

Beet Western Yellows Virus (synonym: Turnip Yellows Virus) and its vector Green Peach Aphid in canola

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Green Peach Aphid and Beet Western Yellows Virus

- Reports of failing canola crops – started mid June
- First in South Australian Mallee and lower North regions
- Green Peach Aphid reported as widespread in high numbers (>5 per leaf on every plant)
- Beet Western Yellows Virus identified in plants submitted to Horsham
- Field day organised at Riverton (SA) by private agronomists June 30th



BWYV and/or aphid feeding damage

- **GPA sprayed out before entomologists and pathologists visited crops –difficult to identify losses from direct feeding damage**
- **BWYV infects phloem and so symptoms resemble nutrient disorders, herbicide damage, physiological stress etc.**
- **Leaves turn yellow and purple and cupping, starting from older leaves**
- **Premature bolting**
- **Canola is most susceptible to BWYV at rosette stage**
- **Minimal yield loss if infected after mid podding**
- **BWYV is not seed borne**



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 long as it survives



Green peach aphid

Agriculture Western Australia

Turnip aphid



Cabbage aphid



SARDI

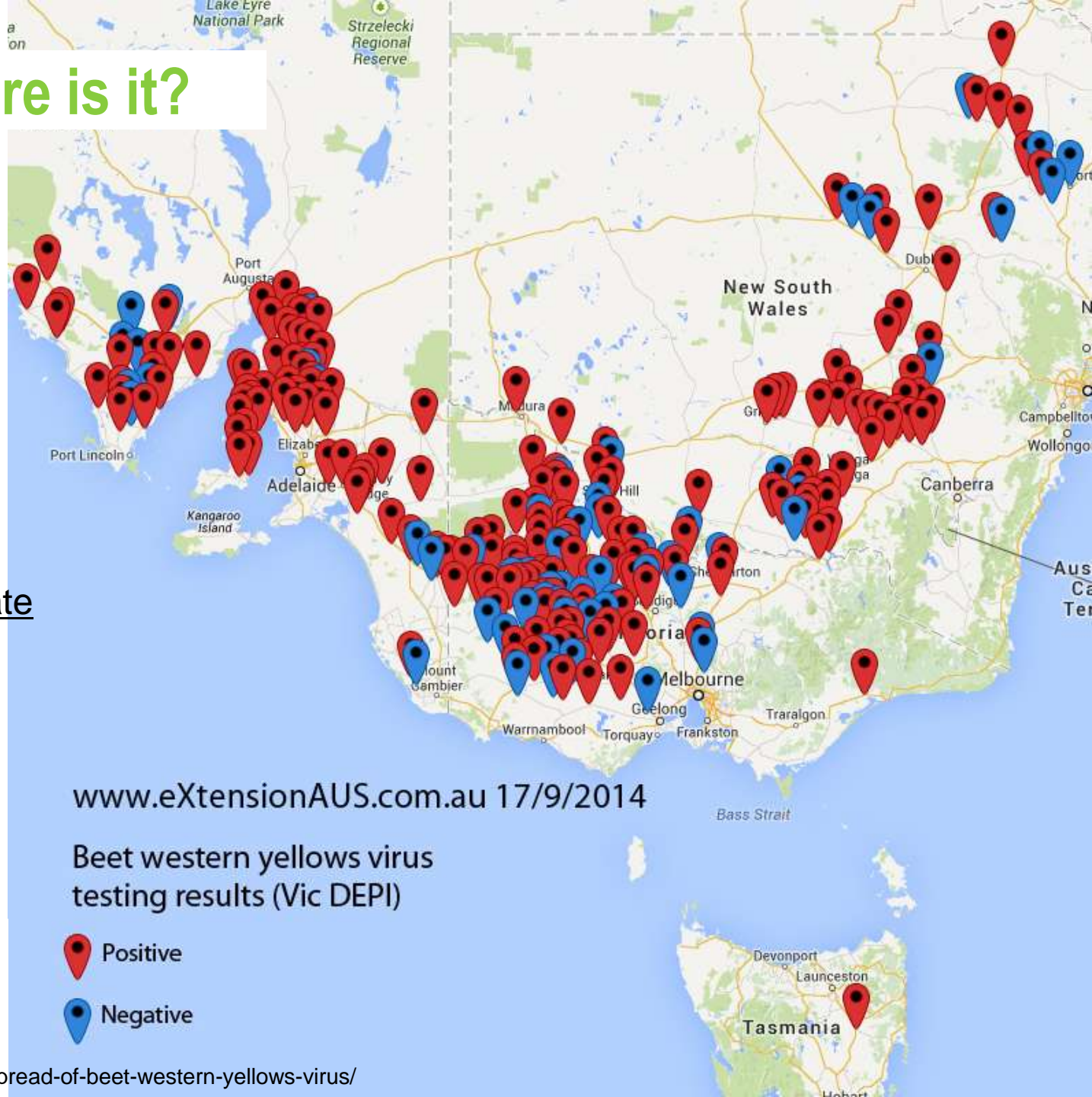
BWYV – Where is it?

