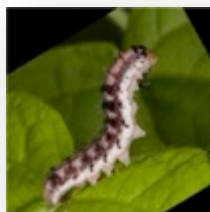




Insecticide Resistance Action Committee

Lepidoptera Working Group 2017 Update

Luis Teixeira
Philadelphia
March 28th 2017



Lepidoptera WG Members

| Representative | Company |
|--------------------|---------------|
| Adeline Bertrand | ADAMA |
| Sebastian Coggiola | ADAMA |
| Paula Marcon | Agbitech |
| Werner Heck | BASF |
| Siddharth Tiwari | BASF |
| Nigel Godley | Bayer |
| Ralf Nauen | Bayer |
| Eric Andersen | FMC |
| Jim Dripps | Dow |
| Maria Torne | Dow |
| John Andaloro | DuPont |
| Luis Teixeira | DuPont |
| Nobuyuki Nonaka | Nihon Nohyaku |
| Brian Duggan | Nufarm |
| Jan Elias | Syngenta |
| SR Gha | Syngenta |
| Daniel Zommick | Valent |
| Total = 17 | Total = 11 |

Lepidoptera WG SMART Objectives 2016

- Maintain currency of the global IRM guidelines based on new experiences, new active ingredients, and application methods.
- Improve Lepidopteran educational and communication tools
- Transition country diamide working groups to resistance action groups
- Initiate compliance process to align IRM recommendations among company product labels.
- Assess usability of “diamide” bioassay methods for lep products
- Conduct Tuta task team

Lepidoptera WG SMART Objectives 2016

- Maintain currency of the global IRM guidelines based on new experiences, new active ingredients, and application methods.
 - Update new global Lepidoptera insecticide IRM guidelines
 - rewrite to transition from diamide to insecticide IRM guidelines
 - clarify recommendations for lep products providing non-lep control
 - incorporate seed treatment application method
 - revise and include product label IRM language examples
 - Agree and disseminate IRM label criteria

IRAC Guideline for Management of Lepidopteran Resistance to Insecticides

Draft, Mar 2017 Version 2.5

IRAC Lepidoptera Working Group

Introduction

Resistance to insecticides is a 'heritable change in the sensitivity of a pest population' that is reflected in the repeated failure of a product to achieve the expected level of control when used according to label recommendations for that pest species. The aim of this guideline is to summarize strategies that companies, influencers and growers can use to slow the development of resistance and provide more effective and sustainable pest control.

IRAC Mode of Action Classification

Lepidoptera insects can be controlled by insecticide compounds with different mode of action (MoA). Repeated use of any insecticide can lead to resistance to that specific insecticide. In addition, if insects become resistant because of a change in the binding site of the insecticide, insects will become resistant to all insecticides with the same mode of action.

The IRAC MoA classification is intended to identify insecticides acting at specific target sites where mutations could confer cross-resistance to all compounds acting on the same site. It provides a guide to the selection of insecticides for use in an effective and sustainable insecticide resistance management (IRM) strategy.

A summary list of insecticide MoA and corresponding chemical groups is shown in Appendix 1. More details on insecticide Modes of Action can be found on the IRAC web site irac-online.org and the IRAC MOA App can be downloaded on to your cell phone.

The IRAC Mode of Action group numbers are now included on product labels in many countries. Additionally, statements providing insecticide resistance management guidance are also often given on the labels.

IRAC Lepidoptera Working Group

The guidelines presented here are designed by the Lepidoptera Working Group of the Insecticide Resistance Action Committee (IRAC). Our objective as industry technical experts and IRAC members is to provide a reference document for designing IRM strategies for lepidopteran pests. The information provided is based on published information and to the best knowledge of IRAC International at the time of writing (February 2017).

As pest problems and control practices differ considerably between countries, crops and climatic conditions, these guidelines are meant to be flexible and allow experts to develop, adapt and implement these options to take local conditions into account. However, exceptions will need to be addressed by experts on a case by case basis.

Guidelines for use of insecticides against Lepidopteran pests and resistance management

- 1. IRAC member companies are responsible for including IRM information in product labels.**
- 2. Always use products at the recommended label rates and spray intervals with the appropriate application equipment.**
- 3. Rotation of insecticide Mode of Action groups prevents rapid selection of resistant populations.**

The recommended approach is to use products of the same MoA within a discrete period of time commonly called a “window”. A window is defined by the duration of an insect generation or approximately 30 days. The period of residual activity provided by a single or sequence of product applications with the same mode of action should fit within a window.

