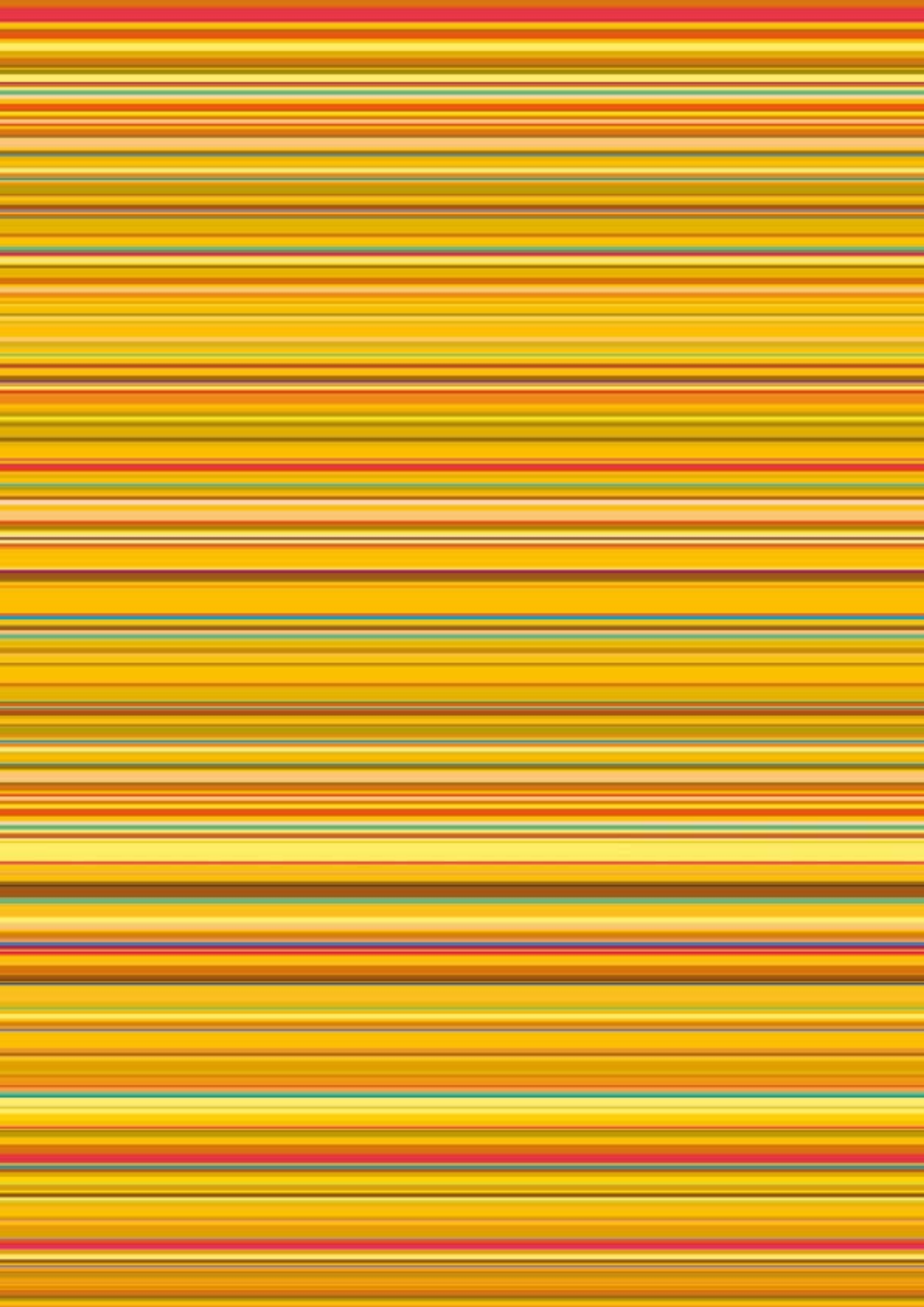
CropLife INTERNATIONAL

Representing the Plant Science Industry

IPM Responsible Use

Case Studies



IPM
Responsible Use

Case Studies

Executive Summary

The Plant Science Industry, comprised of the leading companies and associations allied to the global federation CropLife International, has implemented programmes over the past two decades to promote Integrated Pest Management (IPM) and the responsible use of crop protection products.

The aim of these programmes is to promote the use of crop protection products as safe for both users and the environment, and to facilitate bountiful production of high quality, affordable food. The programmes, which are a part of CropLife's contribution to sustainable agriculture, are continually being developed to meet the considerable challenges facing agriculture around the world.

Recognising its responsibilities as the leading provider of crop protection products and services, the Plant Science Industry has developed a range of educational programmes for diverse target audiences in the responsible use of crop protection products. These programmes started in the early 90s and have since extended their reach to more than 80 countries globally.

As one part of the industry's commitment to product stewardship, training in the responsible use of crop protection products has been implemented with a view to promoting a strategy of Integrated Pest Management (IPM), where all available means to control pests and disease are evaluated before appropriate action is taken.

IPM/Responsible Use programmes are important to the Plant Science Industry represented by CropLife International, as they contribute to the sustainability of the crop protection industry, which values the efficient application of its products and services as an integral aspect of its social and ethical commitments.

IPM/Responsible Use training is important to trainees as it allows them to assimilate knowledge which, if applied correctly, will contribute significantly to their well-being, and to that of their families, communities, and the environment in which they live. Applying IPM/Responsible Use techniques in the field will make them more productive, contribute to socio-economic development, and help alleviate poverty in areas of need.

This publication reviews the global IPM/Responsible Use programme, charts the implementation of three key pilot projects and the development of regional programmes, and assesses the impact and future prospects for the programme.

The case studies described in this publication demonstrate the innovativeness and diversity of IPM/Responsible Use projects in both developed and developing countries. They also illustrate the significant progress made. To date, CropLife associations around the world have trained some three million people through IPM/Responsible Use programmes. The leading companies of CropLife have also collectively trained millions more.

In terms of impact, the IPM/Responsible Use training efforts have considerably increased awareness and knowledge about responsible use practices and have resulted in changing the attitudes of users worldwide. More emphasis is needed to change behaviour on a long-term basis and develop tools to measure and monitor these changes in a practical way. The development and use of key performance indicators will help to shape the direction of programmes and lead to continuous project improvement, whilst objectively measuring progress.

Introducing IPM/Responsible Use

Crop protection products, including those commonly referred to as pesticides, are biologically active compounds. They are important tools used by farmers to reduce damage to crops by pests (e.g. insects), plant diseases, and competing plant species (weeds). But modern crop protection products are by no means confined to agriculture. They are frequently applied in households or gardens, and also in public health programmes to combat vector borne diseases (such as malaria and West Nile virus).

REGULATION

All crop protection products for all uses are subjected to stringent testing for safety and environmental impact before being placed on the market. Products are approved for sale on a country-by-country basis by the national regulatory agencies and afterwards are subject to regular reviews. In addition to tests for possible negative impacts on flora, fauna, and the environment, products undergo trials to ensure they are effective under normal use conditions.

Whilst all crop protection products are subject to these rigorous procedures, the very nature of their intended use often makes them intrinsically hazardous. Some products are more hazardous than others – toxicity and environmental impact vary considerably. However, no crop protection product need pose a risk to the health of the user, or to the environment, if it is used correctly and suitable precautions are taken.

Thus the "footprint" of crop protection products on the environment and human or animal health are largely determined by the way in which they are handled and used by distributors, retailers, and ultimately the end-users. Part of the registration process is the development of a label that gives instructions to the user on how the product should be used and what safety precautions should be taken.

In addition to these statutory requirements, the leading manufacturers of crop protection products, represented by CropLife International, have long recognised their ethical and social responsibilities in making sure that all products are used in a safe, efficient, and responsible manner.

IPM AND RESPONSIBLE USE

The collective effort to ensure safety and effectiveness, from manufacture right through to disposal and recycling, is referred to as "product stewardship." The area of product stewardship most specifically related to the education and training of all persons coming into contact with and using the products is known as "Responsible Use" training. The objective of such training is to maximise the benefits of crop protection products and minimise any risks associated with their use.

Responsible Use training is undertaken within the context of promoting an Integrated Pest Management (IPM)[1] strategy, with the underlying principle that a crop protection product should only be used when necessary – "As little as possible, and as much as necessary." For this reason, Responsible Use and IPM training are integral to each other, hence the IPM/Responsible Use designation.

[1] Integrated Pest Management means 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.

IPM/Responsible Use training may include product handling instructions, spray preparation and application rates, periods between application and re-entry into the crop, periods between application and crop harvest, and the use of personal protective equipment (PPE). Crucially, IPM programmes and Responsible Use training can assist growers in deciding if a pest control action is necessary, what it should be and, if needed, which type of crop protection product is appropriate for a particular job.

TRAINING PROVIDERS

Alongside research & development, manufacture, and marketing of crop protection products, the Plant Science Industry operates various training schemes to ensure that its products are used in a safe and responsible manner. Programmes have been developed with education and training at their core, and have complemented the efforts of the CropLife network.

