Persistence of infectivity in herbicide/aphicide-injected *Banana bunchy top virus* infected plants

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Banana bunchy top disease

- Most devastating viral disease of banana
- No hosts outside Musaceae
- No resistant cultivars
- Transmission by banana aphids and through infected planting material only

- In Australia, BBTV distribution restricted - away from the major production area
- Control supported by State government legislation
Control of banana bunchy top disease in Australia

- Industry-funded inspectors identify and destroy infected plants (control/eradication program)
- In the past, dig out and chop up.
- Now, destruction by injection of pseudostem with
  - herbicide Glyphosate to kill the plant, and
  - insecticide Imidacloprid to kill viruliferous banana aphids without disturbing and dispersing them
- However, plant death is delayed in winter – takes 2-3 months vs <1 month in summer
- Possible lingering source of infection?
Testing insecticide-injected plants as a source of infection

- Plants sampled
  - immediately prior to injection and
  - at 1, 2, 3, 7, 14, 21 and 28 days (summer) or
  - at 1, 2, 7, 14, 21, 28, 42 and 57 days (winter) after injection

- Injection of plant
- Sequential sampling of youngest fully-expanded symptomatic leaf
- Aphid feeding (40 aphids/plant) 2 day AAP, 2 day IAP on healthy tissue-cultured banana plants
- Symptom development monitored
Aphid survival and transmission of BBTV

- Plants sampled while green tissue remained
- Some aphids survived at least 2d at all time points
- Some aphids fed on the leaf section at all time points
- Summer – effect of insecticide decreased after 14d
- Winter – every element was delayed
Results:

- In winter, BBTV-infected banana plants injected with herbicide and insecticide stay green for 2-3 months.
- BBTV transmitted from these plants up to 7 days after injection.
- Despite aphid survival, no BBTV transmission occurred after 7 days.

Conclusions:

- In winter, injected BBTV-infected banana plants remain as a source of infection for at least a week.
- Additional action needed to control aphids as well as injection (eg oil spray)
- Despite aphids feeding, insecticide Imidocloprid apparently affected BBTV transmission
Acknowledgements

National BBTV eradication program
• David Peasley
• Samantha Stringer
• Barry Sullivan
• Wayne Shoobridge

DAFF Maroochy tissue culture facility
• Sharon Hamill & staff

Funding
• Horticulture Australia Ltd (HAL)
• Australian Banana Growers Council (ABGC)
• Queensland Alliance for Agriculture and Food Innovation (QAAFI)
• Queensland Department of Agriculture, Fisheries and Forestry (DAFF)