6 Management options for the use of agro-chemicals

This is the last of six information sheets on improving agro-chemical management in the Caribbean. This sheet reviews existing mandates and management options for agro-chemicals, and identifies existing good practice options for the use and application of agro-chemicals to highlight potential improvements within case study countries, Jamaica and St. Lucia, and for the Wider Caribbean. This forms part of the full picture captured by the Strategy for Management of Agro-Chemicals for Improved Public and Environmental health. A series of recommendations are made that aim to improve the use of such chemicals.

1. Overview

This final sheet in the series concludes that:

- Limited human and financial resources are the major constraints to the full implementation of national and regional obligations and good practice codes of conduct for agro-chemical management.
- Adequate legislation is needed to control the use and application of agro-chemicals and this is best achieved via the implementation of common legislation based on the OECS model throughout the Wider Caribbean.
- Within national systems, jurisdiction for all user groups needs to be defined and duplication of effort reduced to rationalise the use of limited resources.

Farmers are the main users of agro-chemicals, with specific usage varying according to the predominant crop types. Problems identified by Pesticide Control Boards (PCBs) in the Coordinating Group of Pesticide Control Boards of the Caribbean (CGPC), in respect of the use of agro-chemicals, include illegal imports and their use, repackaging of chemicals by vendors without attaching labelling, incorrect application (over-use, wrong application rate or timing, wrong pesticide for problem, use of cocktails of chemicals), inadequate application equipment, and failure to wear protective clothing. Resulting problems include impacts on human health (poisoning), environmental pollution (exacerbated by lack of soil conservation measures), and impacts on non-target species.

2. Requirements under international obligations and national legislation in respect of use of agro-chemicals

Signatories to the Cartagena Convention and its Protocol concerning Pollution from Land Based Sources and Activities in the Wider Caribbean Region (and specifically Annex IV on Agricultural Non-Point Sources of Pollution) are required to have national plans of action (NPAs) for the control of agricultural run-off, and to implement agricultural education programmes within five years of adoption. In addition to formal ratified obligations, the OECS has recommended member states adopt and implement the voluntary FAO Code of Conduct on the Distribution and Use of Pesticides (2002), and the CGPC has recommended the adoption of the FAO Prior Informed Consent procedures, made legally binding through the Rotterdam Convention. Voluntary codes and good practice guidelines produced by a number of organisations (FAO, OECS, IICA) also inform national agro-chemical management.

Model pesticides and toxic chemicals legislation (incorporating many of the regional and international obligations and recommendations) has been developed by the OECS and supported by CGPC and IICA, with aspects relating to the use of pesticides for the OECS. St. Lucia and St. Kitts & Nevis have ratified the model legislation and St. Lucia has based its new Pesticides and Toxic Chemicals Control Act (2001) upon it, but it remains to be implemented more widely. In Jamaica, the Pesticides Act (1975) governs the management of pesticides but a variety of agencies have been involved in pesticide related issues The model legislation requires the formation of a Pesticide and Toxic Chemicals Control Board (Pesticide Control Authority in Jamaica) to administer and implement the legislation. Other government ministries also have formal obligations, such as ministries responsible for agriculture, health, customs and excise, though the Ministry for Agriculture is specifically responsible for ensuring the proper use of agro-chemicals.

Intermediary bodies also have responsibilities relating to the use of agro-chemicals defined in

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terms and conditions of licences issued to importers, manufacturers, retail outlets, and pest control operators. For other intermediaries — the regional and national agricultural boards, and farm owners and managers — the responsibilities are less well defined. No provision for regulation of public end users of pesticides exists in St. Lucia, but the public does come under the requirements of other legislation. This situation is thought to be common throughout the Wider Caribbean. In Jamaica however, pesticide users, including farmers, are covered under the Certificate of Pest Control Operators. This allows for certification of both commercial pest control applicators and private applicators (farmers and other users).

A number of regional organisations provide technical support, training, and resources to national bodies, e.g. the CGPC, the OECS, and IICA. Regional and national agricultural boards (e.g. WIBDECO) also provide advice directly to farmers on the use of agro-chemicals.