The Plant Science Industry member companies are represented by the global trade federation, CropLife International. This Federation operates through a network of six regional associations representing Africa Middle East, Asia, Europe, Latin America, USA, and Japan. These regional associations in turn encompass the national associations in their geographical areas. In total, the industry is affiliated with over 90 national trade associations throughout the world. Almost all of these associations operate some form of product stewardship programme. Many of these stewardship programmes, particularly run by associations in developing countries, include IPM/Responsible Use as a major component.

IPM/RESPONSIBLE USE MESSAGES

Over the past two decades, IPM/Responsible Use programmes have continually evolved and improved. The hundreds of projects around the world differed in their aims, methodologies, and audiences. However, there are some common defining elements pertaining to what the programmes attempt to relay to trainees. These include:

- when and how to manage and control pests, diseases, and weeds in line with IPM principles,
- how and when to apply crop protection products safely and effectively, and whether to apply them at all,
- how to reduce risks to oneself, to other persons, and to the environment;
- how to manage residues.

These common messages vary in content from one project to another and are continually reviewed and updated to meet local needs and take account of new developments.

AUDIENCE

The audience for IPM/Responsible Use training will vary depending on project requirements and local circumstances. Whilst farmers are the key audience and the most obvious direct beneficiaries, there is substantial evidence to suggest that the farmer can be influenced indirectly through the training of other groups. In some cases it may be preferable or more effective, particularly in terms of scale, to leverage these other audiences.

In Africa Middle East, for example, recent programmes have concentrated on the training of trainers. CropLife Latin America has been a pioneering contributor to the development of agricultural subject matter for rural schools.

PARTNERSHIPS

Programmes are usually undertaken in partnership with other stakeholders, (for example, government extension services) or as part of a larger development programme, in order to increase impact and outreach.

Because of the nature and scale of the problems being faced, partnerships are often the only realistic approach for industry programmes. In addition to meeting programme targets, dialogue with partner organisations brings a whole host of other benefits for all parties.

THIS PUBLICATION

This collection of case studies from Latin America, Asia-Pacific, Africa Middle East, North America, and Europe aims to illustrate the diversity, dedication, and innovation of industry sponsored IPM/Responsible Use programmes since their inception via pilot projects in 1991. Other aspects discussed are the impact and achievements of the projects and prospects for the future.

Responsible Use Pilot Projects

In 1991, CropLife International launched three Responsible Use Pilot Projects in Guatemala, Kenya, and Thailand. These projects would later serve as focal points for future expansion into surrounding countries in each region.

The pilot projects – collectively known as the "Safe Use Initiative" – were conceived in recognition of the need for a broad industry approach to the challenges presented by the United Nations' Food & Agriculture Organization's *International Code of Conduct on the Distribution and Use of Pesticides* (CoC).

There were of course other fundamental needs that the projects attempted to address. All projects were staged in three distinct phases, with the following broad goals:

- educate and train farmers, retailers, doctors, and schoolchildren;
- safeguard human health and the environment;
- prevent and treat personal exposure;
- recycle and/or safely dispose of empty containers;
- enforce regulatory legislation; and
- create local poisoning treatment centres.

Each of the pilot countries faced unique challenges at project inception, and during the course of the projects, made adjustments in light of the results and with a view to local needs.

GUATEMALA

A baseline survey identified the need for a retailer certification scheme and to enhance the effectiveness of poison treatment centres; it also highlighted the need for compliance with the CoC.

The implementation phase enlisted the support of the Ministry of Agriculture, and its 200 agricultural extension facilities throughout the country. They supervised the training of 800 government extension workers to become "master trainers". These trainers returned to their communities to deliver instruction to as many users as possible. At the same time, Responsible Use lessons were introduced into the classroom, so schoolchildren could bring messages home.

Through the Ministry of Health, rural doctors and paramedics received diagnosis and treatment counselling, and a database was developed to monitor poisoning incidents and provide statistical records to definitively chart intoxication incidents. Antidote kits were distributed to hospitals.

Mid-term and final audits were taken in 1993 and 1994, and compared with the baseline survey. Significant progress was achieved in storage protocols and label recognition.

Phase II saw procedures redesigned to place greater emphasis on special training for exporters in key vegetable co-operatives. An agro-services registry documented over 700 agricultural enterprises in a centralised registration system.

A more personal, teacher-led approach was adopted, with field visits and demonstration plots as prominent features. One master trainer was installed in each target community to

co-ordinate the efforts of extension workers, home educators, and teachers. Participation of other agencies, universities, and donors provided the impetus for expanding the programme into neighbouring countries.

Phase III, from 1998-2000, consolidated the initial projects in 16 countries throughout the region. Further information can be found in CropLife Latin America's *A Shared Vision* publication.

KENYA

The demands of the Kenya pilot project were fairly extensive and led to a multi-faceted campaign. A trainer base was initially established and a training system was devised to effectively train large numbers quickly. Part of the farmer training involved sessions on understanding labels and pictograms. A nationwide poster campaign was launched and a national design competition encouraged farmers to produce their own posters in many of Kenya's 46 local languages.

One of the major challenges was persuading farmers to use personal protective equipment (PPE). Locally designed and manufactured clothing helped address the cost and cultural issues that often encouraged avoidance of PPE.

A radio broadcast, "Using Chemicals Safely", reached thousands of listeners and became one of the Kenyan Broadcasting Corporation's most popular shows. Textbooks, drama, and song played an important role in rural schools as the importance of educating youngsters was established.

Week-long training courses were run by the University of Nairobi to upgrade the intoxication diagnosis skills of doctors and senior nurses. Basic antidote kits were supplied to hospitals and clinics to complement diagnosis and treatment wall-charts. A retailer accreditation system was introduced with the assistance of the Pest Control Board and the government. The same partners worked together to raise the standards of local formulation plants.

Phase II of the project witnessed the training of additional farmers and retailers. The relationships with government agencies, media, NGOs, and local industry were strengthened. There was heavy demand for training among horticultural and floriculture exporters. IPM/ Responsible Use training was already being interpreted as a way of assuring importers that Good Agricultural Practices (GAP) were being followed. This was welcome progress from the purely safety-driven training objectives pursued at the initiation of the pilot project.

THAILAND

As part of the project inception phase, a comprehensive baseline survey revealed widespread re-use of empty pesticide containers for many different purposes. Improvements in the premises of local formulators and retailers were assessed as a priority. In addition to supporting industry standards, the project aimed to reduce pesticide-related incidents and reinforce a Responsible Use habit along the entire usage and production chain.

In close cooperation with the Royal Thai Government, training modules were developed for retailers, medical personnel, and farmers. The AAA scheme (Award, Accreditation, Advice) provided a checklist of minimum requirements relating to plant location, storage, packing and labelling, employee safety, transportation, and disposal. Project staff provided

free expert advice to all companies, plant audits, information bulletins, practical disposal measures, and written safety guidelines.

Farmer training supplemented the Thai Crop Protection Association's (TCPA) on-going training programmes. Training materials, including audio-visual and safety handbooks, were updated and distributed.

Improving PPE was a major component of the pilot project in Thailand. Good progress was made by demonstrating the principles of effective, practical PPE and encouraging users to develop their own designs.

Workers in the country's citrus fruit plantations were identified as a priority target group and measures aimed specifically at reducing exposure in citrus groves were promoted through a "model farm" concept. The use of improved application equipment and techniques, regular residue monitoring, and additional training in Good Agricultural Practices not only reduced pesticide-related incidents but helped satisfy market standards.

A successful school programme included poster competitions and comics featuring a popular caricature. The projects also contributed to the training of doctors and nurses in the diagnosis and treatment of intoxication by crop protection products.

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Current Global Programme

The pilot projects provided important impetus for the expansion of projects into neighbouring countries, as programmes became an integral part of stewardship activities for both national and regional associations.

IPM/Responsible Use projects are administered locally, with associations identifying training priorities on the basis of local expertise on the ground. Financial and technical support is provided by regional associations or, in certain cases, directly from CropLife International. This financial support is often matched or exceeded by the national association and other project partners. This "bottom-up" approach ensures that actual local needs are addressed.

REVIEW & REDIRECT

Training programmes are reviewed periodically and strengths and weaknesses are identified. The lessons learned and best practices are incorporated into future training programmes, and are disseminated through CropLife's global stewardship network.

As an example of this approach, the different regions have directed training towards distinct target groups, and utilised different media/training materials in doing so. The case studies presented below demonstrate a variety of design and implementation strategies as direct responses to conditions on the ground.

Whilst the pilots provided the blueprints, the operation and review of projects, along with strategic input from project teams, external partners, and other stakeholders, has led to a progression in the rationale driving the IPM/Responsible Use programmes.

Although the primary goals of early Responsible Use projects were safety related, projects quickly acknowledged the need to promote the production of healthy and affordable food in sustainable farming systems.

