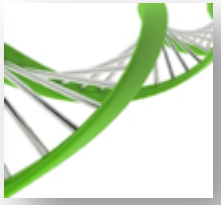
Insecticide Resistance Action Committee

Public Health Team 2016/17

51st IRAC International Meeting Philadelphia




CropLife INTERNATIONAL

Team Overview

- Scope: insect vectors of disease and hygiene/nuisance pests
- Identify potential, new or existing resistance issues. Set up Team Working Groups or Focal Points as necessary
- Provide expert input into IRM initiatives with identified partners
- Preparation of Public Health communication material
- Develop IRAC methods for hygiene pests

Team membership

Chair:	Mark Hoppé	Syngenta
Deputy chair:	Helen Pates Jamet	Vestergaard
Members:		
	James Austin	BASF
	Ronda Hamm	Dow
	Sebastian Horstmann	Bayer Crop Science
	John Invest	Sumitomo chemical UK
	John Lucas	Sumitomo chemical UK
	Ralf Nauen	Bayer Crop Science
	Melinda Hadi	Vestergaard deputy rep
	Alan Porter	APA
Non industry observers:		
	David Malone	IVCC
	Graham Small	IVCC

2016/7 Objectives

Goals	Objectives	Date
Identify potential, new or existing resistance issues. Set up Team Working Groups or Focal Points as necessary	• Monitor and report to the Executive on any potential, new or existing national, regional or global resistance issues that could require action by IRAC e.g. Vectors and Hygiene Pests. Research the issues and report to the Executive on a recommended plan of action including the extent of the problem and whether and how it should be best tackled.	Ongoing
Provide expert input into IRM initiatives with identified partners, interact with groups working in the same field and participate/organise relevant meetings.	• Set up a schedule of IRAC PH Team conference calls, meetings for 2016/17. Identify and invite relevant experts and observers from groups interested in Public Health IRM e.g. vectors, hygiene pests (WHO, Gates Foundation, IVCC) to participate and ensure that IRAC as an expert group provided input into relevant IRM initiatives. • Promote routes of communication with third parties, to disseminate IRM information, e.g. LinkedIn group • Support WHO, VCWG, etc., with IRM activities • Organise a PH team face to face meeting as part of the ICUP in Birmingham UK, July 2017	Ongoing Q2 2017
Formulate the IRAC position on ongoing questions and issues as these arise	• Promote the rational use of mixtures/combinations and synergists in VC • Participate with third parties to identify and promote best practice insecticide resistance monitoring, and results interpretation	Ongoing
Preparation of Public Health communication material	• Review and maintain educational material so that it remains up to date and relevant • Production of educational presentations, based on VM, that can be used by third parties • Develop training modules that can be used for continual education credits in PPM industry • Produce articles on IRM for trade journals, etc.	Ongoing Q4 2017 Q4 2017 Ongoing

Resistance status update

- "Since 2011, the level of pyrethroid resistance in the major malaria mosquito, *Anopheles coluzzi* , has increased to such an extent in Burkina Faso that none of the long lasting insecticide treated nets (LLINs) currently in use throughout the country kill the local mosquito vectors." Toé *et al* 2015

- "The frightening thing is, that a mutation has been found at every other base pair. Every mutation that could occur, has occurred, it is just a matter of selection now." Prof. Janet Hemingway speaking at the VCWG IRM/IRS work stream meeting, Feb 2017
  - Referring to the findings of the Malaria Genomic Epidemiology Network (MalariaGEN), 1000 *Anopheles gambiae* genome project, which has now sequenced 3000 *An. gambiae*

Resistance status update

- Does resistance matter?
  - "There was no evidence of an association between malaria disease burden and pyrethroid resistance across all locations.
  - There was evidence that LLINs [Long Lasting Insecticide treated Nets] provided personal protection against malaria in areas with pyrethroid resistance. There was no difference detected in LLIN effectiveness between higher and lower pyrethroid resistance"
    - WHO-coordinated multi-country evaluation. Implications of insecticide resistance for malaria vector control. November 2016

