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GOVERNMENT OF
WESTERN AUSTRALIA

Pest management in Olives

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AOA webinar series, 31st August 2021

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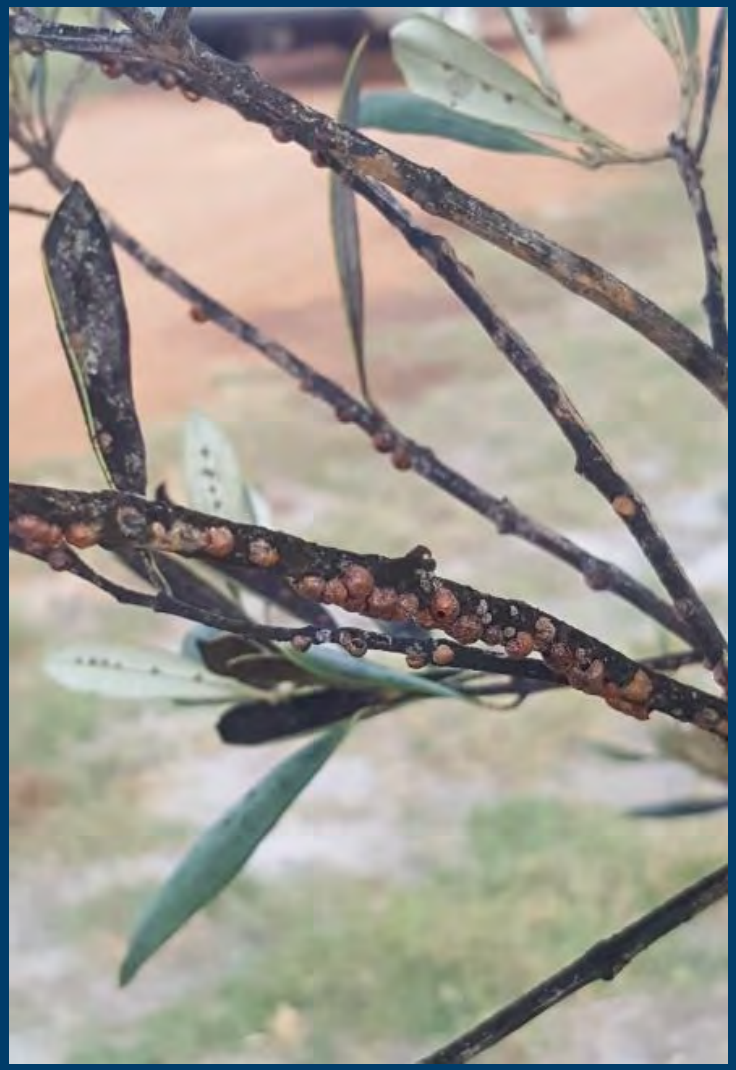
Pests of Olives

- Black Scale
- Apple Weevil (Curculio beetle)

- Pest status
- Identifying
- Life cycle and behaviour
- Management

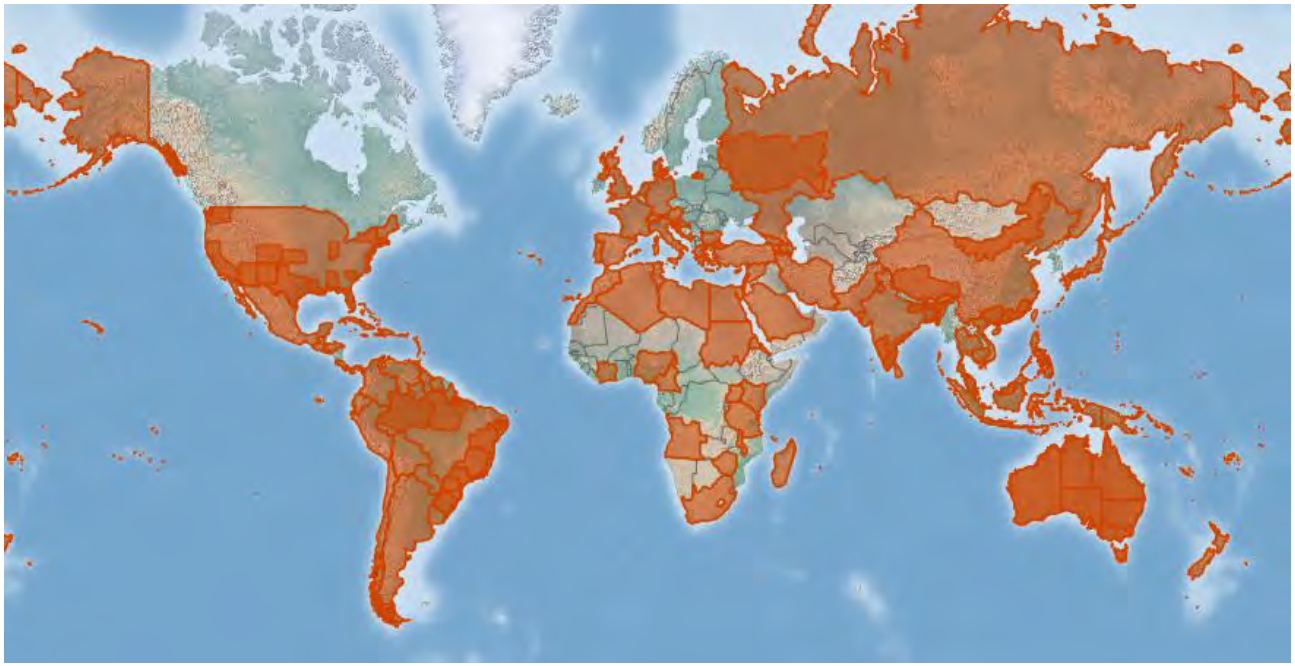


Pest Monitoring

- At least monthly – up to weekly
- Priority blocks
- Assess individual trees
- Monitor blocks, or sub-blocks separately
- Record monitoring data
- Re-check after management

Black Scale, *Saissetia oleae*

- Originally from South Africa
- Now distributed worldwide, with records in Europe, Asia, Africa, Australasia, the Pacific Islands and in the Americas



Source: CAB International, https://www.cabi.org/isc

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Black Scale, *Saissetia oleae*

- Severe infestations:
  - stunt growth
  - reduce tree vigour
  - twig and branch dieback
  - early leaf-drop
  - reduced yield
- The scales produce honeydew on which sooty mould grows.
- Sooty mould
  - interferes with photosynthesis
  - reduces tree vigour
  - reduces yield
  - taint oil
  - increase fruit washing costs at harvest.