Farmers enrolling in training programmes increasingly demonstrated heightened awareness of the potential hazards. The linkage between safer practices and IPM became patently clear through experience. As a result, IPM concepts were incorporated into all programmes under the auspices of CropLife International.

The provision of IPM/Responsible Use training is part of a broader commitment to product stewardship and CropLife's contribution to sustainable agriculture. This includes provisions for the social and environmental responsibilities of users. Programmes in developed countries pay particular attention to environmental concerns, such as the effects of product usage on biodiversity.

TRAINING MODEL

The current CropLife training model is comprised of both strategic and operational elements. The first strategic element concerns the target audience. In general, programmes are aimed at:

- farmers and pesticide applicators
- extension agents and trainers
- medical personnel
- academic staff
- public workers
- farm families,
- retailers/stockists,
- school/university students,
- general public,
- industry employees.

Projects quickly acknowledged the **need to promote the production of healthy and affordable food in sustainable farming systems.**

Some projects attempt to reach a very broad audience, encompassing farmers, trainers, farmer families, and schoolchildren. Others narrow the audience to one or two selected groups, usually trainers and extension workers. Whilst a broad audience approach is desirable, the general aim of CropLife projects is to build IPM/Responsible Use capacity through the training of trainers. Given the scale of the end-user audience and their geographical spread, this is a realistic strategy. Considerable resources are being allocated to the qualification of new training personnel and the provision of new and improved training materials for existing trainers. The current programme in Africa Middle East is a good illustration of this approach.

CULTURAL CHANGE

The second strategic element concerns the outcome from the training programme. In some of the early projects and their interpretations, there was perhaps a tendency to assume that training was the same thing as behavioural change in the field. Changes in attitudes, knowledge, and awareness are welcome, but they do not necessarily lead to the cultural changes needed to affect long-term changes in observable behaviour.

This is why current programmes stress the requirement to address changes in behaviour through practical and accessible training, along with measurement and evaluation procedures. This remains the greatest challenge facing the current programme today.

A third notable part of the current training model concerns a multi-stakeholder approach to Responsible Use and IPM. Any sustainable, widespread educational programme requires the cooperation and commitment of the many sectors of society. Among these necessary participants are government entities, schools and universities, non-government organisations, international organisations, and other influential groups involved in development. This is why the concept of partnership and a *multi-stakeholder approach* is an integral part of projects.

OPERATIONAL ELEMENTS

A number of different methods have been used in IPM/Responsible Use programmes. Experience has shown that a shift from large group lectures to smaller group trainer-led education was more successful. Hands-on training and practical experience within a true-to-life organisational context are key elements of the participatory approach which may include:

- mobile training units to reach isolated areas,
- practical field schools – "learning by doing",
- community drama,
- competitions,
- process involvement – design of Personal Protective Equipment (PPE), posters, storage boxes, etc.

All of the above elements are illustrated in the case studies described in this brochure, beginning on page 17. With such participatory approaches, additional emphasis is placed on follow-up of activities and broad community participation (to include farmer family members, community leaders, and other local opinion influencers for example). The broader the scope of participation within communities, the more likely projects will be viewed as both informative and entertaining. Making the message as "attractive" as possible has its merits.

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A good deal of discussion has taken place on the pros and cons of PPE and its place in Responsible Use training. Distribution of PPE to trainees has been a common feature of projects. Whilst PPE is extremely important, often being part of label recommendations, particularly for mixing and application phases, there is a delicate balance between reliance and practicality, particularly in impoverished farming communities.

Total reliance on PPE in tropical countries where subsistence farming may be the norm is impractical. Such PPE is not always accessible, can be very uncomfortable to wear, may be subject to social stigma, and requires careful maintenance to retain its protective properties. Rather than allocating resources to providing specialised PPE to trainees, projects are now encouraged to assist, wherever possible, in the improvised design and manufacture of PPE from locally available materials. This is one area where a good deal of research and sharing of best practices needs to take place. In general, while important, PPE is the last level of protection, the first being good handling and application practices.

IMPROVEMENT

The ethic of continuous evaluation and improvement is an important component of the programme. Whilst progress to date has been impressive, the challenges faced remain substantial and only through identification of key performance indicators and implementation of practical measurement and evaluation systems, can the campaign progress to meet the ongoing demands of modern agriculture and food security.

CASE STUDIES

LATIN AMERICA

CropLife Latin America's (CLLA) IPM/Responsible Use programmes were designed to fulfill the Plant Science Industry's commitments to the health of the population and the preservation of the environment, to contribute to sustainable agriculture, and to share the benefits of agricultural science and technology with the agricultural community.

Utilising well-established country programmes, large numbers of schoolchildren, in addition to farmers have been trained, often in partnership with other stakeholders.

The pilot project in Guatemala added impetus to well-established training programmes in Latin America, and by the time it ended, had extended their reach to 18 countries. Lessons learned from this project have shaped the direction of CLLA's training model, and distinguish its approach from that of the other regional associations.

IPM/Responsible Use projects have been instrumental in the forging of strategic alliances and co-operative agreements with a range of partners from various sectors. Without the partners, extending the reach of these programmes to a growing number of beneficiaries would have been impossible.

CLLA has been very active in developing academic programmes, particularly for schools, implementing the *Scarecrow Programme* to help young people develop awareness of ecological issues and of the need to protect natural resources. The programme now serves as a model educational system for bringing agricultural concepts into rural classrooms.

CHILE

Despite having over 300,000 farms, Chile has a limited amount of land suitable for agricultural production, with just 6.7% of its total surface area under cultivation. Of this, 6% is devoted to fruit production, one third of which are grapes.

The ongoing IPM/Responsible Use training programme of the Chilean national crop protection association (AFIPA) has been predominantly designed for product applicators, growers, and related field professionals. Before the project started, the association had not addressed the difficult task of training temporary and transitional employees.

In 2003, AFIPA requested the Ministry of Agriculture to broker a multi-stakeholder agreement between itself and various parties including the International Fund for Agricultural Development (IFAD). Through this agreement, a training programme was introduced in three regions of the country for temporary farm workers not applying crop protection products directly. The project trained temporary workers on fruit plantations, agricultural plots, and greenhouses engaged in pruning, thinning out, irrigation, selection and packing, etc., and aimed to educate them on how to prevent, diagnose, and treat cases of pesticide intoxication.

As a side benefit of this effort, training was also given to professionals and supervisors regarding the observance of existing legislation relating to Responsible Use and Good Agricultural Practices.

The significance of this project was that it addressed an audience that had previously received little or no attention. The joint work between public and private sectors and the workers' representatives permitted dialogue and common ground on the best methods for future training.

The scope of the partnership between corroborating agencies facilitated new contacts and dialogue between public and private institutions to further current and future IPM/ Responsible Use training initiatives.

DOMINICAN REPUBLIC

After the successful multi-stakeholder and novel approach in Chile, the government of the Dominican Republic, AFIPA, and project partners agreed to pursue an interest in the crop protection post-graduate course being developed by CLLA at the extension department of Santo Domingo Autonomous University.

Thirty places were offered on the course, with IFAD contributing 25 scholarships. The course was inaugurated in April 2004 at a ceremony in the presence of authorities from the host university, Congress representatives, municipal authorities, and AFIPA directors.

Course objectives were to:

- educate technicians from the country's South-East region,
- contribute to knowledge transfer in one of the poorest regions of the Dominican Republic,
- establish a plant protection diagnostics laboratory with regional remit, under course participant management.


The joint work between **public** and **private sectors** and the **workers' representatives permitted dialogue and common ground on the best methods for future training.**

One significant aspect of the course was that it was offered in a region where the three poorest provinces are located. Close to the Haitian border, 86% of local people live below the poverty line and 42% endure extreme poverty. Despite this, the course succeeded in presenting a rare opportunity for professionals to advance themselves and specialise in their chosen field.

The course was completed in May 2005, with graduates well prepared to transfer their knowledge and practices to the local level.

EL SALVADOR

As part of an ongoing programme started in 1984, CLLA and the national crop protection association of El Salvador (APA) has successfully run a multi-stakeholder IPM/Responsible Use project in four key provinces of the country (Santa Ana, Ahuachapan, Sonsonate, and La Libertad).

The project aimed to improve usage of crop protection products in the agricultural labour sector. Project partners included various government ministries and agencies, civil society family groups, sugar cane and coffee grower representatives, and the University of El Salvador. The project aimed to reach not only farmers, but also to include activities targeted at housewives, teachers, schoolchildren, high school agricultural students, agronomists, agricultural extension officers, health promoters, technicians, and students in tertiary level education.

The programme included general training workshops and courses, five-day intensive courses for new master trainers, participation at agricultural fairs, hospital-based instruction for medical personnel, and the production of posters and other printed materials. The academic courses were of particular note.

These included the follow-up to the *Scarecrow Programme* in El Salvador: the *Growers of the Future*. Ten thousand schoolchildren participated in 200 training courses nationwide under a new curriculum that featured IPM, Responsible Use, and identification of label pictograms.