- 4. Use Integrated Pest management (IPM) practices to protect crops from pest damage and reduce the risk of insecticide resistance.**
- 5. Consider the systemic properties of some soil and seed-applied products.**

- 5. Using insecticide mixtures.**
- 6. The use of insecticides of the same Mode of Action against different pests in the same crop.**
- 7. Never use insecticides from the same Mode of Action where resistance is known.**
- 8. The use of non-specific mode of action products helps to prevent the development of resistance.**
- 9. Monitor problematic pest populations in order to detect first shifts in sensitivity.**
- 10. Where local information is known about cross-resistance between different MoA groups.**
- 11. Never use a product of questionable origin or composition.**
- 12. Make sure to follow appropriate country label instructions.**
- 13. The use of the same insecticide to control different types of insect pests (Lepidoptera, Coleoptera, sucking insects).**

IRAC GLOBAL IRM LABEL ALIGNMENT PROJECT

Minimal IRM Label Requirements for Insecticides

August 17, 2016

Version 11

IRAC Lepidopteran Working Group

2016 -17 SMART Objective

LABEL IRM ALIGNMENT PROJECT: MINIMAL IRM LABELING RECOMMENDATIONS.

| IRM ELEMENTS | MINIMAL LABEL RECOMMENDATION | LABEL CRITERIA TO DETERMINE UPGRADE | MEETS MINIMAL EXPECTATIONS |
|---|--|--|----------------------------|
| 1). MODE OF ACTION NUMBER AND CHEMICAL CLASS | The IRAC MoA icon is on the first page... BUT if prohibited, then the MOA icon is placed in the Resistance Management label text...BUT if prohibited then state the MoA number and chemical class for active ingredient(s) in label text. <div style="border: 1px solid black; padding: 2px; display: inline-block;"> GROUP 28 INSECTICIDE </div> | If the MoA number or icon or chemical class appears on the label unless prohibited by country regulators | YES |
| | | No MoA number or icon or chemical class appear on the label but country regulators allow. | NO |
| 2). MAXIMUM NUMBER OF APPLICATIONS | States the maximum number of product applications for each crop on the label per cropping season or per year | States the maximum number of product applications per cropping season or per year | YES |
| | | No statement of maximum number of product applications per cropping season | NO |
| 3). QUALITY LABEL IRM STATEMENT | Contains at least the 3 "REQUIRED" components for a quality label IRM statement. 1. State the IRAC MoA Number 2. Rotate products with different Modes of Action 3. Provide guidance to avoid treating consecutive generations with the same MoA. | Contains the 3 "REQUIRED" components for a quality label IRM statement or country regulators do not allow. | YES |
| | | Does not contain the 3 "REQUIRED" components for a quality label IRM statement. | NO |

Lepidoptera WG SMART Objectives 2016

- Improve Lepidopteran educational and communication tools
 - Finalize Lobesia and FAW poster
 - Decide future poster needs
 - Assist in completion of IRAC/Crop Life Grower Benefit Brochure
 - Complete an IRM training slide set using new Lepidoptera insecticide IRM guidelines with examples and visuals

Lobesia botrana - Background

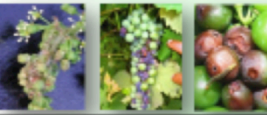
Lobesia (Poliohyalaea) botrana (Denis et Schiffermüller) (Lepidoptera: Tortricidae), also known as the European grapevine moth (EVM) is traditionally a major vineyard pest throughout Europe, the Middle East, North and West Africa and Southern Russia. Native of South Europe, it was more recently reported in Chile and Argentina (2005) and found in the United States (Napa Valley) in October 2009. *Lobesia botrana* is regulated as a quarantine pest in a number of countries.



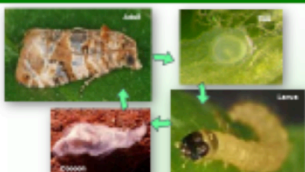
L. botrana is a major cause of economic damage to grape for its direct damage to the berries and for providing entry sites to fungal infections. Potential instances of *Lobesia botrana* resistance to organophosphates, pyrethroids, oxadiazole and spinetolol insecticides have been reported in the scientific literature.

Damage and Symptoms

In spring, the 1st generation *L. botrana* larvae web and feed on the flower clusters during the subsequent generations before and feed on berries. Larval feeding can lead to desiccation of significant bunch portions and, under wet seasons, actively favours the establishment of fungal infections (e.g. Botrytis) and other secondary fungi. Losses up to 40% in the harvest can occur as a result of direct damage to the fruit and subsequent fungal infections.



