

The habits of Queensland fruit fly in winter and using this knowledge to manage it



Study and report by

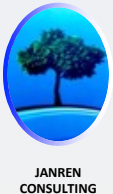
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Produced on behalf of

Cobram & District Fruit Growers Association

From an Industry grant provided by

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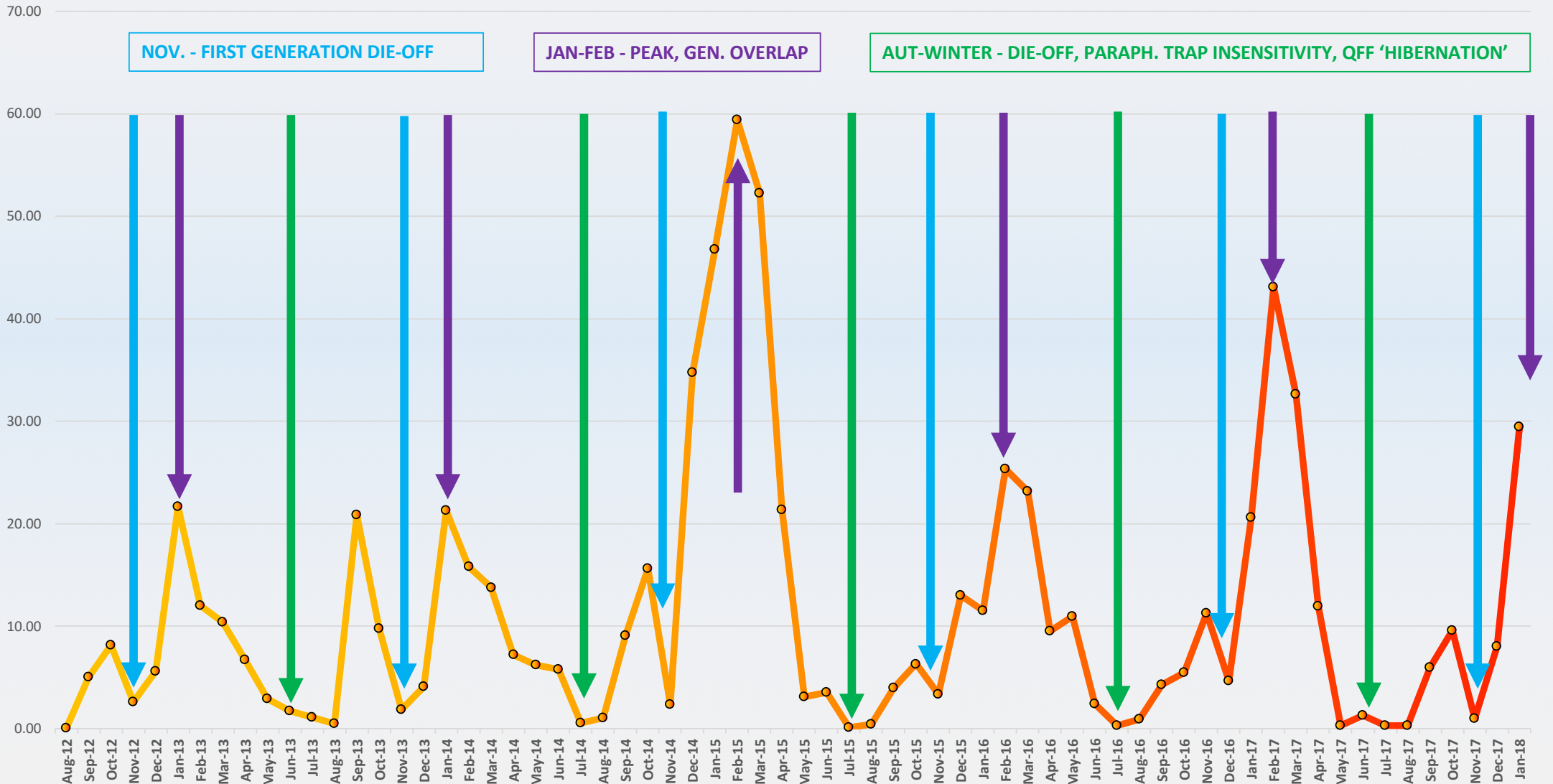
Questions:

1. Does Qff survive winter in the GMV?
2. If yes: where? and how?
3. Can something be done about it?

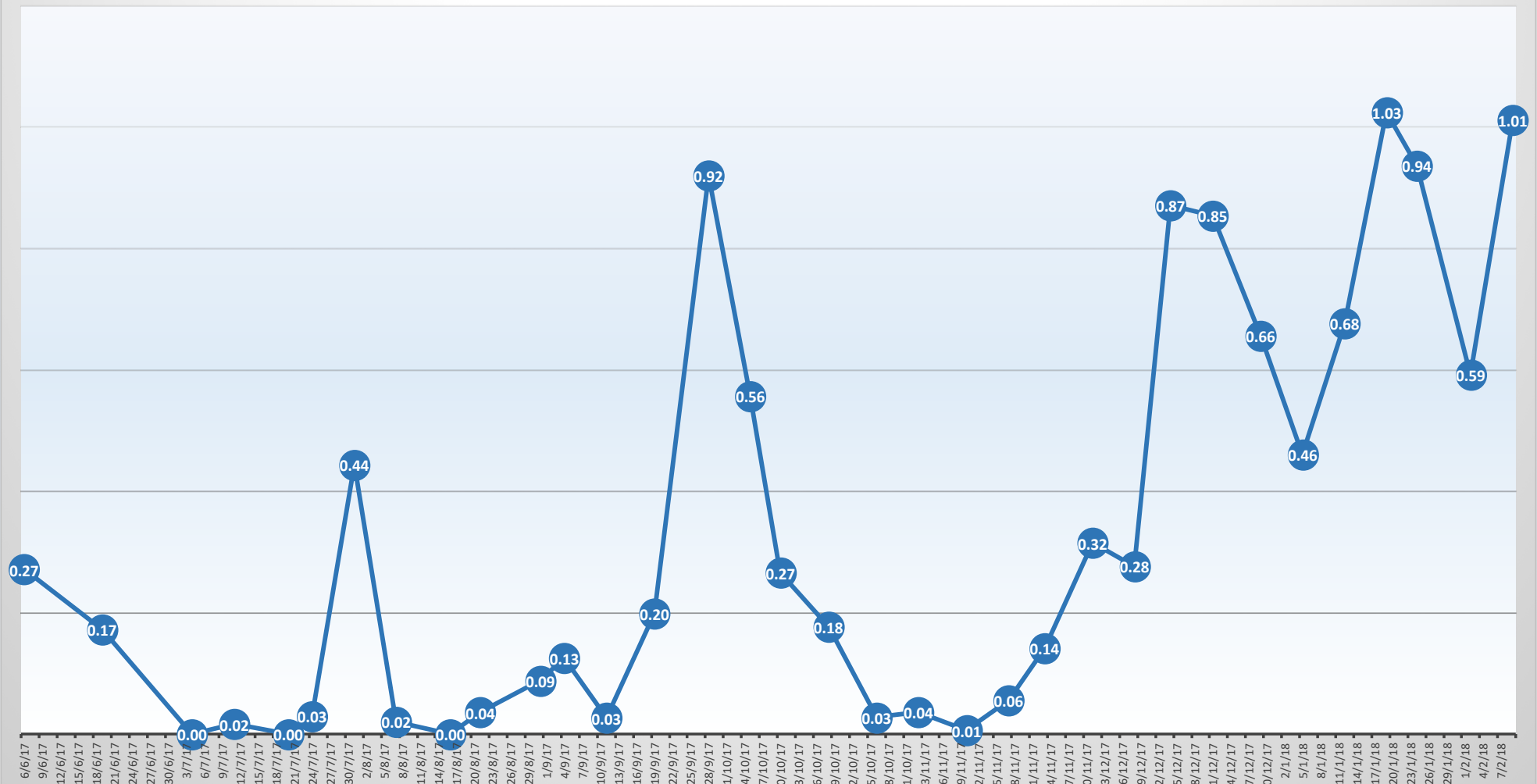
Methods:

- **Winter work:**
 - Trapping
 - Fruit monitoring
 - Experiments on winter fruit infestation
- **Mapping in space and time:**
 - Qff host plants
 - Temperature
 - Qff occurrence
- **Correlation of mapping data:**
 - Timing of, and reasons for, Qff population changes
 - Hot spot awareness
 - Education and awareness
 - Tree removal

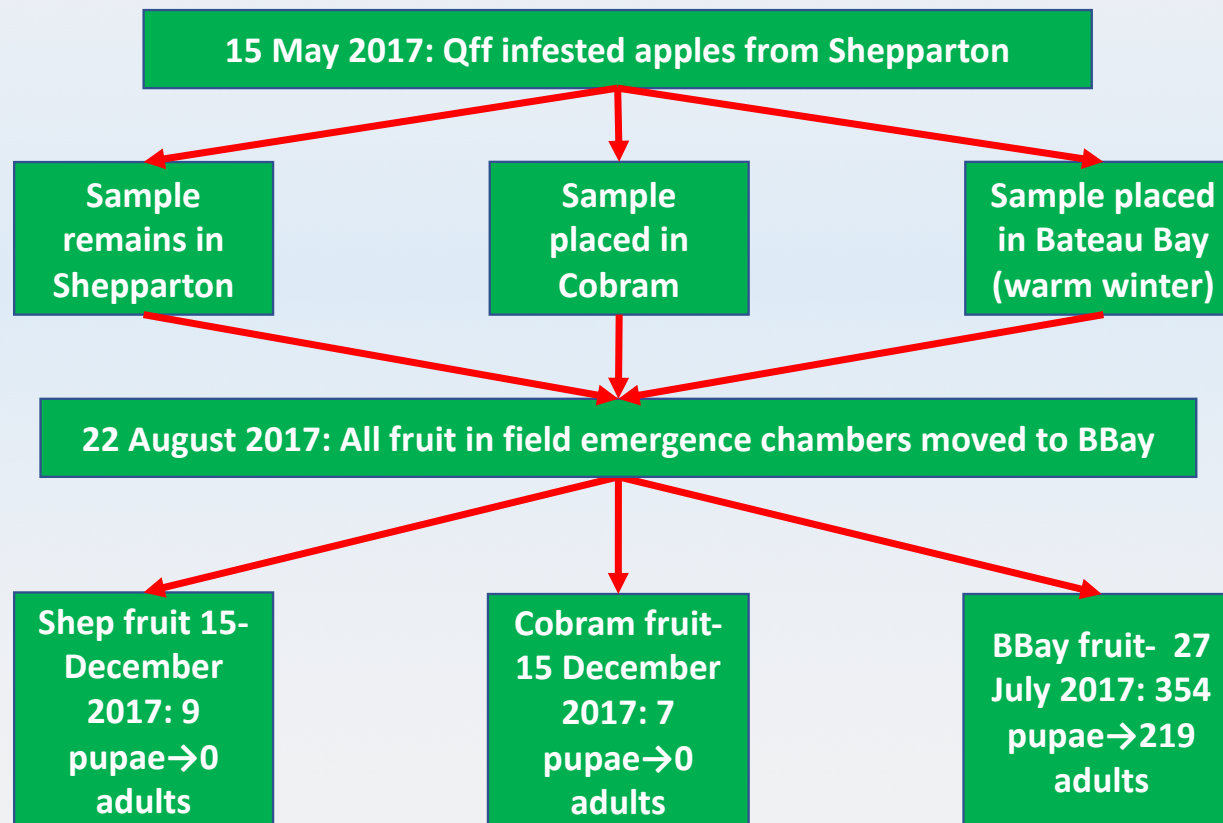
FLIES/ TRAP/ MONTH RECORDED IN THE GOULBURN MURRAY VALLEY FROM 2012 TO 2018 (DEDJTR DATA FROM 78 TRAPS)



Ratio of Qff/trap over entire GMV (330 traps from Strathbogie, Vic to Barooga, NSW)



IN WHICH LIFE STAGE/S DOES QFF OVERWINTER?



