Pesticide Manufacturers’ Perspective on Legislation and other Measures on Pesticide Residues and Food Safety

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A Global Federation

Representing the plant science industry in 91 countries
... driven by 8 core companies

- BASF
- Syngenta
- Dow AgroSciences
- Sumitomo Chemical
- Monsanto
- Bayer CropScience
- FMC
Research goals for a new crop protection product

**Biologically efficient:**
- high selectivity
- fast impact
- optimal residual effect
- good plant tolerance
- low risk of resistance development

**Environmentally sound:**
- low toxicity for non-target organisms
- fast degradation in the environment
- low mobility in soil
- no relevant residues in food and fodder
- low application rate

**User friendly:**
- low acute toxicity
- low chronic toxicity
- good formulation characteristics
- safe packaging
- easy application method
- long store stability

**Economically viable:**
- good cost/profit ratio for the farmer
- broad use
- applicability in Integrated Crop + Pest Management
- innovative product characteristics
- competitive
- patentable

The “perfect” product
Development of a crop protection product

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<th>Year</th>
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<th>Costs in US$</th>
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| **CHEMISTRY**
  Active ingredient | | | | | | | | | | | ~67 million |
  Formulation | Synthesis | | Process | | | Pilot plant | | Production |
  | | optimation | development | | | production | | |
| **BIOLOGY**
  Research | Laboratory/ | | | | | Field trials | | | | ~80 million |
  Development | greenhouse | | | | | for development and registration | | | | |
  | | Pilot trials | | | | Optimisation of | | | | application |
  | | | | | | application | | | | |
| **TOXICOLOGY**
  Mammals | | | Acute, sub-chronic, chronic toxicity/mutagenicity/carcinogenicity/teratogenicity/reproduction | | | | Official evaluation of registration documents/registration/first sales | | | ~53 million |
  Environment | | | Algae/daphnies/fish/birds/micro-organisms/bees/non-target organisms | | | | | |
| **ENVIRONMENT**
  Metabolism | | | Plants/animals/soil/water and air | | | | | | | |
  Residues | | | Plants/animals/soil/water and air | | | | | | | |

Substances 15,000 500 10 3 2 1 1 1 1 1 ~200 million
Pesticide Residues and Food Safety

• MRLs reflect GAP
• Exceedence of MRLs result from use of wrong or illegal product or poor use practices
• Need to ensure availability of appropriate and good quality pesticides – appropriate regulation
• Need to ensure adoption of good practices – stewardship
• Regulation and stewardship are intimately linked
Pesticide Use Context (PUC)

There are many elements influencing the outcome of pesticide use
- International conventions e.g. Stockholm
- Registration system
- Production standards e.g. GlobalGAP
- Equipment design
- Availability of spares
- Specifics of the environment in the use area
- Attitudes and awareness of users
- Availability of personal protective equipment (PPE)
- User knowledge and skills
Addressing the key elements in the PUC

Regulatory/Policy domain
• Appropriate products made available
• Access to illegal/counterfeit products prevented
• Container management systems in place
• Policies to promote IPM/ICM
• Policies to support farmers thru info, inputs, etc
• Markets encouraged through infrastructure, financial systems, information access
Addressing the key elements in the PUC

Equipment domain
- Safe and appropriate application equipment available
- Spare parts available
- Practical PPE available that is appropriate for conditions of use
Addressing the key elements in the PUC

User practise – building capacity

- Knowledge - newspapers, books, posters, leaflets, radio, television as well as formal teaching
- Skills - participatory training courses, farmer days, mentoring and supervised practice
- Positive attitudes - best tackled by longer term information and communication campaigns via multiple media and, as a result, is often omitted

All needs long-term commitment and support
CropLife regulatory principles . . .

8 Steps: Principles of Sound Regulations

1. Provide sound policy framework, aimed at ensuring high standards of use & protection of human health & environment to improve public confidence in chemicals used in food production & in public health applications.

2. To be based on scientific principles & risk / benefit evaluation.

3. Promote international harmonization in regulation of pesticides wherever possible; always taking into account local conditions in defining appropriate risk management measures.

4. Promote data quality & transparency & allow access to useful information by third parties & general public, while protecting confidential business information & intellectual property.
5. Reinforce responsibilities of each party throughout production & supply chains for compliance with regulations plus commitments to responsible action.

6. Provide for compliance monitoring & active response process to manage adverse incidents.

7. Provide consistent process to ensure modern standards are applied to all products in market.

8. Require major changes to / revisions of regulations are preceded by assessment of their impact.
Stewardship definition and principles

Definition:
The responsible and ethical management of a plant protection or biotechnology product throughout its lifecycle
Integrated Pest Management & Responsible Use
IPM Definition

- the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other actions to levels that are economically justified and reduce or minimise risks to human health and the environment. IPM emphasises the growth of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms.
Training in IPM/Responsible Use

- IPM & RU training programmes in circa 50 countries per year
- Approx 300,000 people trained per annum Over 3 million trained since 1991, including tens of thousands of trainers
- More than 100 different partners e.g. IFAD, US EPA, Worldview network, USAID, IFDC governmental bodies – outreach & impact.
- Independent audits show change in attitude and behaviour amongst farmer
The aim:
- Change in behaviour

