



Ministry of Agriculture
Plant Quarantine and Phytosanitary Service
(PQPS)



FALSE CODLING MOTH
(*Thaumatotibia leucotreta*)

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Outline

- i. Identification
- ii. Distribution
- iii. Host Plants / Crops
- iv. Pest Biology (life cycle)
- v. Survey Protocols
- vi. Sample Screening
- vii. Data Collection
- viii. Conclusion

Identification

Scientific Name:

Thaumatotibia leucotreta (Meyrick, 1913)

Taxonomic Position

- Class: Insecta
- Order: Lepidoptera
- Family: Tortricidae
- Genus: *Thaumatotibia*

Type of Pest:

- Moth , Borer

Common Names:

- Citrus codling moth,
- Orange codling moth
- False Codling Moth
- Orange Moth

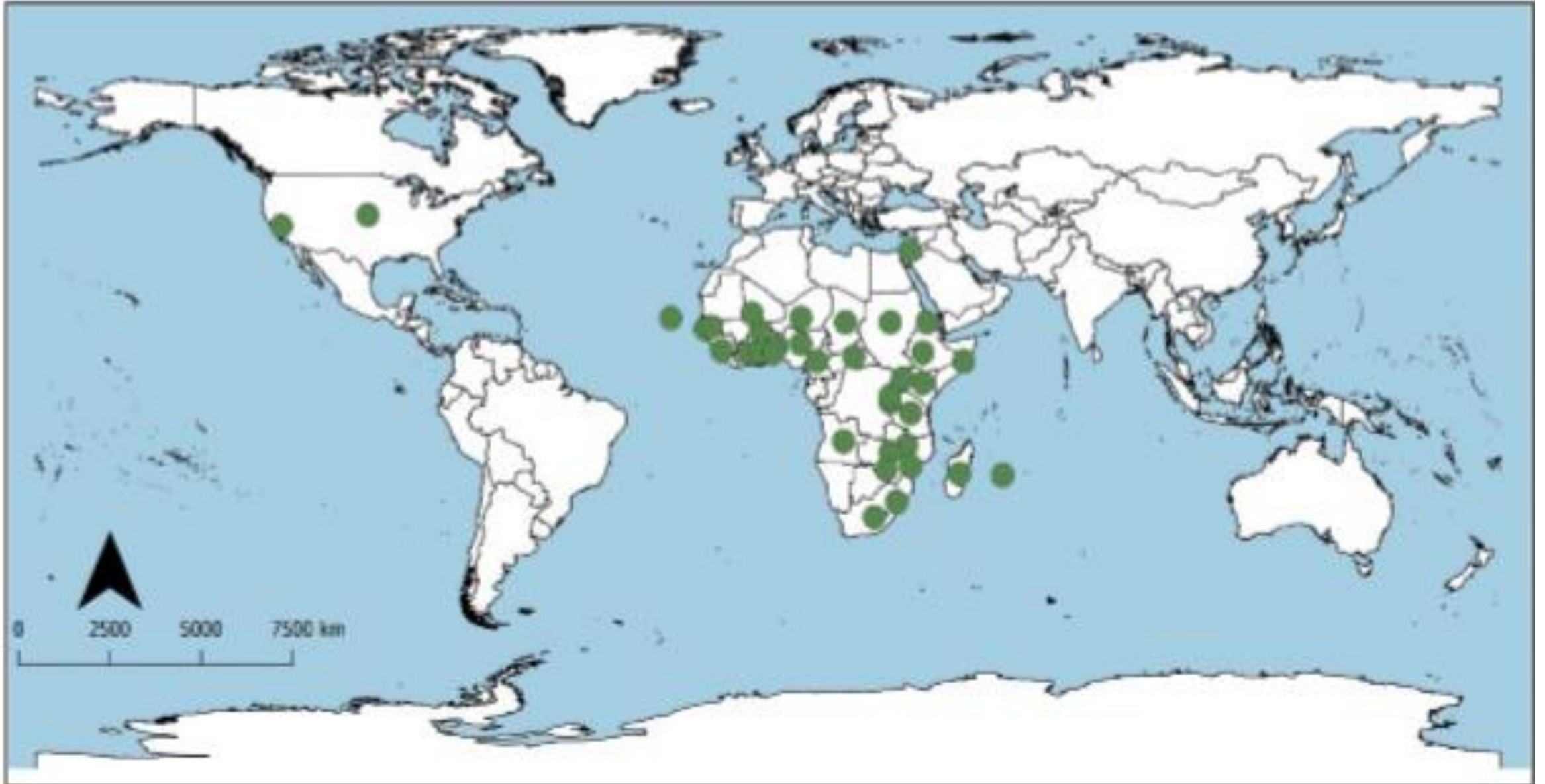


Fig 1. *Thaumatotibia leucotreta* adult male (T. M. Gilligan and M.E. Epstein, TortAI: Tortricids of Agricultural Importance, USDA APHIS PPQ, Bugwood.org).

Distribution of FCM

- False Codling Moth is native and widespread throughout sub-Saharan Africa. It also occurs on some Indian and Atlantic Ocean islands such as Mauritius and Madagascar.
- Since the 1980's FCM has established in Israel. It was intercepted once in a consignment in the USA in 2008, but extensive surveys did not find established populations of FCM in the USA at that time.
- It has occasionally been detected in the Netherlands, UK and Sweden, but these are thought to be incidental collections and not to originate from established populations as temperatures in these regions are too cold to support permanent population establishment of FCM.

Cont' Distribution of FCM



False codling moth, *Thaumatotibia leucotreta*, distribution. Data from CABI (2017). Map drawn by C.S. Bazelet.

Host Plants / Crops of FCM

Known Hosts

- *Thaumatotibia Leucotreta* is extremely polyphagous with over 70 host plants recorded worldwide in 40 plant families.
- False codling Moth is a pest of significant economic importance because of its wide host range with many of the plants it occurs on being valuable and food crop commodities

