



Agriculture & Horticulture
DEVELOPMENT BOARD



Grower Summary

TF 204

Improving codling moth spray
timing

Annual 2013

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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 204
Project Title:	Improving codling moth spray timing
Project Leader:	Professor Jerry Cross
Contractor:	East Malling Research
Industry Representative:	Mark Holden, Adrain Scripps Ltd
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Project Cost:	£56,570

Headline

Codling moth sex pheromone trap thresholds may need adjusting and simplifying

Background and deliverables

Codling moth is the most important pest of apples and also an important pest of pears in the UK. Most insecticide sprays on apple are used against it. Control is usually good, but populations are not being reduced to such low levels that spraying is reduced in subsequent years: growers are on an insecticide treadmill. UK growers generally rely on pheromone traps to decide if and when to spray for codling moth but previous work in project TF189 suggested that they are of limited benefit and growers may not be making best use of their time and effort in using them. Experience in the NL indicates that as good or better control of codling moth can be obtained using development and population simulations given by the RIMpro-Cydia model using data from local meteorological stations. The model, which is available to all growers, takes into account when conditions suitable for egg laying occur (dusk temperatures > 15 °C) as well as maturity and longevity of females rather than activity of males as indicated by sex pheromone trap catches. This work will determine which of the three alternative decision-making methods is best leading to improvements in control and/or savings in monitoring costs and management time.

Summary of the project and main conclusions

In 2012, the first year of a three year experiment, three methods of timing insecticide sprays for codling moth were compared each in three commercial orchards in Kent:

- Method 1 'Trap': Standard method of monitoring male moth flight using pheromone traps and spraying after a threshold of > 5 moths for 2 weeks is exceeded.
- Method 2 'RimPro+trap': Use of the RIMpro-Cydia forecasting model in conjunction with pheromone trap records. Sprays only applied if both model indicates egg laying risk and pheromone trap threshold exceeded.
- Method 3 'RimPro': Use of the RIMpro-Cydia forecasting model in conjunction with an assessment of codling moth damage the previous year to indicate general codling moth risk in the particular orchard.

The 'Trap' and the 'RimPro+trap' methods performed poorly with unacceptable levels of

codling moth damage, which was particularly severe at one site (16.6% and 10.7% fruit damage at harvest for the two treatments, respectively) and still above an economically acceptable level at another (3.3% and 0.3% damage at harvest for the two treatments, respectively). Less than 0.3% fruit damage can be tolerated economically. The damage appeared to be caused by just below threshold sex pheromone trap catches which did not trigger insecticide sprays. The requirement of ≥ 5 moths per trap in two weeks, not necessarily successive, was not quite met on several occasions. The results indicate that the threshold requirement for two catches ≥ 5 moths is too complex as well as being somewhat illogical as a single catch of moths, no matter how large, would not trigger the need for a spray. It is therefore provisionally proposed that the threshold should be simplified to single catch of ≥ 5 moths per trap in the early half of fruit development (May – July) and that it would be prudent to lower the threshold to ≥ 3 moths per trap per week in the latter part of fruit development (August – September) when the fruit is softer and more susceptible to damage.

These proposed threshold changes will lead to a significant increase in insecticide use for codling moth control. For instance at two of the farms, the number of sprays for codling in the 'Trap' method plots would have increased from 1 to 4 and from 0 to 1, respectively, though the number of sprays at the third site would not have been affected. This would probably have greatly reduced the high levels of codling damage that occurred. Further confirmatory work is needed before the modified thresholds can be recommended.

The RIMpro-cydia method resulted in the greatest number of insecticide applications and the lowest amounts of damage to fruits, though damage at harvest was unacceptably high (3.6% fruit damage) at one site and slightly high (0.7% fruit damage) at another. The model may need adjusting to take into account the higher risk to fruits in August and September as they become softer and riper and more susceptible to damage.

It is recommended that these adjusted thresholds are implemented in the experiment as it continues in 2013-14 at the same site using the same plots.

Financial benefits

Codling moth control programmes typically cost growers $>£200$ /ha/season. Even a low level of fruit damage ($< 0.3\%$ fruits damaged) is likely to be economically unacceptable. Improving control and/or reducing insecticide use will be of financial benefit to growers.

Action points for growers

The findings from the first year of this project are preliminary and no grower action points are recommended at this stage.