Life Cycle



Lobesia botrana can have two to four generations per year depending on the climatic conditions and the date of grape harvest.

Key Management Strategy: Integration of Control Measures

The basis for effective and sustainable management of *L. botrana* is the integration of cultural, biological and chemical control tactics.

- Cultural**
- Varietal susceptibility
 - Fertigation practice
 - Vine training and canopy management
 - Quality spray equipment maintenance
- Biological and behavioural**
- Preservation of predators and parasitoids
 - Pheromone-baited traps
 - Mating disruption technique
 - Organic insecticides
- Chemical**
- Adopt insecticides compatible with natural enemies
 - Avoid exposing two subsequent generations to the same MoA
 - Applications on wet thresholds, based on leaf advisory tools
 - Prefer avoidant timing to prevent larval generations



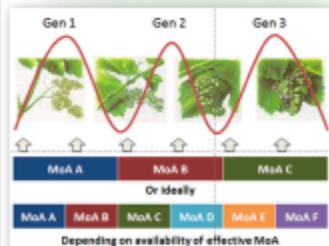
Insecticide Resistance Management

Control of *Lobesia botrana* may require multiple insecticide applications in one season. Fall sprays are mostly targeted to the control of the 2nd generation in wine grapes, and the 2nd and 3rd generations in table grapes. Normally 1 to 3 applications are needed in wine grapes and up to 5 in late-harvesting table grapes.

Insecticide Resistance Management (IRM)

Sustainable IRM management programs are based on the integration of as many pest management tools as possible. Use insecticides only when needed, based on established thresholds and alternating effective insecticides belonging to different MoA groups. The adoption of all applicable control measures (including mating disruption) together with MoA group alternation remains best IRM strategy, as it minimizes the selection pressure for resistance.

Insecticide Mode of Action (MoA) Window Approach



The basic rule for adequate rotation of insecticides by MoA is to avoid treating consecutive generations of the target pest with insecticides in the same MoA group, by using a scheme of "MoA treatment windows" in which every single *L. botrana* generation is regarded as a "window" where an insecticide MoA should be avoided twice in total.

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Developed & updated by the IRAC Lobesia botrana Working Group.

IRAC 016. Insecticide Resistance Management Committee.

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Strategies for Sustainable Control of Fall Armyworm, *Spodoptera frugiperda*

FAW - Background

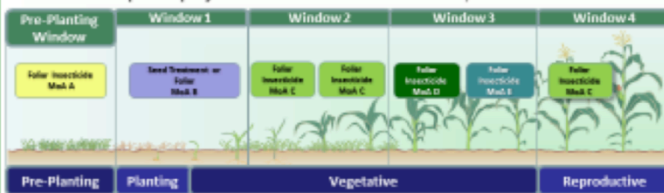
Fall armyworm (FAW), *Spodoptera frugiperda* (L.Z. Serv.) (Lepidoptera: Noctuidae) is native to tropical and subtropical regions of the Western Hemisphere, and regularly migrates to cooler regions in summer. FAW has a very wide host range, with a preference for grasses. The most frequent crop hosts are field corn, sweet corn, foxtail, sorghum, sugar cane, and Bermudagrass. It is also a serious pest in soybean, cotton, peanut/groundnut, brassicas, Cucurbitaceae, alfalfa/legume, onion, sweet potatoes, tomatoes and other Solanaceae, and various ornamental plants. Crop damage results mainly from larvae consuming leaf tissue, but larvae will also burrow into the growing point (bud, shoot, etc.), destroying potential future plant growth. Yield loss can reach 30-60%. The life cycle is highly temperature dependent and lasts about 30 days in summer to 90 days in winter, resulting in multiple generations per year. There is no diapause in this species. FAW has a high reproductive rate. Females can produce up to 2500 eggs, which are deposited on plant leaves in masses of 800-1000 eggs. The egg stage lasts 2-3 days in the summer months. The larval stage lasts 14-20 days and there are usually 5 instars. Pupation takes place in the soil and lasts 5-20 days. Adults are nocturnal and are most active during warm, humid evenings.

The occurrence of multiple generations, the ability to migrate, and the ability feed on a wide range of host plants makes fall armyworm one of the most severe economic pests in the Western Hemisphere.