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Black Scale, *Saissetia oleae*

Females

- 3-5 mm long
- 1-4 mm wide
- 1.2-2.5 mm high
- Dark brown, becoming almost black as they start to produce eggs
- H-shaped ridge on the back

Adults female black scale with associated sooty mould

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Black Scale, *Saissetia oleae*

Eggs

- 0.2-0.3mm long
- Pale orange, turn pink before hatching
- Red eye spots visible within eggs before hatching.

Crawlers

- Pale pinkish orange
- 0.2-0.3mm long
- Most abundant in summer, second smaller generation in autumn.

Black scale crawlers and eggs removed from scale. Photo S. Broughton

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Black Scale, *Saissetia oleae*

Instars

- First instar – 0.6-0.8mm long
- Second – 0.6-0.8mm long, ridge develops along back, four dark patched on back
- Third – 1-1.6mm long, ridges clearly present, light brown and darkens with age

First instar

Second instar

Third instar

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Black Scale, *Saissetia oleae*

Other scales

- Parlatoria (Parlatoria oleae)
- Red scale (Aonidiella aurantii)
- Latania (Hemiberlesia lataniae)
- Ross's black scale (Lindingaspis rossi)
- Circular black scale (Chrysomphalus aonidum)
- Oleander scale (Aspidiotus nerii)

Minor pests that are smaller than black scale

Parlatoria scale

Circular black scale

Red scale

Latania scale

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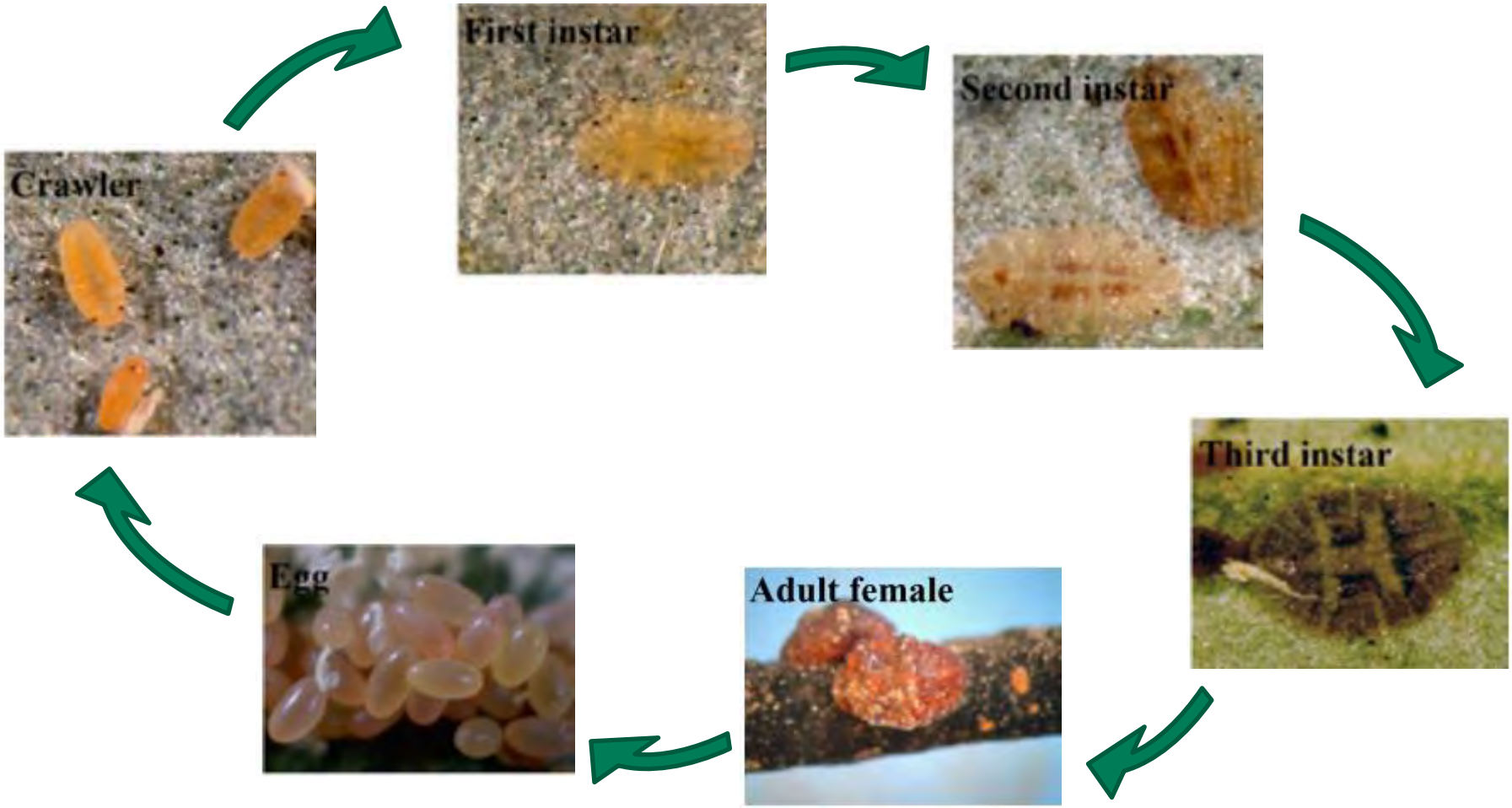
Black Scale, *Saissetia oleae*