3. Management options

A large number of internationally recognised codes of conduct and good practice guidelines for the use and application of agro-chemicals exist, including some developed specifically for the Caribbean region:

- A framework for good agricultural practice (GAP) aiming to produce safe food with reduced dependence upon pesticides. GAP incorporates good practices for integrated crop management, integrated pest management, and appropriate alternatives to pesticides. The EUREPGAP certification scheme defines minimum standards acceptable to EU retailers, including storage, sale, and distribution of pesticides, and training in pesticide safety for users. Caribbean exporters need to comply with these standards. Furthermore, the US Certification scheme, according to the USEPA, has other standards with which Caribbean countries must also comply. Plans to institutionalise GAP for selected commodities in the OECS have been initiated through the CGPC.
- FAO/WHO Codex Alimentarius maximum residue limit guidelines for pesticides in food are based on approved use of pesticides in accordance with GAP.
- FAO International Code of Conduct on the Distribution and Use of Pesticides (2002).
- FAO also produces recommended good practice management guidelines in the use and application of pesticides covering also minimum requirements and certification schemes for equipment to ensure health and safety, and training and certification schemes for users of pesticide application equipment.
- Other good practice codes also exist, such as those of WHO, ILO, and the chemical manufacturers and their associations.
- There are also regionally applicable IICA and OECS guidelines on pesticide use, and for the certification of pest control operators.

These codes of conduct and guidelines cover administration and use of pesticides and include pesticide management, testing of pesticides, reduction of health and environmental hazards, regulatory and technical requirements, availability and use (good practice for pesticide application, including minimum standards for equipment and its certification, testing and use, and minimum standards for users, including training requirements), distribution and trade, labelling, packaging, storage and disposal, advertising, information exchange, and monitoring and compliance.

4. Existing constraints and obligations

Limited human and financial resources are the major constraint. In Jamaica, a paid, full-time PCA staff exists but there are no full-time staff on the PCB in St. Lucia, and this is representative of the situation throughout much of the Wider Caribbean. Adoption of the model legislation for the OECS will ensure that relevant international obligations and good practice recommendations are accounted for, but resources need to be found to enable full implementation, to educate users and the public, and to inspect and monitor pesticide operations to ensure compliance with national laws.

In Jamaica and St. Lucia, full implementation of the requirements of the legislation has yet to be achieved and gaps still remain (Table 1). Gaps include, in St. Lucia, no licensing and training scheme for retailers or pest control operators. But this should change as the new legislation is implemented. Furthermore, according to the LBS Protocol, NPAs need to be set up in both countries and this is currently being undertaken, although considerable work is still needed to meet all the requirements that

need to be incorporated into these plans, and the plans still need to be formalised amongst the existing agencies and government divisions responsible for agro-chemical use and management. In both countries, there appears to be some overlap in the functions of the PCB/PCA and Ministries of Agriculture. In respect of the wider principles for pest control, not covered in the legislation, the GAP principles require promotion, and should be promoted via the recent CGPC/IICA initiative.

With respect to jurisdiction for management advice, in summary, the following tend not to be covered by either national bodies or the agricultural boards (Tables 2 and 3):

- Very small farms (in both St. Lucia and Jamaica)
- Medium to large farms producing export crops other than bananas (St. Lucia)
- Medium farms producing crops for home consumption (Jamaica)
- No licensing schemes for pest control operators or retailers (St. Lucia).

Farm owners in the medium to large categories, however, may provide training and advice for employees. This gap in jurisdiction is potentially important as farms of this size have the capacity to cause significant environmental impacts in the case of misuse of agro-chemicals.

5. Recommendations

- Public health of consumers should be given priority when considering national plans for the use of agro-chemicals (for both domestic and export markets).
    - Ensure proper use of agro-chemicals to facilitate food safety, particularly in the case of produce for the home market not captured under export requirements.
    - Implement GAP and other good practice codes of conduct for pesticide use (e.g. FAO, IICA, OECS), particularly for domestic products not already covered by existing arrangements, and develop adequate training schemes for this.
    - Promote linkages between consumers such as hotels and producers.
    - Set regionally acceptable (or local) standards for Maximum Residue Limits or in the absence of which the FAO/WHO Codex Alimentarius standards should be applied where possible.
    - Ensure adequate analytical capacity to enable monitoring for compliance with standards for public health (i.e. medical and food residue monitoring laboratories).
- In deciding what chemicals to use and where, if doubt exists and there is a lack of available information to inform decisions upon its use, and given limited resources to enable adequate monitoring, a precautionary principle should be applied — that chemicals should not be used until sufficient evidence is available indicating otherwise.
- Legislation based on the OECS model should be adopted throughout the Wider Caribbean to ensure that adequate provision exists in the legislation for the control of the use and application of agro-chemicals.
- Given limited resources, an institutional analysis of PCBs and other relevant executing agencies would be valuable to assess existing capacity and identify constraints and needs, and to suggest alternative mechanisms to overcome identified constraints. Adequate financing mechanisms and cost recovery through licensing are required.
    - The overlap in the functions of the PCB/PCA and Ministries of Agriculture needs to be examined, including which user groups they target, in order to rationalise the use of limited resources. In Jamaica and St. Lucia, RADA and MAFF respectively need to examine whether greater effort needs to be spent on targeting medium farms not exporting produce, and the best mechanism for reaching them (Tables 2 and 3).
- In particular, emphasis should be placed on strengthening capacity and resources for implementing appropriate licensing, monitoring, and compliance control schemes, and training and education of licence holders and users of agro-chemicals. Additional gaps in implementing activities to meet the requirements of legislation and codes of conduct need to be fully identified throughout the Wider Caribbean (Table 1).

