

## Insecticide Resistance Action Group

Minutes of the 40<sup>th</sup> meeting held at Agrii's Throw Farm, Dunmow

Wednesday, 25 April 2018

Hosted by Chris Wallwork



Collier, Rosemary (Warwick Crop Centre)  
Collins, Larissa (Fera)  
Cowgill, Sue (AHDB)  
Cranwell, Steve (FMC)  
Flind, Andrew (Bayer CropScience)  
Foster, Steve (Rothamsted Research: *Chair*)  
Harris, Dilwyn (Dow AgroSciences)  
Horgan, Alan (Certis)  
Mattock, Sue (CRD)  
Morris, Reuben (Frontier)  
Mortlock, Philip (BASF)  
Newbert, Max (Syngenta)  
Pope, Tom (HAUC)  
Shaw, Bethan (EMR)  
Stevens, Mark (BBRO)  
Wallwork, Chris (Agrii)  
White, Sacha (ADAS: *Secretary*)

### 1. Welcome

IRAG welcomes Steve Cranwell, joining as a representative of FMC, Gareth Jones will be Steve Cranwell's substitute when he cannot attend, and Caroline Nicholls as an AICC representative.

### 2. Apologies for absence

Bailey, Andrew (Adama)  
Bean, Chris (Zantra)  
Denholm, Ian (University of Hertfordshire)  
Fenton, Brian (SRUC)  
Morris, Reuben (Frontier)  
Pickup, Jon (SASA)  
Slater, Russell (Syngenta and IRAC representative)

### 3. Minutes of last meeting

*Action: IRAG to prepare All-Party Parliamentary Group on Agriculture (APPG) proposal. RC to send information to group.*

- Done

*Action: Secretary to contact Russell Slater prior to meetings for update when RS not able to attend.*

- Done

*Action: Joint RAG statement to be drafted regarding MoA labelling and be sent to SM. SF to lead for IRAG.*

- Done

*Action: LC to email details of saw-tooth grain weevil and grain weevil resistance to SF.*

- Done

*Action: SW and RC to update guidelines.*

- Done

*Action: SF to contact RAGs regarding issuing a joint statement.*

- Done

*Action: SW to circulate link to the final report in the “Combating insecticide resistance in major UK pests” project.*

- Done

*Action: SF/SW to draft an insecticide resistance guidance fact sheet.*

- Done as part of updated guidance.

*Action: SW to request FRAG policy wording from FB.*

- Done

*Action: Group to update membership policy and constitution.*

- Done

### 4. Feedback from IRAC

RS provided the following update in advance of the meeting. IRAC International have incorporated non-chemical insecticides into the IRAC classification scheme without making significant changes to the existing classification. The updated classification will be issued in Q3 this year. The scheme will include classifications for insecticidal products except for insect predators/parasitoids. It will not incorporate non-lethal control methods such as pheromones. IRAC has also formed a Nematode Working Group which is currently working on a statement about resistance risk for nematocides and developing a separate MoA classification for them.

## 5. Regulatory Issues

SM gave the following update:

- There has been broad support for the proposed changes to MoA labelling. The matter is now with CRD. They will take a flexible approach to issues such as position of MoA on the label.
- The EC vote on the proposed extension to neonicotinoid restrictions has been delayed again. Will be discussed on 27 April. Issues relating to insecticide resistance management (IRM) will have little impact on the decision process.

## 6. Update on research

### Work at Rothamsted Research

SF provided an update on PS2720 project – ‘Monitoring and managing insecticide resistance in UK Pests’.

*Myzus persicae* (peach-potato aphid):

- More field samples in 2017 than in previous years, especially from Scotland. Still not many samples from protected crops. More are needed.
- Neonicotinoids: Only susceptible and Nic-R (low resistance) found in the UK. Individuals with Nic-R resistance are capable of walking after dosing but cannot reproduce. The highly resistant R8IT clone (Nic-R<sup>++</sup>) has been found in North Africa and is able to reproduce on tomato, pepper, potato and melon but not tobacco. These resistant forms do not appear to be spreading northwards, which is good news for the UK.
- MACE, kdr and super kdr: MACE and super kdr are common in the UK. Clones tend to carry both mechanisms. Kdr is not common but is becoming more frequent. 89% of *M. persicae* caught in suction traps have MACE/super kdr, mainly represented by the P clone, with O clone appearing to be on the wane.
- Esterase: R3 not found in field or protected crops in 2017.
- Turnip yellows virus (TuYV): 50-80% of tested aphids from north England and Scotland carried the virus. MS added that the % of aphids with Beet yellows virus (and crop infection) was low at Fulbourn but the % with TuYV was high.
- Rarer resistance genotypes continue to be more common in protected crops. This is likely due to importation from areas with sexual populations of *M. persicae*.

*Macrosiphum euphorbiae* and *Nasonovia ribisnigri*:

- No reduction in susceptibility detected in 2017.

*Aulacorthum solani*:

- Baseline susceptibility to pyrethroids determined.

