damage: Aphids may also need to be controlled to prevent direct damage, crops should be assessed on a crop by crop basis.

Start monitoring earlier – check parasitism/predation SARDI

GPA – natural aphid control agents can help reduce populations, and direct feeding damage

Beneficial insects – predators and parasitoid wasps



Fungal diseases – cause aphid mortality, observed in 2014





GPA – natural aphid control agents can help



Ladybird



Nabid



Brownlaceing larvae



Hoverfly larvae SARDI **Insecticidal Control**

Only use products registered or with a permit for use in the specific crop, and

Adhere to ALL label directions (method of application, rates, withholding period, etc.)

Regulators and export markets are alert to the current issue!





Green peach aphid insecticide resistance 2014



Current as of 28th August 2014

GPA Foliar Insecticides for Canola

Insecticide Group	Example product names	Known resistance (R) in SA	Implications for GPA control
SPs (3A)	Astound, Dominex, Fastac etc	Widespread.	SP's not recommended.
Carbamates (1A)	Pirimicarb Eg. Pirimor®, Aphidex etc	Patchy.	Consider small strip field test to assess efficacy.
OPs (1B)	Dimethoate, Chlorpyrifos, Lorsban, etc	Patchy.	Consider small strip field test to assess efficacy.
Sulfoxaflor (4C)	Transform [®]		If OP & Carbamate R status in local GPA unknown, Transform is 'best-bet' option.



BWYV – Where to from here?

Potential impact on pulse crops

Potential virus transfer during spring aphids flights to chickpeas, lentils, faba beans and field peas; Lupins are not affected

Monitor aphid populations to spray ahead of flights

Potential strategies-

a. Pirimor – Pulse Australia seeking a permit for broadacre pulse crops

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- b. Transform <u>not</u> available no residue data
- c. Indirect control through sprays on infested canola

GPA Foliar Insecticides for Pulses

Insecticide Group	Chemical Products	Known resistance (R) in SA	Implications for GPA control
SPs (3A)	Astound, Dominex, Fastac etc	Widespread.	SP's not recommended.
Carbamates (1A)	Pirimor [®] , Aphidex etc Registered for lupins, APVMA Emergency permit approved for all other pulses (PER 14981)	Patchy.	Consider small strip/plot field test to assess efficacy.
OPs (1B)	Dimethoate (800 ml ha ⁻¹ of 400 EC products)	Patchy.	Consider small strip/plot field test to assess efficacy.

Transform is not registered for Pulses: Do NOT use.

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Maybe it's not BWYV

Widespread reports of Select herbicide damage

Reddening and yellowing of leaves very similar to BWYV

Malformation of flower heads

Damage most likely if application after 4 leaf stage,

and/or rates over 1 L/ha

Is there an interaction between virus stress and Select?

Other herbicides? Water logging? Nutrition? Other insects?





Images courtesy Sam Holmes

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BWYV – Where to from here – future years?

Greater attention to green bridge control

- Control broadleaf weeds

In high risk season (green bridge and mild late summer/ warm autumn)

- Insecticide (neonicotinoid) seed dressing at sufficient rate to coat seed
- Sow at higher rates to reduce aphid landing
- Later sowing time to avoid aphid landing
- Sow into standing stubble
- Good agronomic practice to get good crop establishment
- Monitor young crops for aphid infestation

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BWYV – Where to from here?

Funding from SAGIT and GRDC

- a. Coordinator(s) for data collection and collation
 - Ken Henry and Bill Kimber (08 8303 9536)
- b. Aphid populations for insecticide resistance testing
- c. Virus survey of weeds around affected crops and of unaffected crops in diseased regions
- d. Virus testing in NVT trial, Time of sowing x sowing rate trial, clethodim x application timing trial
- e. Crop Survey Monkey to gather data on crop management in affected vs. unaffected crops through consultants/ agronomists.

Grains Research &

Development Corporation

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NB. Individual property data will be strictly confidential.