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FAW IRM example – Spray windows for conventional maize, Brazil



Known insecticide resistance in FAW

Resistance results from the repeated exposure of multiple pest generations to the same insecticide mode of action. Several biochemical mechanisms are known to contribute to the evolution of insecticide resistance in FAW. These mechanisms may act separately or in concert. Known resistance has occurred to the following MoA groups: Carbamates (Group 1A); Organophosphates (Group 1B); Pyrethroids (Group 3); Scytho thymopylest and Cry-1F protein (Group 11A).



FAW Resistance Management

- To prevent the development of insecticide resistance, use a combination of all available pest management and resistance management tools to decrease FAW exposure to insecticides.
- Always follow the directions for use on the label of each product.
- Consult product label or IRAC's website (www.irac-online.org) to determine the mode of action (MoA) of each product.
- Do not treat successive generations with products of the same MoA.
- Follow the "treatment windows" approach (see example above).
- A "treatment window" is the period of residual activity provided by single or sequential applications of products with the same mode of action. This "treatment window" should not exceed approximately 30 days (generally used as the length of an insect pest generation) but can be less and should not exceed more than 2 applications of products from the same MoA.
- Following this treatment period rotate to an approximately 30 day "window" of effective insecticides with different modes of action if needed.
- Generally, the total exposure period of products representing a single MoA applied throughout the crop cycle (from seeding to harvest) should not exceed approximately 50% of the crop cycle or exceed 50% of the total number of insecticide applications targeted at the same pest species.
- Apply insecticides only when needed based on economic thresholds.

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**Insecticide Resistance Management
Recommendations for Diamondback Moth
Mexico Brassica
December 2016**



Provided by:
COTECO
Mexico Resistance Action Group
Insecticide Resistance Action Committee (IRAC)

Lepidoptera WG SMART Objectives 2016

- Transition country diamide working groups to resistance action groups
 - Choose new global liaisons to communicate to country teams
 - Lep team companies identify country reps to participate in local meetings
 - Update country resistance action group membership and emails

| Representative | Company | Country groups | | | | | |
|--------------------|-----------|----------------|-----------|-------------|----------|----------|----------|
| | | by company | Country | Country2 | Country3 | Country4 | Country5 |
| Adeline Bertrand | ADAMA | 2 | France | Israel | | | |
| Sebastian Coggiola | ADAMA | | | | | | |
| Werner Heck | BASF | 0 | | | | | |
| Siddharth Tiwari | BASF | | | | | | |
| Nigel Godley | Bayer | 3 | India | Philippines | Turkey | | |
| Ralf Nauen | Bayer | | | | | | |
| Eric Andersen | FMC | 2 | Chile | Mexico | | | |
| Jim Dripps | Dow | 3 | Korea | | | | |
| Maria Torne | Dow | | Spain | Italy | Morocco | | |
| John Andaloro | DuPont | 7 | Argentina | Indonesia | Japan | Malaysia | USA |
| Luis Teixeira | DuPont | | Brazil | S Africa | | | |
| Nobuyuki Nonaka | N.Nohyaku | 0 | | | | | |
| Brian Duggan | Nufarm | 1 | Australia | | | | |
| Jan Elias | Syngenta | 4 | | | | | |
| Robert Senn | Syngenta | | China | Thailand | Vietnam | Taiwan | |
| Daniel Zommick | Valent | 0 | | | | | |

Country Resistance Action Groups (formerly Diamide) Contact Details

| Country | Participant | Company | Email | Global Contact | Last Update | Comments |
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| France | François Sénéchal | Syngenta | | | 25 January 2016 | |
| France | Céline Thibault | Syngenta | | | 25 January 2016 | |