Preferred Hosts

Capsicum spp. (peppers), *Citrus* spp. (citrus), *Gossypium* spp. (cotton), *Litchi chinensis* (litchi), *Macadamia* spp. (macadamia), *Persea americana* (avocado), *Prunus persica* (peach), *Punica granatum* (pomegranate), *Ricinus communis* (castor bean), and *Zea mays* (corn).

Other Hosts

Butilon spp. (Indian mallow), *Albuca* sp., *Annona cherimola* (cherimoya), *Annona glabra* (pond apple), *Annona muricata* (soursop), *Annona reticulata* (Bullock's heart), *Annona squamosa* (sugar apple), *Asparagus crassifolius*, *Averrhoa carambola* (carambola), *Bauhinia galpinii* (red bauhinia), *Caesalpinia pulcherrima* (pride-of-Barbados), *Caesalpinia* spp.

Biology of False Codling Moth

The False Codling Moth has a complete life cycle;

- **Egg**

Size: 0.9 mm long Duration: 9-12 days winter; 6-8 days in summer Eggs are flattish and oval.

- **Larva**

Final instar size: 15 mm long Duration: 35-67 days in winter, 25-35 days in summer, Early instars are pale and spotted. Later instars are bright pink and can be distinguished from other species under the microscope by using several larval morphological features on the head, thorax, and abdomen.



FCM larvae.

Cont' Biology of False Codling Moth

- **Pupa**

Size: 11 mm long Duration: 29-40 days in winter, 21-24 days in summer Pupae are contained within a tough cocoon in the soil. The pre-pupal stage is light beige.

- **Adult**

Size: male: 15-16 mm, female: 19-20 mm wingspan Duration: 2-3 weeks Number of eggs laid by single female: 100-400 eggs

Adults are easily recognizable by a triangular marking on the other edge of the wing, with a c-shaped black marking above it.

Adult males have a tuft of fine hairs on the hind wing for sensing as well as a tuft of elongated scales on the hind tibia and abdominal terminus



FCM adult wings. Female on left (no scent organ on hind wing); male on right (scent organ on hind wing - androchonia).

