



## Issue 13

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### Introduction to eConnection

#### ■ eConnection Issue 13

Welcome to the latest issue of the IRAC eConnection. Some of you may have noticed that we were unable to produce the March issue due to other activities by the IRAC Communication and Education Team - you can read more on these activities later in this issue. As always remember the eConnection is best read in conjunction with the IRAC website which often has further information on the topics described. [See the site](#)

Past issues of eConnection (Nos. 1-12) can be located on the website, now under the heading "eTools" or via [this link](#).

#### ■ In this Issue

Outlined below we have news of exciting developments within IRAC, two articles covering different resistance problems around the world and our normal update on upcoming conferences and symposia. The first resistance news article is a report from the IRAC Public Health Team, re-formed last year to tackle the increasing problems of resistance in vectors. This is followed by an article on an IRAC U.S. funded two-year project (2006-2008) to support a significant geographic expansion of corn earworm moth flight monitoring, and pyrethroid resistance monitoring. Details of this including support for an interdisciplinary and private/public sector partnership to begin to develop a practical corn earworm migration forecasting system is given below.

#### ■ Send us your feedback and News

If you have Resistance Management information that you think should appear on the IRAC website or eConnection please contact us with details. For IRAC Country Groups and Teams around the world please send updates on your activities, meeting minutes etc. for inclusion in the relevant areas of the IRAC website. [Email aporter@intraspin.com](mailto:aporter@intraspin.com).

### IRAC News

#### ■ Membership of IRAC International increases

IRAC has been exceptionally busy over the last 6 months. First of all we want to welcome new member companies to IRAC International. Makhteshim Agan joined the Committee in March and Monsanto, a long time member of IRAC US, has also just joined the IRAC International Executive Committee. With the membership of Sumitomo Chemicals last year this now brings the number of IRAC International Executive member companies to 9 ([See the website homepage for a full list](#)). Membership of the International Executive Committee is important in terms of providing support and funding for the development of central resources such as the Mode of Action Classification, the Susceptibility Test Methods and of course the IRAC website. Other companies interested in joining the IRAC International Executive Committee should contact the IRAC Coordinator [Email aporter@intraspin.com](mailto:aporter@intraspin.com).

#### ■ New IRAC website launched on schedule

One of the big successes for IRAC and particularly the Communication & Education Team has been the development and launch of the new IRAC website ([www.irc-online.org](http://www.irc-online.org)). The proposal for the project was approved by the International Committee in June 2006, work on the design and content for Phase I was completed in February 2007 and the official launch of the new website was at the Resistance 2007 Conference at Rothamsted, UK in April. The new site is a database driven, cost effective, information management solution that provides an IRAC/IRM Global Knowledge Hub. The application includes an integrated Content/Document Management System with improved scalable navigation, information organisation and data accessibility. The next phase of the website development is ongoing so watch out for more news.

#### ■ A joint CropLife International and IRAC publication on IRM

IRAC and CropLife have cooperated and generated a valuable new publication titled: Resistance Management for Sustainable Agriculture and Improved Public Health. The publication outlines the work of IRAC, defines resistance, explains the different types of insecticide resistance and outlines recommended strategies to prevent or delay the onset of resistance. Also included are short overviews of the increasing importance of IRM in transgenic insect-protected crops and pests and vectors important for public health. Copies can be obtained from CropLife in Brussels or from IRAC via the IRAC Coordinator [Email aporter@intraspin.com](mailto:aporter@intraspin.com). An electronic pdf version (13MB) is available from the website by clicking [here](#)

■ **IRAC International's Spring Meeting a Big Success**

IRAC International held their 42nd Meeting following the Resistance 2007 Conference in April 2007. This was one of our most successful meetings in recent times and was attended by 19 IRAC members, Country Group representatives and guests. A range of IRM topics was covered with presentations from a number of recognised experts in the field of resistance management. Action items and goals for the coming year were identified and these will be followed up by the various IRAC working groups and teams.

## Resistance Management News

■ **IRAC Public Health Team tackling vector-borne diseases**

Vector-borne diseases such as malaria are global problems that will only increase with the development of global warming. The economic and social impact of vector-borne diseases is enormous according to the latest WHO Malaria report. It is still considered to be the most important disease worldwide, with 350-500 million clinical cases occurring annually and more than 1 million deaths caused by infection with *Plasmodium falciparum* and *P. vivax* transmitted by Anopheline mosquitoes. Insecticides play an essential role in the fight against such diseases and in the improvement of public health by controlling the vectors themselves; however, resistance to commonly used insecticides is on the rise. Since insecticides remain the mainstay of many tropical vector control programmes, the potential for such programmes to be compromised by insecticide resistance is of major concern.