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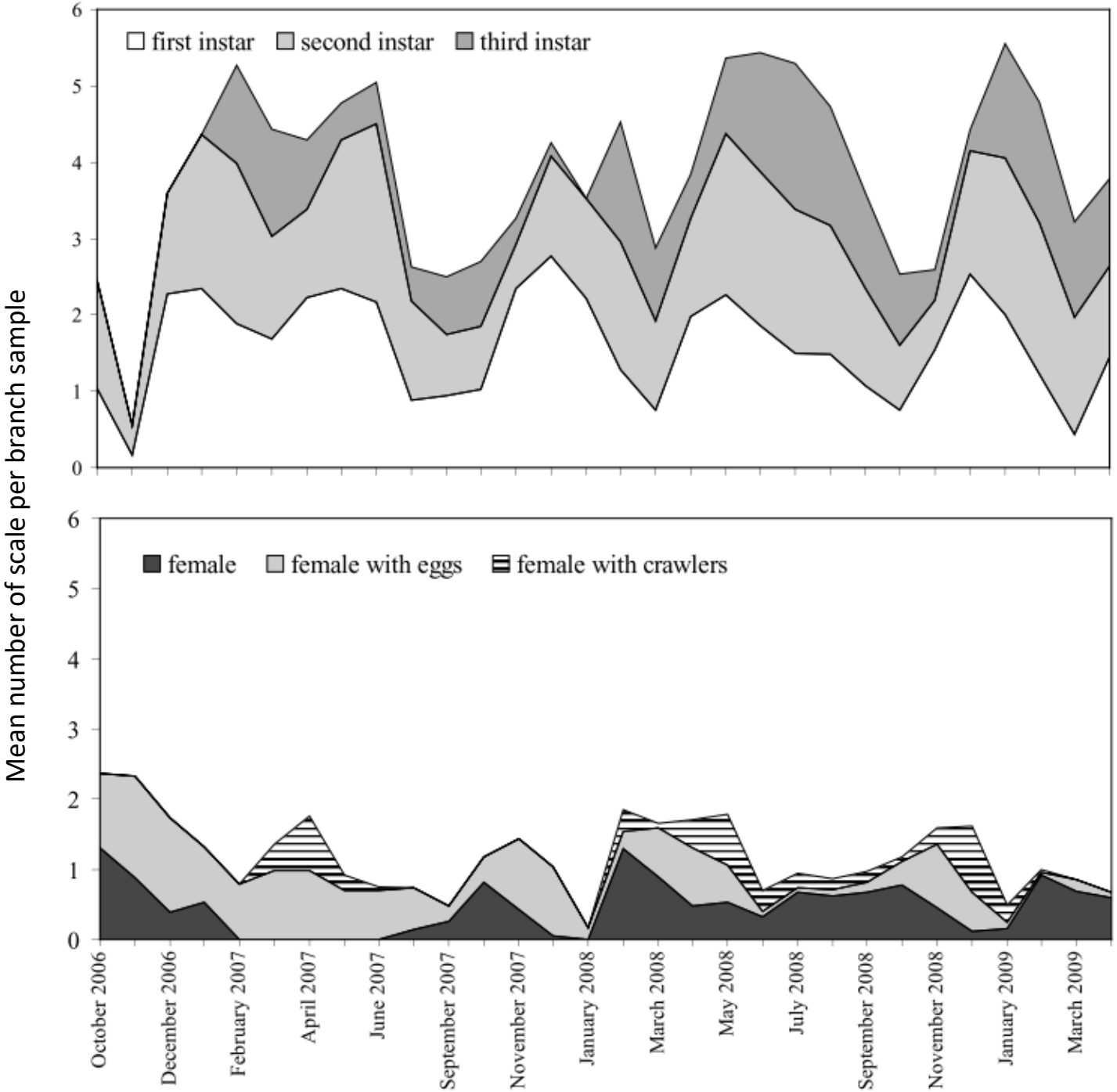
Black Scale, *Saissetia oleae*

- How prolific are they?
- What level of parasitism is there?
- What life stage is present?

Multiple life stages will be present at the same time

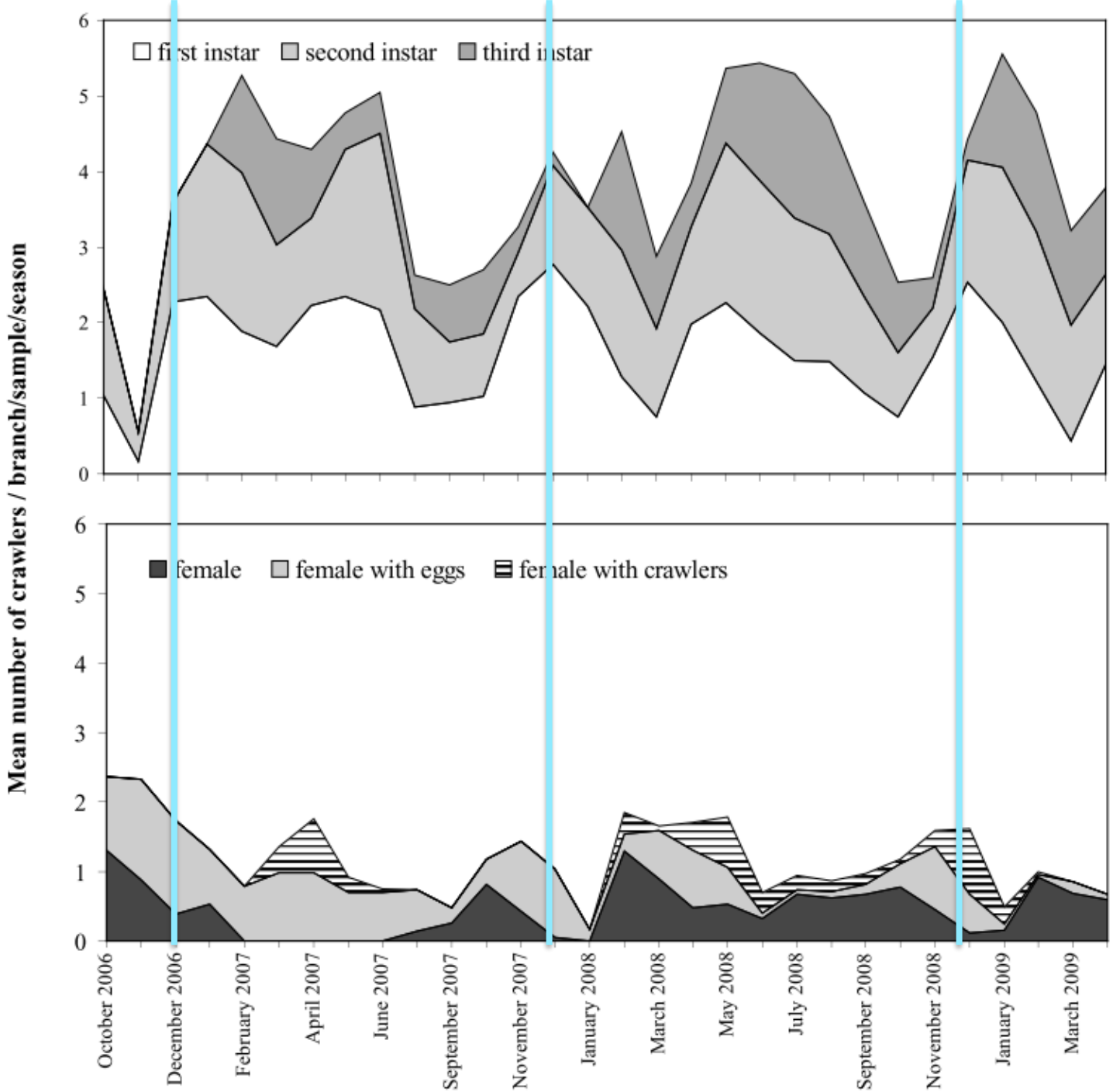
Exit hole made by the wasp *Scutellista caerulea* in an adult female black scale

