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IMPACT AND AMELIORATION OF SEDIMENT AND AGRO-CHEMICAL POLLUTION IN CARIBBEAN COASTAL WATERS

IMPORTATION, ADMINISTRATION AND HARMONISATION OF AGRO-CHEMICAL MANAGEMENT IN ST LUCIA, JAMAICA AND THE WIDER CARIBBEAN

JULY 2003



MRAG

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EXECUTIVE SUMMARY

This report describes the institutional arrangements for the management of agrochemicals in Jamaica and St Lucia: specifically administrative and legal systems relating to importation, manufacture, and the distribution chain. It explores the potential for harmonisation of administrative arrangements throughout the wider Caribbean.

- The administrative and legal systems for import and manufacture of agro-chemicals in both St. Lucia and Jamaica are largely respectively controlled by the Pesticide Control Board and the Pesticide Control Authority. These were set up under the Pesticide Control Acts in each country and are in need of further more sustainable financing mechanisms.
- The composition of the PCB / PCA needs to be broadened to include more persons with experience in ecological issues and on the fate of agro-chemicals in the environment.
- There is a lack of consistent enforcement in these systems and a more stringent penalty scheme is recommended for those that do not abide by the various regulations for importing, exporting, handling or storage of agro-chemicals.
- Long-term trends indicate that total pesticide use is increasing in both St. Lucia and Jamaica, and that agricultural pesticides form a large proportion of the pesticides in use.
- There is clear evidence of a long term increase in the quantities of imports and manufacture of agro-chemicals, not only in St. Lucia and Jamaica but also in the wider-Caribbean. The data also show that there is also a lot of inter-annual variation in the use of different fertilisers as well as pesticides.
- The main factors to have influenced the quantity of agro-chemicals in use include: changes in legislative arrangements, dumping of agro-chemicals, increased pests and diseases, changes in agricultural practices and changes in crop types. Other external factors include international trade and climatic variation.
- It is recommended that the harmonised OECS legislation on Pesticides and Toxic Chemicals be promoted in the Caribbean and that the regional web site, launched in June 2000, be used as a contribution to this harmonisation process and provide a means of exchanging information.
- It is recommended that all countries of the CGPC adopt a Prior Informed Consent procedure to give importing countries the tools and information needed to identify potential hazards and exclude chemicals they cannot manage safely.
- The CGPC provides a valuable mechanism for information exchange and keeping interest in sound pesticide management at the forefront of the mandates of national PCBs.
- 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.

ACRONYMS

ACP	African Caribbean and Pacific States
BVI	British Virgin Islands
C&E	Customs and Excise
C-CAM	Caribbean Coastal Area Management (Jamaica)
CEHI	Caribbean Environmental Health Institute
CGPC	Coordinating Group of Pesticide Control Boards in the Caribbean
CIF	Item cost plus Freight and Insurance
DDT	Dichloro Diphenyl Trichloroethane
DFID	UK Department for International Development
GP	General Practitioner
IICA	Inter-American Institute for Cooperation on Agriculture
IMDG	International Maritime Dangerous Goods Code
IPM	Integrated Pest Management
LWI	Land Water Interface
MAFF	Ministry of Agriculture, Forestry and Fisheries (St Lucia)
MRAG	Marine Resources Assessment Group Ltd (UK)
MS	Member States
MSDS	Material Safety Data Sheet
MSMA	Sodium hydrogen methylarsonate
NRCA	Natural Resources Conservation Authority
NRMU	Natural Resources Management Unit (of OECS)
NRSP	Natural Resources Systems Programme
OAS	Organisation of American States
OECS	Organisation of Eastern Caribbean States
OPCW	Organisation for Prohibition of Chemical Weapons
PCA	Pesticides Control Authority (Jamaica)
PCB	Pesticides Control Board
PDS	Product Data Sheet
PIC	Prior Informed Consent
PSD	Pharmaceutical Services Division, Jamaica
RADA	Rural Agricultural Development Authority (Jamaica)
SCIC	Société Caraïbe d'Industrie Chimique
SLASPA	St Lucia Air and Sea Ports Authority
SLBC	St. Lucia Banana Corporation
STATIN	Statistical Institute of Jamaica
USAID	United States Agency for International Development
UWI	University of the West Indies
WHO	World Health Organization
WIBDECO	Windward Islands Banana Development Corporation

Note that all currencies quoted in this document are national currencies. For reference purposes, please find exchange rates below (correct at time of press).

Local rate	GBP (£1) =	USD (\$) =
J\$ (Jamaica)	J\$85.67	J\$54.18
EC\$ (Eastern Caribbean)	EC\$4.27	EC\$2.70

1 BACKGROUND

This report contributes to a three-year research project *Impact and amelioration of sediment and agro-chemical¹ pollution in Caribbean coastal waters* which is funded by DFID's NRSP LWI programme (R7668). It follows on from an earlier LWI project *Review of the impacts of pollution by sediments and agro-chemicals of tropical coastal waters with reference to the Caribbean region* (R7111). The present project is managed by two organisations: the University of York, responsible for the sedimentation aspects of the project; and MRAG Ltd, responsible for agro-chemical components of the project, and was conducted in collaboration with project partners in Jamaica (University of the West Indies: Centre for Marine Sciences, Department of Chemistry, Natural Products Institute, and Caribbean Agricultural Research Institute; and, Caribbean Coastal Area Management Foundation) and St Lucia (MAFF: Department of Fisheries and Department of Agriculture; and, Caribbean Environmental Health Institute). Agro-chemical related activities were undertaken in St Lucia and Jamaica. The project commenced in June 2000 and ends in July 2003, with the publication of guidelines for best management practices for agro-chemical management.