- Legislation relating to the regulation of public end-users of agro-chemicals and their responsibilities should be considered via the CGPC in order to advise national systems. Certification schemes for all users of agro-chemicals should be adopted throughout the Wider Caribbean. These should include the provision of training in pesticide use and the implementation of health and safety standards for applicators and farm employees, including adequate home storage.
- Communications experts should be engaged to assist the implementing authorities in delivering messages on the correct use of agro-chemicals and public safety issues. This should encompass both targeted training of license holders and farmers, and wider public awareness-raising via locally relevant media, including TV and radio. Change-management concepts should be applied (e.g. to influence changes in agricultural practice, storage, labelling, sale, and disposal of agro-chemicals, and outcomes of public health monitoring and research).
- In order to reduce the burden on government organisations, more should be done to investigate where else in the system responsibility for stewardship of agro-chemicals (including training in their use and application) can be applied. Thus, responsibility would be transferred to intermediary bodies and defined in their terms and conditions of licence (importers, manufacturers, retail outlets, and pest control operators). Governments would maintain a monitoring and compliance control role.
- Given limited national capacity, there is a need to ensure continued and enhanced support provided by regional bodies and external agencies. To avoid duplication of effort at a national level, regional bodies should explore where they can provide assistance common to each state, e.g. to develop and provide regional trainers (of trainers), courses and workshops to train staff at national PCBs and ministries of agriculture in all the various functions, and help develop locally relevant material that can be disseminated and promoted via national agencies. Harmonised legislative and administrative systems throughout the region should continue to be pursued, to enable this to occur and to enhance national capacity.
- Through the CGPC, a regional pesticide database for registration, licensing, and quantification has been suggested as a good overall means of harmonising pesticide registration amongst Caribbean states, and this study endorses that view.

Further information

Available as downloadable files under the Land-Water Interface option in the left-hand panel at http://www.mragltd.com:

- Seddon-Brown, S., C. Mees, and N. Esteban. (2003) Management Options for the use of agro-chemicals in the environment. DFID NRSP Project R7668. MRAG Ltd.

Other information sheets in the series are:

1. Management of agro-chemicals for improved public and environmental health
2. The fate of agro-chemicals in the land-water interface in St. Lucia and Jamaica: Environmental monitoring
3. The quantification and toxicity of agro-chemical imports into St. Lucia and Jamaica
4. The on farm use of agro-chemicals and associated soil management and farming practices in St. Lucia and Jamaica
5. Harmonisation of agro-chemical management in the Caribbean

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Table 1 Formal responsibilities in respect of management of agro-chemical use, voluntary codes of conduct, principles and internationally recognised recommendations, the institutions responsible for administering them, and the status of implementation.