At a tertiary level, CLLA developed a course, similar to that in the Dominican Republic at the University of El Salvador, offering a post graduate professional development course in "Plant Protection". Twenty eight students graduated from the course.

The most significant aspects of the national programme in El Salvador are its diversity, number of events held, and the strategic alliances that were forged in order to build credibility with the target audiences. Furthermore, the alliances allowed the project to reach geographically isolated trainees, whilst keeping costs within budget.

Support from two civil society groups, the *National Secretary of the Family* and the *National Coordination for Woman*, were particularly gratifying for the national association. A further highlight was the successful adoption of the *Growers of the Future* programme, with its introduction into 66 primary schools and involving teachers, schoolchildren, and parents. The programme is ongoing with the support of the strategic allies, and the search continues for new partners. Audit and measurement systems are a priority for development to ensure effective feedback into the project design and operation.

HONDURAS

In Honduras, IPM/Responsible Use projects have been operational since 1992 under the management of CropLife Honduras. Recent projects have aimed not only to improve use of crop protection products, but also to contribute to good agricultural practices in fruit and vegetable production.

The most recent project was partly funded by the US Environmental Protection Agency (EPA) and welcomed the contributions of a wide range of partners, including the German Technical Aid

Agency (GTZ), various government and academic institutions, and growers groups. These partners contributed expertise by providing trainers and logistics assistance.

Almost 10,000 people from the various target groups were trained per year, including the graduation of almost 100 master trainers from five-day courses, and 200 training staff from three-day courses.

The project represented an important milestone for CropLife Honduras, since it was its first experience working in cooperation with US-EPA. Thus far, the collaboration has been a success, and the three-year project agreement was expanded in 2006 to other areas of the country, and to El Salvador and probably Nicaragua.

BRAZIL

Brazilian legislation (NR 31), introduced in May 2005, stipulates that crop protection handlers and applicators must show an acceptable level of competence in performing their working activities. The region of Alto do Tietê in São Paulo state is a traditional centre of vegetable production serving São Paulo city. Despite this volume, untrained handlers and applicators are the norm. In this context, a training programme was developed to assist untrained personnel in meeting NR 31 requirements, limit MRL violations, stop the use of unregistered CPPs, promote GAP, and ensure proper disposal of empty packages.

In a partnership between Cantareira University and BASF, supported by Camara Setorial de Hortaliças, Coordenadoria de Desenvolvimento dos Agronegócios (CODEAGRO), and the Brazilian Crop Protection Association (ANDEF), a "Vegetables: Safe and Healthful Food" training project was developed. Initial training at two events focused on proper use of PPE, empty container disposal, and application technology. Over 500 trainees have completed the course to date. Implementation of GAP has moved on from post-training tests and observations to the preparation of trainees for certification under rule NR 31.

ASIA

CropLife Asia serves as the regional hub for the Plant Science Industry in Asia-Pacific. Its stewardship and sustainable agriculture programme spans 14 countries utilising the collective experience of 15 years of programme operation.

The association is dedicated to quality, stewardship, safety, and value.

IPM/Responsible Use training constitutes a major activity for CropLife Asia's stewardship and sustainable agriculture programme. Through a process of continuous improvement, dating back to the Thailand pilot, and input from members, projects are making significant strides in accordance with the CropLife training model. These advances can be summarised under three headings.

First, renewed emphasis has been placed on integrating IPM into national projects. This is explained in economic terms to trainees, allowing them to use products more effectively and efficiently, avoiding residues, and highlighting market access issues. The integration of Responsible Use and IPM has moved the programme towards a sustainable agriculture approach.

Secondly, projects are focused on introducing and measuring behavioural changes in trainees. This strategy has been implemented at field level, and various measurement methodologies, involving third parties, are being explored and evaluated.

Thirdly, partnerships with government agencies, NGOs, and agricultural research centres have been incorporated into programmes, and national associations are viewing the multi-stakeholder approach as a necessary component of their project designs.

HIGH IMPACT COUNTRIES

In an effort to appropriate resources better and address local needs, CropLife Asia has recently identified priority countries for IPM/Responsible Use programmes, including the Philippines, India, Sri Lanka, China, Thailand, and Indonesia. Projects in other countries are ongoing and promising results have been achieved. In Bangladesh, for example, the Bangladesh Crop Protection Association is working with the world's largest NGO, the Bangladesh Rural Advancement Committee, to produce radio and television features to reach a significant farmer audience. Training of doctors in Pakistan is helping the medical profession adopt the latest diagnosis and treatment of pesticide-related incidents. CropLife Malaysia developed interactive teaching materials for use in schools, working closely with the Ministry of Agriculture. Farmer training in Cambodia continues, and has been strengthened by partnership with local stakeholders.

The following case studies from China, Sri Lanka, and Vietnam illustrate the development of programme concepts over the 15 years of Responsible Use training by associations in Asia-Pacific.

SRI LANKA

Since 1986, the Sri Lanka Crop Protection Association (now CropLife Sri Lanka) has worked at the grassroots level with various partner agencies to address the agronomic training needs of multiple target audiences.

Malaysia developed interactive teaching materials for use in schools, working closely with the Ministry of Agriculture.

The agricultural workforce has been hampered by the lack of knowledge of safe, effective, and environmentally conscious handling and storage of crop protection products. Most alarmingly, more widespread social problems have emerged in the use of crop protection products for self-harm, incidents of which have blighted rural farming areas.

In 2001, the Ministry of Health unveiled an 18-point public health campaign. One of the campaign's priorities was "to educate the public on safe handling of insecticides to reduce the incidence of accidental and suicidal poisoning." The Ministry of Health & the Office of the Registrar of Pesticides initiated several studies to evaluate the relationship between incidents of self-harm with crop protection products and the imposition of purchase restrictions of acutely toxic products.

CropLife Sri Lanka's contribution was to initiate a project in collaboration with the government to improve storage security on farms and in retail locations. In addition to restricting unauthorised access and use, improved storage would also help prevent accidental poisoning.

A 2004 study by CropLife Sri Lanka showed that only 38% of farmers stored crop protection products separately from other goods, and of those that did maintain separate storage, only 42% kept such facilities locked.

The first programme was conducted at Pollonnaruwa District, one of the major rice paddy areas, in 2004. CropLife Sri Lanka designed a storage box built to store an average season's supply of pesticides. Two hundred and fifty farmers were trained and storage boxes were given to all participants. Similar programmes were conducted in Nikeweratiya and Kurunagala District.

Concise IPM/Responsible Use messages featuring storage precautions were developed and used in mass media campaigns via radio and print. Over 300 radio spots were run reaching an estimated audience of 50,000 listeners. Newspaper announcements reached over 100,000 readers.

Follow-up field schools were conducted in major agricultural areas to stress the importance of secure storage and to promote the box design. Farmers were surveyed on how they could easily make their own boxes from locally available materials. It is clear that a sustained and concerted effort will be required if a major change towards secure storage conditions on the farm, at home, and in retail locations is to be realised.

CropLife Sri Lanka realises that both the sustainability and measurement of its IPM/Responsible Use projects are important. It is working with the Faculty of Agriculture, at the University of Peradeniya on methods for pre- and post-training auditing of all training courses.

VIETNAM

In the intensive vegetable producing areas of Vietnam, problems with crop protection product usage are common. These growing areas are important to Vietnam's economy, which means that the farmers not only needed safety messages, but also information on the quality requirements for export produce.

In response to this situation, the Plant Protection Department (PPD) of the Vietnam's Ministry of Agriculture and Rural Development, in collaboration with CropLife Asia,

The **agricultural workforce** has been **hampered** by the **lack of knowledge of safe, effective, and environmentally conscious handling and storage of crop protection products.**

introduced a campaign in 2003 to *Strengthen the Responsible Use of Crop Protection Products in Vietnam*.

The campaign was launched in four key vegetable and tea growing provinces (Vinh Phuc, Lam Dong, Quang Nam, and Ho Chi Minh City). Through training workshops, the department's staff met farmers and disseminated the latest information, organised farmer contests, and assessed which training methods would best serve needs both immediately and in the future.

The creation of a forum for farmers and PPD staff to discuss crop protection issues was a welcome benefit of the project. Updating farmers on new regulations and permitted product uses was invaluable in the wake of changes in national legislation. The project also brought the government training personnel into contact with representatives from various civil society groups (farmers, women, and youth groups), crop protection companies, media, local extension agencies, medical personnel, and others that otherwise might not have had the opportunity to engage in dialogue with staff from Hanoi.

ACTIVITIES

One hundred and thirty trainers were trained over a six-day course in Ha Tay and Ho Chi Minh City. Farmer training courses took place at 33 farmer field schools in the four target provinces.

Part of the innovative approach used during the programme included farmer contests and community drama. The latter were broadcast on Vietnam Television and reached millions of viewers. Three broadcasts were made as a result and they attracted additional attention through a national competition for script writers. The winning screenplays were broadcast on network television.