Objective

The present document aims to provide an understanding of the administrative systems in place in St Lucia and Jamaica for the management of agro-chemicals². In the context of this report this refers specifically to administrative and legal systems relating to importation, manufacture, and the distribution chain. The potential for harmonisation of administrative systems throughout the Caribbean is explored.

This information will contribute to the wider project objective of a broader technical understanding of the extent in which agro-chemicals are applied and impacting the environment in two representative countries in the Caribbean (described in other project reports). St Lucia has been selected as a detailed case study, including thorough investigation of the fate of agro-chemicals in the environment. Jamaica has been chosen to provide a contrasting example of intensive agricultural land use on a large Caribbean island. Agro-chemical inputs will be estimated there from importation data and literature review and differences in appropriate best management practices explored.

Administrative systems have been studied within both St Lucia and Jamaica and reports by a number of project partners³ contribute to this document. Consultations with relevant institutions⁴ have also taken place between November 2000 and June 2002. Whilst the Jamaican legislative framework was established in 1975 with two amendments in 1996 and 1999, the first legislative arrangements for pesticide control in St Lucia (Pesticide Control Act of 1975 with statutory instruments in 1987) were revised recently in 2001 and the old system and new system have been described for comparative purposes. Knowledge of the old system is still pertinent as similar systems are in existence in other Caribbean countries.

¹ For the purpose of the current project, the term agro-chemical includes pesticides and fertilisers used in agriculture.

² For the purpose of the current project, the term agro-chemical includes pesticides and fertilisers used in agriculture.

³ Jamaica: CCAM Jamaica; St Lucia: MAFF Agricultural Extension Services.

⁴ Jamaica: PCA, RADA, PSD, Coffee Industry Board, Water Resources Authority; St Lucia: PCB, MAFF, SLASPA, Customs & Excise, OECS, SWMA, STATIN, WIBDECO, Bureau of Standards, SCIC, WASCO, Water Authority.

2 INTRODUCTION

The major threats to the health, productivity and biodiversity of the world's oceans result from human activities along the land water interface and as much as 80% of marine pollution originates from land based activities (UNEP, 2001). These land based activities result in municipal sewage and solid waste, chemical discharges from factories, fertiliser and pesticide run-off and other pollution from farms and oil spills. The consequent pollution then places intense pressure on fragile coastal resources systems such as estuaries, wetlands, mangroves and coral reefs.

In response to these problems, 108 governments and the European Commission (EC) have committed themselves to protect and preserve the marine environment from the adverse environmental impact of land based activities and, in 1995, the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) was adopted at an intergovernmental conference in Washington DC. In terms of its regional seas' programme, member states of the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention, 1983; entry into force 1986) include St Lucia and Jamaica and other members of the Coordinating Group of Pesticide Control Boards of the Caribbean (CGPC) such as Antigua and Barbuda, Barbados, Dominica, Grenada, St Vincent and the Grenadines, and Trinidad and Tobago. Implementation of the GPA is primarily the responsibility of governments working with local communities, NGOs, public organisations and the private sector and governments selected UNEP as the GPA Secretariat with the task of promoting and facilitating implementation of the Programme of Action at national, regional and global levels.

The urgent need to address the amelioration of agricultural non-point sources of pollution in the Wider Caribbean Region was formalised by UNEP in the Draft Land-Based Sources of Marine Pollution Protocol (LBSMP) in 1999 (UNEP, 1999). One of the categories of land-based marine pollution that has been targeted by the GPA is that of agro-chemicals. The impact of fertiliser and pesticide run-off has thus been recognised within the GPA and the Regional Seas Programme also focuses on agro-chemicals (UNEP-GPA, 1999). With this in mind, it is clear that many Caribbean countries are obliged by international treaties, to which they are signatory, to place emphasis on agro-chemical administration procedures.

Although the need for control of agro-chemical pollution has been internationally recognised, there is a paucity of data about the environmental impacts of pollutants. At the same time, recent reviews have showed that there is little information available on the use of pesticides or the impacts of agro-chemicals on the ecosystems of tropical coastlines (MRAG, 1998; UNEP-CEP, 1999) and it is clear that there is need to synthesise available information on usage of agro-chemicals and systems for management before setting out to determine appropriate controls for agro-chemicals.

The current document focuses on some of the information gaps about agro-chemical pollution in Caribbean coastal waters identified in the LBSMP Protocol and, by doing so, may provide considerable assistance in the development of appropriate national plans. The aim of this report is to describe the current status of systems for agro-chemical management in St Lucia (a small island with small-scale farming) and Jamaica (a larger island with intensive agricultural land use), to quantify imports and manufacture of agro-chemicals and then discuss the differences and need for harmonisation of agro-chemical management in the Caribbean. There are three main sections:

1. Administrative and legal procedures for import and manufacture of agro-chemicals
2. Quantification of import and manufacture of agro-chemicals
3. Summary and recommendations for harmonisation of administrative arrangements and agro-chemical imports and manufacture

The aim of the final section is to use knowledge gained from administrative systems within the Caribbean, particularly in St Lucia and Jamaica, and to seek to identify potential best management practices for agro-chemical administration and management in the region.

3 ADMINISTRATIVE AND LEGAL PROCEDURES FOR IMPORT AND MANUFACTURE OF AGRO-CHEMICALS

3.1 Importation procedures for pesticides and fertilisers in St Lucia

Import procedures in St Lucia have been investigated through a series of meetings with relevant institutions, including Customs and Excise (C&E), St Lucia Air and Sea Ports Authority (SLASPA), the Statistics Office (STATIN), the Pesticide Control Board (PCB), the Société Caraïbe d'Industrie Chimique (SCIC) and the Coordinating Group of Pesticide Control Boards of the Caribbean (CGPC). Meetings took place in November 2000, June 2001 and November 2001. Based on information collected during meetings, an institutional framework for importation procedures has been developed (see Figure 3.1). Procedures and legislation are described below for each institution.