Life-cycle & Behaviour



Source: Broughton, S. 7 Learmonth, S. 2012, Management of Black Scale and Apple Weevil in Olives

Life-cycle & Behaviour



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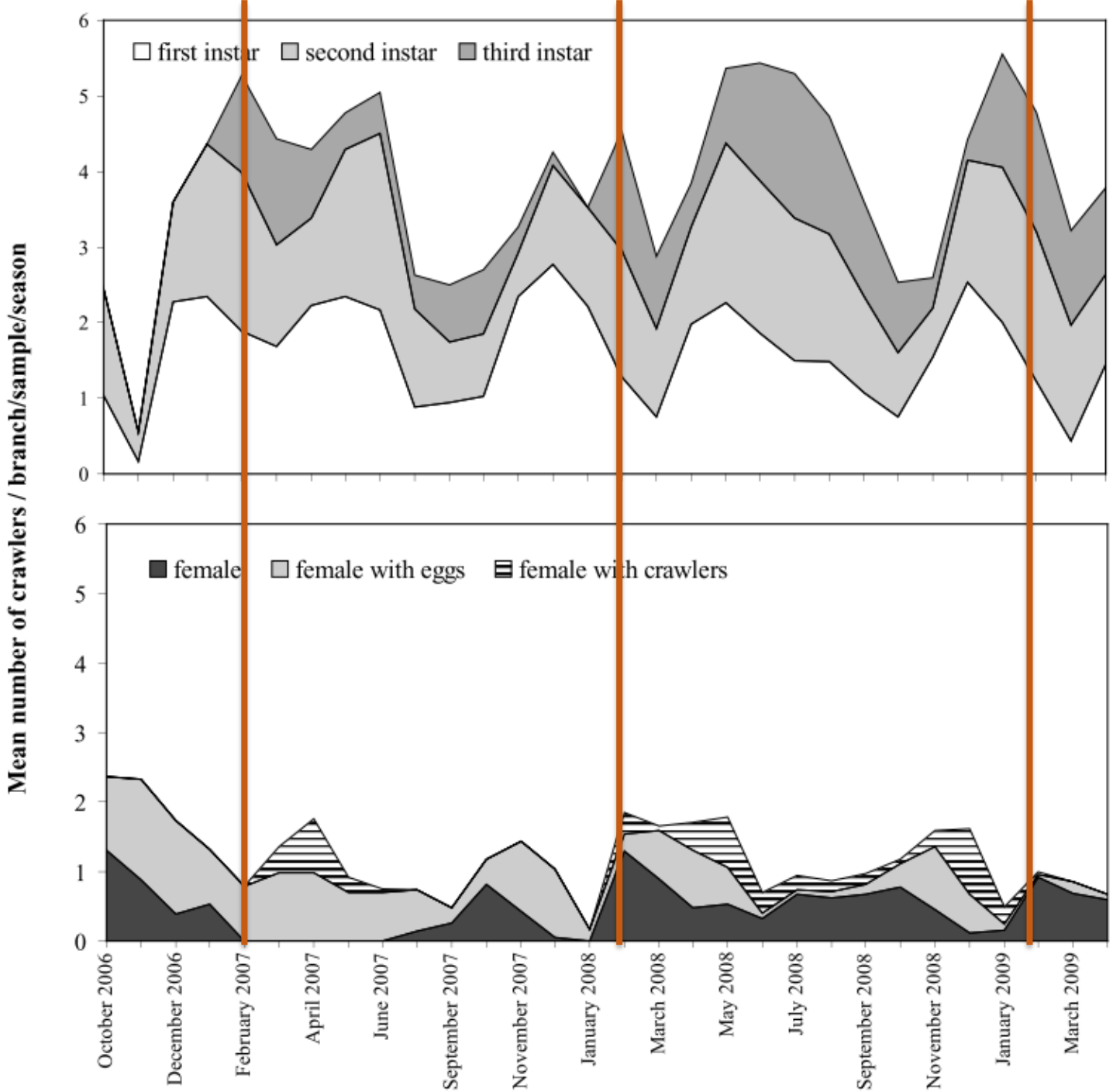