Resistance status update

- Does resistance matter?
  - WHO have no evidence to suggest it is impacting malaria control…
  - IRAC was initially on the steering committee of this 14 million USD (BMGF funded) multi-year and country project. The invitation was withdrawn by WHO due to concerns over the potential for conflicts of interest*
  - There are a number of reasons to challenge the high level conclusions of this study

Resistance status update

- Does resistnace matter?
  - In Ghana, when switching from pyrethroid IRS to non-pyrethroid IRS (Indoor Residual wall Spraying) incidence of malaria significantly fell
  - In Sudan (in WHO study) when switching from LLIN plus pyrethroid IRS to LLIN plus non-pyrethroid IRS, malaria indices fell
  - Pyrethroid LLINs still offer some protection, but if the mosquitoes were not resistant, greater levels of malaria reduction would be achieved

Resistance status update

- In recent years the awareness, and incidence, of insect vector borne disease has increased
  - Zika
    - Said to have impacted the tourist industry in Porto Rico by 100s of millions of USD alone. Similar impact on wider Caribbean
  - Dengue
  - Yellow fever
    - Resurgent in Africa and South America leading to vaccine rationing
  - Chikungunya
- All vectored by Aedes mosquitoes – sporadic data, but high levels of insecticide resistance found

Resistance status update

- It is anticipated that during the next decade a number of novel insecticides will be developed, or repurposed, for vector control, from novel, to VC, insecticide mode of action classes
  - With new insecticides available, to which anopheline mosquitoes are susceptible, there will be the opportunity to undertake effective resistance management, perhaps for the first time in 30 years

Resistance status update

- IRAC therefore has an opportunity to represent the industry members developing these insecticides to ensure that best practice IRM is implemented when they first reach the market – not just for malaria, but all mosquito vectored pathogens
- Maximising the utility of these life saving interventions

Activities

- Insecticide resistance is now seen as the biggest threat, not just to malaria control, but other mosquito vectored diseases, e.g. dengue, yellow fever and Zika
  - The IRAC PH team and its members are involved with a number of initiatives with third parties and aim to provide a consistent and coordinated "industry" voice

Activities

- Initiatives and groups IRAC PH team members are involved with include:
  - WHO
  - RBM Vector Control Work Group
  - Innovation 2 Impact
  - Working party to update WHO test procedures for monitoring insecticide resistance
  - Academic institutes
  - Etc.

Challenges

- Everyone is in the VC resistance game
  - Ca. 200 people attended VCWG IRM work stream meeting in Geneva Feb. 2017
  - Number of workshops set up by Universities keen to become centres of excellence
  - John Lucas gave an IRAC talk to ca. 70,000 ! who streamed it live from a Zika focused conference Dec. 2016
- Mixed messages from WHO
- No clear guidelines – few tools to use

Challenges

- With many IR initiatives on going it is difficult to get everyone together for IRAC specific activities
- Focus of team is on VC, which takes energy away from other PH/hygiene pests
- In large non-VC PH markets, users, regulators, and even industry, looks to academics for IRM guidance

Looking forward

- IRAC PH team should ensure best practice IRM is widely promoted:
  - Lobbying
  - Education
  - Supporting research
  - Supporting appropriate initiatives

Looking forward

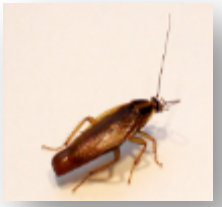
- Education
  - Supporting the RBM VCWG proposal to produce an IRM "MOOC" – Massive Open Online Course
    - A high quality training course with the aim of turning IRM theory into actionable practice
    - Open to, and free for, anyone, but target audience will be actively encouraged to study the course
    - Proposal supported by VCWG, a number of Universities and Schools of Public Health
    - Watch this space…

Looking forward

- IRM recommendations
  - Developing recommendations, susceptibility monitoring methods, etc., for new VC insecticides

- PH Face to Face meeting
  - July, Birmingham UK, day after the ICUP 2017
  - Focus on Aedes mosquitoes
  - Invited guest speaker/s

With thanks to the IRAC PH team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