3.1.1 Customs & Excise

There are no specific records for agro-chemical imports and all imports are entered on the UN-designed international imports database that is reportedly used throughout the Caribbean. Imports are grouped in accordance with international tariff bands, brand names are not recorded and original documents are filed per carrier. C&E appear fully aware of regulations for pesticides and their actions are guided by instructions from the PCB. C&E have the list of registered pesticides and require the import agent to produce a license together with the customs declaration form for each consignment. Each license is issued and signed by PCB and if the agent does not possess a copy of this license, then the imported goods are stored in the Dangerous Goods' Shed by SLASPA. The agent is then directed to the PCB to obtain the appropriate license. Licenses are filed at entry. C&E works in close association with SLASPA and details of inter-agency collaboration are described in the next section.

3.1.2 St Lucia Air and Sea Ports Authority

St Lucia Air and Sea Ports Authority (SLASPA) is empowered by the SLASPA Regulations and the St Lucia Shipping Act No.11 of 1994 (concerning dangerous goods). With regards import of agro-chemicals, SLASPA also abides by the International Maritime Dangerous Goods (IMDG) code. SLASPA is informed of shipments of chemicals by each ship's manifest and by shipping agents who write/call SLASPA to identify chemicals and make arrangements for onward transport. The goods are imported in approved containers and are segregated according to IMDG class in the dangerous goods shed, where all chemicals are placed upon discharge from the ship. If highly toxic, arrangements are made for chemicals to be transferred ex-ship and straight to a truck for onward transport. All pesticides are placed in the dangerous goods category according to the (IMDG) code (various classes including oxidising, toxic, flammable and infectious substances), which also regulates storage on ship.

The importer processes the discharge of goods through C&E (import license, tariff payments, etc). Once the requirements of C&E are met, the goods can be released. SLASPA releases goods from storage upon receipt of a discharge notice (approved by C&E and given to importer) and payment of any storage fees (as described

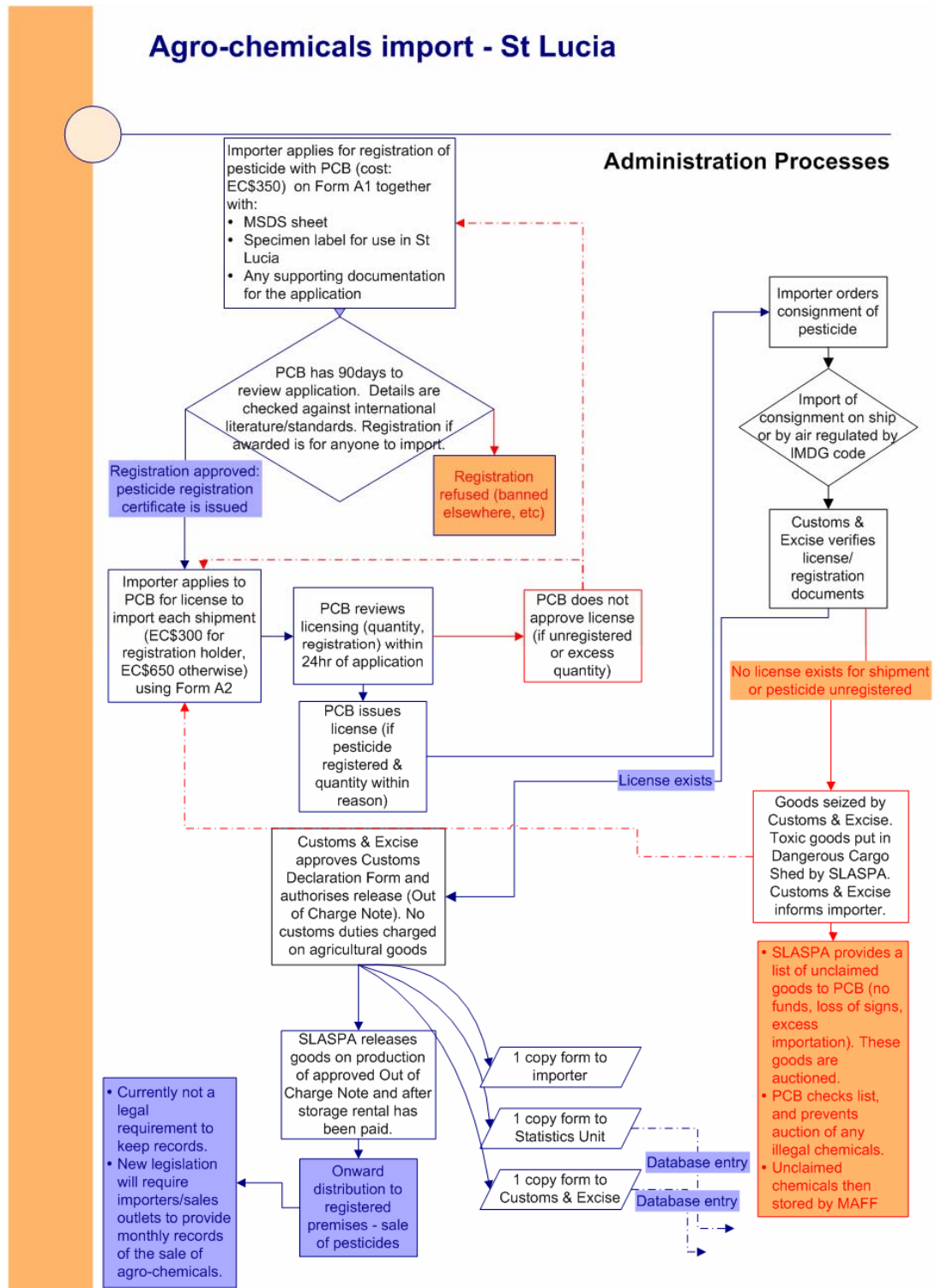


Figure 3.1 Flow chart to illustrate administrative arrangements for import of pesticides to St Lucia

