Insecticide Resistance Action Committee Update, September 2007

Alan McCaffery

2nd Meeting of EPPO Permanent Panel on Resistance, St Petersburg, September 2007

Content

- IRAC Membership and new structure
- IRAC team developments
- Website, publications
- IRAC MoA Scheme update
- Pollen Beetle working group
- Country Group developments
- Future activities and developments

Insecticide Resistance Action Committee

IRAC's growing membership

- Currently 9 IRAC Executive member companies + international coordinator
- Makhteshim Agan and Monsanto joined in the past year
- Ongoing recruitment drive
  - IRAC is actively negotiating with 3 potential new members
  - One current focus is on Neonicotinoid producers

New IRAC Structure, 2007

Insecticide Resistance Action Committee

Also a new constitution including
code of conduct and anti-trust guidance

New IRAC teams

MoA Group 28
Flubendiamide
Chlorantraniliprole

IRAC INTERNATIONAL

IRAC Executive

Core activity teams and workgroups

- Crop protection
  - Neonicotinoids
  - **Diamides**
  - **Pollen beetle**
  - Codling moth
- Plant biotechnology
- Public health

Functional teams

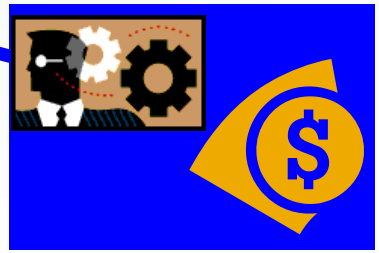
- **Advocacy**
- Communication & Education
- **Strategy & Finance**

Expert teams

- Mode of action
- Methods

IRAC Country Groups

- Australia
- Brazil
- India
- South Africa
- **SE Asia**
- Spain
- US



New IRAC teams

~130

IRAC INTERNATIONAL

14

IRAC Executive

33

Core activity teams and workgroups

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Functional teams

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Expert teams

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IRAC Country Groups

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- Brazil
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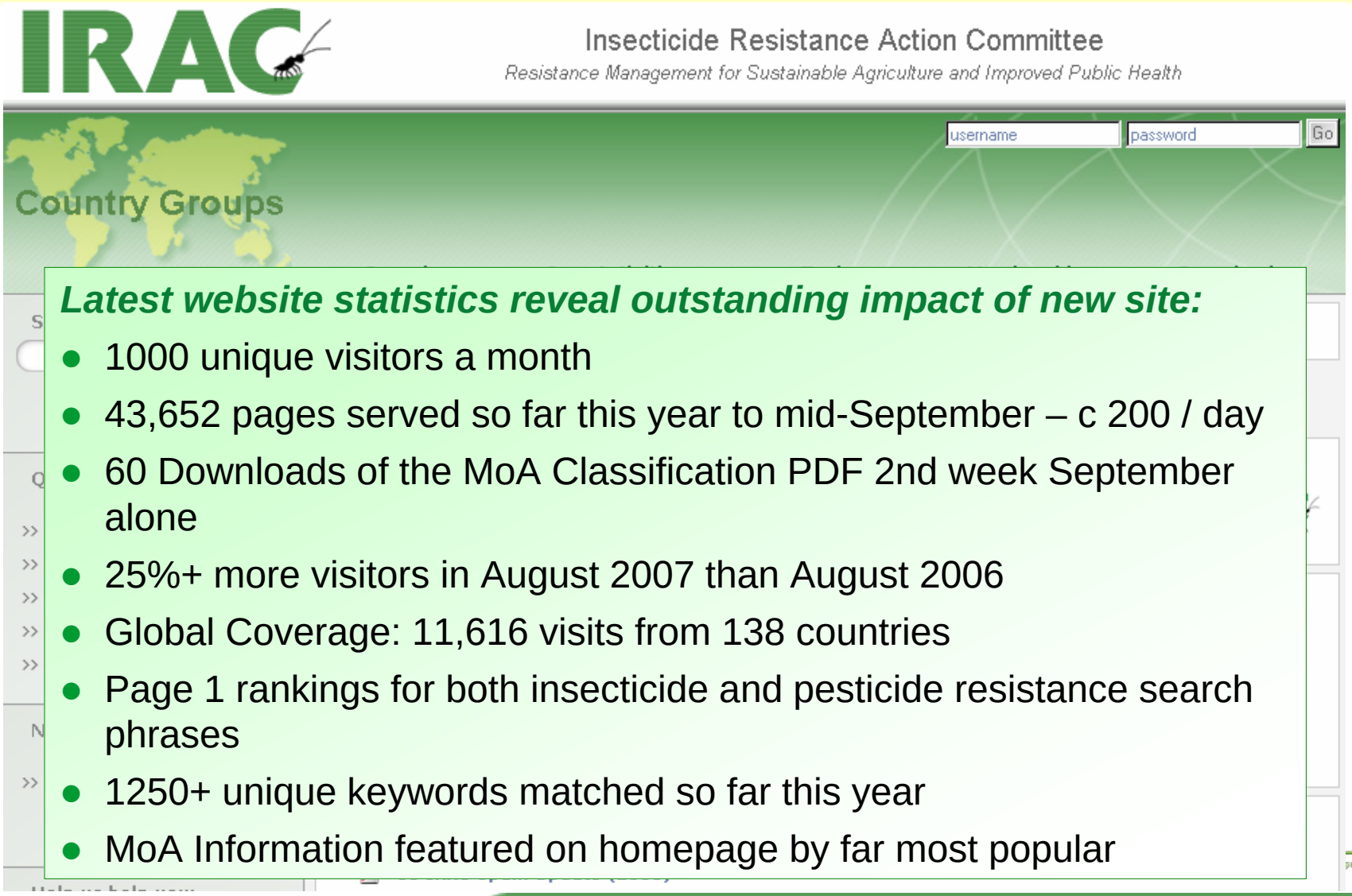
- South Africa
- **SE Asia**
- Spain
- US

