Industry commitment to stewardship on weed resistance
CropLife International: Mission

CropLife International and its global network are the voice and leading advocates for the plant science industry.

Helping Farmers Grow

We work together worldwide to make the most of plant science innovations.

We increase awareness and understanding of the benefits of plant science.

We promote the responsible use of plant science technologies.
CropLife International: Member Associations

North America
- CropLife Canada
- CropLife America
- Biotechnology Industry Organization (BIO)
- Agrobio Mexico

Latin America
- CropLife Latin America
- AgroBio Brazil
- CIB Brazil
- ArgenBio

Africa/Middle East
- AfricaBio
- CropLife Africa/Middle East

Europe
- EuropaBio
- European Crop Protection Association

Asia Pacific
- CBI Japan
- Japan Crop Protection Association
- CropLife Asia
Benefits of Crop Protection Products

**Kenya:** 33% higher yields with herbicides versus handweeding

**Pakistan:** 64% higher wheat yields with herbicides

**Brazil:** Disease control increases soybean yields 44%

**France:** Without fungicides, wheat yields would drop 26%

**Australia:** Crop protection reduce grain crop losses from 21% to a mere 4%
But society expects minimal risk!

Stewardship: The Responsible and Ethical Management of a Product throughout its Lifecycle

*Maximizing Benefits, Minimizing Risks*
Crop Protection Stewardship

- Research and Development
- Manufacturing
- Storage, Transportation, and Distribution
- Integrated Pest Management
- Responsible Use
- Container Management
- Management and Disposal of Obsolete Stocks
Biotech Products

Gene Discovery -> Plant Development -> Seed Production -> Seed Marketing & Distribution -> Crop Production -> Crop Utilisation -> Product Discontinuation
Crop Protection Stewardship
Biotech Products

Gene Discovery → Seed Development → Seed Production → Seed Marketing & Distribution → Crop Production → Crop Utilisation → Product Discontinuation

Resistance Management
Managing Stewardship: Resistance Action Committees

- Stewardship Steering Committee
- IPM/Responsible Use PT
- Container Mgt PT
- Obsolete Stocks PT
- Insecticide RAC
- Fungicide RAC
- Herbicide RAC
- Rodenticide RAC

Integration of RACs in 2010
Strategy

Stewardship Vision 2020
Global Resistance Management Strategy

- Develop and promote resistance management strategies
  - IPM
  - Mode of Action (MOA) rotation
  - Mixtures
  - Correct dose and application
  - Address illegals and counterfeits
- Support research for RM strategies
- Advocate for RM to regulators etc
  - MOA labelling
- Develop training material for farmers
The World of Herbicides
According to HRAC classification on mode of action 2010

HERBICIDES AFFECTING: Light Processes  Cell Metabolism  Growth/Cel Division

www.hracglobal.com
Farmer Training

Implementing Integrated Weed Management for Herbicide Tolerant Crops

Bayer CropScience
Simple Messages: IRAC example
Within an Insect Population…

SUSCEPTIBLE:
Can be easily killed

MODERATELY SUSCEPTIBLE:
Not easily killed

RESISTANT (IMMUNE):
Cannot be killed under normal dose
Different MoA targets different parts

- Feeding
- Respiration
- Digestive
- Reproduction
- Nerve
- Growth / Development / Molting
- Excretory
- Energy / Muscle
What Happens in the Field?

Continued use of 1 Product
What Happens in the Field?

Continued use of 1 Product
What Happens in the Field?
Remaining Reproduces

\[ \text{Remaining} \times \text{Reproduces} = \text{Red Bugs} \]

\[ \text{Remaining} \times \text{Reproduces} = \text{Yellow Bugs} \]
resistant population

Continued use of 1 Product
resistant population

Continued use of 1 Product
resistant population

Continued use of 1 Product
Insecticide Resistance Management (IRM) Strategy in Rice

Seedling  Leaf Development  Tillering  Stem Elongation - Booting  Flowering  Ripening

0  5  10  15  20  25  30  35  40  45  50  55  60  65  70  75  80  85  90  95  100  105  110  115  120

1st Generation  35 Days  2nd Generation  35 Days  3rd Generation  35 Days

Stemborer  32 Days  Brown Plant Hopper  32 Days  Green Leaf Hopper  30 Days

Insecticide Application (Need – Based)

Option 1  MoA 1  MoA 2  MoA 3

Option 2  MoA 1  MoA 2  MoA 1

MoA 2

MoA 1

MoA 3
Training in Action
Location of Association supported IPM/RU training
- 71 countries across the world (circa 55/yr)
- In partnership with >350 different groups – governments, farmer groups, private sector, NGOs, academia, donors
- Many more reached through media campaigns, cascade training etc.
Training approaches: Honduras

CropLife partnership with USAID to train 30,000+ farmers in good agricultural practices
Training Approaches: India

CropLife partnership with local NGOs to train 120,000+ farmers to tackle plant pests and diseases
Training Approaches: West Africa

CropLife partnership with World Cocoa Foundation to train Spray Service Providers to help small-scale cocoa farmers
Training Materials: Global
Training Materials: Web-based
Training Materials: Local
Communicating

By definition, crop protection products are designed to protect crops from insects, diseases and weeds. They do so by controlling pests that infect, consume or damage crops. Uncontrolled pests significantly reduce the quantity and quality of food production. It is estimated that annual crop losses could double without the use of crop protection products.

All of these products are intensively tested and regulated around the world to ensure they don’t cause unacceptable adverse effects to humans, non-target wildlife or the environment. Some products are highly toxic in order to control a group of specific pests or highly threatening diseases. Risk assessment and management identify the benefits of certain uses of HHPs may outweigh their risks by controlling pests that spread disease or threaten the food supply.

Risk Management
The Code stipulates that “prohibition of the importation, distribution, sale and purchase of highly hazardous pesticides may be considered if, based on risk assessment, risk mitigation measures or good marketing practices are insufficient to ensure that the product can be handled without unacceptable risk to humans and the environment.”

CropLife International is striving to work with the UN Food and Agriculture Organization (FAO) and other stakeholders...
Thank you for listening!