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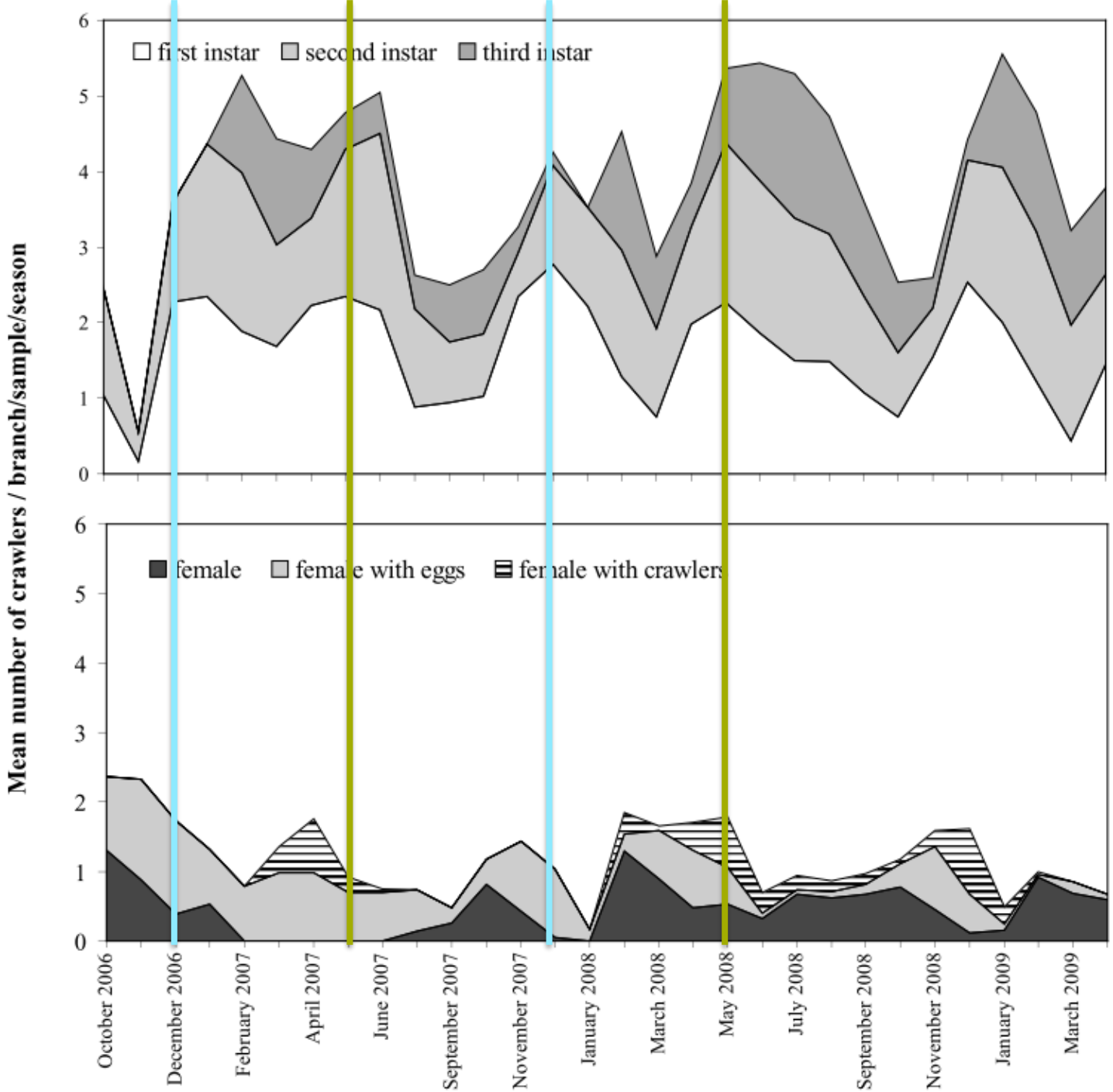

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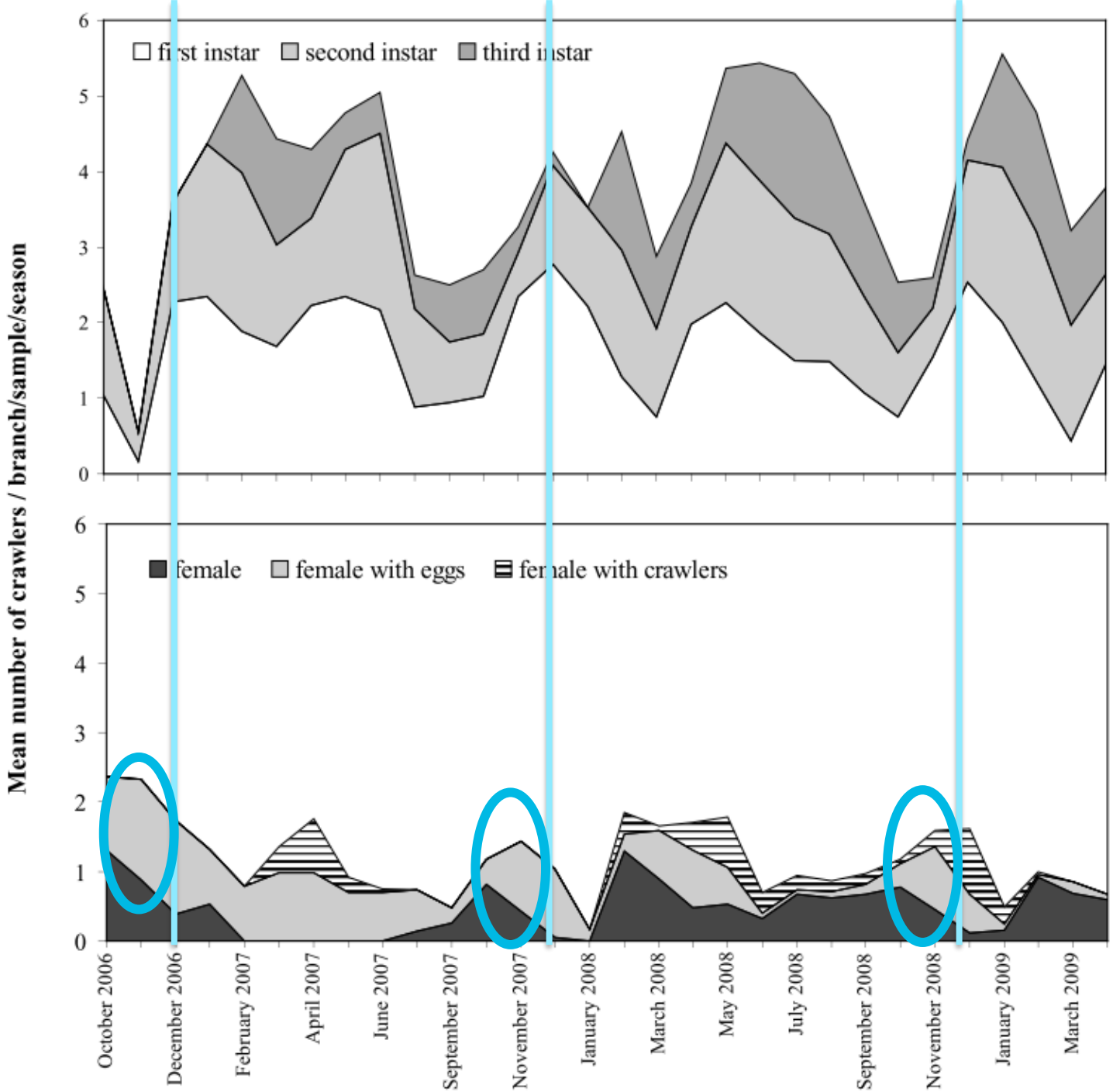

