Carpophilus beetle & carob moth

PIT Groups

November 9 & 10, 2022

Hort Innovation

australian almonds
ALMOND BOARD OF AUSTRALIA

SARDI
SOUTH AUSTRALIAN RESEARCH AND DEVELOPMENT INSTITUTE

NSW GOVERNMENT Department of Primary Industries

VICTORIA State Government Jobs, Precincts and Regions

Almond IPM: Project team

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SARDI: Field application
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Past valuable contributors:
Mofakhar Hossain (parasitoids/pesticides)
Farrukh Baig (PhD, pheromones)
Daniel Lai (insect culturing)
Geoff Furness (SA fieldwork)

Collaboration with IDM team

Almond IPM

Carpophilus beetle & carob moth

Identification & life cycle

Damage

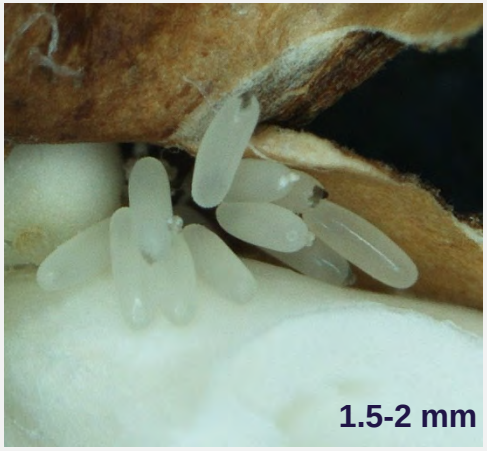
Monitoring

Management

Almond IPM: Carpophilus beetle (CB)

Carpophilus truncatus

9+ months?



2 to 4 days

3-5 weeks

Brazil nut
Candlenut
Cashew
Pistachio
Quandong
Walnut
wattle seed

12 to 20 days

4 to 14 days

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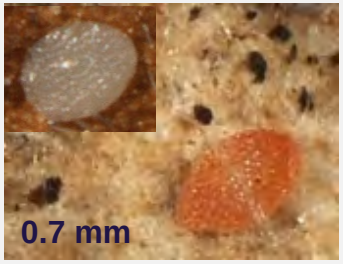
Almond IPM: Carob moth (CM)

Apomyelois ceratoniae



6 to 10 days

2 to 3 days

6 to 10 days

40 to 50 days

Almond
Apple
Apricot
Black locust
Blue palo verde
Canna
Carob
Cherimoya
Chestnut
Chinese fan palm
Date
Fig
Flame of the forest
Grape (dried)
Grapefruit
Guava
Honey locust
Japanese quince
Loquat
Macadamia
Natal plum
Oak
Olive
Orange
Peanut
Pigeon pea
Pistachio
Pomegranate
Poplar
Tamarind
Walnut

