



Agriculture & Horticulture
DEVELOPMENT BOARD



Grower Summary

TF 189

Optimum treatment timing to
reduce overwintering codling
moth populations

Annual 2010

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Before using all pesticides check the approval status and conditions of use.

Read the label before use: use pesticides safely.

Further information

If you would like a copy of the full report, please email the HDC office (hdc@hdc.ahdb.org.uk), quoting your HDC number, alternatively contact the HDC at the address below.

HDC
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2TL

Tel – 0247 669 2051

HDC is a division of the Agriculture and Horticulture Development Board.

Project Number:	TF 189
Project Title:	Optimum treatment timing to reduce overwintering codling moth populations
Project Leader:	Prof. Jerry Cross
Contractor:	East Malling Research
Industry Representative:	Colin Corfield, Owl House Fruit Farm & Paul Bennett, Agrovista Ltd
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Headline

- Temperatures > 15 °C are required for mating and egg laying by codling moth and need to be taken into account in timing of insecticide sprays in addition to catches in pheromone traps.

Background and expected deliverables

Codling moth is still the most important apple pest in the UK. Despite regular use of insecticides through the season to control it and prevent the damage the larvae cause, populations persist from year to year to give rise to new attacks. Work is required to study the egg-laying dynamics of codling moth through the season in relation to pheromone trap catches and forecasts by the RIMpro-Cydia model, to find when treatments are best applied to reduce overwintering populations. The results should guide control strategies for long-term reduction of moth numbers.

Summary of the project and main conclusions

The seasonal dynamics of codling moth were studied in two unsprayed areas (each of ~200 trees) in infested apple orchards near Faversham and Lamberhurst, Kent. Two standard sex pheromone baited delta traps were used to monitor males and two pear ester kairomone (DA2313) baited delta traps to monitor males and females (early May to mid October). Each week, a count was made of the codling moth eggs and larvae on 200-300 fruit clusters per orchard. The approximate date of egg hatch for each larva collected was back-calculated from temperature records. Larvae migrating to pupation sites were monitored from mid May to September at fortnightly intervals using corrugated cardboard bands around the tree trunks. Pupation success was quantified to determine contributions to the infestation the following year.

- Sex pheromone trap catches of males gave a general indication of the presence of codling moth but did not give useful predictions of the occurrence of eggs.
- Using the traditional pheromone trap threshold of 5 moths for two successive weeks would have led to sprays being applied starting in early June, with insecticidal protection

needing to be maintained by sprays at 2-3 week intervals until the middle of July. This would amount to a total of 3 sprays.

- Egg laying patterns indicated that insecticidal protection was needed between 22 June and 24 August at site 1 (Teynham) and between 29 June and 5 August at site 2 (Lamberhurst). This amounted to a total of 3-4 sprays at 2-3 week intervals at site 1 and 2-3 sprays at site 2.
- The period of insecticide cover using the pheromone trap catches would have started too early and been too short, failing to cover the critical late July to early August period.
- The pear ester male and female monitoring traps gave the additional information about the female flight. Catches were later than pheromone trap catches and appeared to coincide better with egg laying. However, the numbers of females captured were rather small.
- Growers/advisors would also require training in identification of male versus female in the traps, which would be a more time consuming process.
- Dusk (21:00-24:00 h) temperatures are critical for mating and egg laying activity, higher temperatures being progressively more favourable. Little activity occurs unless temperatures are $>15^{\circ}\text{C}$. Dusk temperature should be used to determine periods of egg laying risk.
- The RIMpro-Cydia forecasting model which takes dusk temperatures into account provided generally accurate and useful predictions of egg hatch to direct the timing of sprays.
- Migration of mature larvae to overwintering sites (in tree bands) started in mid-August, reached a peak at the end of August but continued at declining levels into mid- October.

Financial benefits

The timing of insecticidal sprays against codling moth is crucial for the limitation of damage to the crop. Better timing will result in a higher yield and a more effective use of the plant protection product used.

Action points for growers

It is too early to make firm recommendations to growers based on this single years data, but the results to date indicate that temperature models which take dusk temperatures into account, such as the RIMpro-Cydia forecasting model, should be in combination with pheromone traps and pear ester kairomone traps to better time sprays against the egg laying stage of codling moth.