Training plan
- Increase knowledge
- Change in behaviour

Measurement
- Numbers trained
- Change in Awareness

Achievement
% different groups trained

- Farmers: 47%
- School: 35%
- Retailers: 5%
- Leaders/Trainers: 5%
- Others: 8%
- Doctors/Nurses: 7%
Training Routes

- Training of Trainers
- Direct farmer training
- Farmer to Farmer
- Children to Parents
- Play role and cultural shows
- Media: printed, radio, tv
Field demonstration

- carried out on personnel protection equipment (PPE) and secure storage box (SSB)

- usage of SSB also demonstrated in the farmer’s houses
Re-enforcement Posters, Mass Meetings, Wall Writings
Re-enforcement: Door-to-Door Campaign, School Campaign, Cultural Events
Impact Measurement

• How many people are subsequently trained? e.g. Africa
  – >650 Master Trainers
  – 170 000 direct cascade
• Need to monitor both cascade and impact of training
• Continual re-enforcement
Adoption of IPM Practices (% farmers – Guatemala)
Number of Applications per Season (India)

![Graph showing the number of applications for Cotton, Chili, and Rice, comparing pre-training and post-training.]
Use of Protective Clothing (% farmers – India)
Training Guidelines
For large quantities of crop protection products, a detached, enclosed store is preferred. Where this is not practicable, crop protection products may be kept in a segregated, dedicated storeroom which is part of a larger building provided the building does not contain a staff room, vehicle store, workshop, office or area used in any way for food.

Site access

The site must provide suitable access for safe delivery and collection with a reasonable working area for loading and unloading of delivery vehicles. Ideally, the building should stand alone with a space of at least 10 metres between it and the surrounding property. The distance depends on the applicable building codes and fire protection codes and on local legislation, e.g., if the warehouse contains flammables, the amount of material stored and the rating of the fire wall can determine how far away other structures must be. As a consequence, more buffers to the neighbouring property line may be needed.

Access for emergency vehicles should preferably be available from two sides. The emergency response vehicles (e.g., fire fighters) should be able to take a route that cannot be blocked.

The response to an emergency should be planned in advance, especially it is known that the approach to the building might be restricted for any reason.

Care must be taken to ensure that packages are correctly handled during loading and unloading. In general, the use of suitable mechanical handling equipment is recommended, as it can reduce the risk of damage.

Conversely, the use of unsuitable equipment or poor handling techniques can seriously damage packages and increase the risk of spillage.

3. FORMULATIONS, PACKS, MEASURING AND MIXING

Formulations

Crop protection products are formulated (made up into usable products) by manufacturers to optimise the activity and safety of each crop protection product and to accommodate the ways in which it is to be used.

There are many different types of formulation - liquids and solids - most requiring to be diluted, usually with water, before use, although some are used without dilution. The most common are shown in Appendix 2 (pages 56–57), which also gives a general indication of the associated problems and hazards of which users must be aware.

Do not buy packs with broken seals

Do not re-pack crop protection products into other containers
agLearn.net - A Network for Sustainable Agriculture

agLearn.net, the Network for Sustainable Agriculture, is dedicated to sharing knowledge, attitudes, and working practices of farmers through the promotion of sustainable agriculture practices.

agLearn.net is an Internet based series of courses aiming to support farming communities through the sharing of knowledge and positive experiences, stakeholders together via partnership and constructive dialogue. The key areas of agLearn.net cover three key areas:

1. Responsible Pesticide Use
2. Integrated Pest Management (IPM), and
3. Integrated Soil Fertility Management.

In line with the Plant Science Industry's commitment to the principles and practice of IPM, four courses are offered in the field of IPM:

- Introduction to IPM
- Cotton IPM
- Rice IPM, and
- Vegetable IPM.

**INTRODUCTION TO IPM**

**Economic Injury Simulator**

Use the EIL simulator below to see how EILs work. This EIL simulator allows you to adjust the parameters discussed on the previous in order to see how they affect the Economic Injury Level. You can use the arrow buttons to adjust the values up and down. When you have set the EIL at the desired level, press play. When (or if) the pest population reaches the EIL level, press the spray button to knock the population back below economically damaging levels.

To see the effects of the pests on your harvest, you can adjust the number of pests to zero in the population bar and run the simulation. This will give you an idea of how much crop you can harvest in a completely pest-free environment. You may also want to test the effect of numerous or particularly damaging pests. Setting the initial pest population to a high number (e.g. 50) or setting the injury per pest or damage per injury levels high will certainly reduce harvests.
Is the global federation representing the plant science industry
Local Guidelines/Material
“Something’s just not right—our air is clean, our water is pure, we all get plenty of exercise, everything we eat is organic and free-range, and yet nobody lives past thirty.”
Thank You

"IF YOU THINK SAFETY IS EXPENSIVE, TRY ACCIDENT"

"MENGUTAMAKAN KESELAMATAN LEBIH JAUH NILAINYA DARIPADA MENGALAMI KEMALANGAN"