Field emergence chamber (uncovered) with potting mix, infested Pink Lady apples and digital temperature logger in place on-site in a Cobram backyard beneath a loquat tree.

- Qff eggs, larvae and pupae survived in or near the apples at BBay (between 5°C and 20°C) where accumulated DD above the Qff dev. threshold of 12.405°C was 261DD between fruit collection and adult eclosion.
- Qff perished under winter conditions at both Shep (-1.3°C to 19.8°C) and Cobram (0.2°C to 20°C). When Shep and Cobram fruit were moved to BBay there was no Qff development.
- 261DD from apple collection to adult eclosion for both Shep and Cobram fruit was est. to occur by early December.

- The last date of infestation after which Qff eggs, larvae and pupae perish due to the cold was estimated by working backwards by 261DD on Shep and Cobram temps.
- Qff eggs, larvae and pupae in fruit infested < **16 to 20 April** had sufficient warm days to allow adult emergence prior to the commencement of the lethal winter period. These may overwinter becoming the source of new infestations and population expansion in the following spring/ summer.
- Qff eggs and larvae in fruit and pupae in soil > mid-April will not survive the GMV winter.



Citrus

Grapefruit

Kumquat

Lemon

Mandarin

Citrus mixed

Orange winter

Orange summer

Other fruit

Avocado

Blackberry

Cherry

Feijoa

Fig

Grape

Indian fig

Loquat

Medlar

Mulberry

Nut Chestnut Walnut Almond

Olive

Persimmon

Pomegranate

Rose hip

Tomato

Pome & Stone fruit

Apple

Pear

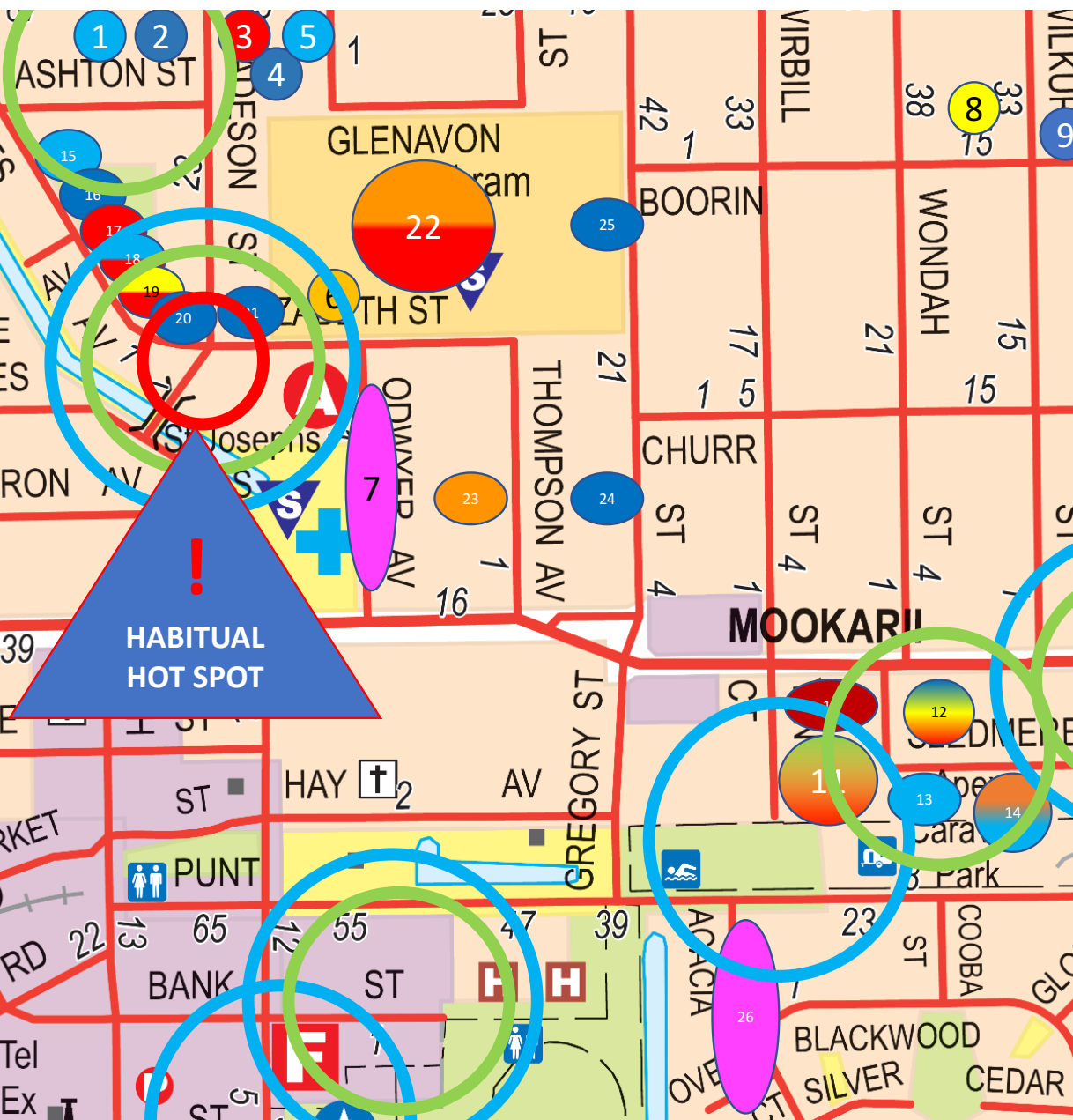
Pear Asian

Apricot

Peach Nectarine

Plum

Prunus street

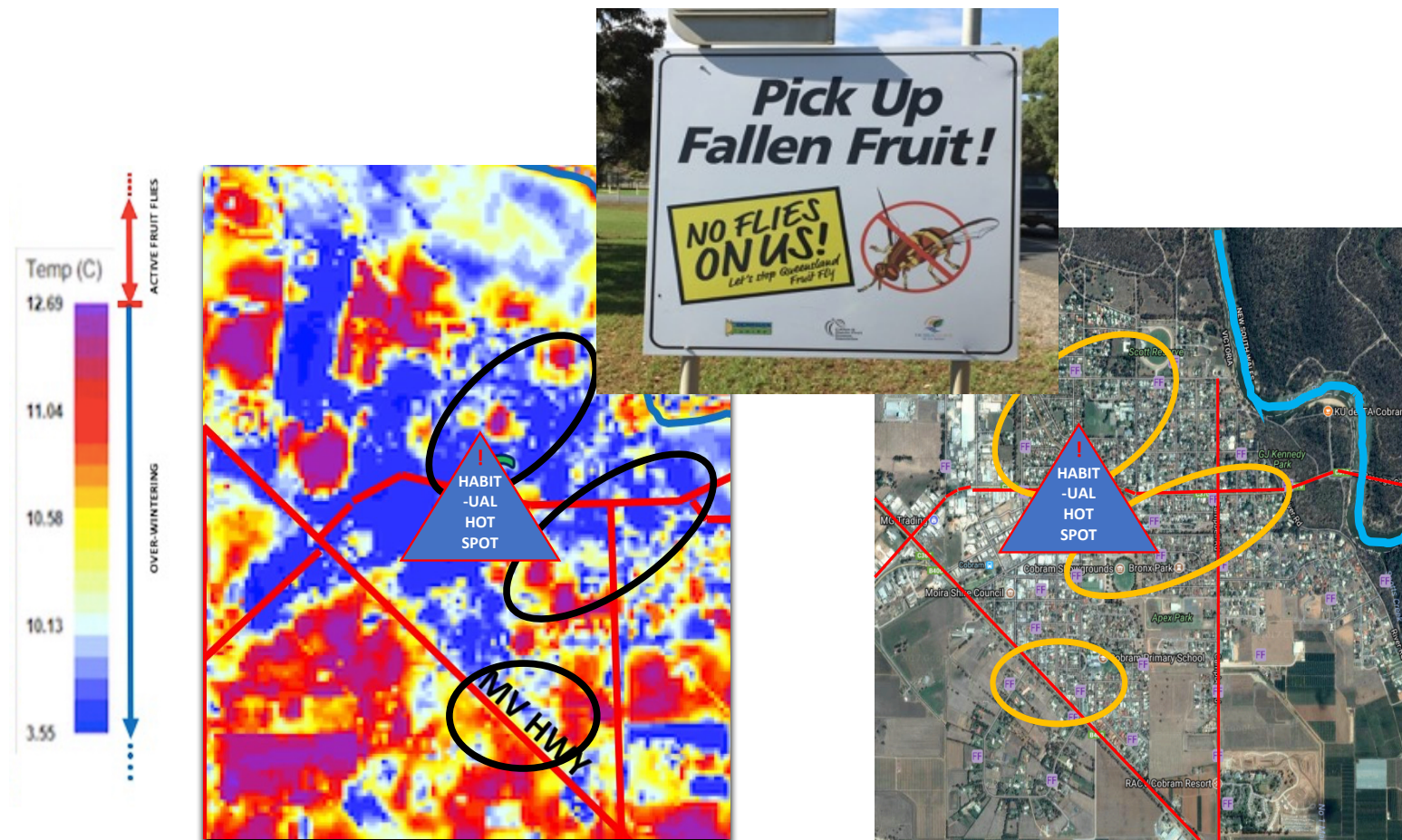


7. COBRAM

1. Apples and other fruit
2. Citrus
3. Peaches and plums
4. Citrus
5. Citrus (late)
6. Apricot
7. Prunus street trees
8. Fig
9. Lemon
10. Peach
11. Peaches, apples, lemon, lime, orange, finger lime, cumquat
12. Persimmons, figs, olives
13. Oranges (late)
14. Loquats, olives, citrus (late)
15. Citrus (late)
16. Olives
17. Plum
18. Citrus (late), peach
19. Figs, plum
20. Citrus
21. Citrus
22. Pioneer Park surrounded by house gardens with many plums, peaches, apricots, citrus, mulberry, kiwifruit
23. Loquat
24. Citrus
25. Citrus
26. Prunus street trees

BLUE circle: ≥1FTW – Sept 2017
 GREEN circle: ≥1FTW – Oct 2017
 RED circle: ≥1FTW – Nov 2017

Colour code	Fruit ripening time	Infestation risk
	Early	Low
	Early	Medium
	Early	High
	Mid-season	Low
	Mid-season	Medium
	Mid-season	High
	Late	Low
	Late	Medium
	Late	High



Thermal image (~1030h 27 May) of Cobram urban area with corresponding trap locations. Coloured ovals denote the September, October, November fruit fly “hot spots” for 2017

Questions:

1. Does Qff survive winter in the GMV?
2. If yes: where? and how?
3. Can something be done about it?



- **Yes:**

- Population predictions based on historical data and weather patterns
- Hot spot ID
- Education and awareness
- Tree removal

Answers:

- **Yes:**

- The more Qff present in late summer/ autumn the more will survive the winter
- (Winter survival) = (Spring/ summer Qff risk level)
- Risk level depends on:
 - Previous summer heat
 - Previous winter cold
 - Rain
 - Previous summer/ autumn Qff population

- **Host plants and warm spots:**

- Qff hosts available most of the year in town
- Warm spots exist near mid to late season Qff hosts and subsequent Qff hot spots
- Degree-days:
 - >mid-April Qff overwinter as adults
 - <mid-April Qff immatures produce adults prior to winter setting in
- High-risk mid-late season hosts: apples, feijoas, Indian figs, oranges, peaches, plums

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