

## **Insecticide Resistance Action Group**

**Minutes of the 10th meeting, held at the PSD-DEFRA Offices, York, England.**

**Wednesday 9<sup>th</sup> April 2003**

- |  |                                  |
|--|----------------------------------|
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| 6) Mattock, Sue (PSD)                    | sue.mattock@psd.defra.gsi.gov.uk |
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| 12) Ramsay, Ewan (HSE: BPAU)             | ewan.ramsay@hse.gsi.gov.uk       |

### **1. Welcome and apologies for absence:**

As of the next IRAG meeting, DM will no longer represent Bayer CropScience. His place will be taken by Richard Meredith. RM was welcomed to IRAG and DM was thanked for his contribution. Sue Mattock (PSD) was also welcomed. She takes over from Oliver Macdonald. Vivian Powell and Emma Garrod (both HDC) will cover future IRAG meetings between them depending on availability and agenda.

Apologies were received from:

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|-------------------------------|-----------------------------|
| 1) Bean, Chris (UAP)          | cbean@uap-europe.com        |
| 2) Garrod, Emma (HDC)         | emma.garrod@hdc.org.uk      |
| 3) Hingley, Peter (Certis)    | hingley@certiseurope.co.uk  |
| 4) McCaffery, Alan (Syngenta) | alan.mccaffery@syngenta.com |
| 5) Solomon, Mike (HRI)        | mike.solomon@hri.ac.uk      |
| 6) Woodford, Trefor (SCRI)    | t.woodford@scri.sari.ac.uk  |

### **2. Minutes of last meeting (already distributed)**

IRAG minutes are available on <http://www.pesticides.gov.uk/committees/resistance>. ID summarised the minutes of the last meeting (18<sup>th</sup> September 2002) and these were approved.

### **3. Feedback from IRAC**

AMcC had sent a summary of recent IRAC developments. A highly successful codling moth symposium was organised at the European Congress of Entomology in October 2002 (abstracts to be sent out with final version of these minutes). Publicity for IRAC has been through stands at the Brighton Crop Protection Conference and through a new collaboration with CropLife. Formerly

known as the Global Crop Protection Federation (GCPF), CropLife is a global network that represents the plant protection industry (BASF, Bayer CropScience, Dow AgroScience, DuPont, FMC, Monsanto, Sumitomo and Syngenta). Their website is <http://www.croplife.org>.

Posters detailing IRAC organisation, projects and pesticide mode of action are all available on the website (<http://plantprotection.org/irac>). IRAC is particularly interested in informing interested parties about the implications of insecticide de-registration and re-registration for pest and resistance management.

IRAC and CropLife seek examples of successful pest and resistant management for distribution to users, industry and policy makers. IRAG members wanted clarification of what sort of publicity this would involve. VP noted that HDC would also like to cooperate in this exercise.

*Action: GD to send out codling moth abstracts to members.*

*Action: AMcC to instruct IRAG members on publicity requirements.*

#### **4. Feedback from CPA**

The Crop Protection Association (<http://www.baa.org.uk>) is the UK trade body representing those companies engaged in the manufacture, formulation and distribution of pesticide products for agriculture, forestry, horticulture, gardening, industrial, amenity and Local Authority uses. They are currently engaged mainly in “the promotion and implementation of the voluntary programme of research, training, stewardship and information provision agreed with Government in place of a pesticides tax”.

IRAG members questioned whether feedback should remain an agenda item as there was little interaction between IRAG and CPA. However, as the CPA have a pesticide efficacy group that meets about once per year, it was felt that it remained important to know what topics were on their agenda.

*Action: All members to consider best way for IRAG to retain some link with CPA.*

#### **5. Regulatory Issues**

##### **EPPO guidelines:**

SM reported that the EPPO guidelines (Standard for the efficacy evaluation of plant protection products [PP 1/213(1)]: Resistance Risk Analysis <http://www.eppo.org/Standards/GI213.html>) are now in place. The EPPO guidelines are considered workable. Risk analysis models are being used by some companies.

##### **SOLAs:**

It was felt that the recent endorsement of a SOLA for pymetrozine by IRAG was a useful extension of the group’s remit and influence. From now on, whenever a resistance matter arises from a registration, PSD may recommend that IRAG comment. SOLAs in particular are likely to become increasingly important as organisations such as HDC and other levy boards search for products to

fill gaps in protection (VP). It was noted that one off-label approval per pest crop is not desirable from a resistance management standpoint (e.g watercress)

PH tabled a note (in absentia) on the fact that some SOLAs appear to contravene resistance management guidelines already in place for other registered compounds with the same mode of action. The example given was for a fungicide - the azoxystobin off-label for lettuce. For the off-label purpose, this compound can be applied 4 times in a season. The FRAC recommendation however, is for a maximum of 2 applications (for all strobilurins). Apparently, PSD had argued that this was reasonable because the azoxystobin off-label was being targeted at a different fungal organism. However, PH noted that these fungal diseases do not occur in isolation and that other organisms would be present at the same time.

