

REPORT OF THE
OECD/FAO WORKSHOP
ON
PESTICIDE RISK REDUCTION

Uppsala, Sweden
16-18 October 1995

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FOREWORD

The recommendations presented in this workshop report, and proposals for implementing them, were presented to the OECD Pesticide Forum in February 1996. The Pesticide Forum is the body which directs the work of the OECD Pesticide Programme. The Forum is composed primarily of delegates from OECD Member countries but also includes representatives from the pesticide industry, non-governmental organisations, and other international organisations.

After reviewing the report's recommendations, the Pesticide Forum agreed to begin work on risk reduction in two areas: (1) development of indicators or measures to assess progress in risk reduction, and (2) development of systems for information exchange. The Forum also agreed that a detailed proposal for work in these two areas should be developed for consideration at the Forum's meeting in November 1996. The proposal will be developed by the Pesticide Programme's Risk Reduction Steering Group, which has planned and directed the work on risk reduction to date.

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INTRODUCTION

1. This report presents the recommendations made by the OECD/FAO workshop on pesticide risk reduction, held in Uppsala, Sweden, 16-18 October 1995. The purpose of the workshop was to identify projects that could be undertaken by governments, international organisations, and others to reduce risks associated with pesticide use in plant protection, i.e. agriculture, forestry and horticulture.* The workshop was organised at the request of the OECD Pesticide Forum, which intends to use the workshop's recommendations to guide the OECD Pesticide Programme's work on risk reduction. The workshop included both OECD and FAO countries, in recognition that pesticide risks concern both developed and developing countries, that actions taken in one can affect the other, and that a plan of action for the future should include both.

2. The workshop intentionally avoided considering risks of specific pesticides and methods for determining those risks. It also avoided discussing the details of pesticide registration. Instead, the workshop's starting point was the presumption that even within the context of a sound registration system, such as exists in virtually all OECD countries and a growing number of FAO countries, pesticide use in plant protection is generally associated with a certain level of risk. The workshop's purpose was to elucidate the types of actions that could be taken to reduce this risk.

3. Background information used in the workshop included:

- a survey of OECD and selected FAO countries' current activities to reduce pesticide risks (a draft survey report provided for the workshop will be completed and published in 1996);
- a "mini-survey" of the workshop participants' views on the most important risks and problems associated with pesticide use, and possible solutions (the results of the mini-survey are attached in Annex 1);
- a paper on current international activities to implement the recommendations relevant to pesticide risk reduction made by the United Nations Conference on Environment and Development; and
- a paper on problems and issues in developing countries that affect pesticide risk reduction.

4. The workshop was hosted by the Swedish National Chemicals Inspectorate (KEMI) and chaired by Dr. Vibeke Bernson of KEMI. Seventy-eight people attended, including government officials from 15 OECD countries and seven non-OECD FAO countries; representatives from the European Commission and the United Nations' International Programme on Chemical Safety; and experts from farmer, environmental, and pesticide industry organisations (a list of participants is attached in Annex 2).

*This focus was chosen because plant protection represents an area of high pesticide use for which countries have similar regulatory programmes.

Workshop Focus

5. During most of the workshop, the participants were divided into four working groups, each focusing on a different area. The working group discussions were organised as follows:

The Working Group on **Pesticide Policy** discussed existing approaches to pesticide risk reduction, and identified seven policy instruments or approaches that countries could use to improve their national programmes. These included activities to reduce both risks from and reliance on chemical pesticides.

The Working Group on **Economic Instruments** reviewed the economic instruments that are currently used by national governments and international organisations to encourage the use of biologically-based farming methods. The group then considered ways that these and other instruments could be applied more effectively and efficiently.

The Working Group on **Farming Methods** discussed the farming methods currently used to reduce risks from and reliance on chemical pesticides. The group then reviewed the types of programmes national governments and international organisations have undertaken to encourage farmers to switch to biologically-based methods, and it identified the main elements that would make such programmes successful.

The Working Group on **Safety** reviewed the risks associated with pesticide use that are most important in developed and in developing countries, and identified activities that could reduce those risks. The group focused mainly on worker safety and pesticide storage and disposal -- areas that were highlighted in the mini-survey -- and only briefly considered consumer risks from residues in food, an issue that has been discussed extensively in other international fora.

Context for the Recommendations

6. Several of the working groups reviewed the economic and agricultural setting in which pesticides are used, and identified factors that should be taken into account in implementing risk reduction activities. Although these were not discussed in depth or agreed by the workshop plenary, they nevertheless provide a context for the recommendations. They include the following:

Origins of the current situation

Current agricultural systems have been strongly influenced by high subsidy levels in OECD countries, averaging more than 40 percent of the value of agricultural production. Subsidies linked to crop production can result in more pesticide use by encouraging monoculture and reducing crop diversity and rotation, leading to increased vulnerability to pests and diseases. By contrast, relatively few resources have been devoted to supporting low input farming or alternative pest control measures. For example, this type of farming receives only one percent of the European Union Common Agriculture Policy budget. It is reasonable to assume that changing the manner of providing assistance -- for example, linking payments to "environmentally friendly" farming practices -- may lead to changes in pesticide use.

Food security

Food production and food security are priorities, especially in FAO countries. Fear of losing a crop can push farmers to use pesticides as a form of security.

Consumer demand

Although the demand for organic and other ecologically grown food is growing in some OECD countries, market forces often push farmers towards pesticide use. Among these forces are: consumer preference for unblemished products whose production generally requires intensive chemical use; processor demand for uniform products; and consumer preference for low food prices, which result partially from the economies of scale achievable in large-scale monoculture operations.

The international market

Current competitive forces prevent farmers from passing on cost increases (such as might be incurred by a tax on pesticides without remittance of the tax yield, or by use of organic methods) to consumers.

Production trends

Agricultural production in developing countries continues to shift toward export crops, some of which are produced with high levels of pesticide.

Availability of Alternatives

Insufficient availability of alternative, safer pest control products and strategies is in some cases a major impediment to reduced reliance on chemical pesticides.

Farmers' experience

In spite of the forces working to the contrary, some farmers do practice ecological farming and manage to stay in business. The challenge is to share their knowledge and experience with other farmers, and to provide an agricultural, economical, and political context that supports ecological farming.

WORKSHOP RECOMMENDATIONS

7. This section summarizes the recommendations made by the four working groups (the full recommendations of each group are attached in Annexes 3-6). These recommendations were discussed and revised in plenary sessions attended by all workshop participants.

8. **The recommendations fall into two general areas:** first, *minimising risks associated with pesticide application and handling*; second, *reducing reliance on chemical pesticides by increasing the use of biologically-based farming methods*. With regard to the former, the workshop noted that pesticide registration offers an essential foundation for risk reduction -- by providing for the evaluation and control of risks associated with individual pesticides -- but that a wider approach, which addresses risks more comprehensively and involves the people who use pesticides, is necessary. With regard to the second area, the workshop stressed the need for practical, farmer-driven programmes to facilitate the transition from chemical-intensive agriculture to an agriculture that maximizes the use of horticultural and biological tools to grow healthy crops and control pests.

9. The detailed recommendations made by the four working groups are summarised below under the four categories of pesticide policy, economic instruments, farming methods, and safety. To a large extent, the recommendations in each category were made by the corresponding working group. However, the groups also made recommendations that involved each other's areas, and these have been placed in the most appropriate subject area. The recommendations are further summarised on page 8, according to who should be responsible for further action (i.e. OECD, FAO, countries, industry).

Pesticide Policy

10. Recommendations for establishing policies and policy frameworks that encourage pesticide risk reduction were made in nine areas:

Implementing pesticide risk reduction programmes

OECD and FAO should urge countries to implement national pesticide risk reduction programmes that use an integrated approach, encouraging participation of all important actors from a local to national level. Such programmes could include instruments and activities in seven categories: (1) regulations; (2) instruments/activities to promote safe use and improved farm management; (3) advice, education and training; (4) monitoring and evaluation; (5) information exchange; (6) economic instruments; and (7) research and development.

