IRAC
Insecticide Resistance Action Committee
eConnection

Issue 24

October 2010

www.irac-online.org

About This Issue

I hope you find this edition of the IRAC eConnection informative and interesting. In this issue, as well as our normal news snippets, we include details of two IRAC sponsored symposiums at the ESA in December along with first details on the resistance conference, R2011, held every 4 years at Rothamsted, U.K. Other articles in the newsletter included an update on the Resistance Database (APRD), run by Michigan State University and details of the new version of the IRAC Mode of Action Classification Scheme just published on the website. The Lepidoptera WG, one of the more recently formed IRAC teams, reports on a new diamondback moth poster along with details of the 6th International Workshop on Management of the Diamondback Moth and Other Crucifer Insect Pests to be held next March.

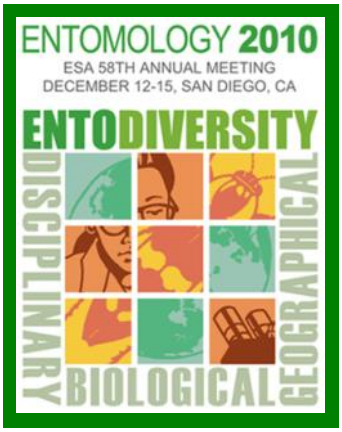
Remember if you have any news or resistance topics of interest please let us know so that we can inform others in the IRAC Network. We hope you enjoy the issue.

News Snippets

- The IRAC Pollen Beetle WG has changed its name to the Oilseed Rape WG to reflect the wider remit of the team investigating resistance in pests of oilseed rape including the ongoing multi-year monitoring programme in pollen beetles.
- The IRAC Sucking Pest WG is continuing its survey of the instances of *Myzus persicae* resistance and, with the support of EPPO, has so far received completed questionnaires from UK, Germany, Switzerland, Latvia, Malta, Hungary, Italy and the Netherlands. The team would welcome further inputs so please make contact via the website if you would like to take part in the survey.
- The first cases of resistance to the diamide chemistry in diamondback moth have been reported from Thailand. Details are being investigated by the local IRAC Diamide WG with support from the Global Team.
- Work continues on the second edition of the very popular IRAC Vector manual - “Prevention and Management of Insecticide Resistance in Vectors of Public Health Importance”. It is hoped to have printed copies of this available by the end of the year.
- IRAC has been shortlisted in the Agrow Awards category of Best Stewardship. Winners will be announced on November 2nd, 2010.

IRAC Symposiums at the ESA Meeting , December 14th & 15th, 2010, San Diego

The ESA meetings in December 2010, to be held in San Diego, CA, have as a theme ***"Entodiversity: Biological, Geographical and Disciplinary."*** IRAC-US is sponsoring a symposium at the meetings entitled, ***"Understanding and Capitalizing on Agricultural Diversity in IRM/IPM."*** The symposium will host speakers from Academia, Research Institutes, Government and Industry, discussing systems approaches to agriculture including, ecology, pollination, predation & parasitization, multi-crops systems, etc. IRAC-US encourages members and visitors to attend this symposium scheduled for the morning of Tuesday, 14th December.



IRAC is also sponsoring a second symposium on Wednesday, 15th December, focusing on best IRM practices and recommendations for key lepidopteran pests such as beet armyworm, corn earworm and diamondback moth in vegetables. Discussions will include the best utilization of the diamide insecticides in the overall IRM strategy in vegetables. Attending will be representatives from the IRAC International and IRAC US Diamide WGs along with key experts working in the field. Further information on both symposiums is available from IRAC via the website.

Arthropod Pesticide Resistance Database (APRD)

The Arthropod Pesticide Resistance Database (APRD) was created by Michigan State University with the intent to establish a source of pesticide resistance information for scientists, researchers, government officials, and industry specialists. With this information, resistance management practitioners can develop and refine IPM and IPM/IRM programs to prolong the usefulness of insect management tools. The database has been supported in part by the USDA and the Insecticide Resistance Action Committee (IRAC).