This was the first time that such subject matter had been given air time on a national station. This was all the more significant as it was the output of one of the first collaborative projects between the Vietnam Government and the Plant Science Industry.

CHINA

Amongst the many challenges facing agricultural productivity in China are low input levels in the production process and frequent water shortages. Awareness of food safety issues and related implications are increasing, and production methods must overcome input limitations whilst meeting stringent food safety legislation.

The Chinese Ministry of Agriculture recently unveiled a comprehensive action plan for the production of "safe food". One of the plan's key stipulations concerned the elimination of high residues of crop protection products in produce. Two hundred key production sites around the country were designated as model systems for the production of fruit, vegetables, and tea.

CropLife China proposed a co-operative programme with the government's National Agri-Tech Extension Service Centre (NATESC) to provide IPM/Responsible Use training at these model sites. The training was aimed at safeguarding users and the environment, and facilitating the production of high quality food.

The Chinese Ministry of Agriculture recently unveiled a comprehensive action plan for the production of “safe food”. One of the plan’s key stipulations concerned the elimination of high residues of crop protection products in produce.

NATESC operates Plant Protection Stations (PPS) at the provincial and county level. These stations tested knowledge and awareness before and after training, monitored residues, and assessed changes in behaviour among farmers with regard to the use of crop protection products.

As the co-ordinating agency for Responsible Use training at the sites, CropLife China arranged training personnel from member companies to conduct 10 training sessions at sites in Hunan, Guangdong, Guangxi, Fujian, Sichuan, Shandong, Hebei, Xinjiang, and Shaanxi provinces. Each training session consisted of practical training in the field, backed up by teacher-led interactive lessons in the classroom, with emphasis on "edutainment". Training handbooks were distributed along with posters, quality sprayers, and PPE (ponchos and face shields).

RESULTS

For many of the farmers, it was their first experience of formal training in the use of crop protection products. Farmers were enthusiastic participants, particularly when the training promoted economic benefits, labour saving, and compliance with export standards.

Observations following training in Guangxi indicated a 20% reduction in the use of acutely toxic products for vegetable production, with a reduction in spraying frequency from five to six times to four to five times, leading to a cost reduction of 8-12%. The residue test pass rate was 96.4% compared with 94% on the local market.

PARTNERSHIP EFFECTS

The project has enabled the members of CropLife China to build alliances with the local crop protection industry, which commands most of the market share in China. The China Association of Pesticide Industry (CAPI) has more than 200 members and CropLife China called for their collaboration and support for IPM/Responsible Use training during their annual conference in December 2004.

Significant demand for IPM/Responsible Use training at the grassroots level exists, but funding is a real constraint given the scale of the programmes required. Despite the lack of resources, there is general enthusiasm from the Ministry of Agriculture. This initial collaboration between CropLife China and the Ministry has mobilised provincial extension offices, which has been beneficial for both farmers and retailers.

One of the key objectives of this project was to encourage further activities and persuade both the government and other parties to allocate resources in support of IPM/Responsible Use. Once others have witnessed the efforts of the Plant Science Industry members, it is hoped that they will also take up the challenge. It is expected that future collaborations will extend the reach of activities into other key agricultural provinces in China.

AFRICA MIDDLE EAST

CropLife Africa Middle East directly administers knowledge transfer programmes employing the train-the-trainer approach in many African and Middle East countries.

Whilst the unique challenges facing the campaign are considerable, the approach yields results in terms of alliance building, outreach, training materials development, and placing qualified personnel in the field.

Over the years, CropLife Africa Middle East (CLAME) has responded to widespread demand for comprehensive IPM/Responsible Use training programmes, and now leads efforts across Africa to build capacity through the qualification of training personnel.

Demand has centred not only on health and safety concerns but also on the quality assurance aspect. For example, IPM/Responsible Use training of estate employees is now mandatory for exporters in the region. There is a new focus on smallholder growers, supported by levies on imports with significant donor involvement.

CLAME has assumed more of a leadership role in terms of operations on the ground than has been the case for other regional associations. In this section of case studies, it is therefore pertinent to review the latest activities of CLAME as a direct participant in the train-the-trainer effort in Africa Middle East.

REGIONAL OVERVIEW

After the completion of the Kenya pilot project, CLAME embarked on its regional knowledge transfer initiative to provide credible, qualified resource personnel in all countries. These trainers would later be called upon to deliver IPM/Responsible Use training to personnel at all levels, in all sectors, and at any location.

The initiative began in 2002 with an analysis of training needs. Thirty-four country visits were made and personnel from the national crop protection associations, NGOs, training institutions, and other stakeholders were consulted on the requirements. As a result of this effort, a pilot project (Phase II) was introduced in Zimbabwe, where the first train-the-trainer course was presented. This course was made up initially of three five-day sessions, and was later condensed into a single five-day intensive programme.

The first intensive course as part of Phase III was conducted in Amman, Jordan for industry trainers drawn from countries throughout the North Africa Middle East region. Subsequently, another 12 courses were conducted in 2004, 15 in 2005, and another 16 in 2006.

The next critical phase of the programme will be farmer training by the newly qualified master trainers. This is an ongoing commitment. Phase V will assess the performance of the master trainers, and this has begun in Ethiopia and Ghana, with the assistance of Belgian Technical Cooperation and the International Centre for Soil Fertility & Agricultural Development (IFDC), respectively.

Partnerships have been formed in several countries, including IFDC (Malawi, Ghana), United States Agency for International Development (Uganda), GTZ (Egypt), United Nations' Food & Agriculture Organization (Tanzania, Ethiopia, Mozambique, South Africa), Belgian Technical Cooperation (Ethiopia), and the United Nations' Development Programme (Somalia).

The final part of the programme, Phase VI, is the critical assessment of trainees in each country. This outcome assessment will be a significant challenge, requiring well designed training surveys.

RESULTS

To date, the regional programme has trained over 400 master trainers during 31 courses in 21 different countries, throughout Africa and the Middle East, with additional courses in Italy for Mediterranean students. In addition, two French-speaking facilitators, funded by IFDC, have started a train-the-trainer programme in West and North Africa. Training took place in Portuguese in Mozambique during 2004 for 22 master trainers as well as during 2006. This programme is likely to be linked with Angola in partnership with IFDC. The plan is to have several facilitators in each of three regions, East-Southern, West-Central, and Middle East-North Africa, each conducting train-the-trainer courses, thereby building capacity throughout the region.

The train-the-trainer courses incorporate appropriate adult training techniques, not only to pass on knowledge and skills, but also to change attitudes, perceptions, and ultimately practices in the field. Courses are highly participatory and participants are required to complete an assessment and pass a formal examination before receiving a certificate of competence.

KENYA

Among CropLife Kenya's training targets are retailers who sell both crop protection and animal health products. These retailers are key advisors to farmers and have considerable interaction with them.

Whilst a retailer may be well-versed in animal health, he/she may lack adequate knowledge in crop protection and *vice versa*. Inaccurate information passed on to farmers by untrained personnel can result in incorrect use and potential injury. CropLife Kenya decided to address this problem with various stakeholders in agriculture and animal health with a view to developing a training course to bridge the knowledge gap.

The Pest Control Products Board, Director of Veterinary Services, Kenya Plant Health Inspectorate, and the Ministry of Agriculture helped develop a training curriculum for the one-week *Bridging Course for Agrovet Owners and Attendants.* The course covers pest control products for both crops and animals, and IPM/Responsible Use is included as a significant component. The training was conducted by personnel from the agriculture and livestock sectors, and trainees were required to pass a formal examination in order to graduate from the course.

In June 2005, a total of 28 participants graduated from the course. In 2006, three training courses were arranged. These training schemes were a major success, judged by the immense interest shown nationwide by retailers.

ETHIOPIA

CropLife Ethiopia's Responsible Use projects have been some of the association's most important initiatives undertaken since its foundation in 1998. Over this period, more than 1,000 crop protection experts, extension officers, storekeepers, pesticide spray operators, and medical personnel have been trained. From 2003 onwards, "subject matter training"

Since 1998, more than 1,000 crop protection experts, extension officers, storekeepers, pesticide spray operators, and medical personnel have been trained in Ethiopia.

evolved into a train-the-trainer approach. Thirty-six master trainers from nine regions of the country have been appointed.

Subject matter training met with considerable success, with courses being conducted at the Horticulture Development Enterprise, an organisation engaged in the production of fruit and vegetables both for the local and export markets. The Upper Awash Agro Development Enterprise, the Ethiopian Horticultural Development and Export Association, and the Cotton Crop and Coffee Production Enterprises also benefited from training and have requested refresher courses.

In accordance with the CropLife training philosophy, the train-the-trainer approach has yielded impressive results. Master trainers are providing credible sources of expertise around the country, working with subject matter experts and retailers in Oromia, Tigrav, and Addis Ababa.

SOUTH AFRICA

CropLife Africa Middle East's master trainers based in South Africa have carried out extensive training in IPM/Responsible Use in the fruit and vegetable industries, particularly in the Western and Eastern Cape Provinces.