In 2006, IRAC strengthened its public health activities by setting up a new IRAC Public Health Team. The team, consisting of representatives from the private (industry) and public (WHO and Gates Foundation) sectors, recently edited a manual titled: Prevention and Management of Insecticide Resistance in Vectors and Pests of Public Health Importance. The manual was completed and approved by the IRAC Public Health Team in Geneva, Switzerland during a meeting at the WHO Headquarters in August 2006. Printing and production of the manual was in collaboration with CropLife International funded by the Bill & Melinda Gates Foundation. Copies of the printed version of the manual are available from the IRAC Coordinator [Email aporter@intraspin.com](mailto:aporter@intraspin.com). An electronic pdf version is available from the website by clicking [here](#)

■ **IRAC U.S. Supports Pyrethroid monitoring for *Helicoverpa zea***

The corn earworm (CEW), *Helicoverpa zea* (Boddie), is a highly mobile pest of numerous crops throughout North America, causing millions of dollars in damage and excessive control costs each year. In the Midwestern U.S., *H. zea* is an economic pest of several high-value crops including: sweet corn, tomatoes, snap beans, peppers and seed corn. Historically, the synthetic pyrethroids have proved cost-effective for CEW management. However, beginning in 2000-1, control levels achieved with pyrethroids in Minnesota and Wisconsin decreased markedly. By 2005, small plot trials indicated that pyrethroids were only achieving 19.3 to 37.3% control. In addition to field results, the survival of moths exposed to cypermethrin (5 µg), using the Adult Vial Test (AVT), indicated high survival rates (30-60%).

In response to the increasing concerns about pyrethroid susceptibility in CEW, IRAC-U.S. funded a two-year project (2006-2008) to support a significant geographic expansion of CEW moth flight monitoring, and pyrethroid resistance monitoring. Related to these objectives, a primary goal was to develop new, consistent standards for moth flight monitoring, mapping and resistance monitoring. IRAC also provided initial funding to support an interdisciplinary and private/public sector partnership to begin to develop a practical CEW migration forecasting system that would provide real-time "advance warnings" of late-season flights in the northern U.S.

During 2006, significant progress was made under each of the proposed objectives, including:

- By July of 2006, a greatly expanded network of cooperators was in place for expanding the CEW Moth Flight Monitoring program and for timely reporting data via the new web-form [ZEA MAP web site](#)

- Over 40 cooperators participated in the resistance monitoring effort, using the cypermethrin AVT test, throughout the Midwest and northeastern U.S. Over 4,700 moths were collected and assayed. Survival at 10ug cypermethrin was less than 1.5% overall, with no significant "hot spots" detected.

- Despite the positive results shown from the AVT assays, and although no widespread reports of control failures were reported, CEW larval control in small-plot trials, as well as one large aerial test in commercial sweet corn, continued to show low efficacy with control ranging from 35-50%.

- A meeting to develop a new framework for modeling CEW migration from the southern to northern U.S. will take place in June 2007, at Pennsylvania State University.

All proposed objectives will continue in 2007-2008, with additional studies conducted to better understand how AVT results vary in contrast to larval selection pressure in individual fields.

Continued effective management of CEW will depend upon ongoing collaboration and networking of extension, industry and research personnel to facilitate multi-state resistance monitoring, multi-state research, and the development of new alternatives for CEW management. It is anticipated that the expanded on-line system will improve communication among researchers and provide timely IPM recommendations by extension educators in the regions most affected by pyrethroid resistance in CEW.

The full article was kindly supplied by Bill Hutchison, Dept. of Entomology, University of Minnesota, St. Paul, MN and can be read on the IRAC website.  
[See the IRAC US pages on the website](#)

### Conferences and Symposia

- **4th European Mosquito Control Association Workshop, Prague 11-14th September 2007**  
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- **The XVI International Plant Protection Congress (with IAPPS and BCPC), Glasgow UK, 15-18 October 2007**  
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- **NPMA, PestWorld 2007, Orlando, Florida, 17-20th October 2007**  
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- **ESA Annual Meeting, San Diego, CA, 9-12th December 2007**  
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- **1st Intl. Conference: Agrochemicals protecting crop, health and natural environment (IUPAC sponsored), New Delhi, India, 8-11 January 2008**  
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- **Beltwide Cotton Conferences, Nashville, TN, 8-11 January 2008**  
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- **3rd European Whitefly Symposium, Almeria, Spain, 6th-10th May 2008**  
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- **International Congress of Entomology, Durban S. Africa, 6th-12th July 2008**  
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