Note: This figure was correct at the time of printing although fees are currently not collected at the present time. Furthermore, St Lucia is currently restructuring its administrative procedures according to its new Pesticides and Toxic Chemicals Control Act.

below). Goods that are not released are subsequently sold by auction arranged by SLASPA. SLASPA sends lists of items for auction to the Secretary of the PCB in order to control sale of unregistered/unlicensed pesticides.

In absence of an import license for a pesticide, goods are seized by C&E and reportedly stored by SLASPA for a maximum of six weeks until release on issue of a license. If no license is procured during the six-week period, SLASPA informs the consignee that goods will be auctioned unless collected. Any tariffs/fines are charged by C&E. SLASPA charges a significant rent⁵ on storage of these goods for each period after the initial 5 days period has passed. The costs that will be incurred when a license hasn't been obtained prior to importation may also act as an incentive for the importer to arrange a license prior to ordering the goods.

The dangerous goods' shed (#2) in use until 2001 had restricted storage space and was unmanned, although locked and inspected regularly. The shed was inspected in November 2000 when it was reported to SLASPA that storage was inadequate; the concrete floor was covered by dust and mud with stains around several crates of contaminated containers (detailed in Table 3.1). There were holes in the roof; the atmosphere was odorous and leaking; and dented, rusting and empty drums were visible in several sections of the warehouse. These facts were reported to the Director of Maritime Affairs at SLASPA in November 2000 who has since given approval for a new dangerous goods' cargo shed to be constructed.

Table 3.1 Details of contaminated agro-chemicals in dangerous goods shed, SLASPA

Agro-chemical	Details on packaging
ICI Reglone Bipyridilium pesticides	Liquid, toxic, NOS
ICI Talent weedicides	Broad spectrum pest-emergence for long lasting weed control in bananas and other plantation crops
AKZO Natrets	Fertiliser from Holland

The new dangerous goods' shed was completed during 2001 and has a containment area with two pallets (one as false floor for leaks, one for storage) and also a double door (a lockable ventilating grille (daytime) and outside secure door (nighttime)). It also has emergency facilities such as eyewash station inside the shed and drench shower (pull activation switch) outside the shed. In addition, a committee was also established to oversee construction of the shed and, importantly, to ensure safe handling of dangerous cargo (comprised of Operations Manager and staff, Chief of Ports and staff, Fire Service, Chief Security and staff). A training programme in safe handling is now being organised for all SLASPA staff and dockworkers.

With regards documentation, SLASPA files all information (manifesto, discharge notices) by ship file, not by cargo category. SLASPA automatically receives a copy of the manifesto upon arrival of each ship, and the consignment is also declared to C&E directly by the ship. SLASPA is responsible for the secure storage of the cargo until released by C&E (who carry out *ad hoc* stock checks). SLASPA does not check the manifesto for banned or unregistered substances and is not responsible for repatriation of banned or unregistered substances; this is the role of C&E, which gives instructions to SLASPA.

⁵ EC\$3.50/tonne for 5-7 days; EC\$4.50/tonne for 8-9 days; EC\$6.00/tonne for 10-12 days; and EC\$8.00/tonne for each subsequent 3 day period.

3.1.3 Pesticide Control Board⁶

The Pesticide Control Board (PCB) of St Lucia was established under the Pesticides Control Act (No. 7) of 1975, which provides for the control of the importation, sale, storage and use of pesticides, to carry out the following functions:

- Advise the Minister of Agriculture on matters relevant to the making of regulations under the Act;
- Carry out the provisions of the Act and its regulations.

The regulations passed under this Act are:

- Pesticides Control (Registration and Licensing) Regulations. No. 71 of 1987

The Pesticide Control Board is integral to the control of imports of pesticides to St Lucia and has responsibilities for registration of new pesticides and issuance of licenses for each consignment of pesticides. Details of inter-action between the PCB and other institutions responsible for control of imports (C&E and SLASPA) are described in Sections 3.1.1 and 3.1.2).

Until this period, the national legislation was considered insufficient for integrated pesticide control and, through collaboration with the Coordinating Group of Pesticide Control Boards of the Caribbean (CGPC), a harmonised legislation for pesticide control was drafted by the University of the West Indies (UWI) and funded by an FAO project in 1998 (Polius, pers. comm.).

The Organisation of Eastern Caribbean States (OECS) Secretariat's Legal Affairs Unit then requested that the PCBs of the OECS include in the Model Pesticide Legislation, regulations dealing with the prohibition of the use of toxic substances such as chemical weapons (Chemical Weapons Convention). The OECS Legal Affairs Unit supplied the text of this regulation for inclusion in the legislation and a workshop was held in St Lucia (February, 2000) with PCBs of Antigua and Barbuda, Dominica, Grenada, St Kitts and Nevis, St Lucia and St Vincent and the Grenadines to consider the Convention on Chemical Weapons; and integrate the provisions of this convention into the existing Pesticides and Toxic Chemicals Control Act and Regulations that had been drafted for the OECS (CGPC, 2000).