VP was familiar with this example and pointed out that under the current off-label system, off-label guidelines have to be in line with the supporting residues package. In the case of azoxystobin, this package supports 4 applications. This seems illogical from the point of view of limiting pesticide use. SM acknowledged this but thought that it was a problem that only occurred very rarely.

**Update** (from SM and Oliver Macdonald, PSD):

The limit of two applications of a strobilurin only applies to cereal crops. The SOLA on lettuce does however go against FRAC recommendations. This has been raised as an issue of concern at FRAG. OM is intending to look at all the non-cereal uses of strobilurins soon and amend the anomaly.

**Action: SM will discuss this anomaly internally within PSD and report back.**

**Action: ID will draft a letter to Oliver Macdonald on the matter.**

### **Harmonisation procedures:**

The re-registration of existing actives (following European Directive 91/414/EEC) is gaining momentum. Ten or twenty 'actives' are coming through the registration system every quarter (SM). Resistance issues are far more important now than they were when these compounds were originally registered. Commonly, registration packages need to address whether any resistant management strategy had worked, whether any other resistance-risk modifiers are in use or present evidence that resistance is not a threat (from 'in-house' monitoring to literature reviews). Routine monitoring packages are not expected by PSD unless there is very good evidence that the resistance risk is high. Many companies considering 'pan-European' registration need to be aware that they may not be able to rely on the presence of alternative actives for resistance management (particularly in the UK, where fewer actives are registered than elsewhere).

Pressure is clearly greatest on glasshouse pests. It was suggested that these should be targeted by IRAG in terms of future resistance management advice. The 'resistance risk matrix' drafted by BP should help direct that effort.

### **Comparative assessments:**

One worrying 'bolt-on' to 91/414/EEC is that of 'comparative risk assessment' where the efficacy and resistance risk of active compounds is compared. The idea is that the registration of a new compound may knock an older compound off the list because of some highly subjective measure of 'relative' safety. The aim is clearly to develop the most desirable set of compounds possible, but the

reality is that the further loss of actives (and particularly off-label compounds) will cause pest and resistance management problems over and above those already caused by 91/414/EEC.

ID circulated a letter from Nigel Hardwick (FRAG) that had been written to the environment minister Michael Meacher and copied to representatives of the NFU. The letter noted the problems that the further legislative changes such as comparative assessment would cause. DM stated that the response from DEFRA had not helped to clarify their stance.

All IRAG members agreed that a similar letter should be tabled, directed at Michael Meacher (Minister of State for the Environment) and Lord Whitty (Food and Farming Minister) and copied to the NFU (Chris Vice), DEFRA-PSD (Sue Popple), CPA and CropLife. The letter should make it clear that the loss of actives under current legislation is already problematic enough from a pest and resistance management stand point and that further strictures (both legislative and from bodies such as supermarkets) make the problem far worse. The regulatory burden, particularly for crops of minor use, is becoming too large.

Comparative assessment is already written in to the Biocidal Products Directive (98/8/EC). The wording of the relevant article can be viewed on the website of the European Chemicals Bureau <http://ecb.jrc.it/biocides> under 98/8/EC. Look under article 10.5

**Action: ID to contact Nigel Hardwick (FRAG) and Oliver Macdonald (PSD) to find out what correspondence and responses had been made. ID will then draft and circulate a letter from IRAG.**

## **6 & 7. Update of recent research**

SF and GD detailed recent research on *Macrosiphum euphorbiae* which, although control failures are yet to be reported from the field, appears to be an emerging problem. Increased titres of esterases (categorised as low, medium and high) similar to, but not identical to E4 / FE4 in *M. persicae* are correlated with pyrethroid, carbamate and organophosphate resistance identified in bioassays. There is no evidence of MACE or kdr.

Field-simulator studies, using aphids on potato, show that high esterase in *Macrosiphum euphorbiae* does not allow aphids to survive the full recommendation application rate of pirimicarb. However, decreased rates (such as those that might occur over time or with uneven spray deposition) allow a greater proportion of these aphids to survive than low esterase forms.

In comparisons of high esterase variants of *M. persicae* and *M. euphorbiae*, the former appears to be better protected than the latter when exposed to insecticides.