Agricultural policy

The agricultural policy of all OECD and FAO countries should encourage a shift toward biologically-based farming methods. FAO should assist by developing a code of principles for integrated pest management (IPM).

New technologies

Governments and other relevant actors should encourage research, development and commercialization of new products that are low-risk and farming practices and technologies which support risk reduction.

Information exchange

OECD and FAO should initiate activities to facilitate information exchange among countries.

Measuring progress

OECD should develop protocols to measure progress in pesticide risk reduction. This would include systems for collecting data on pest management and pesticide use (see also recommendation of Farming Methods and Economic Instruments Working Groups).

Workshops and other projects

FAO and OECD should organize regional workshops and projects to address issues related to pesticide risk reduction, including the policy instruments outlined in this report.

Training and education

National governments should support training, education and certification programs and should support agricultural extension services, which have a key role in transmitting information to farmers about new technology (see also recommendation of Safety Working Group).

Registration

OECD and FAO should facilitate a process whereby countries with established registration systems can assist other countries seeking to establish or improve their registration process.

Risk assessment

OECD, in cooperation with other international agencies, should strengthen its efforts to improve and harmonize pesticide risk assessment methodologies.

Economic Instruments

11. The recommendations for further activities made by the Economic Instruments Working Group are very general in nature. The reason was explained by the group as follows: "... [E]conomic instruments are an important component of pesticide risk reduction policies, and therefore should be taken into account in developing such policies. Economic instruments will probably be more effective when integrated with other kinds of instruments. Analysing and evaluating various economic instruments requires an in-depth study at various economic levels, geographic scales, etc. Also, the interaction with other types of instruments should be taken into account."

12. The recommendations fall into five broad areas:

Consideration by IFCS

Economic instruments should be considered in the national programmes called for by the International Forum on Chemical Safety.

Characteristics of instruments

Economic instruments should be designed to permit and encourage innovation in technology and practice among farmers, industry and consumers.

Context for instruments

Economic instruments should not be considered in isolation but should be integrated with each other and with other risk reduction activities.

Opportunities for risk reduction

When analysing agricultural economic policy and economic development policy, OECD and FAO should consider the effects on pesticide use and opportunities for risk reduction.

Measuring progress

OECD should take the lead in establishing systems to monitor pesticide risk reduction and the effectiveness of economic instruments in achieving this reduction. (See similar recommendation under Farming Methods.)

Farming Methods

13. Recommendations to increase the use of biologically-based farming methods were made in eight areas:

Support for transition to biologically-based farming methods

Countries should provide technical assistance, economic incentives, and/or other such means of support to encourage farmers to reduce their reliance on chemical pesticides and to adopt biologically-based pest management systems, such as those listed in Annex 5. These pest management systems must be economically viable.

Farmer-driven research

Countries should expand and encourage farmer-driven participatory research and education efforts based on demonstration farms and field-based experiments.

Farmer exchanges

OECD and FAO should encourage countries to initiate farmer exchange programmes, so as to facilitate sharing of information and experience concerning farming methods that reduce reliance on pesticides. Countries should organise such exchanges.

Methods to measure progress

OECD and FAO should develop protocols and/or methodologies to:

- measure pesticide use, pesticide reliance, and pest management systems,
- show the relationship between different pest management systems and pesticide use, reliance and risk,
- measure progress in reducing risks from and reliance on chemical pesticides.

Countries should use these protocols/methodologies to monitor their progress in reducing pesticide risk.

Workshops

OECD and FAO should organize regional workshops and projects to address issues related to pesticide risk reduction. These should include workshops to:

- discuss the policy instruments and approaches outlined in this report,
- evaluate integrated pest management and organic methods, develop an inventory of viable options, and develop strategies for implementing these options.

Expanding biologically-based farming in developing countries

OECD and FAO should help developing countries introduce, expand and promote farming methods that reduce reliance on chemical pesticides.

IPM Code of principles

FAO should develop a "code of principles" for integrated pest management that countries could adopt as national policy. These principles should take into account the need for IPM programmes to be locally based, and the need for worker safety.

Information exchange

OECD and FAO should facilitate information exchange between the developing and the developed countries, particularly at a regional level, on integrated pest management successes and innovative approaches which have advanced risk reduction. The OECD and FAO should discuss appropriate mechanisms and information requirements for this exchange.

Countries should support and use international networks to share information about farming methods that reduce reliance on pesticides.

Safety

14. Recommendations to improve the safety with which pesticides are used were made in nine areas:

Training and certification

Countries should establish properly targeted, staffed and funded training and certification programmes for regulatory officials, extension and training officers, and farm level workers. Developing countries should be given assistance to establish such programmes.

Labelling

Both international organisations and countries should adopt the principle of simplicity and clarity for pesticide labelling. OECD should transmit this recommendation to the International Labour

Organisation Co-ordinating Committee on Chemical Classification Schemes and Hazard Communication.

FAO Code of Conduct

Countries should implement the FAO Code of Conduct for the distribution and use of pesticides, in order to establish good agricultural practices and reduce risks associated with the use of highly hazardous products.

Registration systems

All countries should have a product registration system to control the use of pesticides. National governments should, where appropriate, initiate co-operative regional efforts to implement and improve these systems.

Poor-quality products

OECD and FAO should address the problem that poor-quality products not meeting the specifications of registration are in international trade. OECD countries should improve their certificates of pesticide registration so as to give more complete information on product composition. The purpose would be to discourage distribution of poor-quality products to developing countries.

Post-registration monitoring

OECD countries should develop guidelines on the form and implementation of post-registration monitoring and surveillance. This should cover both human health and environmental monitoring.

Product and container stewardship

Industry should extend its product and container stewardship so that products and containers are designed to facilitate safe handling, ready rinsibility and appropriate disposal.

Personal protective equipment

All parties involved should be made aware that certain types of personal protective clothing and equipment (e.g. that which covers the body and traps heat) is not appropriate for use in tropical conditions. Governments should take this into account in their registration decisions and in pesticide labelling. Pesticide manufacturers should identify products that require such equipment, and should design safer alternatives that would be appropriate for use in hot climates.

Application equipment

OECD countries should implement systems for certification and inspection of spraying equipment to reduce spillage and waste of pesticides and increase efficiency of delivery to crops. Where appropriate, such systems should also be implemented in developing countries.

Measuring progress

Countries should monitor their progress in reducing pesticide risk.

SUMMARY OF RECOMMENDATIONS AND RESPONSIBILITIES

Responsibility	Recommended Activity
OECD/FAO	<ul style="list-style-type: none"> • urge countries to implement national pesticide risk reduction programmes • initiate activities to facilitate information exchange between countries on: <ul style="list-style-type: none"> - national risk reduction programmes - IPM and other alternatives - safety implications of various formulation types - measures to facilitate choice of lower risk alternatives • organise regional workshops to: <ul style="list-style-type: none"> - evaluate new policy instruments - evaluate biologically based farming methods, strategies for implementation • facilitate a process by which countries with established registration programmes can help others to develop and/or improve such programmes • consider effects of pesticide use and opportunity for risk reduction when analysing agricultural economic policy • develop systems to measure progress in risk reduction, e.g. <ul style="list-style-type: none"> - pesticide use - pesticide reliance - pest management (and effect on use & reliance) - effectiveness of economic instruments • help developing countries introduce, expand and promote farming methods that reduce reliance on chemical pesticides • address problems of poor quality pesticides • improve labelling (advice to International Labour Organisation)
OECD	<ul style="list-style-type: none"> • improve risk assessment methods • develop guidelines for post registration monitoring and surveillance
FAO	<ul style="list-style-type: none"> • develop 'Code of Principles' for IPM

Responsibility	Recommended Activity
countries	<ul style="list-style-type: none"> • adopt and implement national pesticide risk reduction programmes • amend agricultural policy to encourage, facilitate use of biologically based farming methods • provide technical assistance, economic incentives and/or other measures to help farmers adopt biologically based pest management systems • expand and encourage farmer-driven research and education, e.g. through demonstration farms, field-based research • encourage research, development, commercialization of safer technologies (methods, products, product packaging) • support information-transfer systems (e.g. agricultural extension service) • establish training and education programmes for users • initiate farmer exchange programmes • implement the FAO Code of Conduct for pesticide use • monitor progress in reducing pesticide risks • improve certificates of registration
industry	<ul style="list-style-type: none"> • develop safer products that can replace highly hazardous pesticides and that do not require personal protective equipment (crop protection industry) • design better personal protective equipment (equipment manufacturers) • extend product/container stewardship programmes (crop protection industry)

ANNEX 1

MINI-SURVEY RESULTS
Workshop Participants' Views
on
Pesticide Risks

Includes 38 responses:

26 from 14 OECD countries

5 from 5 FAO countries

1 from IPCS

4 from farmer groups

1 from pesticide industry

1 from environmental group

BACKGROUND

The following tables summarise the views of the workshop participants regarding: (1) the most important risks associated with pesticide use, (2) problems associated with pesticide use, and (3) solutions to address the problems and reduce pesticide risks. These views were collected in a very brief "mini-survey" carried out shortly before the workshop. Thirty-eight people -- approximately half of the workshop participants -- responded.