There was general acceptance for the proposal to incorporate provisions of the Convention on Chemical Weapons into the existing draft legislation. In St Lucia, the PCB endorsed the integration of the two legal instruments, as the new version retained much of the elements of the old draft legislation whilst being strengthened by provisions of the Organisation for Prohibition of Chemical Weapons (OPCW) (St Lucia country report, CGPC, 2000). The revised Draft Act and Regulations were then reviewed by the Attorney General's Chambers, submitted to Government and issued in August 2001 as the Pesticides and Toxic Chemicals Control Act of St Lucia (No. 15 of 2001) with the aim of regulating pesticides and toxic chemicals (St Lucia, 2001; Mathurin, pers. comm.).

At the time of this research in 2000 and 2001, pesticides control was legislated by the Pesticides Control Act No. 7 of 1975 and the Pesticides Control (Registration and

⁶ The information contained within this section describes the PCB as it was in 2000-2001. New legislation for the PCB changed in late 2001 and the resultant effects had not been fully realised at the time of this report although legislation is described in the next section.

Licensing) Regulations No. 71 of 1987. The PCB was governed by this legislation, was unfunded and voluntary, and composed of seven members (see Table 3.2). Meetings of the PCB were scheduled at monthly intervals although they were often postponed or cancelled due to busy schedules of board members (Mathurin, pers. comm.). During the final period of research, the new legislation had not been fully implemented (Polius, pers. comm.) and therefore the details contained in this report reflect the administrative arrangements as legislated prior to 2001.

Table 3.2 Members of the PCB, St Lucia (June 2001)

Board member, position	Institution/profession
Mr Julius Polius, Chairman	Director Agricultural Services, MAFF
Mr Guy Mathurin, Secretary	Acting Senior Research Officer, Pest Control, MAFF
Dr Stephen King	GP, represents Ministry of Health
Mr Everton Ambrose	IICA, Secretariat of CGPC
Mr Tedburt Theobalds	Representative, Chamber of Commerce
Mr Henry Lubin	Produce Chemist, MAFF
Mr Lesmond Magloire	Occupational H&S, Ministry of Labour

There are various stages involved in the PCB's control of pesticide imports and they have been summarised in Figure 3.1. There are two requirements for import of an agro-chemical: firstly the agro-chemical must be registered by the PCB, secondly a license must be obtained from the PCB for each consignment (using Form A2). In order to register an agro-chemical, an agent submits an A1 form together with an original copy of the product Safety Sheet, a specimen label and any other relevant supporting data (results of trials, WHO data). The PCB meets monthly (or in accordance with the number of applications) to consider applications and make recommendations. From date of application, the PCB has up to 90 days to consider registration. Under the present system, there are no fees, an indefinite registration period and agro-chemicals can be banned at any time. A license is approved using Form A3. The list of registered agro-chemicals is published and updated annually in the St Lucia Gazette (the last edition was 25th September 1999; additional pesticides registered post-publication were *Spectrum* aerosol #99/018 and *Dursban* TC chlorpyrifos 42.86% #99/019). The 2001 Pesticides and Toxic Chemicals Control Act provides Schedule 5, which is a list of pesticides and toxic chemicals which can be imported/exported/manufactured under license from the PCB. Anyone can obtain a license, independent of the agent who has registered the agro-chemical. To obtain a license, the shipping agent completes a form noting the brand, volume of shipment and active ingredients. If the agro-chemical is registered, the import license is issued and there is no fee. The license is generally applied for once the shipment has arrived. The Secretary of the PCB maintains records of all registration and licensing for agro-chemicals. At present, these records are not entered on any database and annual summaries are calculated by hand for nematicides, insecticides, tickicides, rodenticides, molluscicides, fungicides and herbicides.

3.1.3.1 Pesticide and Toxic Chemicals Control Act, August 2001

As mentioned in the previous section, it is expected that the system for registration and licensing will change with the recent issuance of the Pesticides and Toxic Chemicals Control Act (August 2001). A copy of this legislation is annexed to this report as it represents the harmonised legislation agreed on by the PCBs of the OECS in February, 2000 (CGPC, 2000) and can be considered as a framework for regional legislation.

The new legislation covers pesticides and toxic chemicals for warfare and industry and could eventually incorporate fertilisers. Under this system, all pesticides will have to be registered (for a fee). Any consignment must have a license (fee based) and operators will need a licence for handling of agro-chemicals (PCB will provide training courses). Registration will last for three years and the registrant will be the sole agent for a certain period or else a fee will be imposed. The new legislation attempts to make sure that the importer is responsible for stewardship (providing emergency information, training, antidotes, etc). The legislation provides for import, export and manufacture of pesticides and also sets out those pesticides that are either prohibited (see Table 3.3) or issued subject to a license.

The Act also provides administrative arrangements for the PCB, which is to be established as a statutory board known as the Pesticides and Toxic Chemicals Control Board. Arrangements are cited as follows (paragraph 6, page 281 of the Act):

1. The Board should comprise not less than six, and not more than 12 persons appointed by the Minister:
 - a. At least 4 members shall be public officers from any one or more of the following Departments of Government:
 - i. Agriculture;
 - ii. Public health;
 - iii. Legal affairs;
 - iv. Trade;
 - v. Customs;
 - vi. Environment;
 - b. At least 2 members shall be persons representing private sector interests; and
 - c. Members appointed under subsection (a) shall exceed those appointed under subsection (b).
2. The Minister shall designate one of the members to serve as Chairperson of the Board. The Board shall choose a Vice-Chairperson and Secretary respectively, from its members.
3. Names of initial members, title and every change in membership should be published in the Gazette.