AMcN reported on ongoing work at CSL examining pyrethroid resistance in Varroa mites. This problem was confirmed in the UK. Mutations to the sodium channel structural gene have not been found, although they have been reported from the USA (Wang RW, Liu ZQ, Dong K, Elzen PJ, Pettis J, Huang ZY [2002] Association of novel mutations in a sodium channel gene with fluvalinate resistance in the mite, *Varroa destructor*. *Journal of Apicultural Research*. **41** (1-2): 17-25). CSL have a proposal to extend this work under consideration by DEFRA.

## 8. Resistance risk matrix

BP presented a resistance risk 'matrix' that he had drawn up, the purpose of which was to help direct the actions of IRAG, to be used to inform growers and farmers and to influence policy makers and funders.

All IRAG members agreed that it was a most useful summary. In particular it made clear that the main problems were to be experienced by the horticultural industry. There was some discussion of the categories into which pests were divided and to various omissions. All these should be directed to BP as soon as possible for an update.

**Action: All members to make suggestions to BP on inclusions and amendments to matrix.**

**Action: BP to amend and then recirculate once complete.**

## 9. Management of West Nile Virus vectors

ER and SB circulated a briefing note on the topic in relation to the contingency strategy being developed by the Department of Health (DH) against the possibility that WNV may enter the UK. As this strategy envisages that it might become necessary to use UK approved insecticides against mosquitoes, and as HSE has responsibility for the regulation of such insecticides in the UK, DH had asked HSE to assess the implications of such insecticide use in relation to WNV. Having identified mosquito and non-target resistance as a potential issue, HSE had been referred to IRAG by the Advisory Committee on Pesticides (ACP) to seek advice on this issue. DH had identified a limited number of pyrethroids that could be used as adulticides and *Bacillus thuringiensis* var *israelensis* as a larvicide. These products will be used both indoors and outdoors and will be applied by ULV spray.

IRAG members were asked to comment on some specific issues outlined in the briefing note provided by ER and SB. In response, IRAG members felt that the monitoring of baseline susceptibility in *Culex* species, for most of the compounds listed, has been done in many regions of the world, but probably not in the UK. This information would be essential to informing any resistance monitoring programme. It might be done through Janet Hemingway's group at the Liverpool School of Tropical Medicine (<http://www.liv.ac.uk/lstm>). A good initial contact might be Hilary Ranson. Alternatively, Mark Rowland at the London School of Hygiene and Tropical Medicine ([http://www.lshtm.ac.uk/dcvbu/staff/mark\\_rowland.htm](http://www.lshtm.ac.uk/dcvbu/staff/mark_rowland.htm)) might be contacted.

One assumes that the UK *Culex* spp population has not been exposed to significant insecticide selection pressure. Thus, unless chemical control in the UK was to take place over very wide areas and over prolonged timescales, it is unlikely that insecticide resistance will develop quickly. Although the choice of insecticides is constrained (one adulticide and one larvicide) the use of both compounds during any outbreak should be effective, in that adults developing from larvae selected for Bti resistance are highly unlikely to cross-resist pyrethroids. Similarly, adults selected for pyrethroid resistance are highly unlikely to give rise to Bti-resistant offspring. Any control programme involving chemical tools also needs as many cultural control methods as possible to be used alongside (removing breeding sites etc). Chemical control should be as temporally and spatially limited as possible in order to decrease selection pressure.

Under these circumstances, and given that WNV is at best a sporadic threat, resistance is unlikely to occur. However, if changes in susceptibility did occur, the only practical steps would be to increase the number of actives available and continue to institute all possible cultural controls.

The likelihood of resistance developing in other 'non-target' insects is minimal. Most UK pest species are already heavily selected by insecticides. The additional pressure exerted by tools used for the control of WNV vectors are unlikely to add to that load.

## **10. Future administration of IRAG**

ID reported that his current work commitments at Rothamsted are leaving little time to devote time to IRAG. Following discussion of possible alternative arrangements, the meeting expressed the view that IRAG should continue to be administered from Rothamsted. The administration of IRAG will now be shared between ID, SF and GD

## **11. Forthcoming meetings and events**

The BCPC: Pests and Diseases meeting in November 2003 (Glasgow) will include posters and presentations on resistance issues. These include:

- 1) an assessment of resistance risk in the new compound spiromesifen.
- 2) insecticide resistance in Spanish populations of *B. tabaci*.
- 3) the role of diagnostics in resistance management.
- 4) an industrial perspective on existing risk assessment procedures.

## **12. AOB**

None

## **13. Date venue of next meeting**

The 11<sup>th</sup> meeting of IRAG will take place on 2<sup>nd</sup> of October 2003. Bayer CropScience (Richard Meredith) will host. Details to be sent later.

***Action: All members of IRAG to advise GD re: availability on that date***