

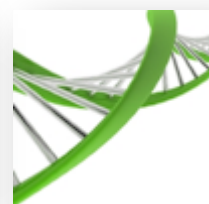
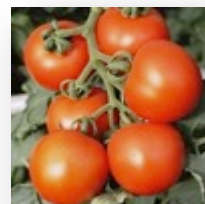
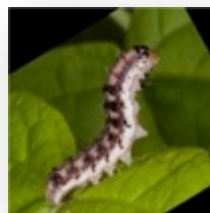


Insecticide Resistance Action Committee

Biotechnology Team 2016 Update

Clint Pilcher

4-5-16



General Team Goals

- Improve cross-industry cooperation towards common goals for resistance management of Biotech crops
- Promote practical approaches to resistance management for insect-protected biotech crop
- Assist country and regional industry associations in developing locally appropriate IRM programs
- Provide forum for exchange of information on putative and real resistance incidents
- Engage key stakeholders and deliver practical IRM outreach through workshops and conferences
- Promote IRM considerations as an integral component of Bt crop development by public and private sectors

IRAC-Biotech Intro

- Clint Pilcher (DuPont Pioneer) (Chair)
- Chris Sansone (Bayer)
- Tim Dennehy (Bayer)
- Deb Carstoiu (CLI)
- Taiwo Koyejo (CLI)
- Nick Storer (Dow AgroSciences)
- Dwain Rule (Dow AgroSciences)
- Graham Head (Monsanto)
- Isaac Oyediran (Syngenta)
- Tony Burd (Syngenta)

2015 Goals

- Continue Implementation of CLI Integrated Biotech IRM Strategy
- Follow-through on LATAM IRM implementation initiatives
- Work with IRAC Crop Protection colleagues on trait & chemistry interactions
- Publish white papers on IRM related topics
- IRM industry discussions and infrastructure in India

2015 Highlights

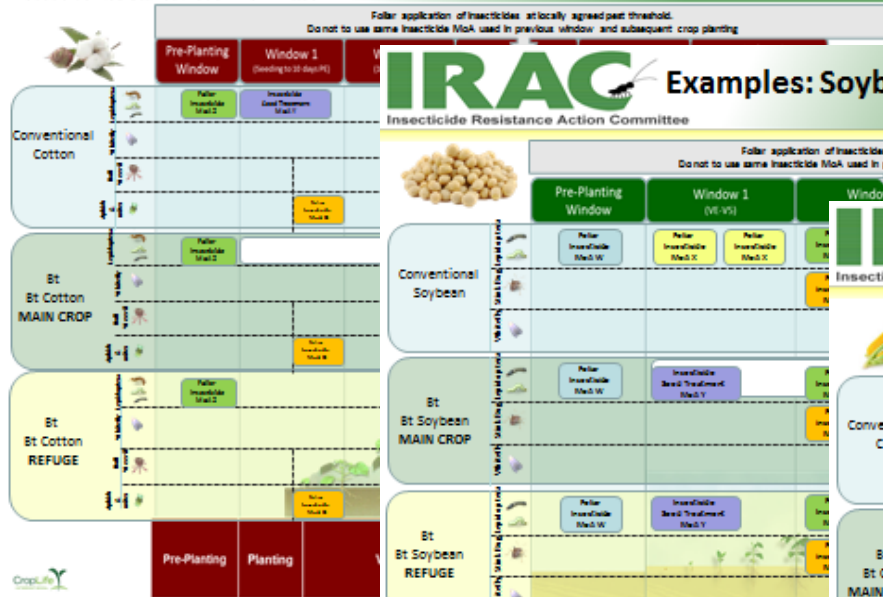
- IRAC Brazil Task Team Meeting
 - Finalized recommendations for Brazil
- ETS IRM module implementation
 - Brazil and Argentina audits
- Integrated IRM Strategy
 - Continued discussion on harmonized global IRM framework
- Argentina IRM
 - Hired ArgenBio (CLI) consultant for Argentina
- Finalized white paper on:
 - Appropriate Regulation of Resistance Management for Insect Protection Biotech Traits in Argentina
- Monitoring Brazil IRM implementation
 - Waiting for compliance information
- Contributed to India Cotton IRM workshop

Accolades for Technical Alignment



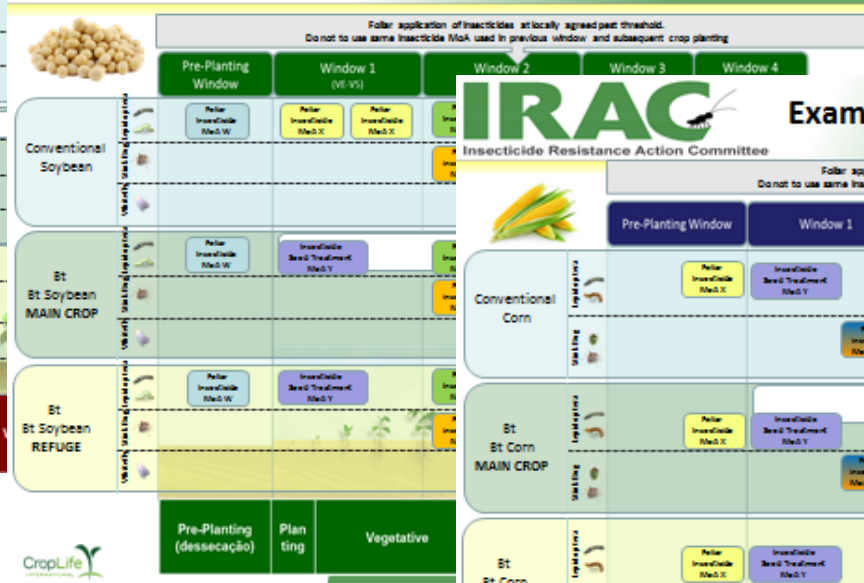
IRAC Examples: Cotton Application Windows