The CLAME training model dovetails well with South African farming experience and demographics. Training is usually subdivided into two single-day sessions that cater to trainees unable to read or write, who are usually the general handlers of chemicals. The second training course is presented over two days and caters to literate trainees. Both training courses incorporate the South African National Standards 10206 statutes.

Training sessions were conducted in the fruit producing areas of the Eastern and Western Cape and over 1,000 people have been trained to date. This number encompasses general chemical handlers, tractor drivers, operators, farm managers, co-operative shop managers, chemical agents, and government extension officers. Agrochemical retailers have organised training sessions on farms. These retailers hold the CropLife training in high esteem and are glad to refer trainees to the programme.

Very few farm managers have attended the training sessions to date, and this makes it difficult for farm workers to put into practice what they have gained from the training session. Farm managers will be encouraged to attend training sessions tailored to their needs, perhaps focusing on certification scheme compliance, but also stressing the need for safety and environmental protection.

EGYPT

Several years ago, a pesticide retailer certification scheme was developed by USAID and GTZ in cooperation with the Ministry of Agriculture (MoA) and CropLife Egypt. CropLife Egypt continues to manage the project, the aims of which are to:

- ensure that retailers possess adequate knowledge of CPP safety in line with MoA recommendations,
- support the principles of GAP, IPM, and protect the environment,
- ensure that CPPs are transported, handled, and stored correctly, and
- establish a certification and licensing scheme for pesticide retailers throughout Egypt.

Retailers hold the CropLife training in high esteem and are glad to refer trainees to the programme.

At the end of training by CropLife Egypt and two NGO partners, a test is conducted by the MoA's Central Pesticides Laboratory. Those that pass the test are certified by both the Agricultural Pesticides Committee and the Central Pesticides Laboratory, and receive a licence to operate from the MoA.

The course consists of 30 hours of training in 10 sessions performed by a master trainer and two assistants. The certification test, which lasts two hours, consists of 50 multiple choice questions. To pass, a score of 60% is necessary. Licensing is granted by the MoA once the above certificate has been obtained. Renewal pending re-examination is every three years.

Seventeen CLAME master trainers have trained 2,000 pesticide retailers, all of whom have been tested and licensed as of early 2006. A further 800 have been trained by CropLife Egypt trainers. CropLife Egypt aims to continue the certification of pesticide retailers nationwide, introduce various categories of certification, and extend the scheme to product applicators.

IRAQ

USAID has introduced an Agriculture Reconstruction and Development Initiative (ARDI) in Iraq. Master trainers who graduated from CropLife Egypt and CLAME's training programmes have been important participants in this programme.

The ARDI has broad aims, including expansion and improvement of IPM-related products and services, upgrading of pesticide retail facilities, and retailer knowledge related to IPM/ Responsible Use.

CropLife master trainers conducted sessions in Erbil and Dahuk (Kurdistan) over five days for 58 retailers in 2005 and approximately 60 in 2006. They have been able to reaffirm retailers' commitment to forming an "Iraqi Pesticide Dealers Association".

CropLife Egypt and CLAME master trainers will train another 60 retailers by May 2006. They will provide various support functions and assist in brokering dialogue with the Iraqi MoA and other NGOs.

AMERICA

CropLife America and the Agricultural Retailers Association (ARA) have joined forces as part of the American Agronomic Stewardship Alliance (AASA).

Between 2004 and 2005, for example, over 400 US agricultural retail locations were inspected; with a goal of 6,200 inspections. With its independent inspectors, a 40-plus point checklist and complete transparency, the AASA offers a comprehensive quality assurance system for US agrochemical retailers.

Product Stewardship activities in North America follow different priorities to those offered by crop protection associations in the developing nations. Representing the Plant Science Industry in the United States, CropLife America provides appropriate advice as required through third-party organisations. These include land-grant universities, government agencies, and consultants.

CropLife America has devoted significant resources towards container recycling and is actively working to develop a national standard for recycling one-way containers. An innovative approach to retailer quality assurance has been the most recent stewardship highlight for the association.

As part of its stewardship commitment, the association has undertaken a leading role in the American Agronomic Stewardship Alliance. The AASA is the lead organisation in a stewardship inspection and accreditation programme for agricultural retail facilities storing bulk, mini-bulk, and packaged crop protection products.

The concept of self-regulating requirements for retailers originated in 1997. In 2001, CropLife America joined with the ARA to develop a stewardship programme designed to increase efficiency and promote stewardship among retailers. The two groups worked for two years to build a single checklist and a schedule for inspecting and accrediting agricultural retail facilities. The scheme was launched in 2004 and replaced the duplicative bulk inspections of facilities conducted by manufacturers over the previous 15 years. Working together, manufacturers, distributors, and retailers have developed a more effective way to conduct facility inspections.

NEW STANDARD

The inspections have created a new standard for the industry. Rather than each manufacturer or government agency having their own set of requirements, they can now consult a single 40-plus point AASA checklist. The centralised checklist helps reduce the number of yearly inspections manufacturers perform. Instead, inspectors from accredited third-party organisations perform inspections on behalf of the AASA members.

The AASA website, www.aginspect.org, lists all the information retailers need to know regarding the inspections. Not only can retailers find a complete list of bulk tank and mini-bulk tank facility requirements, they will also find the complete manual used for inspections. With this knowledge in hand, retailers are well prepared for inspections. AASA officials do not make surprise visits. Each retailer facing an inspection receives a notification letter indicating that it is their turn.

The second phase of the plan is once the inspections are complete. AASA is planning to move accreditation to retailers. The accreditation process recognises all the retailers that have passed inspections.

EUROPE

The European Crop Protection Association (ECPA) acts as the ambassador of the crop protection industry in Europe, promoting agricultural technology in the context of sustainable development.

The association represents the industry's European regional network and is committed to product stewardship activities that include IPM/Responsible Use as part of a broader Integrated Crop Management approach.

The Safe Use Initiative, launched in Spain, is ECPA's flagship IPM/Responsible Use project that sets a high standard for other programmes to emulate.

One part of ECPA's product stewardship programme is dedicated to recommending that optimal safety measures be employed during product use. These measures are put to severe test by the warm, often humid conditions of the Mediterranean countries. It is here that most of Europe's fresh produce is grown.

With these two decisive factors in mind, ECPA decided to develop its own initiative aimed at improving the working conditions of millions of farmers in the intensive growing areas of Portugal, Spain, France, Italy, and Greece. From these countries, ECPA decided to launch its *Responsible Use Initiative* in Almeria, Spain.

SPAIN

Almeria is located in south-eastern Spain and is home to the largest protected cultivation area in Europe. About 20,000 growers cultivate vegetables under 35,000 ha of glasshouses. The area has been the target of media reports claiming operator exposure, particularly to immigrant workers. National occupational health agencies have also voiced their concerns about crop protection product usage.

To get an objective measure of the actual situation regarding use practices, ECPA commissioned an independent baseline survey in 2002. A representative sample of 200 small-to-medium growers were visited and mixing, loading, and application activities were observed. To complement the observations, personal interviews were conducted.

From the survey it became clear that application equipment and methods, personal protective equipment (PPE), and general hygiene were the main issues with regard to operator safety. Thirty critical *success factors* were identified and targeted for improvement.

PROJECT AIMS

The broad aims of the project were to reduce potential user exposure through innovative application techniques and best practices in handling. Novel application equipment and technology were researched and field tested. Recommendations were given based on efficacy and benefits to growers. In addition, measures were explored to reduce dermal exposure and inhalation by the identification, development, proper use, and maintenance of appropriate PPE.

One part of the ECPA's product stewardship programme is dedicated to recommending that **optimal safety measures be employed** during product use.

PPE was researched and tested for comfort and safety, and specific recommendations were given for coveralls, gloves, boots, masks, goggles, and face shields. The recommended clothing had to be comfortable, cost-effective, available in the local market, and offer adequate protection under worst-case scenarios.

Media and awareness campaigns were launched that included press inserts, radio spots, and billboard advertisements. Participation in agricultural trade events was a priority. Furthermore, an audio-visual training module was developed, which made specific recommendations originating from this research into application equipment and PPE. In common with other IPM/Responsible Use projects around the world, the initiative also trained trainers on compliance with official certification schemes.

RESULTS

In January 2005, the same 200 growers were observed and interviewed. This follow-up survey focused on the success factors established in 2002 to measure the outcomes of the project. All 30 success factors showed a positive trend. The number of growers wearing gloves during mixing and loading increased from 38% to 63%, and operators who exposed their unprotected hands with product dropped from 44% to 17%. Coveralls worn during application increased from 58% to 75%, and the exposure of unprotected arms and legs with spray was reduced from 40 to 14%. The use of novel spray equipment that reduced potential exposure of operators during treatments grew from 23% to 32%.