The occurrence of pesticide resistance can result in serious economic loss and social disruption. The APRD's mission is to report cases of arthropod adaptation to insecticides since the 1900s. APRD has documented 570 species and 9,121 cases of pesticide resistance, most of which have occurred over the last 60 years of intensive pesticide use. Resistance Case Analysis has demonstrated that most of the cases were found in agricultural, forest and ornamental plants (65.1%) while another 31.3% occurred in medical, veterinary and urban pests. Only 3.1% of the cases recorded the development of resistance in natural enemies such as predators or parasitoids. Pollinators account for only 0.05% of the cases along with other non-target arthropod species. APRD's managers intend that arthropod pesticide resistance reporting should contribute to designing better integrated pest management (IPM/IRM) programs through selection of diversified management materials and strategies; and in the end contribute to the world's effort to reduce hunger, improve food security and assure human and animal health.

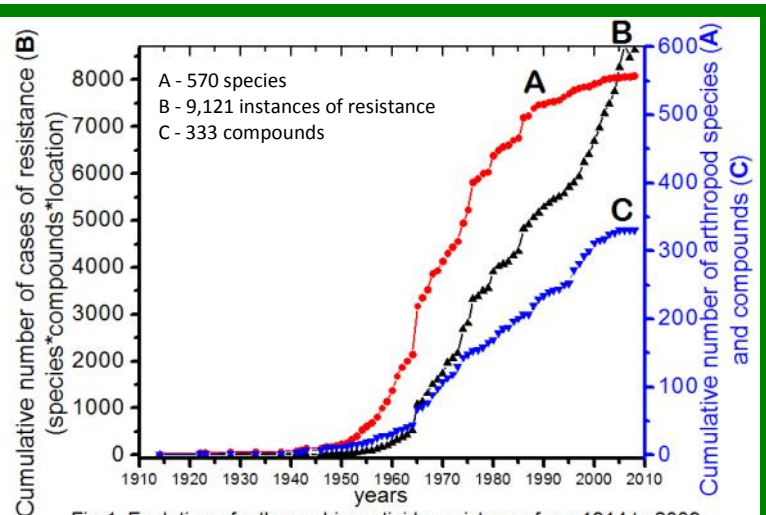


Fig 1. Evolution of arthropod insecticide resistance from 1914 to 2009. (species, compounds and total number of instances).

Staff & students working on the APRD. The APRD can be located at: www.pesticideresistance.org

The APRD is designed to be searched by species, active ingredient, location, reference, or the mode of action that resistance occurs in arthropods. Anyone with access to the WWW can search the database which has a wealth of information. However, only registered contributors can submit pesticide resistance cases for peer review and incorporation into the APRD. In just May of 2010 the APRD website experienced more than 64,000 hits with nearly 5,000 staying for 15 minutes or longer. Typically the APRD sustains more than 500,000 search-related visits annually lasting longer than 15 minutes. Nearly 1/3 of the monthly traffic to the APRD is from US educational institutions (.edu) while a large portion of others are from EU, India, Japan and China. The APRD has over 400 registered contributors from 46 different countries. These contributors represent scientific researchers, government officials, private and industrial employees, as well as members of non-profit organizations. A recent addition to the data base is the IRAC survey of regional experts that reports expert opinion of the current status and economic impact of the most common species.

Updated IRAC Mode of Action Classification (Version 7.0)

A number of changes have been made to the IRAC MoA Classification Scheme justifying the publication of version 7.0. The main updates are listed below but the full scheme can be downloaded from the MoA WG page on IRAC website.

IRAC MoA Classification v 7.0, September 2010		
Main Group and Primary Site of Action	Chemical Sub-group or exemplifying Active Ingredient	Active Ingredients

- Changes to active ingredients included in the scheme:
  - Active with code number RU 15525 replaced with the name Kadethrin
  - Active with code number ZXI 8901 deleted
  - Sulfuramid added to Group 13
  - Diflovidazin added to Group 10A
  - Bromopropylate added to Group UN
  - Lepimectin added to Group 6
- New Appendix including :
  - Appendix 3: A listing of all the MoA group descriptors
  - Appendix 4: The procedure for allocation of new insecticidal materials to the MoA classification
  - Appendix 5: A list of active ingredients with MoA classification in alphabetical order
- Some editorial updates including the addition of a table of contents

Some background information on the actives that have been added to the scheme:

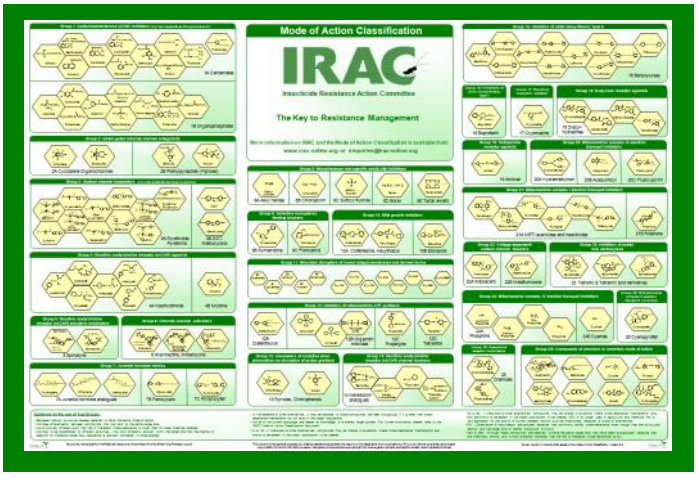
Sulfuramid - Introduced to the US market in 1989, sulfluramid is an insecticide used primarily (in baits) for the control of household insect pests such as termites and cockroaches. It is a proinsecticide that acts as an uncoupler of oxidative phosphorylation. (Group 13)

Diflovidazin - Diflovidazin [diflovidazine, flufenzine, SZI-121] was introduced to the market place in 1997. It is an acaricide used for the control of a wide variety of phytophagous mite species and acts by disrupting mite development. (Group 10A)

Bromopropylate - Related to dicofol, bromopropylate was developed in the late 1960s. It is an acaricide used for the control of a variety of tetranychid and eriophyid mite species. Like dicofol, bromopropylate has been reported to have several biochemical actions and is thus included in Group UN pending further clarification.

Lepimectin - This is a semi-synthetic derivative of milbemycin that was registered in Japan in 2010. It is effective against a variety of lepidopterous insect pests and acts though ligand gated chloride channels (Group 6).

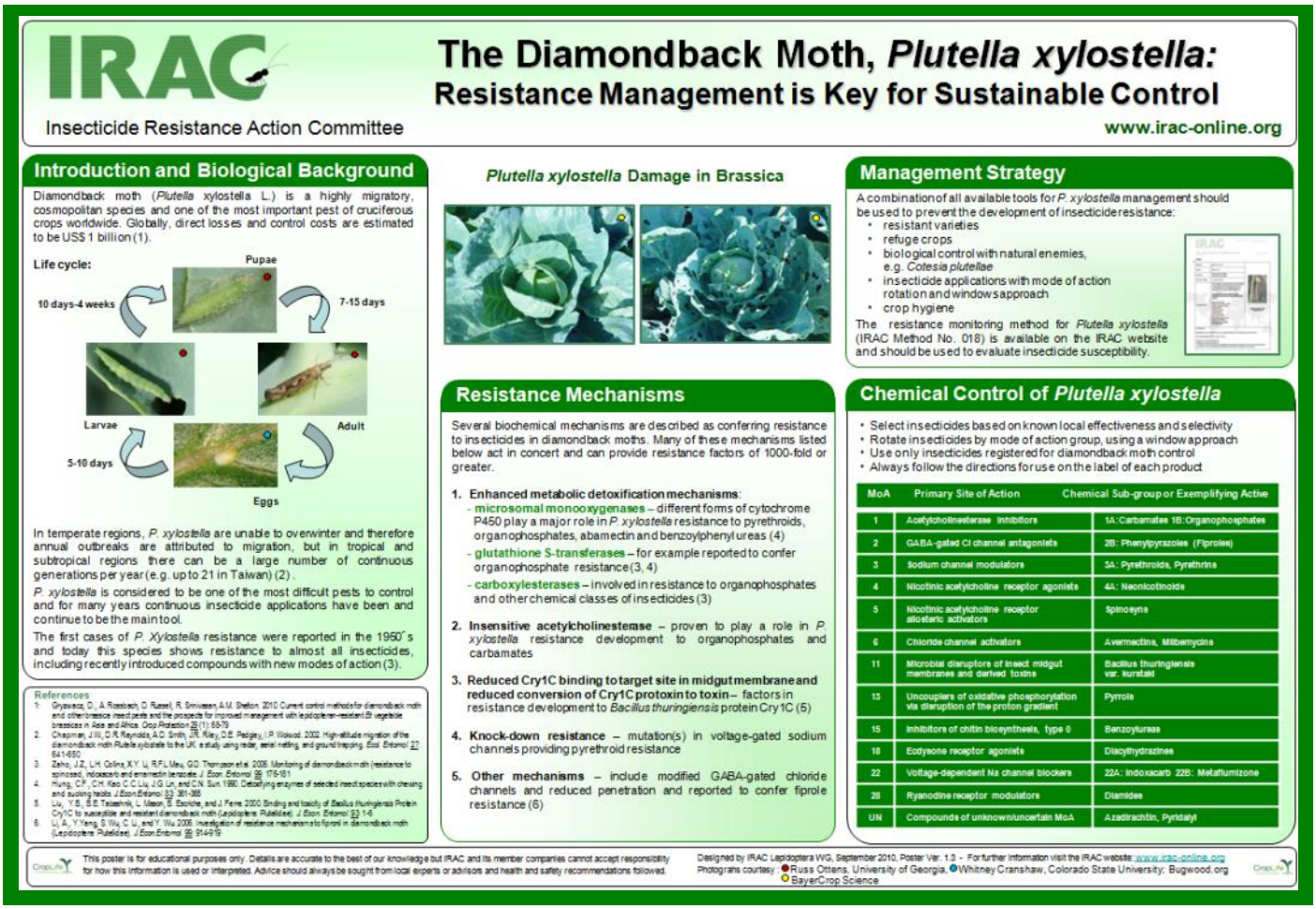
Printed copies of the MoA booklet and the MoA Poster based on the earlier version (v 6.3) of the scheme are available from IRAC members or via the website.



