Grower Summary

TF 204

Improving codling moth spray timing

Final 2015

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Read the label before use: use pesticides safely.

Further information

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Project Number:	TF 204
Project Title:	Improving codling moth spray timing
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Contractor:	East Malling Research
Industry Representative:	Mark Holden, Adrian Scripps Ltd.
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GROWER SUMMARY

Headline

- Improved methods of timing sprays for codling moth have been developed.

Background and expected deliverables

Codling moth is the most important pest of apples in the UK and is also an important pest of pears. Control using traditional crop protection products is usually good, but populations are not being reduced to the low levels required to avoid use of sprays in subsequent years. 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. In the Netherlands, development and population simulations given by the RIMpro-Cydia model using data from local meteorological stations, has apparently provided growers with an accurate indication of the optimum time to apply sprays for control. The model, which is available to all growers, takes account of suitable conditions for egg laying (dusk temperatures >15 °C) as well as maturity and longevity of females, rather than activity of males as indicated by sex pheromone trap catches.

The purpose of this project was to assess three methods of deciding the best time to spray to control codling moth. These included the standard method of monitoring male moth flight using pheromone traps, use of the RIMpro-Cydia forecasting model in conjunction with pheromone trap records, and using the forecasting model in conjunction with an assessment of codling moth damage from the previous year. The work sought to develop improvements in control and/or savings in monitoring costs and management time.

Summary of the project and main conclusions

In 2014, the trial comparing the three methods was continued for a third year using the same plots in three commercial orchards in Kent. In the first year (2012), the sex pheromone trap threshold used was a count of ≥5 moths/trap/week in two weeks but not necessarily successive. In 2013 and 2014 this was amended to a single catch of ≥5 moths in June-July or ≥3 moths in August and September.

The RIMpro Cydia model parameters were also adjusted by the provider to give a greater proportion of the population entering a 2nd generation, which the model had failed to predict in 2013. Thus the insecticide timing methods were:

- Method 1: Standard method of monitoring male moth flight using pheromone traps and spraying after a threshold of ≥5 moths is exceeded in June-July or ≥3 moths is exceeded in August and September.

- Method 2: Use of the modified RIMpro-Cydia forecasting model in conjunction with pheromone trap records. Sprays only applied if both the model indicates egg laying risk and the pheromone trap threshold is exceeded.

- Method 3: Use of the modified 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 results of the project (set out in the Science Section of this report) led to the following overall conclusions:

1. The codling moth sex pheromone trap threshold should be lowered from ≥5 moths/trap/week in two weeks (not necessarily successive) to a single catch of ≥5 moths in June-July or ≥3 moths in August and September. There is little advantage of using Combo or Combo+AA (acetic acid) lures in orchards where mating disruption is not being used, as catches of females with these lures are too small and erratic. Further work is needed to validate these revised thresholds and investigate the use of alternative lures.

2. The RIMpro-Cydia model is a useful indicator of egg laying risk but the model needs calibrating. Use of an egg laying risk threshold of 100 in the RIMpro-Cydia model appears to overestimate egg laying risks and larval emergence which, if the model is used alone to time sprays, can result in much larger numbers of spray applications, many of which are probably unnecessary. It also appears to be difficult to set the parameters of the model to give reasonable predictions of the risks from 2nd generation egg-laying. Further, the sensitivity of the model and the proportion of the first generation that fed through from the 1st to the 2nd generation appeared to greatly increase when the model was converted to an online version for the 2014 season and

this needs to be corrected. These factors taken together indicate that although the model may give good predictions of relative risks, basic work is needed to calibrate it in terms of the scale of risks of egg laying and the proportion of the population producing a 2nd generation.

3. Use of the RIMpro-Cydia forecasting model in conjunction with pheromone trap records, only applying sprays if both the model indicates egg laying risks and the pheromone trap threshold exceeded (method 2) will help avoid unnecessary early sprays when males are flying but there is little or no risk of egg-laying.

4. The results from the project suggest that the interval between sprays for codling moth (expected cover period) should be reduced where significant (>1%) crop damage occurred the previous year or where trap catches are very high. An interval (cover period) of 2 weeks for Coragen, and 10 days for other products may be appropriate. The intervals should also be similarly reduced in periods of hot weather, when pesticide metabolism and breakdown, and fruit expansion are more rapid.

5. The importance of continuing to monitor and treat for codling moth in August and September is highlighted.

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

- Continue to use sex pheromone traps to monitor codling moth in orchards but use a lower threshold of a single catch of ≥5 moths in June-July or ≥3 moths in August and September.

- Where the RIMpro-Cydia forecasting model is used in conjunction with pheromone trap records, only apply sprays if both the model indicates egg laying risks and the pheromone trap threshold is exceeded, which will help to avoid unnecessary early sprays when males are flying but there is little or no risk of egg-laying.

- Reduce the interval between sprays for codling moth (expected cover period) where significant crop damage occurred the previous year (or trap catches are very high).

- Continuing to monitor for codling moth in August and September and treat when necessary.