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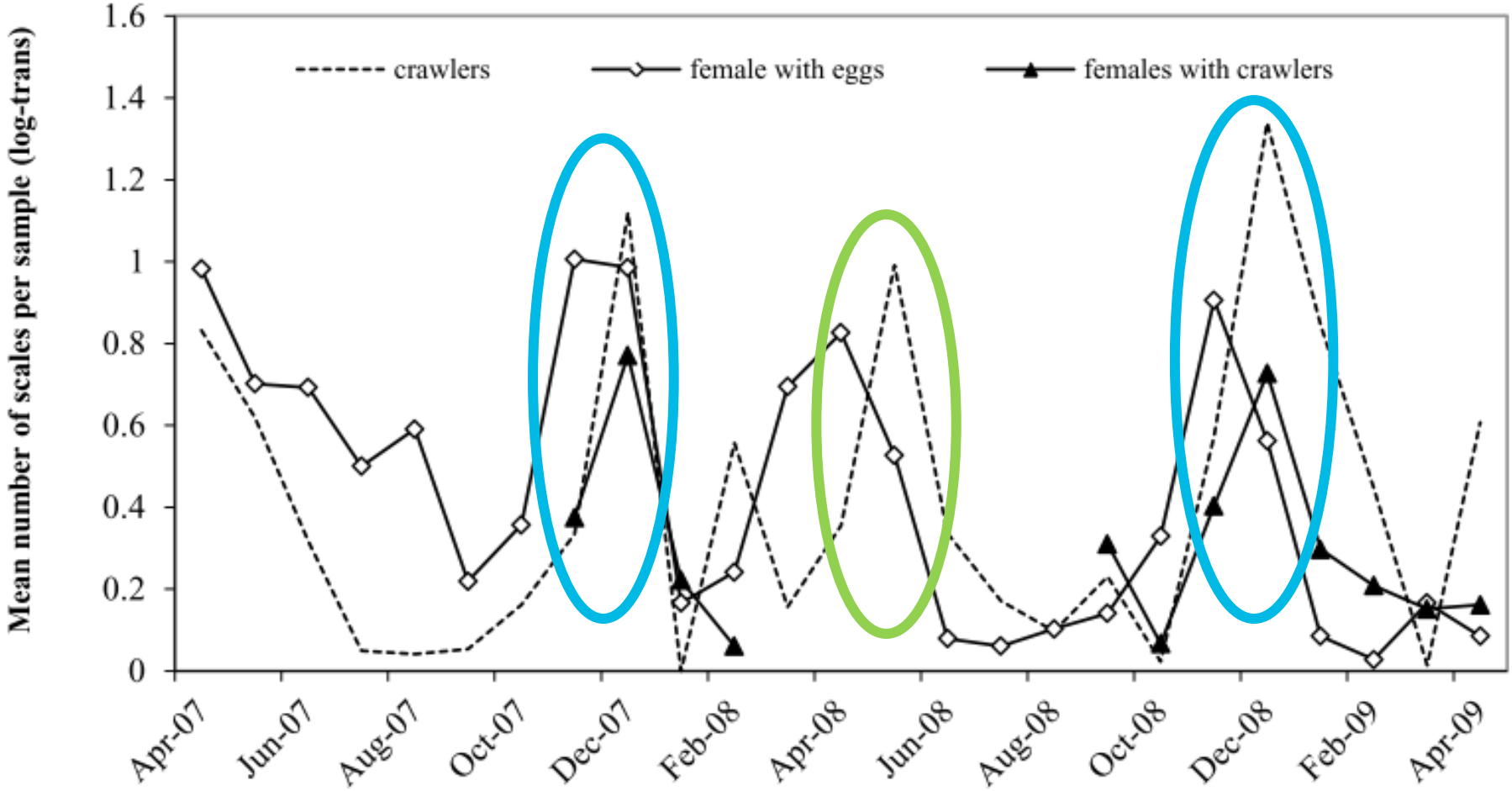

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Black Scale, *Saissetia oleae*

- Jar monitoring method
  - Collect twigs with adult scale
  - Store in a clear container with fine air holes
  - Store out of direct sunlight in an area that mimic the grove temperature
  - Check regularly
  - Once crawlers emerge confirm presence in the field

Scale can be kept in a jar with air holes to determine timing of emergence of crawlers

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Black Scale, *Saissetia oleae*

Cultural Strategies

- Good farm hygiene
- General tree health
  - Irrigation
  - Fertiliser
  - Soil health
- Canopy management
  - Open canopies are less conducive environments
- Managing the surrounding landscape
  - Alternative hosts
  - Food supply for beneficials

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Black Scale, *Saissetia oleae*

Biological strategies

- Beneficial invertebrates
  - predators
  - parasitoids

Example of different species of predatory ladybirds of black scale

Remains of a black scale that has been fed on by a ladybird

Cryptolaemus montrouzieri larva feeding on black scale

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Black Scale, *Saissetia oleae*

Parasitoids

- Scutellista
- Metaphycus

Black scale with parasitic wasp larvae

Exit holes from parasitic wasps

Black scale with eggs, crawlers, hatched eggs and parasitic wasp larvae pupa under scale