Table 3.3 Prohibited pesticides and toxic chemicals in St Lucia (2001)⁷

Aldicarb (Temik)
Azinphos-ethyl (Gusathion A)
Azinphos-methyl (Gusathion M. Guthion)
Demeton (Systox)
Dicrotophos (Bidrin)
Dimefox (Pestox XIV)
DNPC
EPNB
Fensulfothion (Dasanit, Terracur P)

⁷ Source: Pesticides and Toxic Chemicals Control Act, August 2001 (Schedule 4).

Fluometil (Lambrol)
Fonofos (Dyfonate)
Gophacide
HCH Lindane
Parathion
Parathion-methyl
Pentachlorophenol ACP
Phorate (Thimet)
Scjradam
Sulfotep
TEPP
Thionazin (Nemofos, Zinophos)
Zectran

3.1.4 Statistics Office

The Statistics Office receives a copy of the customs declaration forms (passed on by C&E) and enters data into their database. They analyse data by end use and by international tariff codes. They do not retain records of brand specific data.

3.1.5 WIBDECO

Through its regulation of agro-chemical usage in the banana industry, the Windward Islands Banana Development Corporation (WIBDECO) plays a leading role in determination of a substantial proportion of agro-chemicals coming into St Lucia. WIBDECO has a banana certification programme for growers for the export trade and advises them on the types of pesticides to use, as well as banning certain pesticides (see Table 3.4). The certification programme and code of practice are determined by the market buyers (predominantly UK supermarkets) and by the vendor (in terms of quality as an asset and a marketing tool). WIBDECO therefore has a strong influence on agro-chemical usage in St Lucia.

Table 3.4 WIBDECO approved chemicals for use on bananas – January 2001

Type	Commercial Name	Technical Name
Fungicides Post-Harvest	Fungaflor, Decozil	Imazalil
	Mertect 20S, Tecto B	Thiabendazole
Fungicides Pre-Harvest	Benlate, Pillarben	Benomyl
	Vectra BN	Bromuconazole
	Punch	Flusilazol
	Anvil	Hexaconazol
	Tilt	Propiconazole
	Sigma	Thiophanate-methyl
	Calixin	Tridemorph
	Petroleum oils	
Herbicides	Reglone	Diquat
	Fusilade	Fluazifopbutyl
	Basta	Glufosinate of Ammonium
	Round up	Glyphosate
	Touchdown	Glyphosate

Type	Commercial Name	Technical Name
	Rival	Glyphosate
	Gramoxone	Paraquat
	Talent	Paraquat/Asulam
	Gramocil	Paraquat/Diuron
Insecticides	Vertimic	Abamectin
	Dursban	Chloropifros
	Torque	Fenbutalin
	Regent	Fipronil
	Dicofol	Kelthane
	Actellic	Pirimiphos-methyl
	Malathion	
Nematicides	Rugby	Cadusafos
	Furadan	Carbofuran
	Mocap	Ethoprophos
	Vydate	Oxamyl
Others	Klerat	Brodifacoum
	Metaldehyde	Metacetaldehyde
	Mesurool	Methiocarb
	Alum	Monoaluminium sulfate
	Formalin, Formaldehyde	Trioxymethylene
	Agral	

3.1.6 Société Caraïbe d'Industrie Chimique (SCIC)

The majority of agro-chemicals until recently were either imported or produced by the SCIC as the company imported pesticides as well as raw materials for the production of fertiliser. The SCIC has recently closed and the main importer is now the St. Lucia Agriculturists' Association who distributes to the banana companies and farmers. Other importers include Renwick & Company and the St Lucia Agricultural Association, however the majority of agro-chemicals used in St Lucia are sold from the two SCIC depots (Vieux Fort in the south and Cul de Sac in the northwest). The St. Lucia Banana Corporation (SLBC) (see section 3.1.7) gives farmers credit slips for agro-chemicals which they can only use at the SCIC depots hence guaranteeing business there.

Purchases of agro-chemicals (type and volume) are made on recommendations by WIBDECO (based on maximisation of impact of agro-chemical on the crop). SCIC also has an agronomist who characterises soil types (analysis paid for by farmer) and recommends fertiliser type. Purchases of fertilisers are made on the basis of WIBDECO recommendations. Use of agro-chemicals in St Lucia has largely been influenced by the banana industry and, since the decrease in the banana prices in July 2000, sales of agro-chemicals have reportedly decreased by 70% (Palmer Martin, pers. comm.). Through its role as lead vendor of agro-chemicals to farmers, SCIC can influence the type of agro-chemicals imported.

3.1.7 St Lucia Banana Corporation

At the end of 2000, there were 3,997 registered shareholders in the SLBC. Registered farmers sell their products directly to SLBC. In exchange, they receive a

credit facility, assistance from SLBC extension officers and advice on soil conservation. The SLBC also produces a Banana Growers' Manual with advice on banana farming, agro-chemical application rates and treatment. All registered farmers purchase agro-chemicals directly from the depots of SCIC (Vieux Fort and Cul de Sac) using the credit facility offered by SLBC. SLBC therefore has a role in determining types of agro-chemicals imported and/or manufactured in St Lucia.

3.2 Manufacture procedures for pesticides and fertilisers in St Lucia

There is no manufacture of pesticides in St Lucia⁸. The principal supplier, importer and only manufacturer of fertilisers is SCIC (this company has since closed and ceased operations) (see Section 3.1.6). Other minor importers are Renwick & Company and the St Lucia Agricultural Association.

The 2001 Pesticides and Toxic Chemicals Control Act provides legislation for control of manufacture of pesticides and toxic chemicals, including production, export, licensing of premises and products, and inspections of premises.