The survey results are organised as follows:

- Separate tables show the results in each of the three categories (i.e. risks, problems and solutions).
- Each table organises the responses into those focusing on OECD countries and those focusing on FAO developing countries.
- Specific risks, problems and solutions are listed in the tables according to the number of times they were cited in the survey responses. Thus, in the table focusing on risks, "worker exposure" was cited by more survey respondents than any other risk. It should be noted that the survey form intentionally provided only a small amount of space to respond, thus discouraging long lists of all possible risks, problems and solutions, and encouraging respondents to name only the most important ones.

SUMMARY TABLES

TABLE 1. MOST IMPORTANT RISKS ASSOCIATED WITH PESTICIDE USE

RISK	OECD	FAO
worker exposure	X	X
contamination of ground, drinking water	X	
other environmental risks, contamination:		X
non-target organisms	X	
persistence, bio-accumulation	X	
disruption of the natural balance	X	
pollution of surface water used for drinking		X
pollution of water used for recreation (rivers, lakes)	X	
intentional poisoning (human suicide, poisoning of wildlife)		X
residues in food	X	X
concern about unknown or poorly understood human health risks:		
hormonal effects, allergies, metabolic changes	X	
interaction of different pesticides: synergism, additive effects	X	
effects of metabolites	X	
bystander risks	X	
development of pest resistance	X	

TABLE 2. PROBLEMS ASSOCIATED WITH PESTICIDE USE

PROBLEM	OECD	FAO
misuse	X	X
unsafe disposal of waste pesticides and containers	X	X
unsafe storage, transport	X	X
lack of knowledge, awareness		X
overly technical labelling, can't be understood		X
impracticality of protective clothing, equipment (in hot climates)		X
accessibility of dangerous pesticides to untrained users		X
difficulty in removing old products from the market (and replacing them with new technology)	X	
use of unregistered products	X	
excessive use of pesticides	X	
inappropriate selection of pesticides	X	
lack of environmental monitoring data	X	
inadequate labelling for environmental hazards	X	
long-range transport, fallout in rain	X	

TABLE 3. SOLUTIONS FOR REDUCING PESTICIDE RISKS

SOLUTION	OECD	FAO
education, training programmes for users	X	X
more IPM, good agricultural practice	X	X
increase awareness across all sectors of society		X
remove hazardous and persistent pesticides:	X	X
restrict availability, not simply ban		X
replace with new methods	X	
disposal programmes	X	X
reduce total amount of pesticide used	X	X
monitor water and soil	X	
establish pesticide-free areas	X	
improve application techniques	X	
better monitoring and enforcement	X	
epidemiology studies, surveillance of exposed population	X	
good advisory system close to the farm	X	
co-ordinated international effort on risk reduction		X

ANNEX 2

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ANNEX 3

REPORT OF THE
PESTICIDE POLICY WORKING GROUP

Chair: Janet Andersen (United States)
Rapporteurs: Wendy Sexsmith (Canada)
Gunver Bennekou (Denmark)

INTRODUCTION

This working group brought together 27 people from diverse backgrounds: OECD and FAO countries, international organisations including the European Commission and the World Health Organisation/International Programme on Chemical Safety, farmer and environmental organisations, and the pesticide industry.

The working group's purpose was to consider how pesticide policy could be structured so as to contribute to risk reduction. The group considered the following questions:

1. What are the goals, principles, and groups or individuals which constitute the policy framework for pesticide risk reduction?
2. What are the policy instruments and/or approaches to be taken?

Registration for the OECD countries underpins pesticide risk reduction, but developing countries may lack adequate registration procedures and processes. Registration procedures for biological control agents is lacking in some cases for both OECD and FAO countries. Although registration is intended to reduce risks from the use of pesticides to users/growers, consumers, and the environment, risks do remain, as identified in the mini-survey.

What other legal background is needed?
What are additional key policy instruments and approaches?
Who should be involved?

3. What policy instruments/approaches seem most successful?

coordinated national programmes?
set targets for use reduction? alternatives to set targets?
voluntary/mandatory?
national, international, regional approaches/programs?
different policies for different crops?

4. What are the key links between policy areas involved with pesticide risk reduction?

environment
agriculture
economics
health
pesticide industry
trade

How can conflict be avoided or managed?

5. What are the Policy Working Group's: Recommendations, rationale for these recommendations, and steps for implementation of these recommendations (when, who, how)?

for OECD countries for FAO countries
OECD helping FAO countries FAO helping OECD countries
for national programs non-government organizations
pesticide industry users/farmers

BACKGROUND

As a starting point for its work, the Policy Working Group agreed on several assumptions and definitions developed at an earlier OECD meeting in Sweden (Saltsjöbaden, 1991). These included:

- the assumption that, without defining the size of the risks, the use of agricultural pesticides is associated with potential risks for users, consumers, the public, and the environment;
- the assumption that the use of agricultural pesticides, as it currently exists, is not optimal either from a sustainable agriculture point of view or from an environmental, occupational, or public health point of view;
- the definition of 'sustainable agriculture' as meeting the needs of the present generation without compromising the ability of future generations to meet their needs.

The working group also agreed that pesticide registration systems are an essential building block for risk reduction, but that other programs are needed.

CONTEXT

The working group agreed that a pesticide risk reduction policy should be developed and implemented within a context that acknowledges:

- the need for crop protection as a component of sustainable agricultural systems
- the importance of a sound pesticide registration system, and
- the desirability of reducing the risks associated with pesticide use.

GOAL

The group agreed that countries' goal should be to develop a framework to facilitate the implementation of policies that reduce risks associated with pesticide use.

PRINCIPLES

The working group agreed that the following principles should be considered as a basis for national risk reduction programs:

1. Any risk reduction program must be underpinned by and in line with a registration system that is dynamic (up to date and periodically reviewed) and transparent (with the logic behind the regulatory decisions clear), and that ensures:
 - availability of new, safer technologies and products,
 - a high level of protection of health and environment,
 - a sufficient range of efficacious products.

2. Programs should encourage reduced risk/safer alternatives (e.g. products, practices, methods).
3. Policy development and implementation should be done in an open and inclusive process that includes maximum participation of pesticide users, pesticide industry, and all others involved.
4. Governments should adopt risk reduction systems appropriate to their needs and resources.
5. Governments should consider the economic, health, social and environmental risks and benefits of pesticide use in the development of their risk reduction policies.
6. Governments should consider the 'precautionary principle' when developing and implementing risk reduction policies. This means that when there are unknowns and uncertainties regarding a pesticide's potential risks, the decision-maker should make a conservative decision erring on the side of caution, so as to ensure that the decision is sufficiently protective even if the risk proves to be greater than expected.
7. National risk reduction programs should include a consideration of effects on other countries resulting from their risk reduction program. For example, developed countries should consider the effect of a pesticide ban on a developing country which uses that pesticide on export crops, and which might switch to other crops whose production has even more negative effects.