Almond IPM: Crop residues are critical

Both pests survive winter and breed in mummy nuts

Almond IPM: Crop infestation

Both pes
soon afte

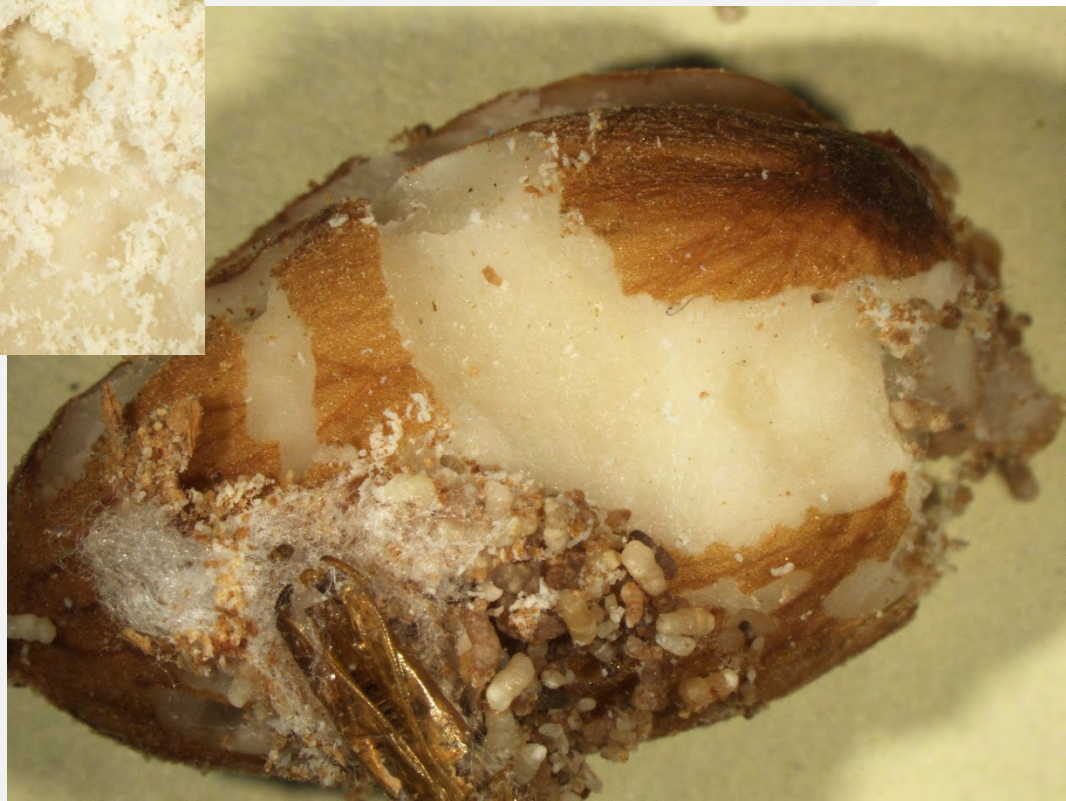
Almond IPM: Kernel damage