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Black Scale, *Saissetia oleae*

Ants

- Physical or chemical barriers
- Pruning tree branches in contact with the ground
- Ant baits and sprays

Ants are often associated with black scale

Black Scale, *Saissetia oleae*

Active ingredient; concentration	Rate	Withholding period (days)	Comments
Paraffinic oil	1L/100L	1 day	• Best results achieved when applied to crawlers in spring • Minimum of 1000L water/ha
Emulsifiable botanical oil	1L/100L	Not required when used as directed	• Apply at early signs of scale • Apply two sprays at 7 day intervals. Repeat if needed • Spray to run-off
Fenoxycarb, e.g. Insegar	40g/100L	8 weeks	• Make first application when scale hatchings are at 75% and the second application when hatchings are at 100% • Minimum retreatment interval 10 days • Ensure thorough coverage • No more than two applications per season
Pyriproxyfen	50mL/100L	7 days	• Apply at the time of crawler release • Do not apply more than twice in any one season
Acetamiprid & Pyriproxyfen, e.g. Trivor	40mL/100L or 800mL/ha	28 days	• Apply when monitoring indicates onset of crawler release • Do not target populations where mature adults dominate the population • Do not apply more than 2 applications per season • Do not apply more than 2 applications per season

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Apple weevil, *Otiorhynchus cribricoliis*

Adults

- approx. 8mm long
- shiny dark reddish-brown
- long rows of pits on their back bearing spines
- slightly bulbous abdomen
- ‘play dead’ when disturbed

Larvae

- C-shaped
- legless
- white to cream coloured
- brown head capsule
- obvious black jaws
- indistinguishable from garden weevil larvae

Apple weevil adult and larva

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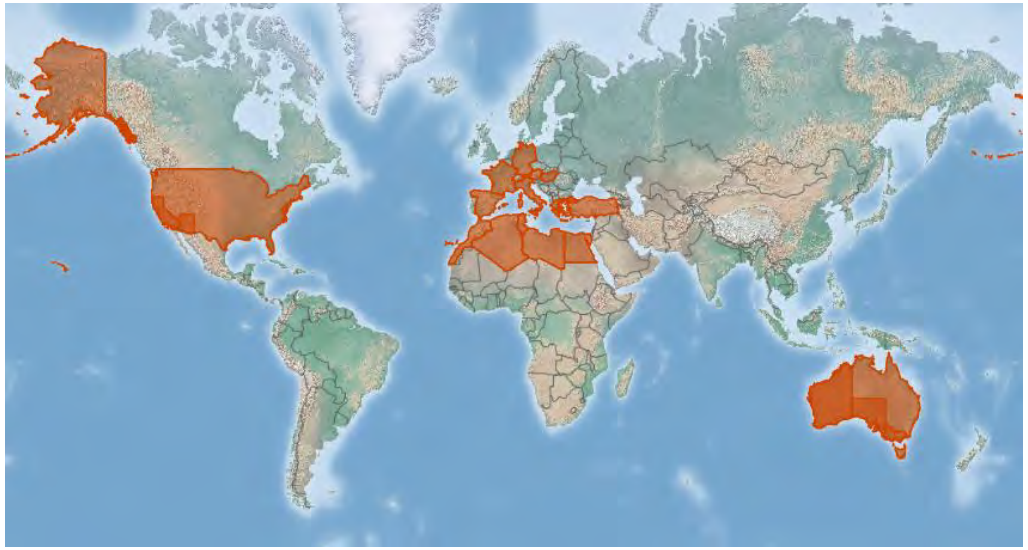
Apple weevil, *Otiorhynchus cribricollis*

- Native to the Mediterranean
- Considered a pest in coastal parts of southern Australia with Mediterranean or warm temperate climate
- Inland NSW, Vic, SA and WA although quite minor pest in some of those areas

National distribution of apple weevil (source: ala.org)



Global distribution of apple weevil (source: CABI.org)

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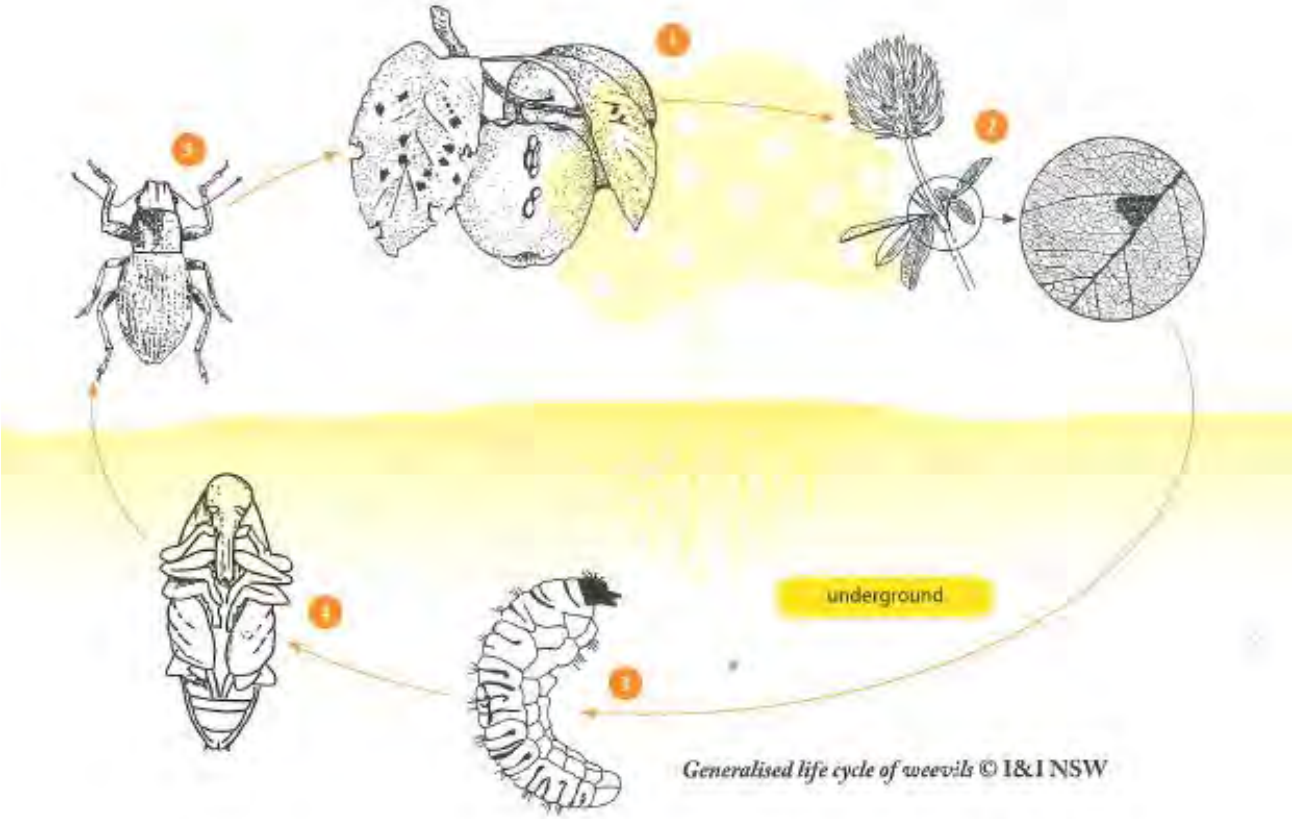
Apple weevil, *Otiorhynchus cribricoliis*