PARTICIPANTS

The working group agreed that the following groups should be considered as possible participants in a national pesticide risk reduction program:

National Authorities

government agencies (environment, agriculture, etc); medical, public health, and education professionals; extension service agents; and science and research institutions.

Industry

agrochemical manufacturers and producers, water industry, food industry/processors, forest product, transport/trade, supermarkets, retailers

Users:

users/growers, farm workers, commercial applicators

NGOs:

fish and wildlife organisations, environmental and consumer organisations, representatives of the public/bystanders

International Organisations

OECD, FAO, etc.

POLICY INSTRUMENTS

The working group developed an inventory of policy instruments that could be used in a pesticide risk reduction strategy. The inventory was grouped into seven broad categories: (1) regulatory

instruments, (2) research and development, (3) financial instruments, (4) farm management instruments, (5) advice, education and training, (6) monitoring and evaluation, (7) improving policy framework.

The categories of financial instruments and farm management instruments were not dealt with in detail, because they were covered by other working groups. The remaining categories were dealt with in greater detail, but a thorough evaluation was not possible given the time constraints of the workshop. The working group did, however, highlight a few of the important types of instruments in these categories.

1. Regulatory Instruments

Regulatory instruments could include the following:

- restricted use of pesticides in designated sensitive areas
- codes of practice
- improved information regarding import, export of pesticides
- certification of application equipment
- incorporation of precautionary principle in risk assessment and risk management (including restrictive margins of safety for environmental impact)
- control import/export of active ingredients for which products have not been registered.
- control of pesticide advertising to eliminate false claims
- legal instruments
- enforcement and proper labelling to ensure proper use of products
- substitution programmes that allow for a more hazardous product to be de-registered when a safer product is registered
- quantitative use reduction targets
- phase-out programs for most risky pesticides
- regulation of use and distribution of pesticides
- legal framework to encourage registration of new, safer products for minor crops
- measures to prevent use of herbicide-tolerant plants
- incorporation of risk reduction goals in government policy decisions.

The working group recognized regulatory instruments as an essential component of risk reduction, and also noted that their effectiveness can be enhanced when they are used together. Some successful examples include:

- regulations restricting use of pesticides in designated sensitive areas (e.g. water basins), which can be enhanced with financial incentives;
- a "code of practices" providing guidelines for pesticide use, which some countries include in their regulations. Many users follow these codes and thereby reduce risks;
- certification of field equipment, a practice that is required in some countries and voluntary in others;
- advertising and import/export controls through both mandatory and voluntary programs have been successful, but the working group noted that these two areas had problems that need to be addressed;

- the "substitution principle" is effective in some cases, replacing more hazardous with less hazardous products; but it is less successful in others, such as in integrated pest management programs for minor crops for which good alternatives are not always available;
- use of the "precautionary principle" and setting restrictive margins of safety for environmental impact;
- use of information from monitoring and evaluation to improve national risk reduction policy;
- mandatory targets for use reduction work well in some countries but are not appropriate in others.

Finally, the working group noted one area in which regulatory instruments have not been adequate to date: the control of unregistered products and products for which the producer has not maintained quality control (percent active ingredient varies, etc) or provides poor use information.

2. Research and Development

The working group highlighted the importance of research and development, and promotion or commercialization of resulting products or systems, in the areas listed below:

- new, safer pest control products (including products for minor use)
- bioindicators that signal adverse effects in agriculture and natural ecosystems
- pest damage thresholds, warning systems and reporting instruments
- technology and methods for integrated pest management.

The group also noted that co-operation between relevant government authorities, scientific, research, educational institutions, and others need to be established and strengthened, in order to achieve progress in this area.

3. Economic Instruments

The following economic instruments could be used:

- subsidies to encourage transition to reduced risk approaches
- taxes
- incentives
- instruments that encourage research, development, and commercialization of technology and methods needed to enhance use of IPM
- promotion of ecological farming methods by financial incentives
- funding which encourages development of products for minor crops included with development of products for major crops
- nb: for other instruments, see the report of the Economic Instruments Working Group.

4. Farm Management Instruments

Measures to encourage farmers to reduce their reliance on chemical pesticides and to adopt biologically based methods could include the following:

- policies to encourage crop rotation, use of resistant varieties, range of crops
- codes of practice
- measures to encourage use of integrated pest management, organic farming
- nb: for other instruments, see the report of the Farming Methods Working Group.

5. Advice, Education and Training Instruments

The following instruments could be used to educate pesticide users about safety practices and biologically based farming methods:

- education, training, certification of users
- user-based certification of application equipment
- codes of practice
- development of practical guidance for farmers
- development of thresholds, warning systems and reporting instruments
- extension.

The working group agreed that training/education/certification of users (applicators, growers, farm workers) and good extension services are essential to a risk reduction program. It was recognized that voluntary certification programs have been successful. This area was considered to be a high priority for FAO countries. It was decided that key linkages would be with relevant government authorities, trade and economic business sectors, but this is not an exhaustive list.

6. Monitoring and Evaluation

Monitoring tools should be developed, and monitoring and evaluation then carried out, in the following areas:

- monitoring of agricultural and natural ecosystems (see recommendation under Research and Development regarding development of bioindicators)
- monitoring of pesticides after registration, e.g. collect data on use, residues in food and water, environmental effects, human poisoning incidents
- indicators for monitoring, measuring, evaluating risk reduction (e.g. quantitative reduction targets).

The working group agreed that target setting is important in risk reduction but that it has to be in accordance with national political consensus. It was agreed that it is optimal if targets can be monitored and measured, are simple and transparent, and are dynamic so they can accommodate newly identified risks. But it was recognized that incorporating all these parameters is difficult.

7. Improving the Policy Framework

A risk reduction policy could include the following elements:

- exchange of information about risk between all interested parties
- cooperation between different authorities
- government-farmer partnerships
- participation of non-government organizations

- voluntary agreements
- flexibility to take into account the points of view of all affected and interested parties
- improved information accompanying import/export of pesticides.

The working group agreed that information exchange and communication at the national and international level is extremely important in risk reduction programs, and that involvement of all interested and affected parties is necessary.

RECOMMENDATIONS

The group agreed on the following recommendations, but did not prioritize them:

1. OECD and FAO should urge countries to implement risk reduction programs based on an integrated approach with participation of all important actors from a local to national level, and using, to the extent possible, instruments in the seven categories identified in this report.
2. OECD and FAO should address the problem that poor-quality products not meeting the specifications of registration, and with insufficient use information, are in international trade. National governments should improve their certificates of registration so as to give more complete information on product composition to other countries.
3. Governments and interested parties should encourage research, development and commercialization of safer technologies (products, strategies, methods) to support risk reduction.
4. OECD and FAO should initiate activities to facilitate information exchange between countries.
5. OECD should develop protocols to measure progress in pesticide risk reduction. This would include systems for collecting data on pest management and pesticide use.
6. FAO and OECD are encouraged to organize regional workshops and projects to address issues related to pesticide risk reduction.
7. National governments should support training, education and certification programs and should support agricultural extension services as part of their risk reduction programs.
8. OECD and FAO should facilitate a process by which countries who have established registration systems can assist other countries seeking to establish or improve their registration process.
9. OECD, in cooperation with other international agencies, should strengthen its efforts to improve and harmonize pesticide risk assessment methodologies.
10. FAO and OECD are encouraged to organize workshops concentrating on the policy instruments outlined in this report.

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ANNEX 4

REPORT OF THE
ECONOMIC INSTRUMENTS WORKING GROUP

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Peter Smith (United States)

INTRODUCTION

The working group brought a diverse set of backgrounds to the issue of how economic instruments could be used to help reduce pesticide risks. The group consisted of governmental officials from agricultural and environmental ministries, a farmer, a journalist, a representative of the OECD Secretariat, and representatives on non-governmental organisations. The group developed a work plan which consisted of:

- reviewing the summary results from the OECD survey of pesticide risk reduction activities
- brainstorming additional economic instruments
- defining the setting for economic instruments in the context of present situation in world agriculture
- developing criteria for the evaluation of economic instruments
- reviewing economic instruments in light of these criteria, and
- developing recommendations for consideration by OECD, FAO and national governments.