IRAC Website: www.irac-online.org

- IRAC's key communication vehicle
- Completely new website launched Spring 2007
- To coincide with Resistance 2007 Conference at Rothamsted Research, April 2007
- Serves whole of IRAC International - both IRAC Executive and IRAC Country Groups

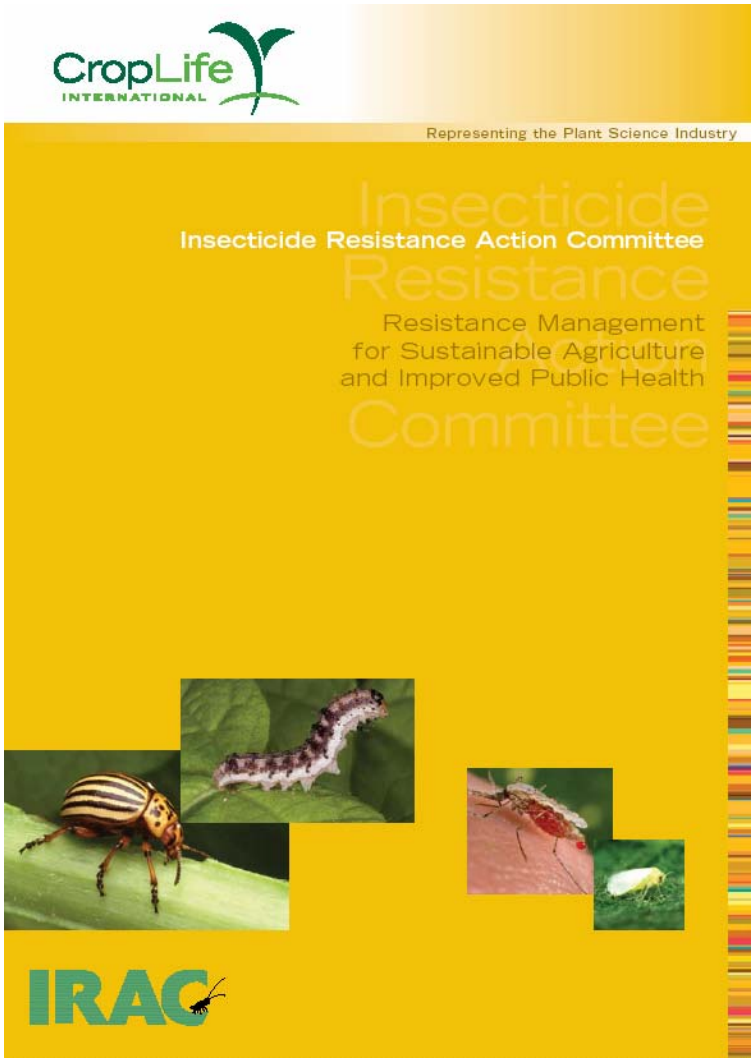
IRAC Website: www.irac-online.org

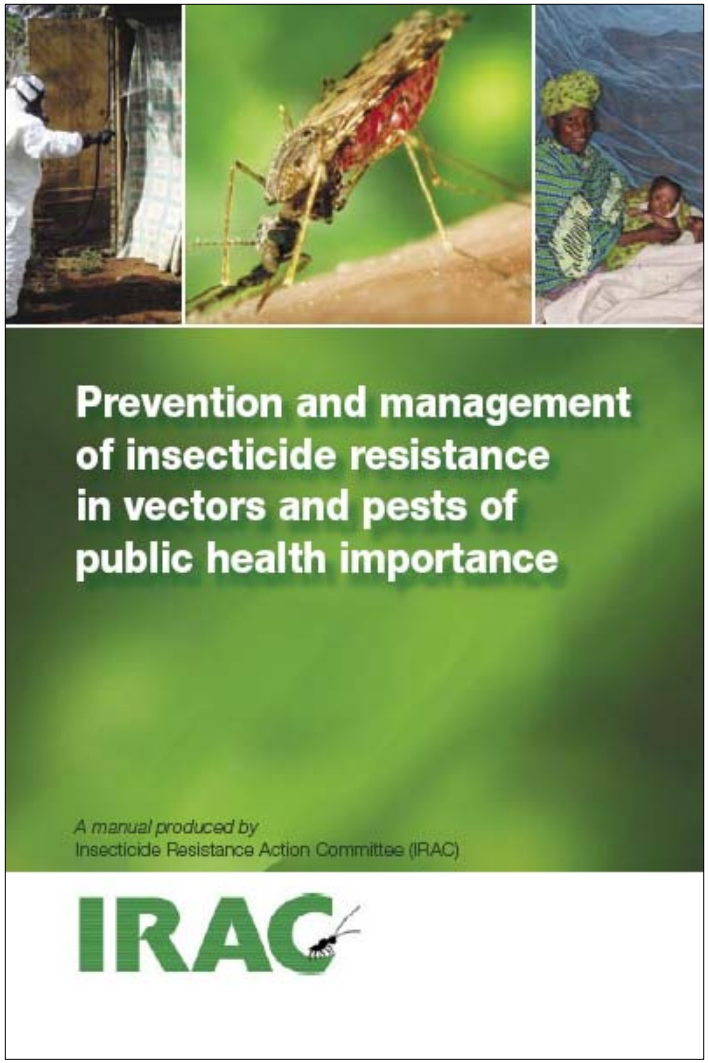


Latest website statistics reveal outstanding impact of new site:

- 1000 unique visitors a month
- 43,652 pages served so far this year to mid-September – c 200 / day
- 60 Downloads of the MoA Classification PDF 2nd week September alone
- 25%+ more visitors in August 2007 than August 2006
- Global Coverage: 11,616 visits from 138 countries
- Page 1 rankings for both insecticide and pesticide resistance search phrases
- 1250+ unique keywords matched so far this year
- MoA Information featured on homepage by far most popular