2017: Country "R" Action Groups Established and Status

| # | Global Liaison | Country | Relative to the Steps in the Country Guidance Tutorial | | | | | | | | | | | | |
|----|--------------------------|--------------|--|---|---|---|---|---|---|---|---|---|----|----|----|
| | | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | DuPont- John Andaloro | Australia | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 2 | DuPont- John Andaloro | Argentina | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | 10 | 11 | 12 |
| 3 | DuPont- Luis Teixeira | Brazil | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 4 | DuPont-Eric Andersen | Chile | 0 | 1 | 2 | 3 | 4 | | | | | | | | |
| 5 | Syngenta- Gha Seung Ryul | China | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 6 | ADAMA – Adeline Bertrand | France | 0 | 1 | 2 | 3 | 4 | | | | | | | | |
| 7 | Bayer- Nigel Godley | India | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 8 | DuPont- John Andaloro | Indonesia | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 9 | DuPont – Maria Torne | Italy | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | |
| 10 | DuPont- John Andaloro | Japan | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 11 | Syngenta- Jim Dripps | Korea | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 12 | DuPont- John Andaloro | Malaysia | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | |
| 13 | DuPont-Eric Andersen | Mexico | 0 | 1 | 2 | 3 | 4 | | | | | | | | |
| 14 | DuPont- Maria Torne | Morocco | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 15 | Bayer- Nigel Godley | Philippines | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 16 | Bayer- Maria Torne | Spain | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | 10 | 11 | 12 |
| 17 | Syngenta- Gha Seung Ryul | Thailand | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | |
| 18 | Syngenta- Nigel Godley | Turkey | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | |
| 19 | DuPont- John Andaloro | USA | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 20 | Syngenta- Gha Seung Ryul | Vietnam | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | |
| 21 | Syngenta- Gha Seung Ryul | Taiwan | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 22 | DuPont-Luis Teixeira | South Africa | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | 10 | 11 | 12 |
| 23 | DuPont- Adeline Bertrand | Israel | 0 | 1 | 2 | 3 | 4 | 5 | | | | | | | |

0. Haven't met yet
1. Understand Objectives
2. Meet and Organize

3. Review Antitrust
4. Review Global Guidelines

5. Select High Risk Insects & crops
6. Develop Plan to Communicate MOA
7. Develop IRM Guideline Plan by Crop
8. Develop Communicate & Educate Plan

9. Act if "R" Occurs
10. Implement 6, 7, & 8-Train/Apply
11. Work on more pests & crops
12. Transition from Diamide to IRM WG



TEAM STATUS

1. Number of meetings in 2016 and 1st Q 17: **6**

2. CRAG members:

jan.vanvuuren@bayer.com, wilbri.vorster@bayer.com; Riaan.Vd-Merwe@dupont.com; Tanya.Joffe@SYNGENTA.COM;
[desiree.van_ heerden@syngenta.com](mailto:desiree.van_heerden@syngenta.com), albert.deklerk@philagro.co.za, andrew.bennett@monsanto.com, ANDRIES.FOURIE@dupont.com



TRANSITION TO BROADER INTER-COMPANY IRM TEAMS

Please comment on your current meeting structure. Have You:

- invited non-diamide company members to attend your country meetings? **YES**
- merged with your country IRAC or Crop Life organization? **YES**
- if you have done any of these....how is the new structure/process working out??

Workgroup functions separately and report back into CRAG meetings, do planning of projects, road trips, etc. in workgroup, general discussions on relevant topics in CRAG



TEAM STATUS

1. Number of meetings in 2016 and 1st Q 17: **3 meetings (March 18th, July 15th and March 22th)**
2. List the CRAG members and their email addresses.

- ✓ Dow AgroSciences - Cristiane Muller – muller2@dow.com
- ✓ DuPont - Eduardo Picelli - eduardo.picelli@dupont.com
- ✓ Bayer - Daniela Okuma - daniela.okuma@bayer.com
- ✓ Syngenta – Patrick Bonani - jean.bonani@syngenta.com
- ✓ Basf – Fernando Gava - fernando.gava@basf.com
- ✓ Monsanto – Renato Carvalho - renato.a.carvalho@monsanto.com
- ✓ UPL – Florindo Orsi - florindo.orsi@uniphos.com
- ✓ Adama – Cristiane Stecca - cristiane.stecca@adama.com



TRANSITION TO BROADER INTER-COMPANY IRM TEAMS

Please comment on your current meeting structure. Have You:

- Invited non-diamide company members to attend your country meetings? **Yes**
- Merged with your country IRAC or Crop Life organization? **Yes, Crop Life organization is invited to all the meetings. All the activities are developed during the regular meetings and when necessary, we schedule extra meetings.**
- If you have done any of these....how is the new structure/process working out?? **This structure has been working well, since all the companies are involved in the discussion and contributes for the management strategies.**

Country Group Review tomorrow

- Argentina ✓
- Australia ✓
- Brazil ✓
- Chile ✓
- China ✓
- France ✓
- India ✓
- Indonesia ✓
- Israel ✓
- Italy ✓
- Japan ✓
- Korea ✓
- Malaysia ✓
- Mexico ✓
- Morocco ✓
- Philippines ✓
- South Africa ✓
- Spain ✓
- Taiwan ✓
- Thailand ✓
- Turkey ✓
- USA ✓
- Vietnam ✓