Legislation, codes of conduct, and recommendations	Management options and action	Jamaica: Responsible institution and status of implementation	St. Lucia: Responsible institution and status of implementation
International and national obligations and legislation			
Cartagena Convention and its Protocol on Pollution from Land-Based Sources and Activities	*National plans for agricultural run-off*	Convention ratified—currently establishing a National Plan of Action–NEPA implementing	Convention ratified—Sustainable Development Unit within the Ministry of Environment
	The development and promotion of economic and non-economic incentive programmes. An assessment and evaluation of legislative and policy measures	NEPA/RADA—not formalised NEPA Legal Affairs Division—limited but ongoing. PCA, RADA, UWI, NGO	Adopted the model legislation drafted by the OECS and incorporated the elements into their new Pesticides and Toxic Chemicals Control Act (2001)
OECS/IICA/CGPC model legislation for harmonisation (NB not all requirements of legislation listed relate to use of pesticides)	Formation of PCBs to administer the legislation (now Pesticides and Toxic Chemicals Control Boards)	Model legislation not implemented. National legislation has established the PCA for this purpose	Yes, new legislation implemented the model legislation into the Pesticides and Toxic Chemicals Act (2001). PCB established but needs to be strengthened and developed
	Registration and licensing of importers and manufacturers	PCA	PCB
	Licensing and training of pest control operators	PCA	Not currently undertaken—should be implemented through new legislation
	Licensing and training of pesticide retailers	PCA	Not currently undertaken—should be implemented through new legislation
	Requirements, training, and public awareness raising re. storage, transportation, use and application, and disposal of pesticides	PCA/RADA —some overlap of responsibilities	PCB
	Monitoring and compliance control	PCA, Customs and Excise	PCB, Customs and Excise—needs strengthening
	Public health monitoring	Ministry of Health	Ministry of Health
	Environmental health monitoring	Ministry of Health and NEPA. UWI and CEHI—limited to locations of interest	CEHI and Dept. of the Environment
Voluntary codes of conduct and good practice guidelines		Voluntary codes of conduct and good practice guidelines	
FAO Code of Conduct on Distribution and	This includes:	PCA. Aspects covered include:	Yes. Aspects covered include:

Legislation, codes of conduct, and recommendations	Management options and action	Jamaica: Responsible institution and status of implementation	St. Lucia: Responsible institution and status of implementation
Use of Pesticides (OECS has recommended implementation of this code)	• Pesticide management • Testing of pesticides • Reducing health and environmental hazards • Regulatory and technical requirements • Availability and use • Distribution and trade • Labelling, packaging, storage and disposal • Advertising, information exchange • Monitoring and observance of the Code	• Pesticides management • Reducing health and environmental hazards • Availability and use • Distribution and trade • Labelling, packaging, storage and disposal • Advertising and information exchange • Monitoring and observance of code	• Pesticides management • Reducing health and environmental hazards • Regulatory and technical requirements • Availability and use • Distribution and trade • Labelling, packaging, storage, and disposal
FAO Prior Informed Consent (CGPC has recommended implementation)	Whilst this deals mostly with arrangements for export/import of hazardous substances, the convention also promotes their safe use through labelling standards and technical assistance	PIC ratified and formally applied through the PCA	PIC not formally applied. Bureau of Standards and PCB to address the matter of labelling
GAP	Recently initiated via CGPC. IICA will coordinate with CEHI and national ministries. National education programmes to be developed	Lack of promotion at present. Responsible agent: Ministry of Agriculture via RADA Extension Services; PCA	Lack of promotion at present. Responsible agent: Ministry of Agriculture via MAFF Extension Services (and OECS)
	EUREPGAP Certification Requirements	Not promoted in Jamaica at present	MAFF, Bureau of Standards and WIBDECO
ICM		RADA Extension Services	MAFF Extension Services
IPM and promoting organic farming and alternatives to agro-chemicals	National and regional 'projects' exist. The EU CAFP aims to enhance national and regional capacity to develop and transfer IPM technologies by 2004	RADA Extension Services (and agricultural boards)	MAFF Extension Services and PCB (and WIBDECO and SLBC)
FAO good practice for pesticide application		PCA certifies users	PCB and MAFF Extension Services (and SLBC, WIBDECO, and OECS)
FAO minimum requirements for application equipment and test procedures			MAFF gives training (also pesticide vendors and importers)
FAO training schemes		RADA Extension Services, PCA, sellers of agro chemicals, CARDI	MAFF Extension Services, PCB (and SLBC, WIBDECO, farm owners and managers, OECS, promoters of agro-chemicals and importers, schools)

Legislation, codes of conduct, and recommendations	Management options and action	Jamaica: Responsible institution and status of implementation	St. Lucia: Responsible institution and status of implementation
FAO certification procedures for operators		PCA	Not covered (some certification programme through MAFF)
FAO/WHO Codex Alimentarius; MRLs	This sets maximum pesticide residue limits in food based on approved use of pesticides in accordance with GAP	PCA	No agency
OECS pesticide labelling and advertising standards		PCA	PCB
OECS pesticide selection, handling, application, and disposal standards		PCA	PCB
OECS certification for commercial pest control operators		PCA	Not covered
IICA Food Safety		National Agricultural Heath and Food Safety Coordinating Committee	PCB, MAFF, Bureau of Standards
IICA worker health and use of safety equipment			MAFF, PCB
WIBDECO standards			WIBDECO, for banana exporters
Control of pesticides at other points in the distribution chain			
FAO obsolete pesticide storage and disposal		PCA	PCB and MAFF Extension Services (and SLBC and WIBDECO)