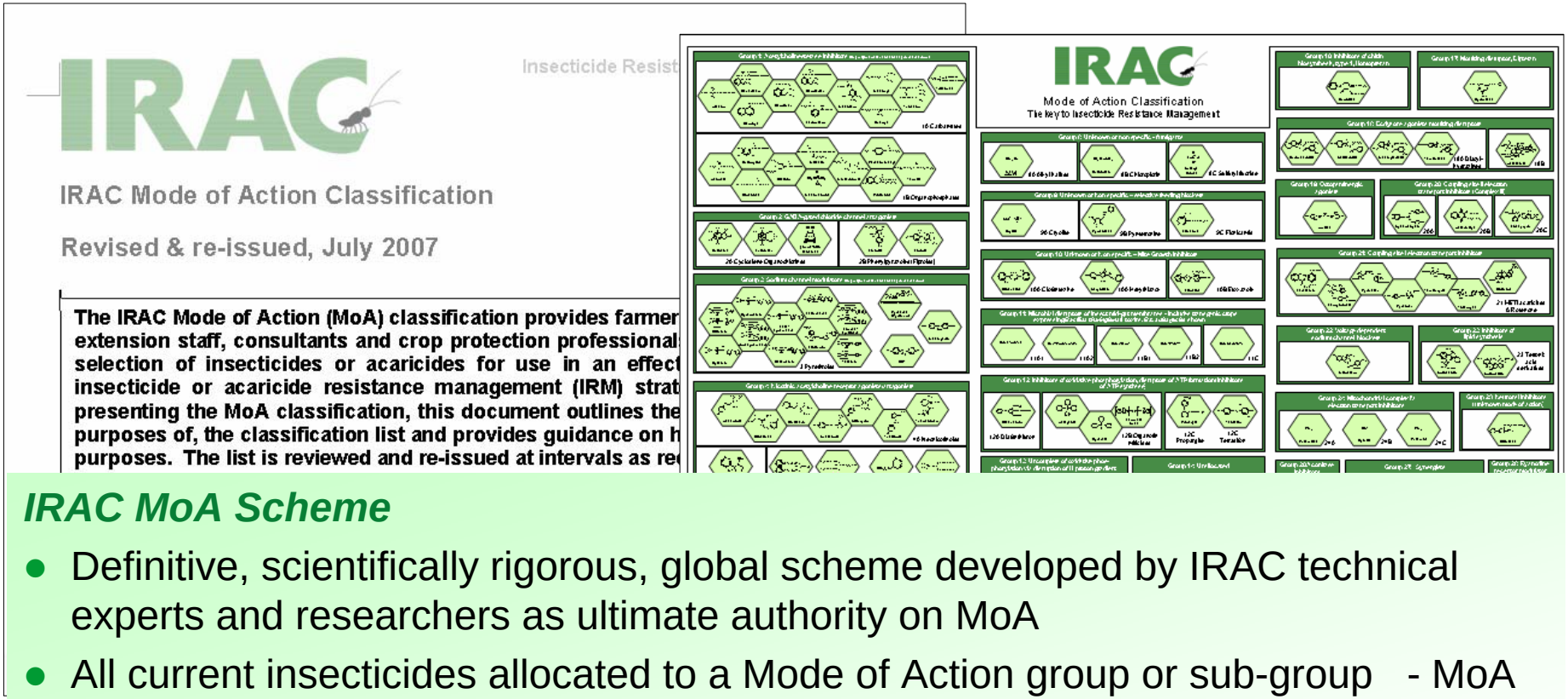
Recent IRAC Publications





IRAC Mode of Action Classification

Insecticide Resistance Action Committee



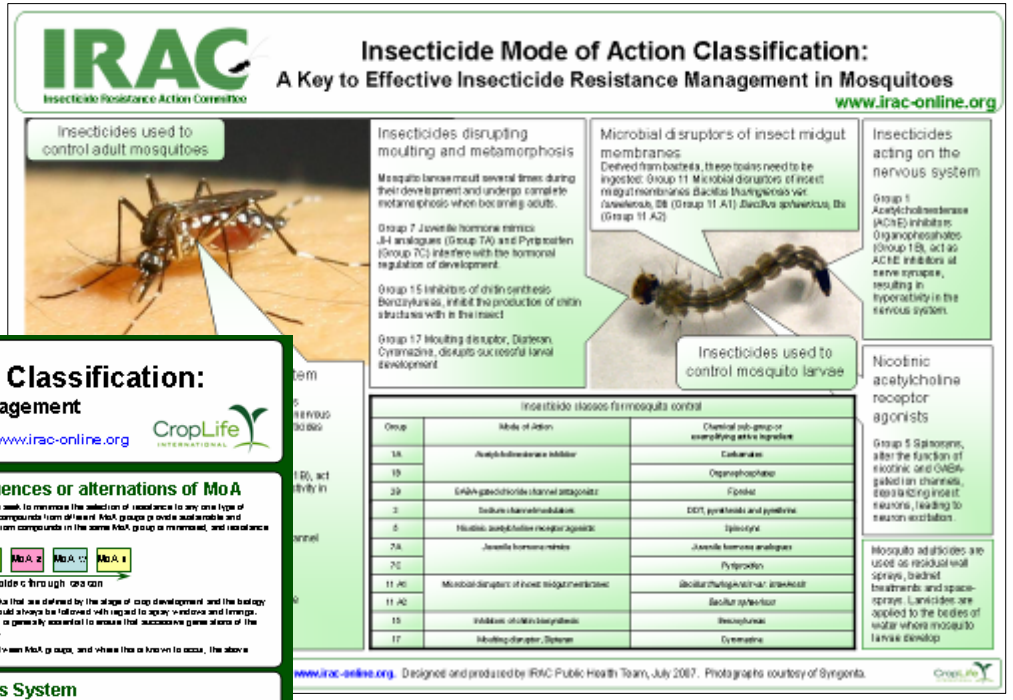
IRAC MoA Scheme

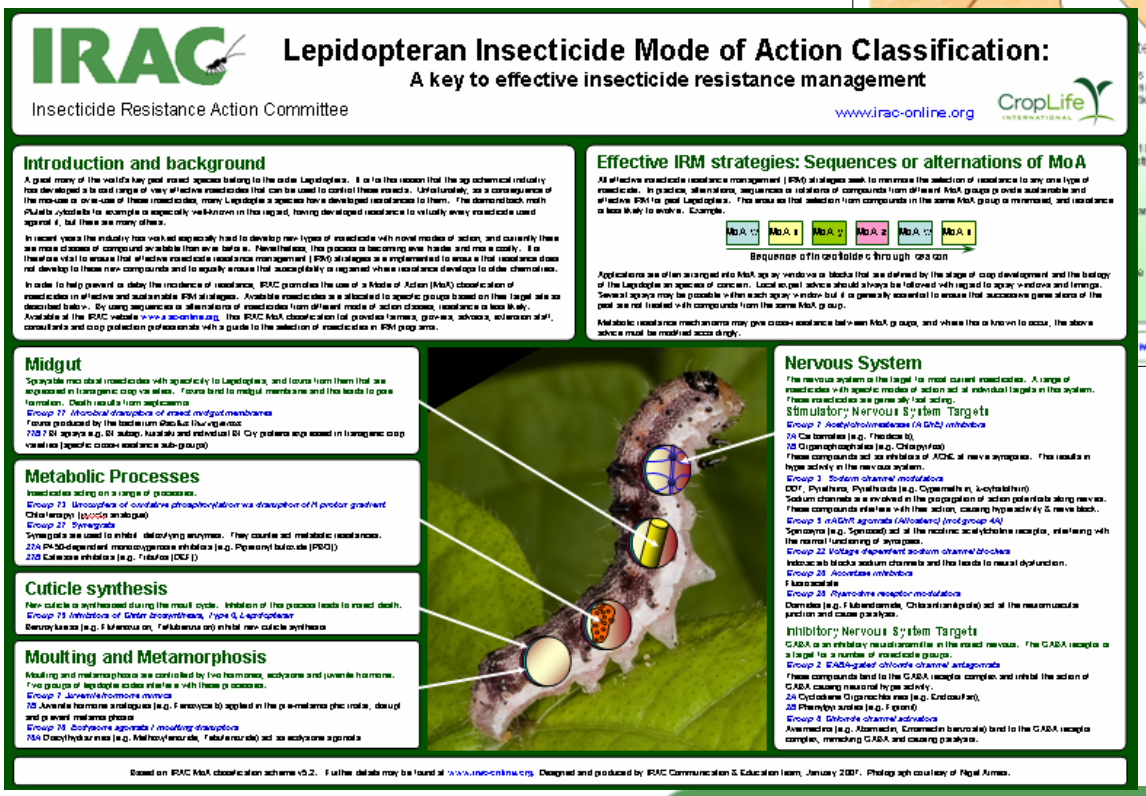
- Definitive, scientifically rigorous, global scheme developed by IRAC technical experts and researchers as ultimate authority on MoA
- All current insecticides allocated to a Mode of Action group or sub-group - MoA groups 1 to 28
- Key tool for selection of insecticides for effective IRM
- Latest version July 2007. Fundamental review underway
- MoA Structure poster extremely popular

Some recent IRAC MoA posters

Insecticide Resistance Action Committee

IRAC has an on-going programme of poster development





New CP posters e.g. Brown planthopper, Pollen Beetle will add to Leps and Whitefly