ECPA is fully aware that IPM/Responsible Use is an ongoing commitment and has continued to support the Spanish Initiative. The national working group, together with the Spanish crop protection industry association (AEPLA), has focused on the availability of PPE through product distribution channels, label specificity on personal protection, and compliance with recommendations through certification schemes. Given the importance of training, material for trainers has been developed so they can effectively disseminate the correct messages and recommendations to users now and in the future. Given the success of the Responsible Use Initiative in Spain, further programmes have been launched in Greece, Portugal, France, and Italy.

GREECE

The Responsible Use Initiative is being carried out in the greenhouse area of Ierapetra, Crete. Much of the knowledge acquired from the Spanish experience has been adapted to local conditions. The initiative is being led by the Greek national crop protection association, HCPA.

A media campaign has been launched via television, radio, and other communication channels. Promotional and informative material, such as brochures, posters, and displays, have been produced to provide information at agricultural events.

PORTUGAL

The area selected for the Responsible Use Initiative was Minho, in northern Portugal. Here, many smallholders tend vineyards. The vines are either grown in rows or as pergolas (roofs), which require upward application of crop protection products.

The project started with the organisational set-up and the appointment of a national co-ordinator. Official bodies, such as the Crop Protection Department (DGPC) of the Ministry of Agriculture pledged their commitment by signing an agreement with the national industry association, ANIPLA. Local authorities, farmer associations, and distributor networks also support the program.

Launch events have been held and a baseline survey was conducted among 200 farmers, who were interviewed on IPM/Responsible Use topics. The survey has yielded 12 main safety messages and has defined 17 success factors. Topics addressed include health and safety, labels, PPE during mixing, loading and application, packaging, and training.

FRANCE

There are a number of IPM/Responsible Use projects and activities in France already well established. Since it was desired to synchronise these ongoing projects with ECPA's Safe Use Initiative, Bordeaux's vineyards were selected as the area of choice. On the basis of the results obtained from a baseline survey, it was decided to focus on encouraging concerned government ministries to enforce training, and on collaboration with distributors, co-operatives, and dealers in order to provide suitable PPE.

ITALY

The Responsible Use Initiative was launched in Apuglia, in southern Italy. A baseline survey was conducted amongst operators treating vegetables in greenhouses and fields, but also with sprayers of crop protection products in vineyards.

Table grapes are treated frequently and, as in Portugal, Italian operators were directed to spray upwards. The baseline survey consisted of a mix of four focus groups and 290 telephone interviews.

CONCLUSIONS

ECPA's Responsible Use Initiative has yielded significant health and safety benefits. Valuable lessons for project design, operation, and measurement have been assimilated and transferred to other countries. Improvements in Spain's success factors demonstrate that the Safe Use Initiative considerably improved practices despite the challenges faced by such important fresh food producing regions.

Impact & Achievements

The global IPM/Responsible Use programme, entering into its 19th year of operation in 2008, has made a significant impact, produced a range of achievements, and realised positive outcomes for trainees across the globe. In addition, project administrators, partner organisations, and the Plant Science Industry itself have benefited from the substantial campaign efforts.

These efforts, through the member companies and associations of CropLife, have been considerable in both scale and scope. Stewardship is a major activity of all CropLife associations, and IPM/Responsible Use training has emerged at the forefront of association activities in Latin America, Asia-Pacific, and Africa Middle East.

The case studies presented in this publication illustrate the original, innovative approaches being taken to meet local challenges head on.

SUCCESS FACTORS

A number of factors have contributed to the success. Foremost is the commitment of the Plant Science Industry. Training and education in IPM/Responsible Use is a long-term undertaking, which requires substantial resources. The members of CropLife have been solidly behind the campaign from its inception and remain committed for the long haul. Without the local knowledge, hard work, and expertise of the CropLife national associations, very few of the projects would have been possible, since success depends on an understanding of local needs, conditions, and cultures.

A range of partnerships and a pragmatic, results-oriented approach have been important components in the process. These process elements are also significant achievements for the campaign.

RESULTS

The most immediate output from the campaign is the numbers of trainees that have participated in IPM/Responsible Use training as part of association programmes since 1991. To date, more than 3.5 million people have been trained directly through the programmes.

In addition, many millions more have received IPM/Responsible Use messages indirectly. Although these numbers can only be estimated, diffusion of messages through communities have reached millions more. This indirect *information cascade*, is an important communication channel. It includes those that receive the messages or are influenced through training by peers, local trainers, family members, credible community members, and other opinion leaders.

Equally impressive is the fact that programmes have run in over 80 countries around the world. This geographical distribution means that projects have reached a wide range of farming areas, from commercial large-scale farms in developed countries to poor, isolated smallholdings in the least developed countries.

Results from 2006 provide an illustration of this quantitative output. During the year, 54 of the 93 national or regional associations undertook IPM/Responsible Use training

activities. These programmes directly reached almost 92,000 people around the world. Figure 9.2 breaks down the numbers trained into percentages by target type. Farmers and schoolchildren accounted for more than 75% of those trained, and significantly, 10% of trainees were trainers who will later pass the instruction on to others. By 2006, the number being trained per year was 300,000.

ACHIEVEMENTS

In addition to numerical outputs, the programmes have produced a number of achievements worthy of note.

CropLife associations have been instrumental in the development of written training materials and Responsible Use guidelines. These publishing activities have complemented training programmes, and provided invaluable source material for other stakeholders engaged in similar training. CropLife has freely distributed these publications, and trainers around the world have adapted the contents for their local needs. These publications and training guidelines are available for free downloads at www.croplife.org.

Through the operation of the programmes, project designers have been able to progress from purely safety-based training to reflect the economic realities of modern farming. IPM has become an integral part of Responsible Use training. Motivating farmers in developing countries to develop their skills in this manner has been shown to be more effective than motivation through health and safety considerations alone. Participation in developed countries, i.e. certification schemes, is a significant achievement, and one area for future expansion offering partnerships and value-added training opportunities.

MULTI-STAKEHOLDER

Another very positive achievement of the programme has been the number of multi-stakeholder partnerships, particularly those with public-sector institutions. Public-private partnerships are often lauded and highly sought after, but do not always realise the intended benefits. CropLife's partnerships in IPM/Responsible Use projects have more often than not achieved a "win-win" scenario.

In forging partnerships, associations have been able to leverage a multi-stakeholder approach for training. This approach has facilitated fresh interaction and dialogue at many different levels. It has also illustrated the necessity for common ground between stakeholders and the shouldering of responsibilities that the training effort requires.

One partnership that has been vital is with farming associations and representatives. Without their participation, actual needs would be difficult to assess and participation in training would be limited. This is an achievement in itself since farmers' interests, particularly in developing nations, are often under represented and are not offered the opportunity to engage in dialogue or partnerships with industry.

IMPROVEMENT

One achievement of the programmes has originated from the results-oriented approach employed by CropLife in its programme operations. The need to measure progress has provided a feedback mechanism, sharing of best practices, and a global network that has contributed to a dynamic improvement process.

Unquestionably, the entire programme has progressed steadily in terms of each association's capacity to inform, motivate, and mobilise target groups. Continuous improvement has become engrained as a habit, no programme can rest on its laurels.

Through this process, project designers have been able to learn from their audience, follow-up on programmes, and develop novel approaches to problems. New approaches to rural education via schools, competitions, design contests, and other personal hands-on experiences are examples of this.

RESULTS

The results of training are both the most important aspects of the impact assessment and the most difficult to measure. In terms of qualitative results at the project level, various audits by project staff and independent third parties have shown changes in attitude, awareness, knowledge, and behaviour amongst trainees. For example, outcomes from the ECPA *Responsible Use Initiative* (see page 36) clearly show a positive affect of training on working practices in difficult conditions.

Associations are working hard to develop reproducible, scientifically grounded methods, at a reasonable cost, for the objective measurement of outcomes, such as behavioural change in trainees. This is a challenge being addressed in all regions.

The future holds great promise, given the solid foundations that have been constructed over the past two decades. Evolution dictates new approaches to emerging challenges, and industry must continue to respond appropriately to move IPM/Responsible Use forward.

PROSPECTS

The challenges facing a practical and accessible global IPM/Responsible Use programme are considerable, though certainly not insurmountable, and CropLife's member companies and associations are working to address the constraints and move the programmes to the next level in the coming years.

The most daunting challenge is the number of agricultural workers who could benefit from IPM/Responsible Use training. There are billions of potential trainees, and those most in need, such as farmers in low-resource, subsistence farming communities in least developed countries, present the greatest challenge to training design and implementation.

CONSTRAINTS

There are a number of constraints on the implementation of effective training in such areas, the most fundamental being the question of how well training will be assimilated by the trainees. Low literacy rates, lack of formal education, low motivation, dialect or language differences, and social pressures can all contribute to rendering well designed training programmes useless. Innovations, such as the development of pictorial messages – pictograms – that the industry has helped pioneer for safety and hazard messages, can help overcome these.

Physical constraints include geographical isolation, poverty, extreme climates, and high pest and disease pressures.

Organisational constraints, often reflecting working or employment status, such as low pay, debt, high turnover rates, seasonal or temporary employment, immigrant labour, and management indifference can make practical implementation of assimilated training worthless in real situations in the field.