3.3 Importation procedures for pesticides in Jamaica

The importation procedures in Jamaica were reviewed through a series of meetings in 2000 and 2001 with relevant institutions, including Customs & Excise (C&E) and the Pesticides Control Authority (PCA), which is the body responsible for pesticides' regulation within Jamaica. Based on information collected during meetings, an institutional framework for importation procedures has been developed (see Figure 3.2). Procedures and legislation are described below for each institution.

3.3.1 Customs & Excise

Customs & Excise do not handle any of the pesticide control legislation or paperwork and require each consignee to produce a permit in order to import consignments of agro-chemicals. Permits are approved and issued by the PCA. If a license is not produced, the agro-chemicals will be shipped back to the consignor.

3.3.2 The Pesticides Control Authority

3.3.2.1 Structure of the PCA

Pesticides regulation in Jamaica is overseen by the Pesticides Control Authority (PCA), a government body established in 1992 under Section 3 of the Pesticides Act, 1975. The Authority (the term properly refers to the Board of Directors and not to the staff) consists of up to fourteen persons appointed at the discretion of the Minister of Health, who appear to him to have ability and experience in the fields of plant protection, food storage, pesticide chemistry, public health, food chemistry, the pest control industry, and matters related thereto. The Minister also designates one member of the Authority as its Chairman and may revoke any membership or fill any vacancies at his discretion. The member's normal term of office shall not exceed three years but any member is eligible for re-appointment.

The PCA Members therefore refer to the Board members and not the staff. The Minister therefore can make changes to board fees but these are set usually by

⁸ Mathurin (pers. comm.); Polius (pers. comm.); Ambrose (pers. comm.).

Ministry of Finance guidelines. Staff salaries are also controlled through Ministry of Finance in keeping with Civil service guidelines.

The PCA has eight full-time staff as follows:

Registrar	1
Deputy Registrar	1
Executive Secretary	1
Financial Controller	1
Accountant	1
Inspectors	2
Driver	1

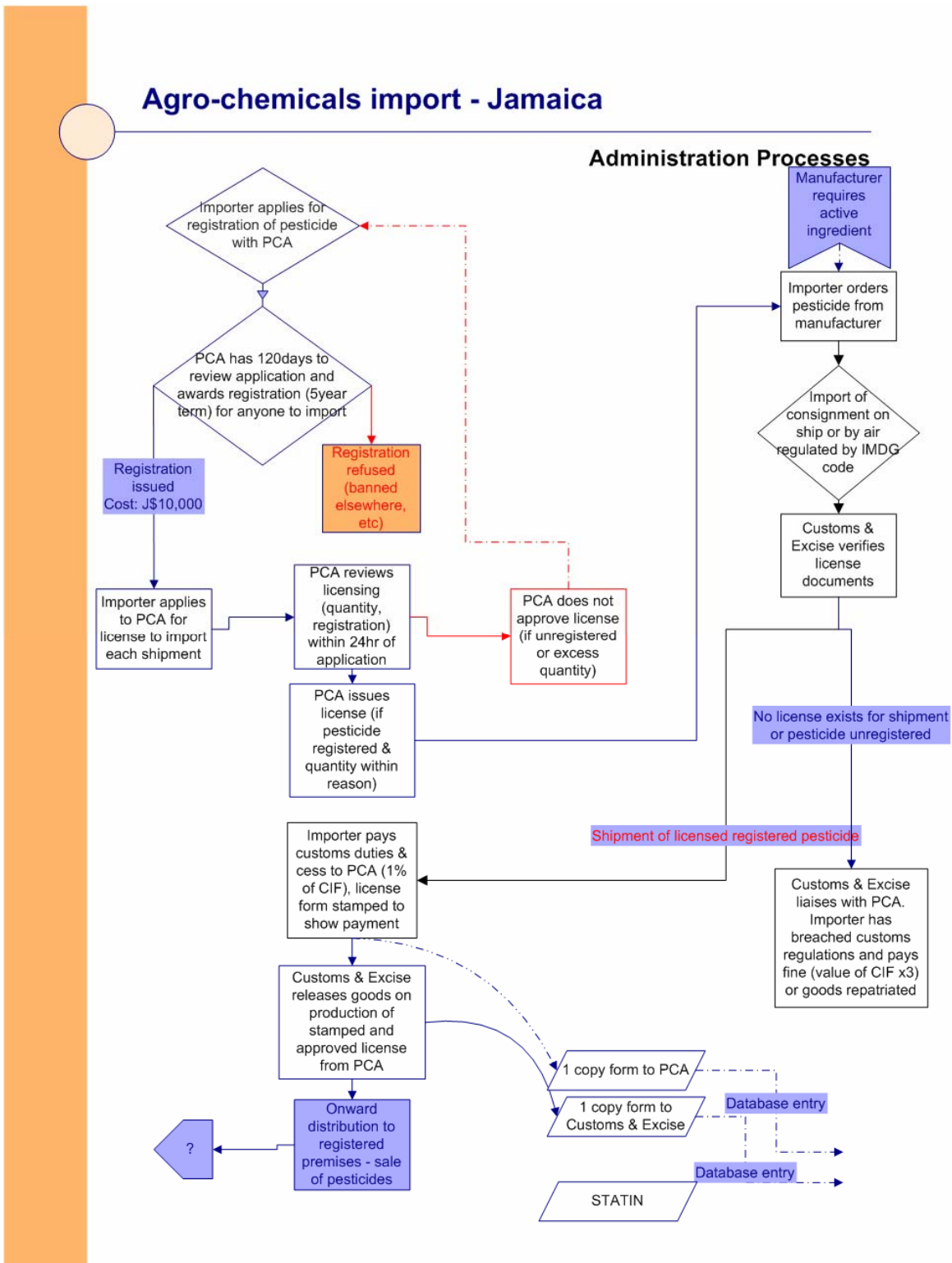


Figure 3.2 Flowchart to illustrate administrative arrangements for import of pesticides to Jamaica

Note: This figure was correct at the time of printing although fees are currently not collected at the present time. Furthermore, St Lucia is currently restructuring its administrative procedures according to its new Pesticides and Toxic Chemicals Control Act.