IRAC Pollen Beetle working group

Insecticide Resistance Action Committee

- Formed in January 2007
- Established in response to request from EPPO Permanent Panel on Resistance (October 2006)
  - Coordinate European pollen beetle resistance monitoring with countries, regulators, researchers, other interested parties
- Regular teleconferences throughout year
- Face to face meetings in April, September

Industry Participants:

Russell Slater – Chair (Syngenta)
Ralf Nauen (Bayer CropScience)
Fabrice Robin (BASF)
Chris Longhurst (Dow AgroSciences)
Jean-Luc Rison (DuPont)
Marco Jegerings (FMC)
Gérald Huart (Makhteshim)

Advising participants:

Udo Heimbach (BBA, Germany)
Christer Nilsson (SLU, Sweden)

Scope of IRAC Pollen beetle working group

Insecticide Resistance Action Committee

- Scope: Initially restricted to pollen beetle. Other OSR pests to be considered if needed
- 2007 Objectives:
  Provide co-ordinated insecticide resistance monitoring in European populations of Pollen beetle
  - IRAC No 11 methodology for PB defined & published on IRAC website:
  - All encouraged to use this methodology & promote use outside the group
- Develop and publish agreed IRM strategy for Pollen Beetle

Insecticide Resistance Action Committee
www.irac-online.org
Resistance Management for Sustainable Agriculture and Improved Public Health

IRAC Susceptibility Test Methods Series *Method No: 11*
Version: 1

Details:

Method:	No: 11
Status:	Approved
Species:	Pollen Beetle, *Meligethes aeneus*
Species Stage:	Adults
Product Class:	Synthetic pyrethroids

Comments: The method was developed as a result of discussions within the German Expert Committee on Pesticide Resistance – Insecticides (ECPR-I), and is a modification of a monitoring method formerly used by Bayer Crop Science and Syngenta. It is currently being widely used in Western Europe for monitoring sensitivity of *Meligethes aeneus* populations in oilseed rape to synthetic pyrethroids.

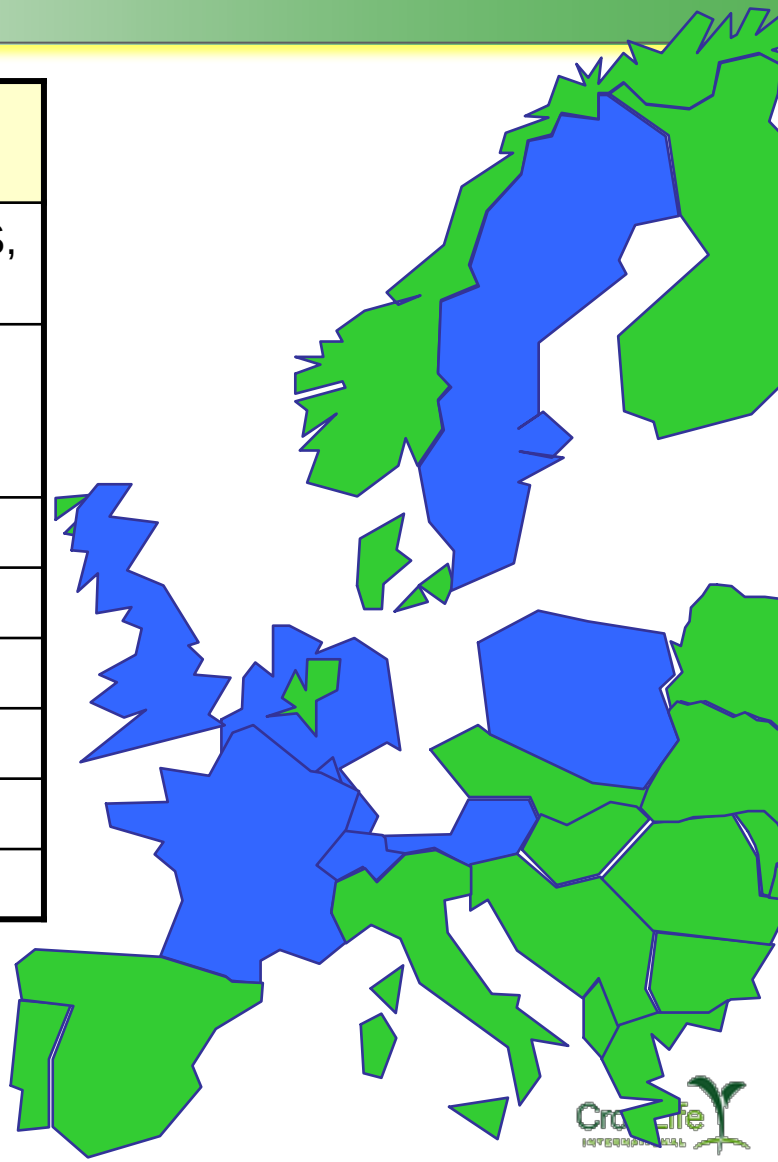
Description:

Materials:
Insect-proof containers, fine pointed brush, beakers for test liquids, syringes/pipettes for liquids or weighing balance for solids, acetone, syringes/pipettes for making dilutions, 20ml glass vials, vial roller (or hotdog roller), small funnel to transfer beetles to vials, binocular microscope or hand lens, paper towels, maximum/minimum thermometer.

2007 Pyrethroid resistance monitoring

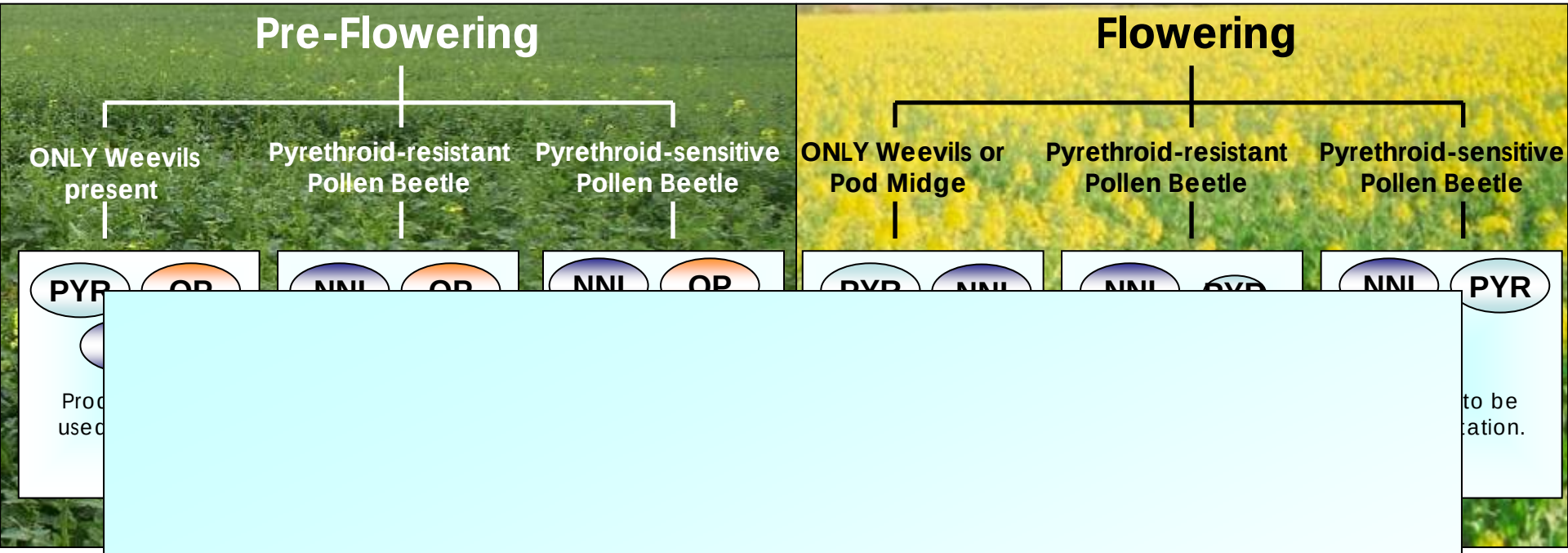
Country	No. of populations	Participant
United Kingdom	75+	Syngenta, BASF, ADAS, FMC
Germany	500+	BBA, Bayer, BASF, FMC, Regional agricultural bodies
France*	10+	Makhteshim
Belgium/Lux	10	BASF
Switzerland	40+	Syngenta, ACW
Poland	15	Bayer
Sweden	tbc	SLU
Austria	15	Bayer