- Adults are the primary pest
- Feed on shots and foliage – scalloped edge
- Can defoliate young trees and kill young branches and growing tips.
- Concern in establishment

Root damage caused by weevil larvae

Foliar feeding damage from apple weevil adults

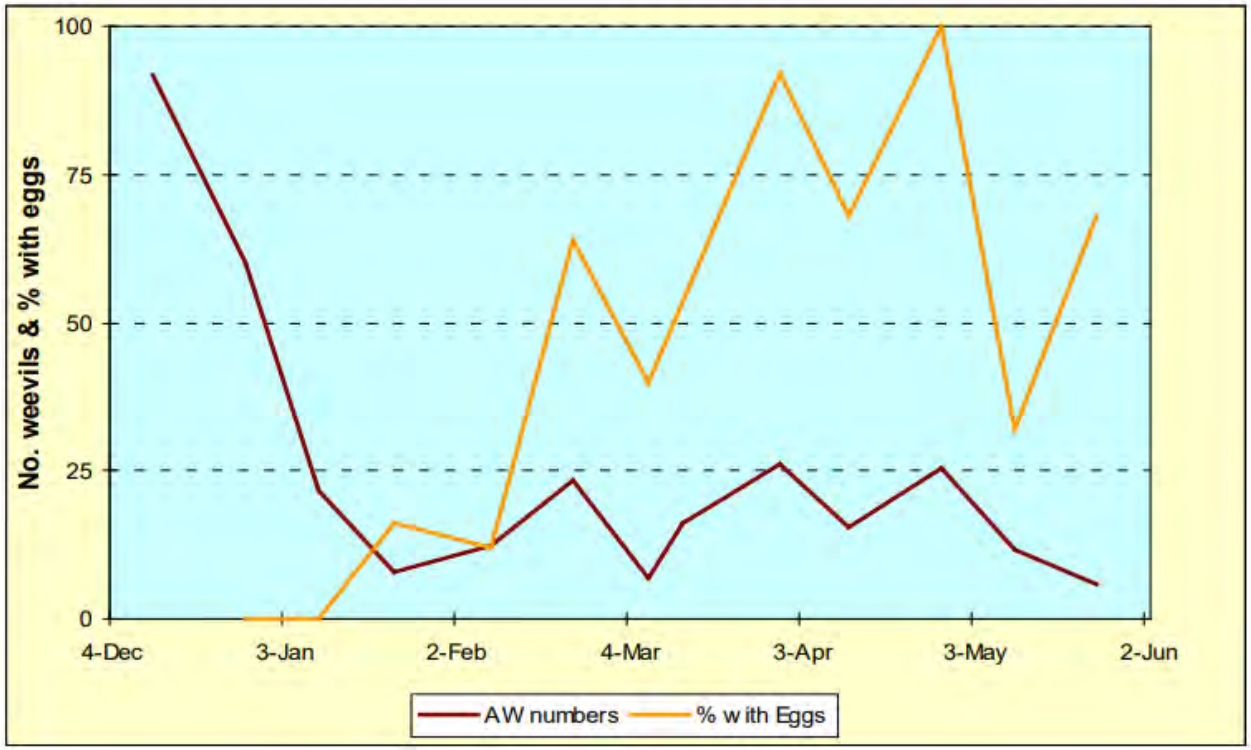
Apple weevil, *Otiorhynchus cribricoliis*



Generalised life cycle of weevils © I&I NSW

Apple weevil, *Otiorhynchus cribricoliis*

- Inactive during hottest part of the summer
- Adults nocturnal - Climb into tree to feed at night.



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Apple weevil, *Otiorhynchus cribricoliis*

- Check new plantings for leaf and stem feeding.
- Confirm whether these weevils are the cause by observations at night.

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Apple weevil, *Otiorhynchus cribricoliis*

Cultural control methods

- Trunk bands
  - Crafter's batting
  - More effective if sprayed with chilli or pyrethrum products.
- Minimise weeds such as capeweed, sorrel and dandelion that benefit weevils.
- Poultry
- Nematodes??

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Apple weevil, *Otiorhynchus cribricoliis*

Chemical control methods

Active ingredient; concentration	Products	Rate	Withholding period (days)	Comments
alpha-cypermethrin; 100g/L	Various e.g. Dominex Duo	100mL/100L	Not required when used as directed	• Do not apply more than 2 applications per season. • Drench spray to the butts if trees and the ground around the butt • It is recommended that this treatment NOT be applied to trees older than 2 years to maximise beneficial predators and parasites.

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Other significant Pests

- Olive lace bug

- Fruit flies
- Grasshoppers/locusts
- Green vegetable bug
- Olive bud mite
- Rutherglen bug
- Armoured scale
- African black beetle
- Cicadas
- LBAM
- Snails
- Thrips

Olive lace bug adults and nymphs

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Thank you

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