THE ECONOMIC SETTING

Economic instruments designed to reduce pesticide risks must operate in a broader economic context. Thus, a brief overview of the world agricultural setting is important in evaluating economic instruments. Some key forces or considerations include:

- Current agricultural systems have resulted from high subsidy levels in the OECD, averaging more than 40 percent of the value of agricultural production, and often leading to high levels of pesticide use. Budgetary pressures and the World Trade Organisation are now forcing the reduction of these subsidies.
- Subsidies linked to crop production have resulted in more pesticide use by encouraging monoculture and reducing crop diversity and rotation, leading to increased vulnerability to pests and diseases. Changing the manner of providing assistance (direct payments to farmers or green payments linked to farming practices) may lead to changes in pesticide use patterns.
- There is a growing market for in some OECD countries, but at the same time consumers still prefer aesthetically pleasing products and processor demand for uniform products continues to increase. Consumers also prefer the low food prices that result partially from the economies of scale achievable in large-scale monoculture operations.
- Relatively few resources have been devoted to supporting low input farming or alternative pest control measures. For example, this type of farming receives only one percent of the European Common Agriculture Policy budget.
- Food production and food security are priorities, especially in FAO countries. While the production of traditional crops for domestic consumption in FAO countries remains high, shifts

toward more export oriented crops continue to occur. Many of these export crops require higher levels of pesticide use.

- Because of competitive forces, farmers generally lack the ability to pass on cost increases to the consumer.

GOALS OF ECONOMIC INSTRUMENTS

Economic instruments can be designed to meet a variety of goals. These include:

- revenue generation
- support to farmers and maintenance of rural communities
- food security
- maintenance and expansion of markets for agricultural commodities

With respect to risk reduction economic instruments might be directed to more specific goals, such as:

- changes in farming practice
- internalizing externalities (i.e., bringing into the price of pesticides costs which are not usually included, such as contamination of groundwater, ground water monitoring, health and food quality monitoring, etc.)
- reducing the amounts of pesticides used

TYPES OF ECONOMIC INSTRUMENTS

The working group developed a list of possible economic instruments that may impact on pesticide use or risk reduction measures. These can be found in Table 1. The list is based on the results of the survey of countries' activities to reduce risks and on discussion in the working group. These instruments may be grouped into the following categories:

Taxes

- flat
- targeted
- levies

Subsidies

- for organic farming and ecological farming
- for IPM, new technology

Market creation

- green labelling
- crop insurance (e.g. yield insurance)
- marketable permits (markets established to allow polluters to trade in a limited supply of "pollution rights")

Cross compliance/conditionality

Deposit refund system (e.g., for pesticide containers)

Agricultural assistance, i.e. government intervention in the agricultural sector, including price and income supports (e.g. tariffs, import quotas, export subsidies, and direct payments to farmers), input subsidies (e.g. subsidies for irrigation water, chemical inputs, commodity storage and fuel), and restrictions on output and input (e.g. output quotas, land set-aside programmes)

- general (national/EU)
- international assistance (e.g. multilateral or bilateral aid directed at agricultural development)

Enforcement incentives (penalties and costs attached to regulations)

Capital expenditure relief

Levies to generate revenue for pesticide registration systems or for supporting research, training and extension in relation to pesticide risk reduction also can be valuable contributions to risk reduction programs. They may have similar effects to economic instruments *per se*, for example by influencing pesticide pricing.

CRITERIA TO EVALUATE THE EFFECTIVENESS OF ECONOMIC INSTRUMENTS

The working group identified the following eight criteria for assessing economic instruments and grouped them under the headings of Goals, Feasibility and Side Effects.

I. Goals	effectiveness precision/focus encourage innovation
II. Feasibility	cost to government or private sector administrative complexity acceptability to government or private sector
III. Side Effects	permanent/transitional competition/equity

These criteria may help in deciding whether to introduce a particular economic instrument, but this is not an exclusive list of all the factors to be considered in evaluating policy options to reduce the risks of pesticides.

The first group concerns the effectiveness of the proposed measure in reducing the identified risks; it is essential to clearly define which risks are being targeted and develop a method for estimating and measuring them. If a narrow range of specific risks is of concern, it will be necessary to choose a highly focused instrument (such as a specific tax or subsidy) rather than broader, less specific measures.

It is also important that the instrument chosen should not act as a disincentive to innovation by supporting one specific technology or production method which is likely to become outdated over time. Economic instruments should allow for the maximum flexibility in response whilst achieving the original objective.

The second group of criteria concerns the cost and acceptability of the proposed instruments. All economic measures involve some transfer costs, usually between the public and private sectors, although it is possible to introduce compensatory payments to restore the overall balance. A neutral instrument would have no cost to the public sector, but might result in transfer between different private sector organisations. Careful quantitative estimates of such costs and transfers should be made. The acceptability of transfers, and of additional taxes or subsidies, is a matter for political decisions, based on careful cost estimates. The complexity of implementing and administering the proposed measure will also affect its cost to the public or private sector or both. Instruments such as a flat rate tax are relatively simple to administer, but are unfocused and may lack precision in impact.

A related factor in the third group of criteria is that of competitiveness and equity considerations. Economic instruments are likely to affect the relative competitiveness of different producers and may be regarded as a form of positive or negative discrimination. Instruments which are financially neutral may avoid this problem. It is also necessary to consider the effects of a proposed economic instrument on international competitiveness and to ensure that it is compatible with wider principles such as the EU single market or World Trade Organisation principles.

Finally, it might be useful to consider both permanent and transitional instruments. Transitional instruments may help to achieve a change from one form of production to another, but such an instrument will only be effective in the long-term if the new procedure is self-sustaining and can find a continuing market for its output without support. Permanent measures are likely to be part of a wider policy initiative intended to achieve long-term change in support of more fundamental policy objectives.

ECONOMIC INSTRUMENTS IN LIGHT OF THE EVALUATIVE CRITERIA

The working group attempted to evaluate a number of economic instruments in light of the criteria it developed. It developed a matrix (Table 2) as a tool for evaluation. The group believes that this matrix will be a useful evaluation tool for countries, international organizations, other levels of government and the private sector to use in economic instrument evaluation.

In its discussions, the group determined that a generic evaluation of instruments was not feasible. This is because the applicability of various economic instruments depends upon the particular economic and political situations facing decision-makers.

Some of the additional factors involved in consideration of a tax include:

- use to which the revenue generated will be put (e.g. support registration systems, support research, return to the farm sector)
- basis for the tax, e.g. amount of active ingredient, number of recommended standard doses, risk level of specific pesticides
- potential to create specific behavioural results,
- possibility of increased illegal pesticide importation
- general fiscal situation and acceptability of introducing new taxes
- possible shift to crops requiring less pesticide use, and resulting trade/revenue implications

With respect to subsidies, the scale can range from redesign of general agricultural assistance programs to a specific subsidy to encourage environmentally friendly methods. Different pesticide risk outcomes will result from different subsidy approaches. Analysis of any subsidy requires consideration of the applicability of World Trade Organisation rules.

The working group found it relatively easy to apply the evaluation criteria to so-called green labelling of commodities produced by organic or other "environmentally friendly farming" methods. Although details require considerable effort, e.g. to define "organic" and ensure compliance, in situations where consumer preference creates a sufficient market this instrument has potential to reduce risks directly. Greater support for organic farming may as encourage development of innovative farming methods which could be of general applicability. As well, it might be possible to encourage consumer general demand for sustainable crop production and hence further risk reduction.