Mid Sept -
618 crops tested
57% crops infected

Map does not indicate severity

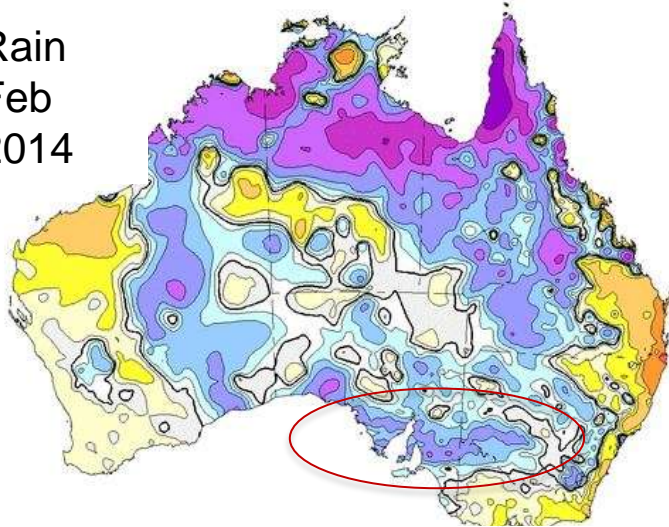
5-10,000 ha severely affected

Remainder growing 'normally'
Is yield affected?

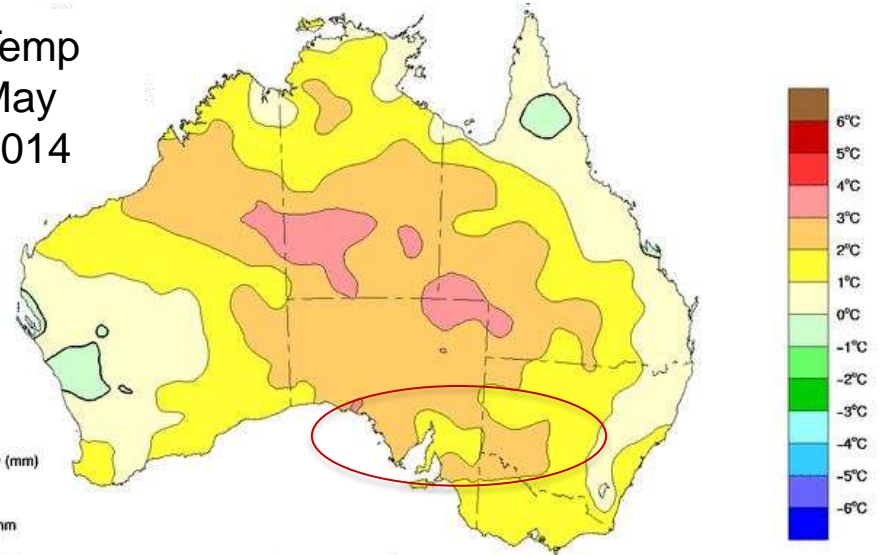


Why did this happen – autumn rain and temperature

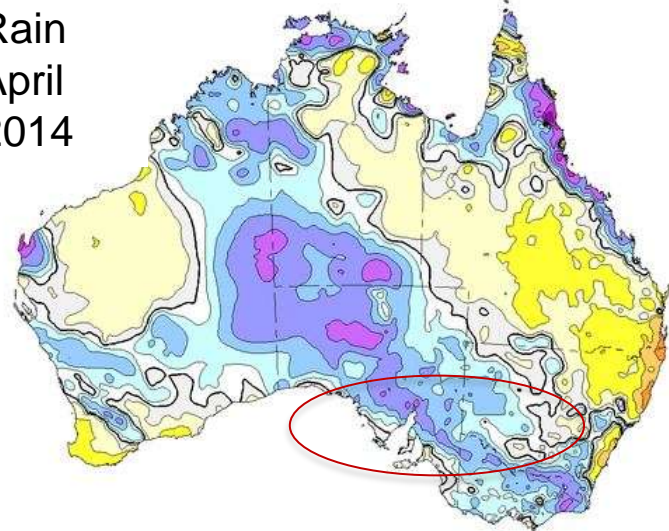
Rain
Feb
2014



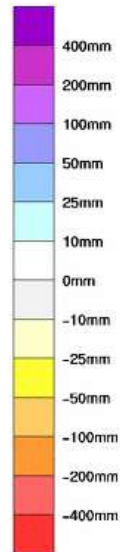
Temp
May
2014



Rain
April
2014



Rainfall anomaly (mm)



Temperature 2-3°C higher than longterm average in May – increased aphid numbers when canola at rosette stage

Did temperature increase virus titre?