Survey Protocol

Survey protocol

Target life stage

The approved survey method is use of pheromone traps for adult males

Recommended Lures and Traps

- FCM Pherolure is composed of E8-12Ac and Z8-12Ac.
- Yellow Delta Traps

Trap Placement and Spacing

- Traps should be placed at least 1.5 m high.
- Do not include lures for other target species in the trap when trapping for *Thaumatotibia leucotreta*

Trap Servicing

- The lure is effective for 56 days



Sample screening

Pest Identification and Diagnostics

- The approved diagnostic method is morphological identification. Male *Thaumatotibia leucotreta* moths can be distinguished from other tortricid species by the pocket of multicolored scales near the bottom edge of the hindwing (hindwing scale pocket). Additionally, the forewings have a scalloped line of black scales near the distal edge of the wing that has a break approximately $\frac{2}{3}$ of the distance from the forward edge. Just beyond the midpoint of the wing near the middle there is a distinct white/cream colored spot.
- Suspect *T. leucotreta* in traps that need to be forwarded to another facility for identification should be packed following the steps outlined in **Fig. 4**.

Cont' Sample Screening



The hindwing scale pocket is only present in *T. leucotreta* males. Other members of the genus have similar structures, but none look like this.

Figure 3. Important diagnostic features for male *T. leucotreta*: wing pattern (red outline), and hindwing scale pocket (red arrow) (Left Image by J. Brambila; Right image by T. Gilligan,)

Cont' Sample Screening

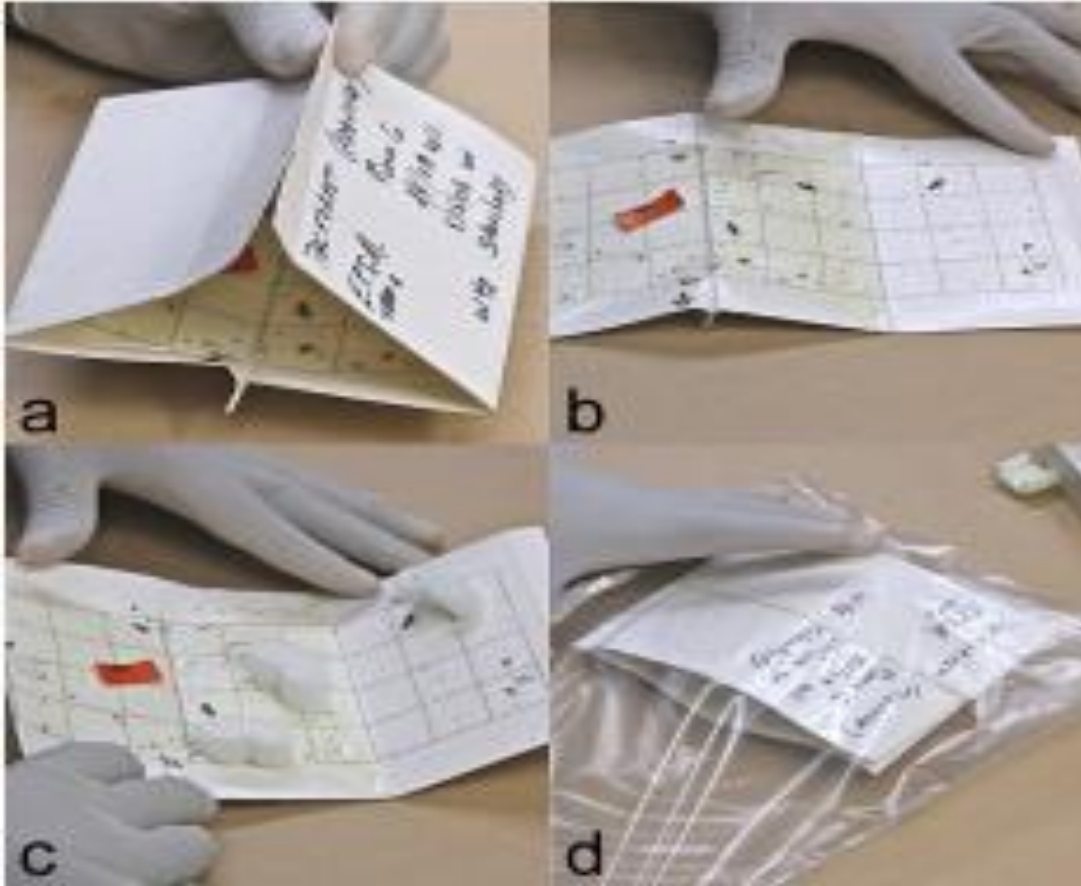
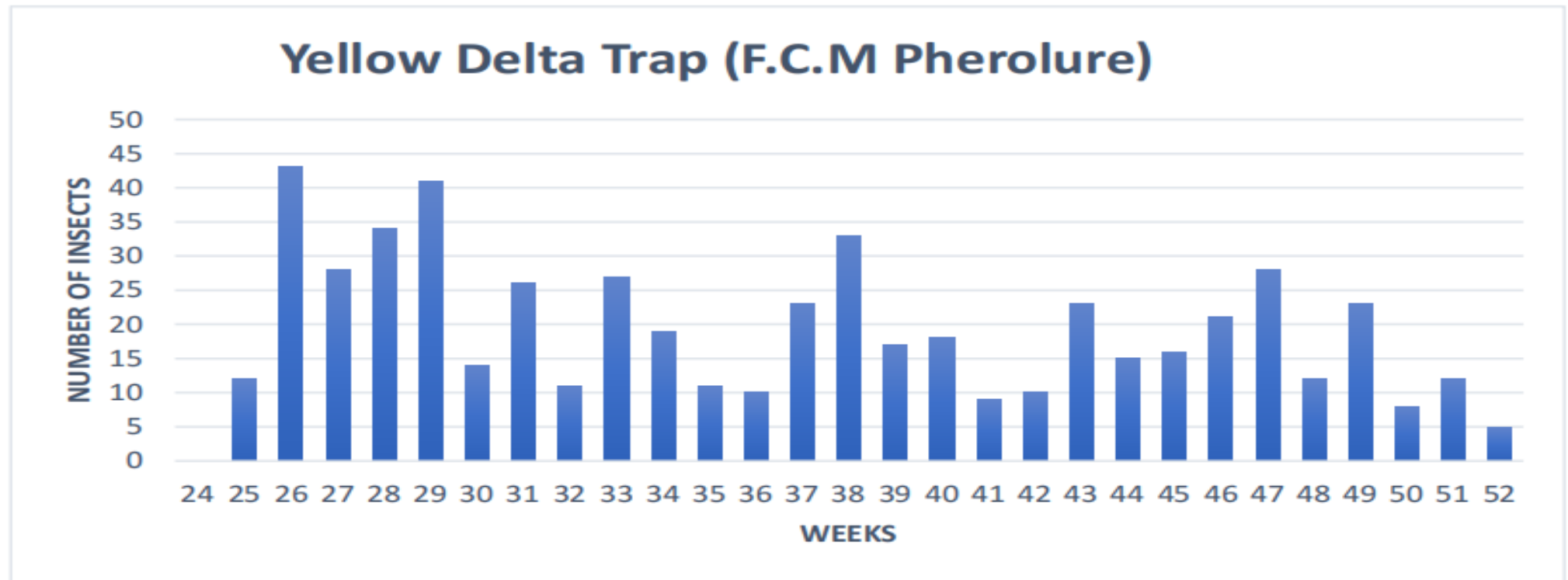