Resistance Management in Diamondback Moth - A New Poster from IRAC

Diamondback Moth (*Plutella xylostella)* is one of the most important pests of cruciferous crops around the world with direct loses and control costs estimated at around US$ 1 billion. It is considered to be one of the most difficult pests to control and many years of continuous insecticide applications has resulted in resistance developing to almost all insecticides including those new MoAs recently introduced.

The recently formed IRAC Lepidoptera WG has identified this key pest as an area needing further action. The group has developed the poster below as a first step in providing education on the need for a strong management strategy to prevent or delay the development of resistance using a combination of the available tools. Further work is planned with the support of the IRAC S.E. Asia group focussing on countries such as Thailand and the Philippines and IRAC will be involved in an upcoming DBM workshop scheduled for next March. (See the article below.)



This new poster is available for download from the Lepidoptera WG page on the IRAC website.

Sixth International Workshop on Management of the Diamondback Moth and Other Crucifer Insect Pests

The Workshop will be organized by AVRDC – The World Vegetable Centre and its Regional Centre for East and Southeast Asia in association with Kasetsart University (Thailand) and Cornell University (USA). It will be held from 21-25th March, 2011 at Kasetsart University, Nakhon Pathom, Thailand and about 200 – 300 researchers worldwide are expected to participate and present research and extension papers. The workshop is designed to provide a common forum for researchers to share their findings in bio-ecology of insect pests, host plant resistance, biological control, pesticides, and insect management on crucifer crops. As with previous workshops, comprehensive proceedings will be published.

Conferences & Symposia

- Entomological Society of Israel, Israel, October 7th, 2010
- Entomological Society of Canada & British Colombia, Vancouver, October 11-14, 2010
- British Crop Protection Council "CropWorld" Congress, London, UK, November 1-3, 2010
- Entomological Society of America, San Diego, CA, December 12-16, 2010

Resistance 2011 Conference, Sept. 5-7, 2011, Rothamsted Research, UK — Register interest now

This major international conference, the sixth in an ongoing series, will review new research on the origins, nature, development and prevention of resistance to insecticides, fungicides and herbicides. It will provide a forum for researchers, consultants, regulators and industrialists to present and discuss approaches to overcoming this continuing and important constraint to effective crop protection. Themes will include: the current status of resistance to pesticides, resistance mechanisms, population biology and modelling, applications of genomics, risk assessment and regulation, and transgenic crops. To register an interest in presenting or attending go to www.rothamsted.bbsrc.ac.uk/resistance2011.html

Feedback

The eConnection is prepared by the IRAC Communication & Education WG and supported by the 15 member companies of the IRAC Executive. If you have information for inclusion in the next issue of eConnection or feedback on this issue please email: aporter@intraspin.com.

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