Carpophilus

- Fine meal
- No webbing
- Skin often left

Carob moth

- Coarse frass
- Webbing
- Skin often consumed



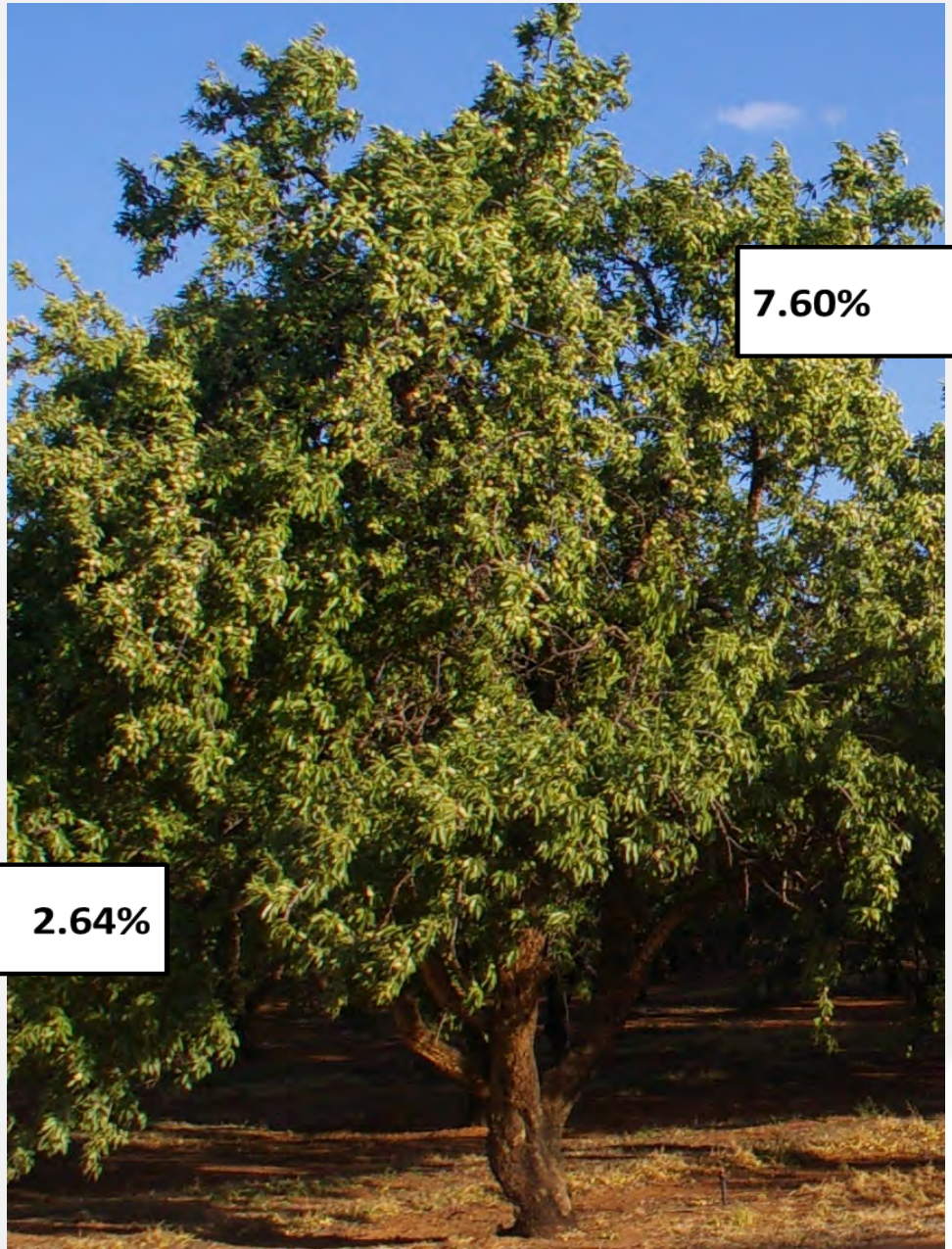
Almond IPM: Monitoring - nuts at harvest

