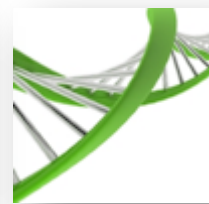
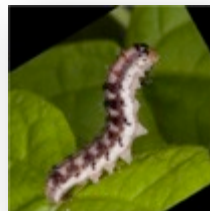




Insecticide Resistance Action Committee

Biotechnology Team

Nick Storer



Team Members

- Nick Storer (Dow AgroSciences) (Chair)
- Clint Pilcher (DuPont-Pioneer) (Vice-Chair)
- Tim Dennehy (Bayer)
- Graham Head (Monsanto)
- Isaac Oyediran (Syngenta)
- Elizabeth Owens (DuPont-Pioneer)
- Chris Sansone (Bayer)
- Tony Burd (Syngenta)

General Team Goals

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

2013 Highlights

- Finalized positions on:
 - IRM for small holders
 - Used to support IRM program development by CropLife Asia
 - Principles of resistance monitoring for traits
 - Used at EPA Science Advisory Panel meeting on corn rootworm resistance monitoring
- Drafting position on
 - Use of insecticides with traits (with Russell and Ralf)
- Initiated program for improved IRM and pest management practices for maize traits in Brazil
- Regional advice to CropLife groups
- Strong linkage to CropLife International Plant Biotechnology Stewardship Committee

Biotech IRM Resources

- CLI Training Manual: *Practical Approaches to Insect Resistance Management for Biotech-Derived Crops* (2012, English and Spanish)
- Whitepaper: *IRM for Transgenic Crops in Small-Holder Agricultural Systems* (2013)
- Whitepaper: *Industry Perspectives on Insect Resistance Monitoring for Transgenic Insect-- Protected Crops* (2013)
- Position paper: *IRAC Position on Seed Blends for IRM* (2013)
- Poster: *IRM for Biotechnology* (2010)
- MacIntosh 2009. *Managing the risk of insect resistance to transgenic insect control traits: practical approaches in local environments.* *Pest Manag Sci* (2009)

Biotech IRM in Asia

- Technical advisor to Program for Biosafety Systems within IFPRI activities in Vietnam and Indonesia
- Technical advisor to CropLife Asia IRM Technical Team
 - Alignment on Refuge approaches for single- and pyramided traits in maize
 - Alignment on timing of refuge implementation relative to product launch

Biotech IRM in Latin America

- **Brazil**
 - Examining fit of refuge seed blends with pyramids
 - Need greater company alignment to unify IRM approaches and messaging to growers
- **Central America**
 - CLI developing regional workshop to reach technical consensus strategy and education/extension program
 - Target Mexico, Colombia, Honduras, El Salvador, Guatemala