* France covered by CETIOM/INRA survey using different methodology



IRAC Oilseed Pest Managment Decision Tree

Version 0.3, Sept 2007



Final version under discussion

- **ONLY**
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- **An a** **lass.**
- **Utilise**
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- **The u** **recor** **n shoul**
- **In co** **ation with a**
- **If aph** **ging to the neonicotinoid (4A), organophosphate (1B) and pyrethroid (3) MoA class are recommended when possible.**
- **Where possible alternative methods of oilseed rape pest management should be employed.**

IRAC SE Asia Group

- Widespread, strong resistance to neonicotinoids recently reported in Brown Planthopper (*Nilaparvata lugens*) from SE Asia: China, India, Thailand, Bangladesh, Vietnam, Indonesia & Malaysia
- IRAC SE Asia group set up 2007 to work with local organisations and regulators
- Active resistance monitoring underway in key countries
- IRAC companies urgently working on alternative solutions and investing in collaborations with key universities and institutes to understand the nature of the resistance
- IRAC planning a series of SE Asia regional IRM training courses (Funding from CropLife applied for)
- IRAC working with CropLife to engage additional Neonicotinoid producers

Only a concerted, co-ordinated approach will work

IRAC participation in key meetings

- International Plant Protection Congress / British Crop Protection Conference, Glasgow, October 2007
  - Platform presentations by IRAC members
  - IRAC Neonicotinoid team presentation
  - IRAC Exhibition stand with CropLife International and European Crop Protection Association
  - A day of IRAC team meetings preceding conference
- Entomological Society of America, San Diego, December 2007
  - IRAC Symposium ‘Prevention and management of vectors and pests of public health importance’
- IRAC-US / CropLife America meeting, Washington DC, April 2008
  - IRAC Executive face-to-face meeting
  - Joint IRAC Exec, IRAC-US, CLA meeting
- International Congress of Entomology, Durban, July 2008
  - IRAC International meeting planned – depending on member availability

Future developments and initiatives

- Continued support for new Country / Regional groups such as IRAC SE Asia
- Continued drive to encourage additional companies to join – especially for off-patent, multi-brand compounds
- Advocacy team developing key focussed, strategic initiatives in Crop Protection, Plant Biotechnology and Public Health that will make a real impact on IRM
- Continued website and Communication & Education initiatives including eLearning material
- Crop Protection team focus on developing and publishing IRM guidelines for key pest groups and on guidance for use of mixtures
- Plant Biotechnology team focus on influencing IRM in emerging markets
- Public Health team focus on education on IRM and on application for Gates Foundation funding

Effective IRM is vital: IRAC is as active as it has ever been in efforts to ensure this happens

Insecticide Resistance Action Committee Feedback on EPPO Resistance Alerts Proposal, September 2007

Alan McCaffery

2nd Meeting of EPPO Permanent Panel on Resistance, St Petersburg, September 2007

IRAC's approach

- IRAC, and its members companies wish to discuss the concept and validity of the EPPO Alerts list proposal
- We have a number of very clear concerns
  - Detailed in the following slides
- Note: IRAC supports valid databases of confirmed cases of resistance

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EPPO Alerts List – Quality of data and responses

- ‘Corrective measures needed early on - impossible to wait for definite confirmatory results’
- Inherently there is danger of inaccuracy and false identification of resistance
  - Proposal admits information needed early on is clearly not totally reliable
  - IRAC is concerned at this
- Only definitive scientifically and technically rigorous data are acceptable
- Wider applicability?
- Who is generating information?
- Labels?
- Techniques?

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EPPO Alerts list – Confidentiality and Liability

- Idea is that the EPPO resistance alerts list will be used solely by the panel and the closed nature of the list will avoid alarmist action
  - How can this be guaranteed? May easily happen
- Where the panel identifies a suspected case of resistance it will be communicated to relevant national bodies, pesticide regulatory authorities, national resistance groups, agricultural boards, etc
- In theory, if an unconfirmed resistance case is formally documented on a (even private) private website, and if this then resulted in an unjustified loss of confidence in a product, there is a strong potential for liability, if the case is later found to be false
- There could be critical impacts on markets for products for which there is not a real resistance problem
- IRAC companies might be justified in legal challenge