% kernel damage by carpophilus beetle

0.55%

1.68%

2.64%



% kernel damage by carob moth

7.60%

1.00%

0.10%

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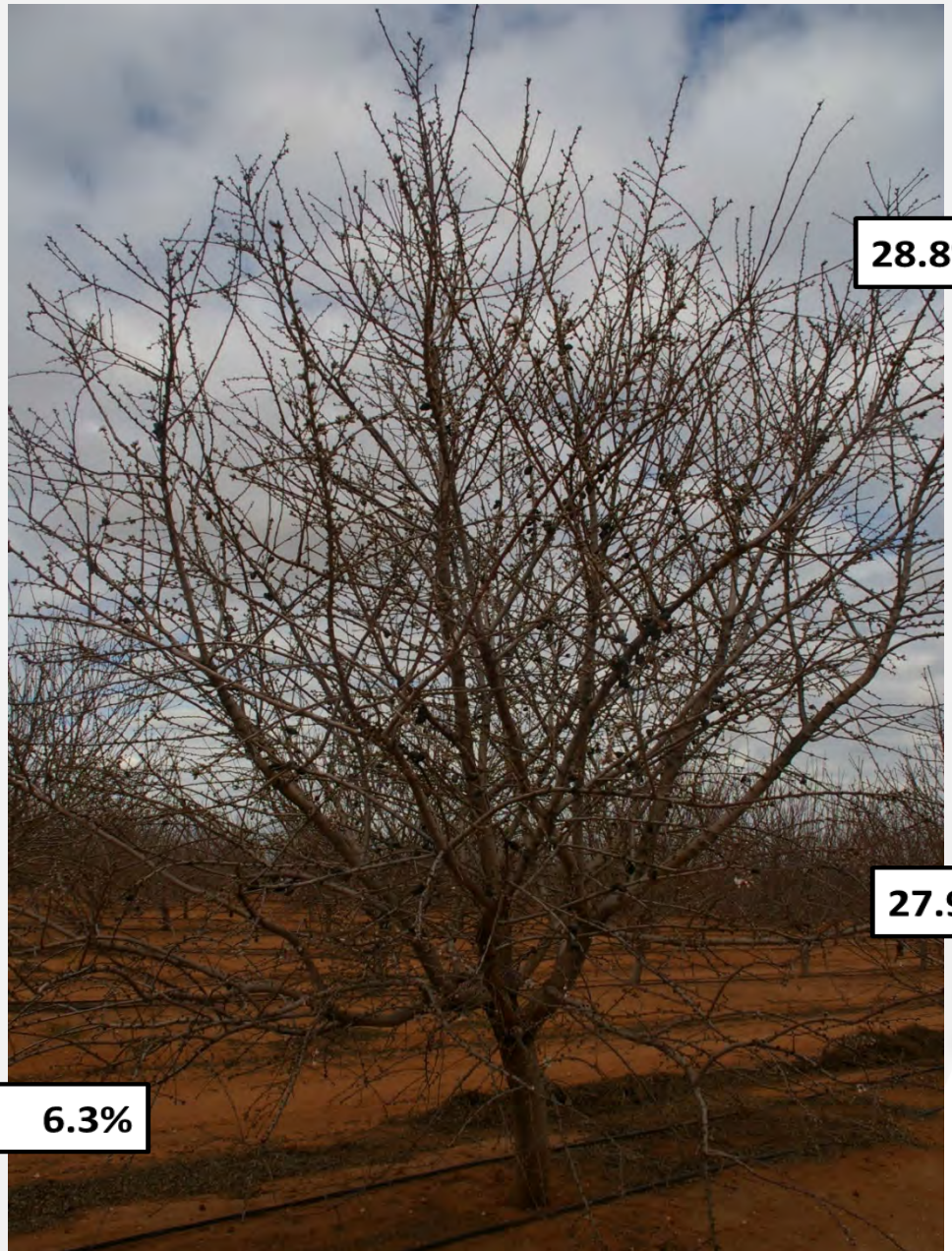
Almond IPM: Monitoring - nuts in winter