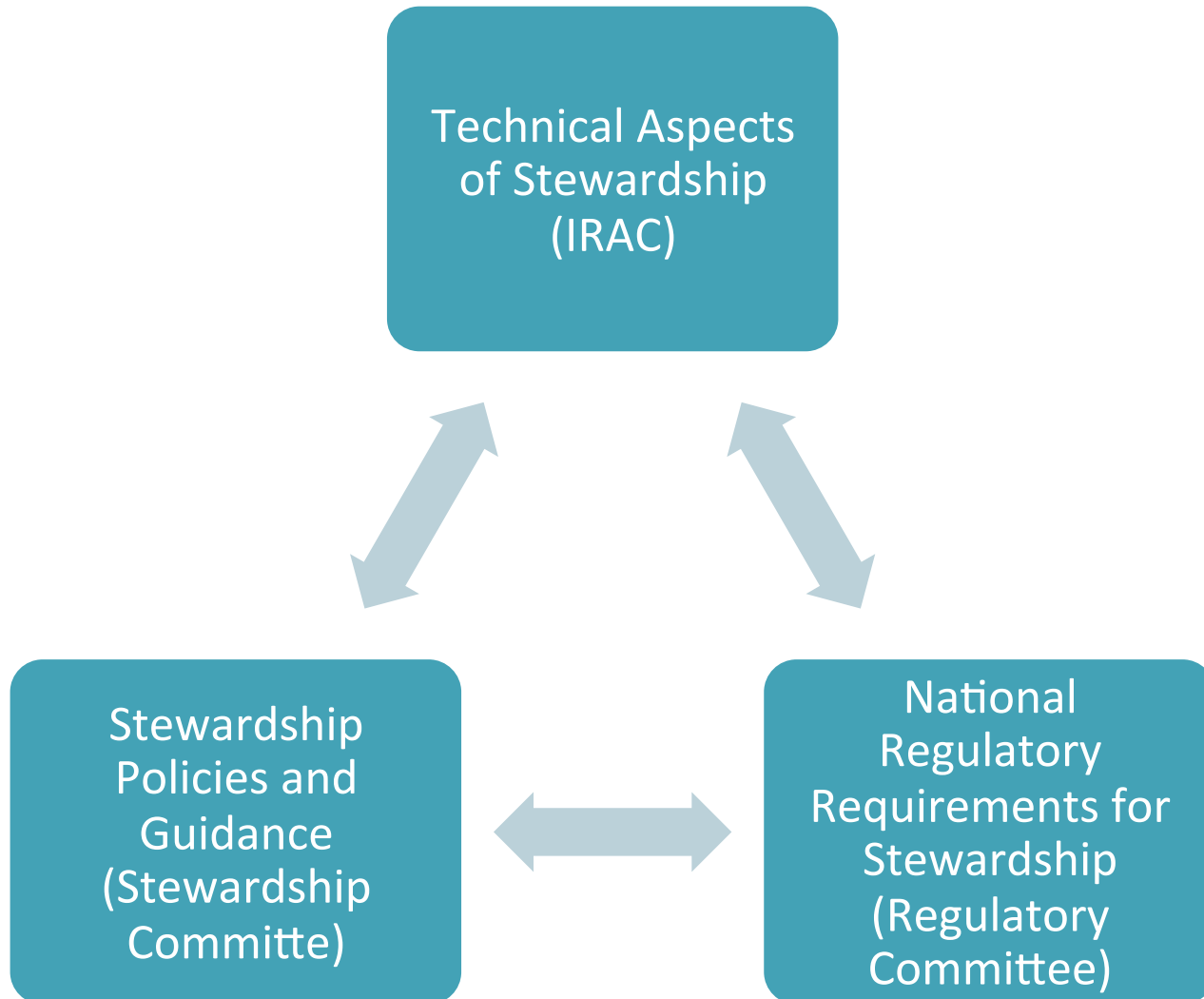
Biotech IRM in South Africa

- Working with AfricaBIO to understand local IRM issues in South Africa
- Technical resource for IRM workshop currently being planned

CropLife International Biotech IRM Initiative

- *Integrated approach to Insect Resistance Management*
 - Develop a framework of harmonized IRM intentions and goals
 - Ensure global coordination of IRM programs as an integral component of technology stewardship
 - Guide and empower local industry teams to develop specific IRM practices
 - Avoid prescriptive inflexible IRM programs
- **Endorsed by Plant Biotechnology Strategy Council**

IRM Framework



Integrated Biotech IRM Strategy Meeting

19 March 2014

- IRM roles and responsibilities
 - IRAC Biotech, Stewardship Committee, Regulatory Committee, Excellence through Stewardship, Communications Committee
- Lessons learned from emerging resistance issues
- Objectives for an integrated IRM strategy
- Proposals for integrated IRM initiatives
 - Industry harmonization
 - Promoting refuge implementation
 - IRM infrastructure
 - Involvement of external stakeholders
 - Appropriate roles for regulators
 - Communications initiatives
 - Others

2014 Goals

- Successfully launch CLI Integrated Biotech IRM Strategy
- Work with local teams in Brazil to finalize IRM and pest management recommendations for Bt maize
- Support adoption of IRM program by tech providers and regulators in Vietnam and Indonesia
- Support IRM workshops in Central America
- Technical lead for IRM workshop in South Africa
- Work with Crop Protection team to finalize IRAC position on use of insecticides with traits