Lepidoptera WG SMART Objectives 2016

- Initiate compliance process to align IRM recommendations among company product labels.
 - Each company assesses 2 product labels/country to include:
 - Max # of apps, quality IRM language, mode of action icon
 - Focus - key lep labels in USA, Brazil, China, India, Italy, Spain,
 - Create process to collect, review, and audit progress

Lepidoptera WG SMART Objectives 2016

- Assess usability of “diamide” bioassay methods for lep products
 - Assess bioassay methods developed for Diamide products vs leps if they can be used to assess non-diamide products.

Lepidoptera WG SMART Objectives 2016

- Conduct Tuta task team
 - Review and update Tuta educational materials
 - Setup core team
 - Implementing a workshop
 - Complete Tuta IRM BMP package

Core team and participants

Cesar Blanco Ruiz cesar.blanco-ruiz@basf.com

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***Tuta absoluta* IRM Technical Exchange**
Wednesday October 25 2016

8:00 Welcome, purpose and expectations, and reminder of antitrust guidelines (Luis)

8:30 Expert Presentations (20 min each + questions)

Update on country resistance problems and management practices; focus on risks, products available for rotation; crop production practices; why growers must implement

- Monserrat
- Bielza

9:30 Draft IRAC Tuta best management practices for IRM (Maria/Stefano/Cesar/Stefano)

Country recommendations; training materials; grower adoption; BMP gaps

- BMP slide deck

10:30 Coffee/Tea

11:00 Interactive session

Introduce interactive session; IRM recommendation development, applicability of IRM BMP for respective countries; ID challenges; who implements.

12:30 Lunch

14:00 Interactive session (Cont'd.)

Group feedback on IRM recommendations, open discussion

15:30 Coffee/Tea

16:00 Implementation and audit plan Outline of country implementation and audit plan

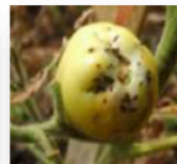
17:30 Wrap-up Closing remarks and next steps



Insecticide Resistance Action Committee

**Best Management Practices to Control
Tuta absoluta and Recommendations
to Manage Insect Resistance**

IRAC Tuta IRM Task Team – 2017 (v6)



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CropLife
INTERNATIONAL
ITA 2017

Best Management Practices to Control Tuta and Manage Insect Resistance

TABLE OF CONTENTS

- 1. Update Tuta presence and pest status globally**
- 2. Recognize Tuta life stages, life cycle, damage, and plant symptoms**
- 3. Tuta control products, resistance publications, and method to evaluate efficacy**
- 4. Monitor Tuta populations**
- 5. Integrate key Tuta control strategies**
- 6. Understand Action Thresholds for chemical and microbiological control**
- 7. Maximize pest control using adjuvants and app tech equipment**
- 8. Understand Insecticide Resistance Management Principles**
- 9. Implement Insecticide Resistance Management Strategies**
- 10. Grower adoption of Tuta IRM: Factors that influence Growers**
- 11. Examples of country MoA alternation programs**
- 12. Country IRM execution guidelines**

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Lepidoptera WG meeting agenda (Wed)



Final, 24-Mar-17

Agenda
Wednesday March 29 2017
IRAC Lepidoptera WG
Session 2D
Betsy I

Session Chair: Luis Teixeira

Agenda:

13:00 Welcome, introductions and reminder of antitrust guidelines (Luis)

13:10 Review 2015/16 Lepidoptera WG activities (Luis)

13:20 Country updates: The liaison presents summary slides. (Liaisons/All)

- Group status, meetings, reports of resistance, label alignment, proposed IRM strategies
- Challenges/highlights, requests from country WGs to the Lepidoptera working group
- Guidance/communications to country WG
- Country group impact discussion (liaison alignment, projects, funding)

15:00 Coffee/Tea

15:30 Lepidoptera WG discussion (Contd.)

- Label Review Compliance project – audit process (John A.)
- Review Tuta task team and Mexico effort and key learnings (TTT core team)
- Review and finalize Lepidoptera IRM guidelines (Nigel G.)
- Review/Edit SMART objectives (Luis)
- Other topics? Research findings?

18:00 Session closed

18:30 Group Dinner (location tbd)

Thank you

- Five conference calls
- Multiple revisions of posters and guidelines
- Multiple Tuta task team audioconferences