% mummies with carpophilus beetle

1.2%

1.0%

6.3%



% mummies with carob moth

28.8%

27.9%

19.5%

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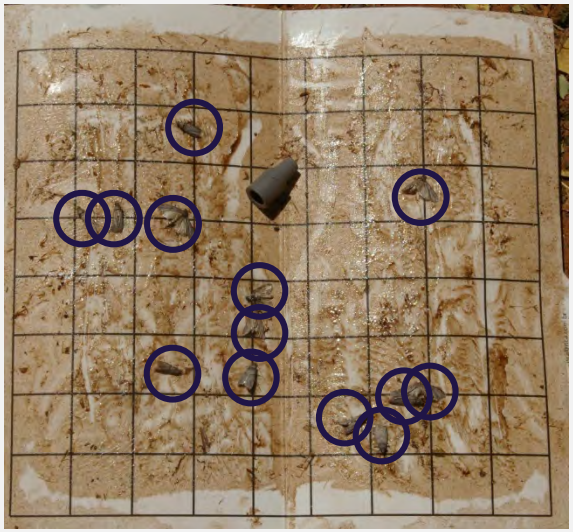
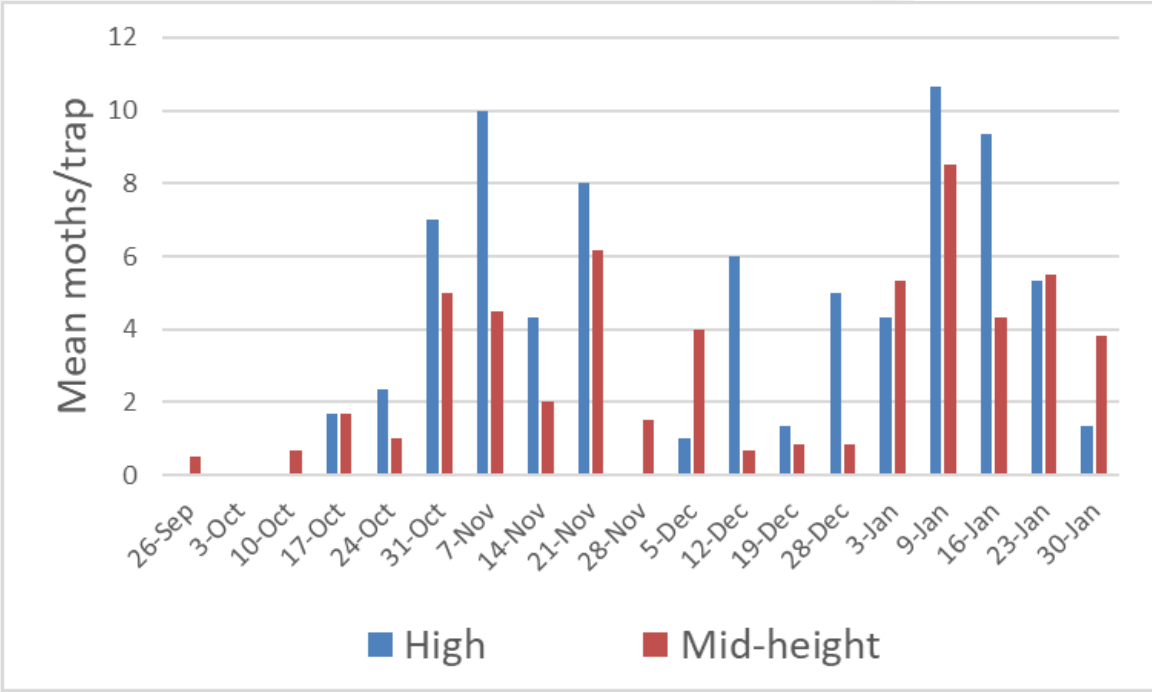
Almond IPM: Monitoring - CB traps

Carpophilus Catcha

Almond IPM: Monitoring - CM traps





High traps generally (not always) catch more moths

Almond IPM: Management - hygiene

Carpophilus beetle

At a local level (within 100 metres or so)

No such link for carob moth at this local level

More nuts on trees in winter

more damage at harvest

Higher infestation level in winter

Almond IPM: Management

CB Mass trapping?

CM Mating disruption?

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Almond IPM: Management - biocontrol

Carob moth: biological control?

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Almond IPM: Management - pesticides

Chlorantraniliprole “specifically designed for use in Integrated Pest Management (IPM) schemes” **CM-S/HS**

Spinetoram “Use as part of an IPM system, ensure good orchard hygiene with the removal of mummified fruit in winter” **CM-S/HS**

Methoxyfenozide “Practice good orchard hygiene with the removal of mummified fruit in winter” **CM-S/HS**

Tetraniliprole “…should form part of and integrated pest management program (to manage carpophilus beetle populations) with a focus on orchard hygiene” **CM-S/HS CB-HS**

Clothianidin “Toxic to non-target arthropods. Not compatible with integrated pest management (IPM) programs utilising beneficial arthropods” **CM-HS CB-HS**

Bifenthrin “is a synthetic pyrethroid with broad-spectrum activity and the compound is likely to be detrimental to resident beneficial insects. It is recommended that bifenthrin based products not be used where integrated pest management is practiced. **CB-?**

Almond IPM:

To summarise:

- Two very costly insect pests
- Both pests rely on unharvested nuts for seasonal carryover & population build-up
- Unharvested nuts translate directly to kernel damage at harvest
- Orchard hygiene is the key to management of both pests

^ which starts at harvest

Almond IPM: Thanks for listening!

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AGRICULTURE VICTORIA

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