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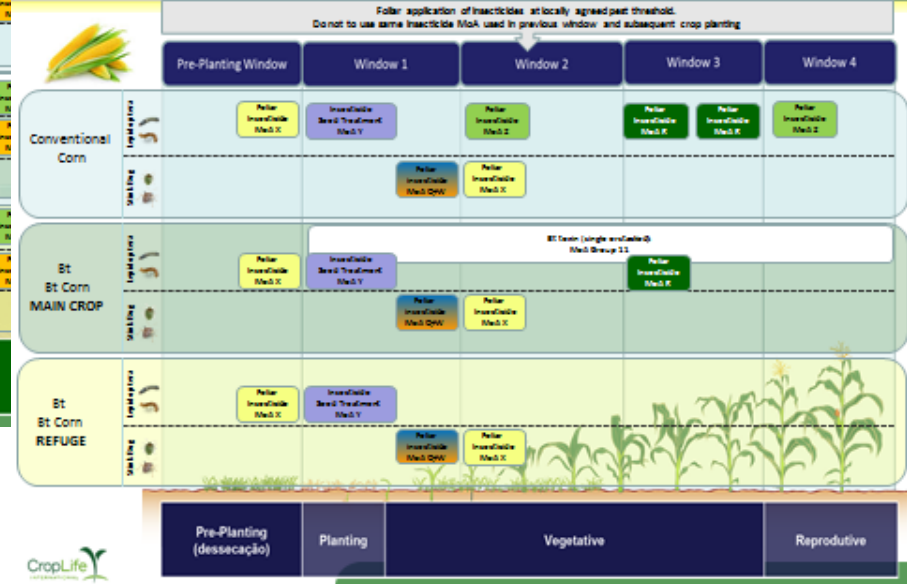
IRAC Examples: Soybean Application Windows

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IRAC Examples: Corn Application Windows

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ETS IRM Guide Outline

Module 1: Risk Assessment

- Organizational structure
- Target geography, regulatory regime
- Target pest(s)

Module 2: IRM Plan Development

- Product characteristics and pest management practices
- Refuge options
- Monitoring plans

Module 3: IRM Plan Implementation

- Market deployment strategy
- Education and training
- Stakeholder communication

Module 4: IRM Program Maintenance and Compliance

- Monitoring procedures
- Complaint handling
- Resistance mitigation

Hiring IRM Consultant in Argentina



Juan Kiekebusch

- Maintain dialogue with IRAC-Biotech
- Industry-wide gap analysis
- Identify key IRM needs for successful framework development
- Facilitate key stakeholder involvement
- Pursue technical industry alignment
 - Refuge
 - BMPs
- Assist with ETS implementation

Regulatory White Paper for Argentina



Appropriate Regulation of Resistance Management for Insect Protection Biotech Traits in Argentina

1. Introduction

Insect protection biotech traits provide extensive economic and environmental benefits to the agricultural community and society in countries where they are cultivated. Argentina has seen tremendous adoption of *Bacillus thuringiensis*-derived (Bt) traits in maize and soybean. These Bt crops are protected from feeding damage by key lepidopteran pests such as *Spodoptera frugiperda*, *Diatraea saccharalis*, and *Chrysodeixis includens*, among many others. As with any insect management tool, it is anticipated that resistance may develop to biotech traits in target pest populations, reducing their benefits. Therefore technology providers have designed practical, science based insect resistance management (IRM) strategies that are intended to delay the development of resistance in target pest populations to these biotech traits. For these strategies to be effective, they must be broadly adopted by growers.

2. Benefits of regulatory involvement

Are we advancing our cause?

- *2015 Goal: Work with IRAC Crop Protection colleagues on trait & chemistry interactions*
 - *Was Brazil task force successful?*
 - *How do we take it one step further?*
- *2016 Goal: Identify and drive defined initiative(s) with crop protection colleagues to improve IRM implementation*
 - *IRAC-Biotech's sole purpose for being here*

2016 Goals

IRAC - Biotechnology Team

- Drive the coordination of integrated initiatives between trait & chemistry organizations
 - Further characterizing the interaction between traits & chemistry on durability
 - Leading coordinated initiatives & activities
- Continue Latin America IRM development
 - Adapting industry actions/activities based on current compliance
 - Continue Argentina framework development
- IRM Principles Industry White Paper
 - Broad overview paper
 - Generic IRM regulatory paper addressing key regulatory questions
- IRM Framework for India
 - Identifying needs and providing information where needed