EFFORTS TO DATE

The CropLife programme to date has made impressive progress, and the achievements provide firm foundations and a branching point for further work to reach more trainees, and train them more effectively.

WHAT CAN WE DO

The way forward for IPM/Responsible Use is being continually evaluated and discussed. Over the long term, CropLife seeks to train more people, more effectively, with measurable impact assessments.

In order to achieve these goals it will be necessary to develop overall guiding principles for project strategy, design, operation, measurement, and evaluation, based upon the positive experiences and lessons learned from the decades of IPM/Responsible Use training. The following aspects will be critical to the programme's future expansion and effectiveness.

PARTNERSHIPS

It is clear that partnerships are vital to the success of the programme. The effectiveness and sustainability of the training correlates well with the number of partners actively contributing to the project. Of all the partners engaged via the various programmes, priority must be given to further alliances with farmer associations, which remain under-represented to date.

Partnerships must also recognise the shared responsibility of training. For this to occur, CropLife must engage more partners through outreach programmes. To accomplish this, industry must not only transfer knowledge and information but also products and services. The Plant Science Industry remains a committed and reliable partner in providing appropriate, modern technologies and services to implement IPM/Responsible Use practices, for local needs.

PROJECT DESIGN

Project design will evolve into a more defined, systematic process in future. One design criterion will be to explore the incentives for training and motivation of trainees. What's in it for them? How are they motivated? Who volunteers for IPM/Responsible Use training and why do they do so? How should projects select trainees? Understanding these questions will enable the industry to provide the right tools to meet farmers' needs – whether these are information, services, or technology. Designing a tailor-made course to meet farmer needs (safety, livelihood, compliance, environmental, etc.) will address various motivational constraints.

Project design will continue to address the trainer audience as the main target. This approach recognises the scale of the training effort, and acknowledges that the one-to-many communication afforded by training trainers is the only realistic solution to the billions of potential trainees around world.

SEED PROJECTS

With resources at a premium, one way forward for future association activities will be to focus on selected "key" countries. This has already been implemented in Asia. The rationale behind the decision is purely qualitative. Keeping a tight reign on centres of excellence that serve as models for transfer to other countries is a prudent approach for regional associations. If projects can start small, offer a practical and cost-effective approach, and be scaled-up and implemented in other countries, they will stand a good chance of having the desired effect without drawing down on resources. ECPA's *Responsible Use Initiative* has employed this strategy to good effect.

IMPROVEMENT

Transfer of successful projects is allied to the continuous improvement habit, which has been a feature of progress thus far. Industry will revisit projects and successful programmes for the benefit of trainees, and for the programme as a whole. Follow-up is needed to effect change locally, and to contribute to the case history and measurement process. In this regard, the development of appropriate Key Performance Indicators will be important.

PARTICIPATORY TRAINING

Industry is committed to a practical, accessible, and participatory approach to IPM/Responsible Use training. However appropriate the teaching materials, whether they be visual aids, handbooks, or posters – they cannot replace hands-on practice; learning by doing is essential. The Participatory Approach successfully employed to date will be further explored and improved.

IMPACT ASSESSMENT

Directly related to programme sustainability, measurement is a vital area for current and future work. A first step will be to define what indicators should be measured and how. The most logical starting point will be to collect significant data to show how training has addressed pesticide-related incidents. Measuring behavioural change by a combination of

observation and interview has been implemented in certain projects. This data needs to be carefully interpreted and revisited to check that changes are habitual, and not just a short-term reaction to training.

As is the philosophy of CropLife at all levels, the willingness to listen and engage in dialogue are defining characteristics of the Federation. Given the multi-stakeholder approach to projects, it is likely that measurement issues will be resolved with significant partner input.

COMMUNICATIONS

We live in an era of instant news, infotainment, and the Internet. How these information technologies can be successfully applied in IPM/Responsible Use training is open to debate. Such technologies have a role in supporting participatory training by providing universal access to the latest information and tools.

Certainly, the Internet serves some audiences better than others, accessibility being the main issue. However, the tools provided have proven effective for many users of crop protection products, and particularly trainers and extension agents. The one-to-many communication gateway offered by the Internet addresses issues of scale, but not, as of yet, that of accessibility.

Information is more recyclable than ever before; electronic training materials can be shared, modified, and redeployed quickly. Costs are kept to a minimum, and repetition and duplication of effort is avoided. Train-the-trainer schemes could make good use of this sort of trainer-friendly material. Personalisation and localisation of communications is important, as is the need to take account of literacy rates, language, and differences in dialect. A more visual approach to communications – a move towards "edutainment" – may serve this purpose and ensure that the material is more readily retained by trainees.

Moving away from lectures to a two-way communication process has its merits. When trainees feel they are part of a conversation, and their participation and input is being valued, messages are more likely to be retained and passed on to others afterwards. Farmer contests and school competitions are examples of synchronous communications that have been shown to be effective.

Ultimately, effective training is about effective communication, tailored to the needs of the audience.

Various publications and training guidelines are available for free downloads at **www.croplife.org**

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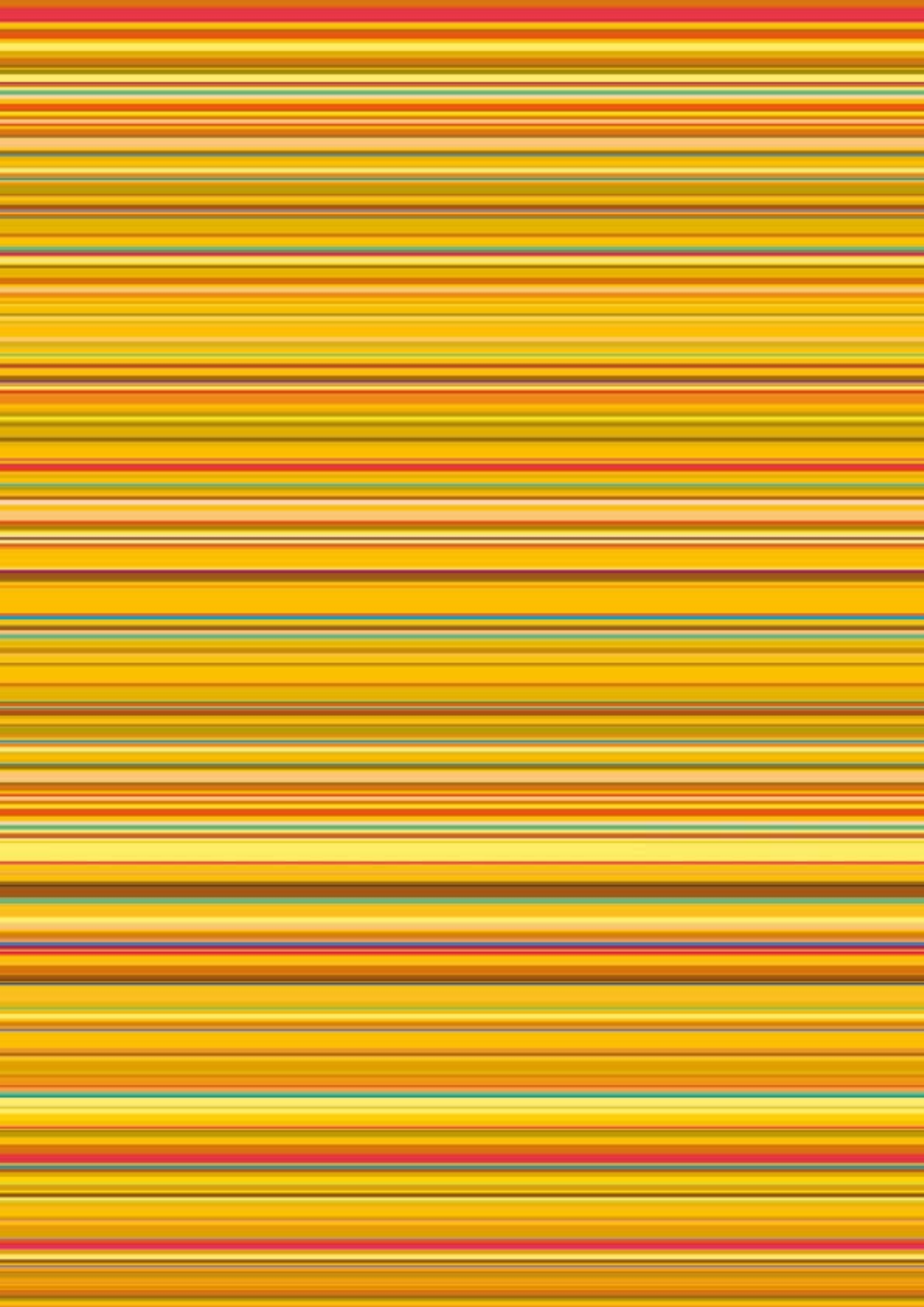
For more information on Integrated Pest Management visit CropLife International's website or contact keith@croplife.org



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