RECOMMENDATIONS

In general, the working group agreed that economic instruments are an important component of pesticide risk reduction policies, and therefore should be taken into account in developing such policies. Economic instruments will probably be more effective when integrated with other instruments. Analysing and evaluating various economic instruments requires an in depth study at various economic levels, geographic scales, etc. Also, the interaction with other types of instruments should be taken into account. Because of this complexity the recommendations of the working group are more general in nature. These recommendations are:

1. Economic instruments should be considered in the national programs called for by the International Forum on Chemical Safety (IFCS) in 1997.
2. When analysing agricultural economic policy and economic development policy, OECD and FAO should consider the effects on pesticide use and opportunities for risk reduction.
3. OECD should take the lead in establishing systems to monitor pesticide risk reduction and the effectiveness of economic instruments in achieving this reduction.
4. Economic instruments should not be considered in isolation but should be integrated with other risk reduction activities and with each other.
5. Economic instruments should be designed to permit and encourage innovation in technology and practice among farmers, industry and the consumers, and should not prevent such innovations.

Table 1
Economic Instruments That May Impact on Pesticide Risk Reduction

<p>A. Results from the survey of countries' activities to reduce pesticide risks:</p>
<p><i>"Carrots"</i></p> <ul style="list-style-type: none"> • subsidies for environmentally-friendly farming (EU countries) • green labelling (several EU countries, US) • grower group agreements with supermarkets (e.g. to promote food grown using environmentally-friendly methods) • protection of commodity program payments to farmers who use resource-conserving methods that would otherwise reduce their payments (US) • farmland set asides (many countries) <p><i>"Sticks"</i></p> <ul style="list-style-type: none"> • taxes/levies on pesticide sales or use (Denmark, Sweden, Norway)
<p>B. Additional instruments discussed in the working group:</p>
<ul style="list-style-type: none"> • registration charges • reduced workers' compensation insurance rates to provide incentives to producers to practice more careful pest management • cross compliance • contracts with food processors to limit and define farmers' use of pesticides to reduce risks • tax incentives for new pesticide application equipment purchases • taxes on output to fund research on pest control methods • subsidized sprayer testing • subsidies for the adoption of IPM and biological controls • direct taxes on producers to support research • reducing high, subsidized prices to limit pesticide application • market incentives for new pest control methods • green payments for improved pesticide practice • tradeable emissions permits

Table 2
Matrix for the Evaluation of Economic Instruments

CRITERIA								
Economic Instruments	Goals			Feasibility			Side Effects	
	effec- tiveness	pre- cision	inno- vation	cost govt.- /private	admin. complexity	acceptability govt./ private	permanent /trans- national	compe- tition/ equity
<u>Taxes</u>								
targeted								
flat								
levy								
<u>Subsidies</u>								
organic/env. farming								
IPM/new technology								
<u>Market creation</u>								
green labelling								
crop insurance								
marketable permits								
<u>Cross compliance/ conditionality</u>								
<u>Deposit refund system</u>								
<u>Agricultural assistance</u>								
national/EU								
international								
<u>Enforcement incentives</u>								
<u>Capital expenditure relief</u>								

WORKING GROUP ON ECONOMIC INSTRUMENTS

(14 participants)

Chair: Mr Van de BAAN, Hugo (Netherlands)

Rapporteurs: Mr CORCORAN, Peter J. (United Kingdom)
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GERMANY	Mr HEIMBACH, Udo
SWITZERLAND	Mr VON ARX, Roland
FAO - Korea	Ms SHIN, Dong-sik
Consultative organization (Netherlands)	Mr De VRIES, Jaap
Farmer organization (Canada)	Mr WILSON, Jeff
Environmental organization (United Kingdom)	Mr BEAUMONT, Peter
OECD - ECO	Mr TOBEY, James

ANNEX 5

REPORT OF THE FARMING METHODS WORKING GROUP

Chair: Richard Davis (United Kingdom)
Rapporteurs: Gerold Wyrwal (FAO Secretariat)
Magnus Franzen (Sweden)

INTRODUCTION

The farming methods group brought together government regulators and extension agents, growers and representatives of farmer organizations, industry and environmental groups and international organizations like OECD and FAO. The working group discussed ways to reduce pesticide use, reliance and risk in agriculture, horticulture and forestry having first agreed to address the following questions:

1. What are the major perceived risks?
2. How can/do farming practices address these risks?
3. What are the alternative options which contribute to decreased reliance on pesticides?
4. How do we encourage growers to adopt these alternatives?
5. How do we share this knowledge?
6. How can lessons learnt in OECD member countries help FAO member countries, and *vice versa*?

DEFINITION OF RISK REDUCTION

In view of the many different ways in which risk reduction can be defined, the working group agreed that a precise definition of risk reduction was not required for the purpose of the meeting on farming methods.

REASONS FOR FARMERS TO CHANGE TO ALTERNATIVE FARMING METHODS

The working group identified several reasons why farmers would consider changing to alternative methods. Some examples are:

- unreliable control and efficacy
- resistance development
- high costs of inputs
- regulations
- problems with secondary / other pests
- catastrophic experience (e.g. poisoning)
- higher market prices for environmentally friendly products

MAJOR PERCEIVED RISKS

The working group reiterated the results of the OECD/FAO "mini-survey" of workshop participants, which found that worker exposure is the major perceived risk. The group noted that worker exposure is highest during mixing and transfer of the pesticide to the sprayer, application, disposal, and re-entry into

recently treated crops. The working group also noted that the following practices can reduce pesticide exposure:

- use of appropriate gloves and other protective clothing
- respirator/face masks
- education in the above, aimed at both farmer and spouse
- safer packaging
- protective clothing that is psychologically and economically acceptable and locally available
- assistance on pre-harvest intervals and re-entry intervals
- training on safe use and application
- certified applicators
- equipment calibration
- use of Global Positioning System (including plane tracking)
- refillable containers (including bulk transport)
- refunds for empty containers
- use/collection/re-cycling
- obligatory rinsing in equipment
- can washing
- triple rinse systems for containers and spray tanks
- return of empty pesticide containers to retailer.

RECOMMENDATIONS

The working group made recommendations in two areas: (1) activities to reduce worker exposure to pesticides, and (2) activities to increase the use of biologically based farming methods.

(1) Recommendations for Reducing Operator Exposure

- encourage move to certification of all spray operators
- underpin certification scheme with appropriate education and training (FAO to first concentrate on education and training)
- develop minimum design standards for machinery
- encourage move to certification of machinery and/or regular inspection, to ensure optimum field performance
- encourage further development and introduction of closed transfer systems (whereby the pesticide is transferred to the sprayer in a way that is totally enclosed, eliminating any spillage or exposure), triple rinse systems (to wash the interior of the container and remove residues), returnable and/or re-usable dedicated containers
- encourage industry to develop safer formulations (e.g. water dispersible granules)

(2) Recommendations for Increasing the Use of Biologically Based Farming Methods

The working group noted that worldwide, a certain number of farmers are already practising some of the options listed in Table 1 (following). The challenge is to share both the knowledge and experience of the practical application of these options amongst a wider audience. On this basis, the farming methods working group developed the following recommendations:

1. Encourage farmers to move through the transition to more biologically-based pest management systems such as integrated pest management (IPM) and organic farming by providing support in a number of areas which can include technical assistance and economic policy tools.
2. Expand and encourage farmer driven participatory research and education efforts based on demonstration farms and field based experiments.
3. OECD and FAO countries should support and utilise international networks to expand the knowledge base and information transfer of farming methods which reduce reliance on pesticides when combined in integrated systems. (A list of available options is shown in the table titled Farming Methods to Reduce Reliance on Pesticides).
4. It is an essential prerequisite that all techniques and/or technologies designed to decrease farmer reliance on pesticides must be shown to be locally commercially viable.

The working group also noted that constructive steps to be taken could include:

1. An OECD/FAO workshop should be organised to evaluate IPM and organic methods leading to an inventory of viable options to achieve pesticide risk reduction and to develop strategies for implementing these options.
2. OECD and FAO should encourage and support the developing countries to introduce, expand and promote farming methods to reduce reliance on pesticides.
3. OECD and FAO should encourage countries to implement farmer exchange programmes to facilitate the transfer of information and experience of implementing farming methods which reduce the reliance on pesticides.
4. OECD and FAO should compile and assess methodologies to measure pesticide use, reliance and risk. Methodologies should also be developed and assessed to link changes in pest management systems to measure pesticide use, reliance and risk.