Figure 4. Recommended packing method for sticky traps: a) and b) open and unfold trap; c) place 2 to 3 packing peanuts (or something similar) in areas of trap with no moths; d) fold trap, secure with rubber band, and place in plastic bag if samples are dry, otherwise store/ship in a paper bag so specimens can dry and do not rot (Image courtesy of Photos by E. LaGasa, WSDA).

Data Collection

Data Capturing of FCM

- The trap must be marked and labeled appropriately indicating the number of the trap, field and block
- The data chart below shows the population dynamics of False Codling Moth during the weeks in the year 2024.



Conclusion

- False codling moth (*Thaumatotibia leucotreta*) is native to sub-Saharan Africa and is found in production areas in Southern African warm climates, cultivated hosts include citrus, stone fruit, avocados, pomegranates, persimmons, macadamias & hot peppers.
- Orchard sanitation and use of pheromone traps can control the FCM populations.
- Use of environment-friendly and natural strategies like biological control can attract natural enemies of the FCM that regulate their populations
- Quarantine mechanisms should be put in place to increase market access for the host crops the pest attacks and to avoid export restrictions/barriers during international trade

References

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5. *Thaumatotibia leucotreta* - False Codling Moth, “FCM” Identification Aid <http://download.ceris.purdue.edu/file/442>
6. *Thaumatotibia leucotreta* - False Codling Moth, Adult <http://download.ceris.purdue.edu/file/1575>



Thank you