Rainfall higher than longterm average in Feb and April – green bridge

Mean monthly rainfall (mm) and temperature anomalies (C)

Beet Western Yellows Virus – Host Range

Green bridge – heavy rains Feb/March promoted weeds

Some weed hosts

Wild radish

Marshmallow

Wild turnip

Fleabane

Nightshade

Stinkweed

Bedstraw

Muskweed

Thistles

Pasture hosts

Lucerne

Medics

Clovers



BWYV– agronomic influences

Standing stubble

Damage is less in crops sown into standing stubble vs bare earth (typical aphid behaviour)

Sowing date – early sown crops worse - linked to timing of aphid flights (eg. Hart Time of Sowing trial – least infected in last sown plots)



BWYV agronomic influences

Varieties - visual assessment still to be confirmed by virus tests

NVT trial – Roseworthy SA

In general the leaf symptoms differ between IMI and TT varieties



IMI

TT

No symptoms

TT varieties	% Leaf Area Diseased	IMI varieties	% Leaf Area Diseased
Variety 1	3.3a	Variety 1	28.3a
Variety 2	8.3ab	Variety 2	31.7a
Variety 3	18.3abc	Variety 3	53.3ab
Variety 4	26.7abcd	Variety 4	76.7bc
Variety 5	31.7abcd	Variety 5	80bc
Variety 6	33.3abcd	Variety 6	86.7bc
Variety 7	35.0abcd	Variety 7	91bc
Variety 8	36.7abcd	Variety 8	93.3bc
Variety 9	45.0bcde	Variety 9	98.3c
Variety 10	45.0bcde	Variety 10	100c
Variety 11	48.3cde	Variety 11	100c
Variety 12	51.7cde	Variety 12	100c
Variety 13	55.0cde	LSD	43.48
Variety 14	55.0cde		
Variety 15	55.0cde		
Variety 16	58.3de		
Variety 17	63.3de		
Variety 18	75.0ef		
Variety 19	100.0f		
LSD	38.05		

GPA – insecticide treatment observations

Seed dressings

Neonicotinoids-

- 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, OP's and Pirimor – widespread GPA resistance

- OP resistance complex – some products proving active in field

Transform – effective against GPA, but applied too late

GPA insecticide resistance 28 Aug 2014

Paul Umina cesar

South Australia

Green peach aphid insecticide resistance 2014



Victoria & New South Wales



<http://cesaraustralia.com>

Concerns re future overuse of Transform which has the potential to create resistance in GPA

BWYV – spread in spring 2014?

Initially there were concerns regarding spring flights of GPA

- **Further spread of BWYV in previously uninfected canola crops**
- **Further spread of BWYV in pulse crops**
 - **particularly chickpea and lentils**
 - **maybe damage in field pea and faba bean**
- **No flights of aphids recorded yet – frosts reduced populations.**



BWYV – Where to from here – future years?

Frequency of similar epidemics likely to be low

But greater attention to green bridge control is required

- **Control broadleaf weeds**

In high risk season

(i.e. green bridge & 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**

BWYV – Where to from here?

Funding from SAGIT and GRDC

- a. Crop Management Survey in affected vs. unaffected crops via consultants/ agronomists. (aim for 400 crops)
- b. Coordinator(s) for data collection and collation
- c. Virus survey of unaffected crops, weeds and NVT and agronomy trials
- d. Aphid populations for insecticide resistance testing (cesar)



Acknowledgements

Funding from SAGIT and GRDC

Virus testing & agronomist meetings

- Frank Henry, Mohammad Aftab, Angela Freeman (VicDEPI)
- Joop Van Leur, Kurt Lindbeck, Don McCaffery (NSW DPI)
- Michelle Russ, Marzena Kaczmarek and casuals (SARDI)

Survey Monkey – Helen de Graaf (SARDI)

Agronomists including-

- Sam Holmes, Mick Faulkner
- Many other agronomists

Brenda Coutts, virologist DAFWA

Murray Sharman, virologist QDAFF

Katherine Hollaway & eXtension Aus (Vic DEPI)

Anyone else that we forgot



Photo: Eudunda (SA) Aug 21st