Table 2 Institutions responsible for implementing management control with respect to agro-chemical use in Jamaica

Institution	Functions in respect of agro-chemical management	Public	Small farms	Medium farms		Large Farms	
			Farmers	General	Employee farmers	General	Employee farmers
PCA	Part of Ministry of Health. Administration: implements legislation and monitors pesticides; regulates import sale and storage of pesticides	X	X	X	X	X	X
	Use: regulates rates of application and other aspects of use	X	X	X	X	X	X
	In conjunction with licensing of retailers' operators, provides advice and training to all types of farmers. PCA approved trainers for all categories including RADA, HEART/NTA, etc.	X	X	X	X	X	X
	In conjunction with licensing of retailers operators, provides training						
	Public awareness programmes	X	X	X	X	X	X
RADA Extension Services	Extension and training, including use of agro-chemicals. Produces briefing notes and guides, focusing on small farms		X				
Agricultural boards	For all export crops, e.g. coffee, sugar. Each board has its own extension officers and produces information brochures to provide advice on agro-chemical use		X	X		X	
Licensed retailers	Licensed by PCA. Includes training and implementation of standards for storage and sale of pesticides. Users tend to ask retailers about rates and choice of chemical	X	X				
Pest control operators	Licensed by PCA. Requires insurance to operate business to address liabilities. They will include service to large farmers but not yet implemented for small farmers	X					
Farm owners and managers	Employee farmers and pesticide applicators *may* be provided with advice and training by owner or manager				X		X
External agencies	CARDI: Research and technology transfer to farmers, mainly on IPM						
	OECS training						
	HEART/NTA national training agency provides training to farmers and commercial pest control operators towards certification	X	X	X	X	X	X

Table 3 Institutions responsible for implementing management control with respect to agro-chemical use in St. Lucia

Institution	Functions in respect of agro-chemical management	Public	Small farms	Medium farms		Large Farms	
			Farmers	General	Employee farmers	General	Employee farmers
PCB	Part of MAFF. Administration: regulates import, sale, and storage of pesticides; registration of new pesticides; guidelines on labelling						
	Public awareness programmes	X					
	Provides advice and training to farmers (of all sizes) through the activities of the Crop Protection and Quarantine Unit (MAFF), where the PCB Secretariat is housed		X		X		X
MAFF	Advice on IPM and use of agro-chemicals: educational pamphlets; demonstrations and workshops; dissemination of material via media and schools with a focus on domestic agricultural crops and small farms as well as medium and large farms	X	X	X		X	
Agricultural boards (bananas only)	For export bananas only (SLBC, WIBDECO). SLBC has extension officers who provide advice on agro-chemical use. The board also has influence over what chemicals are imported. Certification programme ensures farmers demonstrate compliance with legislation. Use of media to inform public and farmers	X	X	X		X	
	WIBDECO recommends field and harvesting practices and regulates the use of agro-chemicals			X	X	X	X
Licensed retailers	There appears to be a gap here where there are no complementary licensing schemes for retailers including training provided as there is in Jamaica. They are supposed to demonstrate stewardship of their products. Although there is no legal requirement for this presently, it will become one under the regulations of the new Act	X					
Pest control operators	There appears to be a gap here where there are no complementary licensing schemes for pest control operators including training provided as there is in Jamaica	X					
Farm owners and managers	Employee farmers and pesticide applicators *may* be provided with advice and training by owner or manager				X		X
Promoters of agro-chemicals	Technical packages for various crops are usually distributed to MAFF personnel and farmers. They mainly contain information on the various pesticide products that should be used	X					
Manufacturers and importers	SCIC, Renwick & Co, SLAA: Some of them have agronomists who carry out training on the use of their various products for sale. These workshops are usually aimed at farmers (all categories) and extension personnel		X		X		X
Schools	Education of children in safety and proper application of agro-chemicals	X					

Institution	Functions in respect of agro-chemical management	Public	Small farms	Medium farms		Large Farms	
			Farmers	General	Employee farmers	General	Employee farmers
External agencies	CARDI: Research and technology transfer to farmers through MAFF. Other organisations mainly supply the PCB with information about pesticides at the international level, such as codes of conduct, labelling regulations, PIC, pesticides safety, changes in status of pesticides registration, etc.	X					
	OECS training	X					
	WIBDECO	X			X		X