OECD and FAO countries should be encouraged to use appropriate measurements to monitor progress in reducing pesticide risk.

Table 1
Farming Methods to Reduce Reliance on Pesticides

<u>Plant Varieties</u>	<ul style="list-style-type: none"> diversification of varieties accelerate resistance breeding programmes plants with pesticidal properties resistant varieties hybridisation local specialised varieties
<u>Healthy Planting Stock</u>	<ul style="list-style-type: none"> seed certification, healthy seeds seed treatment/encapsulation meristem culturing(virus free stock) heat treatment
<u>Crop rotation / diversification</u>	<ul style="list-style-type: none"> companion cropping <i>allelopathy</i> crop selection
<u>Cultural control</u>	<ul style="list-style-type: none"> balanced fertilisation (moderate fertilisation) canopy management soil conservation/management (compost/green manure to improve soil quality) mulching physical barriers plant density seeding rates and dates solarization/heat treatment crop residue management flooding substrate culture
<u>Mechanical control</u>	<ul style="list-style-type: none"> mechanical weeding tillage thermal weeding minimal cultivation direct drilling stale seed bed steam treatment vacuum cleaning of pests post harvest burning, chopping, grazing, burying
<u>Reduced doses</u>	<ul style="list-style-type: none"> band application
<u>Pesticide choice</u>	<ul style="list-style-type: none"> pre/post emergence herbicides selective pesticides pesticide rotation to delay resistance green pesticides intercropping with plants with pesticidal properties
<u>Beneficial organisms</u>	<ul style="list-style-type: none"> beetle banks/refugia wildlife corridors environmental management

<p><u>Biological control = use of living organisms to control pests including augmentation of beneficials</u></p>	<p>better understanding of life cycles and plant-pest interactions buffer zones mating disruption/pheromones trap cropping biotechnology applied to improve diagnosis (<i>see thresholds</i>) sterile male techniques aquaculture animals for weed/insect control</p>
<p><u>Monitoring</u></p>	<p>thresholds (commercially acceptable pest damage levels) biotechnology based diagnostic kits for early detection of plant disease pest identification thresholds for beneficial insect levels colour traps light traps simple tools for counting pests in the field visual scouting for pests and beneficial organisms</p>
<p><u>Forecasting</u></p>	<p>warning messages from non-commercial organisations warning system/pest forecasting observation networks plant disease forecasting models/computer-aided decision models</p>
<p><u>Application technology</u></p>	<p>wick applicators band application coupled with cultivation spot spraying electronic sensors spray topping ultra-low volume applications patch spraying controlled-droplet application air-assisted sprayers timing of pesticide application</p>
<p><u>Plant quarantine</u></p>	<p>pest exclusion protected zones</p>

WORKING GROUP ON FARMING METHODS

(23 participants)

Chair: Mr DAVIS, Richard Paul (United Kingdom)

Rapporteurs: Mr FRANZEN, Magnus (Sweden)
Mr WYRWAL, Gerold (FAO Secretariat)

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Farmer organization (Germany)	Mr GEIER, Bernward
Farmer organization (United Kingdom)	Mr WISE, Christopher
Pesticide industry (United States)	Mr McCARTHY, John

ANNEX 6

REPORT OF THE
SAFETY WORKING GROUP

Chair: Paul Whyllie (Jamaica)

Rapporteur: Carolyn Vickers (Australia)

INTRODUCTION

The Working Group on Safety brought together ten participants, including representatives from OECD and FAO countries, the pesticide industry, and an environmental organisation. The scope of the working group's consideration of risk reduction was:

"manufacture, distribution, use and disposal of pesticides within the context of protecting human health and the environment".

The OECD risk reduction survey and mini-survey of workshop participants' views on risks were considered. The safety group acknowledged that there are risks associated with the use of pesticides and that the OECD surveys identified the most important ones.

The group considered why risks still occur with pesticide use, in both OECD and FAO countries. A wide range of factors which contribute to risk were identified and categorised for discussion under the following main headings:

- training and certification
- labelling
- application of pesticides
- application equipment
- registration systems
- post-registration monitoring
- enforcement
- protective equipment
- container management and disposal.

During discussions the group considered:

- the key ingredients of a pesticide safety scheme that could reduce risk;
- whether these ingredients were presently in place, and
- what should be done to build more effective national and international pesticide safety programs.

TRAINING AND CERTIFICATION

Training of persons involved with pesticide use requires:

- allocation of resources
- inclusion of government and related organisations in the exercise
- adoption of appropriate delivery systems for successful transfer of information
- identification of target groups
- re-training and updating of program content
- monitoring the implementation of information

- implementation of the FAO Code of Conduct for pesticide use
- certification of training personnel
- community investment in the training exercise

National training programs should: (1) include training on how to read a pesticide container label; (2) address the consideration of alternatives for ecologically sensitive areas and species; (3) facilitate exchange of ideas among the group; (4) be with the farmer not against; (5) be organised at the farmers' convenience; (6) include practical demonstrations; and (7) present material as simply as possible.

The working group strongly recommended nationally coordinated training programs which are structured, targeted and resourced. They should cover regulatory officials, extension officers, trainers, retailers and distributors, and pesticide users, including farm managers. Delivery systems must be appropriate to the target audience. The working group noted the contribution that can be made in building awareness in children and the influence children have on parents and caretakers, and therefore recommended that educational programs be introduced in schools.

Training delivery systems need to be appropriate to local needs and therefore would differ between OECD and developing countries. Specific emphasis should be placed on assessment of these systems to allow for maximum transfer of information given social, cultural and intellectual considerations of the target group.

- OECD countries should especially consider interactive farmer counselling services and distribution of information through electronic means, such as video-films and computer networks.
- FAO countries should focus on audio visual means of communication and practicality and encourage farmer to farmer exchange.

Certification can provide a framework for ensuring safe handling of pesticides by trained users. The need for certification and the detail of programs will vary depending on the hazards presented by the chemicals in use, use patterns and the capabilities of the users. National governments should use certification as a tool for reducing pesticide risks, where relevant to local circumstances.

OECD and/or FAO could be a clearinghouse for information on training and certification programmes as part of their efforts on risk reduction.

LABELLING

Language difference, low literacy levels, and long and complex labels are barriers to safe use. In many countries pesticide labels are legal documents, which can present a barrier to label improvement.

A range of activities at the national and international levels are under way to improve pesticide labels. The most important principle in these label improvement activities should be simplicity and clarity. Labels must provide core information on safe and efficacious application, supported by other information on delivery systems and training to ensure that users have all of the information they need.

The benefits to safety of a globally harmonized hazard classification system and hazard communication system are acknowledged. The work of international agencies on a harmonized system is very important. It is recommended that the ILO Coordinating Committee on Chemical Classification Schemes and Hazard Communication take into account the special issues for pesticide labels. Particularly highlighted for consideration are the use of colour coding and analysis of the effectiveness of pictograms.

APPLICATION OF PESTICIDES

The risks associated with pesticide use can be significantly reduced by the choice of lowest risk efficacious pesticides and improving application methods.

Hazardous formulations

Hazardous pesticide products are in use. FAO countries should review the use of particularly hazardous formulations to assess the extent of the risks involved. The FAO/UNEP Panel of Experts on Prior Informed Consent should particularly investigate a feasible method for developing countries to assess the risk associated with the use of hazardous formulations, especially under harsh tropical conditions. This would enable developing countries to provide an acceptable proposal for removal of a pesticide from circulation where warranted.

International information exchange is identified elsewhere in this report as a strategy for furthering risk reduction. This exchange needs to include information on the safety implications of various formulation types and measures to facilitate choice of lowest risk alternatives by users.

Consideration was given to non-availability of certain hazardous products where climatic, cultural and economic conditions compromise safe use. FAO countries in particular should consider this approach where warranted.