*Sitobion avenae*:

- All three samples tested had kdr but no evidence of higher pyrethroid resistance found. Better control likely if sprayed directly rather than by picking up the

insecticide from a surface (as in these vial bioassays). Spray rates should not be reduced.

#### Cabbage stem flea beetle:

- 20 samples screened in 2017. All contained beetles that were resistant to pyrethroids. Resistance mechanism appears to be primarily metabolic.
- Resistance ratios increased gradually between 2014 and 2016 but jumped significantly in 2017. Resistance ratio was >140 in Cambridgeshire and >340 in Suffolk in 2017 (compared to a susceptible population from Denmark).

#### Other pests:

- Pollen beetle: Three samples in 2017. All had pyrethroid resistance (tested against lambda-cyhalothrin). Will also test with tau-fluvalinate at both field rates in 2018 to measure if these compounds have similar activity against resistant beetles.
- Pea and bean weevil: One sample in 2017. Resistant to pyrethroids. Mechanism possibly metabolic as was susceptible when applied after pre-treatment with a synergist.
- Diamond back moth: One sample in 2017. Resistant to pyrethroids. Susceptible to cyantraniliprole and spinosad.
- Willow-carrot aphid: one sample received in 2017. From a culture originally collected from the field in 2014. When exposed to a field rate of lambda-cyhalothrin 50% survived so may be resistant.
- Onion thrips: one sample in 2017. Resistant to pyrethroids (but ubiquitous resistance to pyrethroids was reported in 2010). Some resistance to spinosad (30% survived the field rate). CW commented that there are no alternatives to spinosad that are as effective. An emergency authorisation for Benevia (cyantraniliprole) was approved in 2017. This should provide similar control. DH commented that they had spoken to CRD about spinosad use. Recommended three applications maximum in alliums and one application in tomatoes (as resistance in *Tuta absoluta* detected).
- Bean seed beetle, grain weevil, saw-toothed grain beetle, seed weevil and striped flea beetle are all at high risk of developing resistance to pyrethroids and need continued monitoring.
- Resistance work will feature in relaunched CropProtect site (<https://croprotect.com/>).

#### Work at Warwick Crop Centre

RC updated the group on research underway at Warwick Crop Centre.

#### Diamond back moth (DBM):

- Found DBM larvae in Somerset in January. Reared through at Warwick. At least one survived. Supports idea that some can overwinter in the UK. The moth does

not diapause so needs a food source and so can only overwinter in crops or other hosts. RC considers that migrating DBM remain the primary issue.

- Warwick a web page that collates DBM (and other brassica moth) monitoring information from across Europe. Much is citizen science so there are caveats but it can nevertheless provide early warnings. Meteorologist to study this data to better predict migrations to UK.
- FMC have set-up pheromone trapping for DBM.

SceptrePlus:

- Looking at new pesticides or biopesticides for control of pests and weeds in ornamental crops.
- Long list of targets, including several with resistance issues (e.g. *T. absoluta* on tomato, aphids on peppers and thrips on leeks).
- Bean seed fly a particular problem. Neonicotinoid seed treatments are effective but these will soon be unavailable.
- A number of promising bioinsecticides and insecticides found against *M. persicae* using the P clone (the most common).
- Further work includes additional replication of *M. persicae* bioassays and bioassays on other aphid species.

## 7. IRAG outputs

All-Party Parliamentary Group (APPG) on Agriculture

- A convincing case is needed to justify a session on resistance. The sessions are usually 1-1 ½ hours. Time scale for process is unknown.
- Especially important in light of decision for further neonicotinoid restrictions.
- Should widen subject to resistance to all pesticides and include food security and biosecurity (e.g. Dutch elm disease, Japanese knotweed and oak processionary moth) issues.
- Suggestion to produce a leaflet summarising issues.
- Need to identify 3 or 4 speakers. Suggestion that this should include a grower perspective, but from which sector (e.g. oilseed rape, protected crops)? SF suggests Ian Denholm would be a good speaker.

*Action: RC to send round draft agenda for the APPG session. IRAG members to suggest speakers.*

IRAG resistance guidance documents

- Draft documents have been produced by SW, RC, SF and SC and disseminated for comment. These will now be edited and uploaded to the IRAG site.

*Action: SW, RC, SF and SC to edit IRM guidance documents and AHDB to upload.*

IRAG constitution

- SW updated the constitution (including membership policy) and disseminated a draft version for comment.

## 9. AOB

### Combating insecticide resistance in major UK pests project

- Discussion over the outputs of this project (<https://cereals.ahdb.org.uk/publications/2017/october/25/combating-insecticide-resistance-in-major-uk-pests.aspx>).
- Modelling work suggested that, for target-site resistance, the current guidance may be incorrect. Validation of models is needed. Modelling for non-target site resistance needed.

### Other AOB:

- NFU IPM Summit is on 5 June 2018 at their Stoneleigh Park office.
- Registration for the Resistance 2019 conference at Rothamsted is open (<https://www.rothamsted.ac.uk/resistance19>).

## 10. Date and venue of next meeting

Syngenta, Jealott's Hill on 27 November 2018.