Integrated pest management

In many countries the IPM approach to agricultural practice is not fully acknowledged and broadly implemented. The continued use of chemicals as the first method of control is counter to a risk reduction approach. An IPM approach must be embraced to facilitate rapid sustainable local and global reduction.

All countries are encouraged to: promote the adoption of threshold levels for ascertaining time of application; promote low external input systems; increase the use of integrated systems for pest control; and develop a national policy on IPM to be incorporated into national agricultural policies.

It is recommended that FAO assist by developing a code of principles for IPM, which would include a definition of the IPM concept, a description of how IPM can effect risk reduction and some basic common features of effective IPM programs. This would include the need for IPM programs to be locally relevant and to address the safety of workers.

It is suggested that the European Union IPM Secretariat provide information to other countries on their work. These countries could then contribute to the Secretariat's work, to facilitate comprehensive outcomes. It is recommended that the OECD/FAO assist by facilitating information exchange on IPM successes and innovative approaches which have contributed to risk reduction.

Poor handling

National governments need to increase efforts to encourage farmers and others to read the label and to follow the instructions in order to reduce the risk posed by inadequate and poor handling.

OECD, FAO, and regional mechanisms are needed to exchange guidance material and codes on safe pesticide use. This could be included within the scope of the information exchange initiative described above.

Use of mixtures of pesticide products is a common agricultural practice. It is suggested that the OECD consider development of principles for identifying, the toxicological hazard of mixed products. This should be considered in the context of the Policy Working Group's recommendation regarding strengthening risk assessment methodologies. Recognising the difficulty of hazard assessment of mixtures, registration systems must incorporate exposure reduction principles.

APPLICATION EQUIPMENT

Poor design of application equipment, inadequate calibration and inadequate maintenance of equipment can lead to overapplication and leakage of pesticides, presenting risks to users and the environment.

OECD countries should implement systems for certification of spraying equipment and regular inspection to reduce the overuse of pesticides and increase efficiency of delivery to crops. Even though a voluntary system may be initiated by all countries, a mandatory certification program should be the goal. Industry should also be encouraged to provide support for inspection and maintenance of such equipment to allow maximum proficiency.

REGISTRATION SYSTEMS

A registration system is the foundation of national risk reduction programs. As such systems are not in place in all FAO countries, their implementation was identified for priority action.

Registration systems must continue to incorporate risk assessments relevant to local environmental conditions and use patterns.

POST-REGISTRATION MONITORING

Registration systems assess known hazards and identify risks according to expected use situations. 'New risks' may arise after registration, either because new hazards are identified, or use situations change.

Registration systems need to be vigilant in ensuring that registered products are safe and efficacious in use, to current standards.

This post-registration monitoring must address both human health and environmental safety. Assistance, in the form of guidelines, on the form and implementation of a post-registration monitoring and surveillance system would be helpful for many national governments. This would incorporate both health and environmental effects information (collation of information on poisonings and other relevant effects indicators) and exposure information in order to evaluate theoretical assessments conducted at the time of registration.

PERSONAL PROTECTIVE EQUIPMENT

There has been an over-reliance on personal protective equipment (PPE) to enable safe use. However, such equipment may not be available or appropriate in some countries. Moreover, it needs to be properly selected and maintained. It is a concern that extensive PPE recommended on some labels is unsuitable for use in hot and humid climates. Its use may lead to heat stress and non-compliance, resulting in exposure.

Alternative measures, including selection of lowest risk pesticides and safe application methods, should be applied in the first instance, consistent with the principles of the International Labour Organisation Convention on Chemicals (Convention 170).

PPE requirements on labels need to be realistic, taking into account the way the pesticide is used and climatic conditions.

PPE instructions need to be available for re-entry workers.

Standards for PPE and a certification system for equipment are needed and should be encouraged.

Supporting an ongoing OECD initiative, worker exposure assessment models need to incorporate PPE options and be relevant to actual use.

PPE recommended on labels is largely designed for temperate climates. Pesticide manufacturers are urged to design safer products not requiring use of PPE which is not appropriate for most FAO countries. In addition, PPE manufacturers need to design products relevant for most FAO countries. Further research on PPE is needed.

Industry should consider extending its product and container stewardship programs to facilitate the selection, effectiveness and maintenance of PPE for their products.

ENFORCEMENT

Registration requirements and post-registration controls are an integral part of a risk reduction program and must be complied with.

Occupational health and safety performance in the agriculture sector is a concern. Environmental standards also need to be met. Authorities need to focus attention on compliance and make the necessary resources available.

CONTAINER MANAGEMENT AND DISPOSAL OF PESTICIDES

There are a number of international guidelines and procedures covering the transport, supply and disposal of pesticides, however it was considered that national implementation should be improved. There was consensus that especially among FAO countries much could be done to improve handling of containers.

The working group made the following recommendations on container management for all countries to adopt at a national level:

- Legislate to enable warehousing standards to be set and enforced by regular inspections.

- Warehouse stock management to include the principle of "first in-first out" to avoid date-expired product.
- Develop national container management strategies, relevant to use situations. This would include strategies for product/container design. Especially where closed systems are being used for mixing/loading, it is recommended that these containers are returned to the manufacturer for re-use. Development of formulations suitable for containers that are easily destroyed should be encouraged.
- Incorporate an approach of shared responsibility by manufacturers for containers of pesticides from "cradle to grave".

There is a need to identify unwanted stocks of pesticides. "Unwanted" pesticides should be categorised in order to deal with them appropriately, as either obsolete stocks, unwanted excess stocks, or out-of-date stocks.

- If the pesticide can be identified as usable, then its use should be advocated as the first method of disposal.
- Unwanted unusable pesticides should be identified and destroyed. The FAO work in this area should continue and industry should participate. Industry, national governments and other organisations should be encouraged to share expertise and technology on disposal and destruction methods.
- The procedure for government tender for FAO countries should be overhauled to prevent stockpiling of eventually unwanted pesticides.

OECD and manufacturing countries are urged to discourage manufacturers from exporting pesticide products of inferior quality to other countries.

PRIORITY RECOMMENDATIONS

1. Training and certification

Countries should coordinate properly targeted and resourced training and certification programs for regulatory service officials, extension and training officers, and farm level workers. FAO countries should be provided with assistance to establish their own programs. Certification programs should be relevant to local needs.

2. Labelling

OECD and manufacturing countries should adopt the principle of simplicity and clarity of labelling for pesticides. The International Labour Organisation Coordinating Committee on Chemical Classification Schemes and Hazard Communication should take into account the special issues raised for pesticide labels.

3. FAO Code of conduct

Countries must implement the FAO Code of Conduct for the use of pesticides to establish good agricultural practices and reduce risks associated with poor handling.

4. Integrated pest management

The agricultural policy of all FAO/OECD countries should focus on IPM in order to stimulate risk reduction in pesticide use. FAO should assist by developing a code of principles for IPM, which would include a definition of the IPM concept, a description of how IPM can effect risk reduction, and some basic

common features of effective IPM programs. This would include the need for IPM programs to be locally relevant and to address the safety of workers.

5. Information exchange

OECD/FAO should facilitate information exchange between the developing and the developed countries, particularly at a regional level, on IPM successes and innovative approaches which have progressed risk reduction. The OECD and FAO should discuss appropriate mechanisms and information requirements for this exchange.

6. Registration systems

All countries should have a product registration system to ensure that the pesticides used are safe and efficacious. Regional cooperation in implementing these systems should be considered by national governments.

7. Post registration monitoring

OECD countries should develop guidelines on the form and implementation of post-registration monitoring and surveillance. This would incorporate both health and environmental effects information (collation of information on poisonings and other relevant effects indicators) and exposure information.

8. Application equipment

OECD countries should implement systems for certification of spraying equipment and regular inspection to reduce the overuse of pesticides and increase efficiency of delivery to crops.

WORKING GROUP ON SAFETY

(10 participants)

Chair: Mr WHYLIE, Paul (FAO - Jamaica)

Rapporteur: Ms VICKERS, Carolyn (Australia)

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