3.3.2.2 *Duties of the PCA*

The PCA has responsibility to implement legislation and to monitor and regulate the use of pesticides. Regulating the use of pesticides is currently undertaken through the certification of pesticide applicators both commercial and private (farmers) users (see section 3.3.4.3). A similar system exists to that of St Lucia in that pesticides must be registered and each import consignment licensed by the PCA. The regulations may also specify application rates and maximum acceptable environmental levels of residues and the breakdown products thereof for the health of humans and domestic animals. Regulations may also specify periods of use and the disposal of unused pesticides and used packaging. The Act prohibits erroneous or misleading labelling, packaging or advertising of any pesticide with respect to its character, value, quantity, composition, merit or safety.

In the original 1975 Act, any person found to be in breach of any provision of the Act or its Regulations is liable on summary conviction by a Resident Magistrate to a fine not exceeding \$500 or imprisonment at hard labour for a maximum of six months, or both fine and imprisonment. The amendment of 1996 places the maximum fine at \$50,000.

3.3.2.3 *The Registers kept by the PCA*

The Pesticides Act, 1975 requires the Registrar of the PCA to keep the following public registers:

- a) The Register of Pesticides, that contains names and particulars of all registered pesticides;
- b) The Register of Licensees, that contains details of every person licensed under the Act to manufacture or import registered pesticides;
- c) The Register of Authorized Persons and Premises, containing particulars of all persons authorized under the Act to sell restricted pesticides, and premises that have been approved for the sale of pesticides;
- d) The Register of Pest Control Operators containing particulars of any person licensed to do business as a pest control operator.

3.3.3 *Classes of pesticides*

The Pesticides Act, 1975 identifies fundamentally two classes of pesticides: those which are prohibited and those which may be registered and therefore approved for use under specified circumstances.

3.3.3.1 *Prohibited Pesticides*

The Second Schedule of the Act contains a list of all pesticides which are prohibited, and may not be imported, manufactured or used anywhere in Jamaica. The definition of a prohibited pesticide as stated in the Pesticides (Amendment) Act 1996 is "any pesticide of which the possible effects on the environment, plants, animals or human beings are considered by the Minister to be too dangerous to justify its use". This schedule first gazetted in 1975 along with the Act, names 20 chemicals or classes of chemicals. The 1999 amendment includes an additional thirty-two 32, for a total of 52 prohibited chemicals or classes of chemicals. The list of prohibited pesticides is contained in the Register of Pesticides (see Table 3.5).

Table 3.5 Prohibited pesticides in Jamaica⁹

Prohibited pesticides	
Aldrin	Ethylene Dichloride
Arsenates: lead, copper and calcium	Heptachlor
Arsenites: sodium and potassium	Hexachlorobenzene
Chlordane	Medinoterb Acetate
Chlorfenvinphos	All mercury compounds
Cyanides (inorganic)	Mevinphos (Phosdrin)
Cyhexetin	Mirex
DDT	Monocrotophos
Dieldrin	Pentachlorophenol
Dinoseb, Dinoseb Acetate	Red Squill
Dinoterb	Toxaphene
Disulfoton	White Arsenic
Endrin	White Phosphorus
Ethylene Dibromide	Zinc Phosphide

3.3.3.2 Registered Pesticides

There are three groups of registered pesticides: those listed as "approved", "restricted" or "minor use". Registered pesticides may be imported or manufactured locally. All pesticides to be imported or manufactured must already be in the Register of Pesticides.

3.3.3.3 Restricted Pesticides

The Third Schedule of the Pesticides Act, 1975 contains a list of 68 chemicals or classes of chemicals whose use is restricted. The amendment of 1999 provides a new list of some 162 chemicals or classes of restricted-use chemicals. Restricted chemicals are those which are determined to have impacts on human health or natural ecosystems such that the total annual quantities which enter the environment must be restricted. The PCA has set limits for Jamaica on the amount of restricted pesticides that they allow to be imported or manufactured in any given year. These limits are confidential, and are not published or made available to the public or to researchers. Regulation of sale of pesticides commenced recently and involved regulating the sale of restricted pesticides to certified applicators. Pesticides listed as restricted will only be sold to certified applicators. Those approved are sold to the public. The first phase of restricted sale will affect those listed as restricted and managed.

3.3.3.4 Minor use Pesticides

"Minor use" pesticides are chemicals not in common use, but are required by specialists. The premises of these specialists must be registered in the Register of Premises. They will apply for a license on a "Form 4", but the chemicals they import may not be resold or passed on to others. A product registered under "minor use" is limited to the registrant only, and any other prospective importer must also apply for registration under the "minor use" system.

"Minor use" pesticides may be used only in accordance with the conditions on their license, which could include specific times, locations, application rates, crops and pests on which it may be used. This provision was created to allow specialist producers (e.g. horticulturists) to access very small amounts of specific pesticides

⁹ Source: PCA (2001)

that have a very restricted use. These kinds of compounds are unlikely to be registered by large importers, because the small amounts involved do not make it economical for them to handle.

A registration under "minor use" is limited in quantity annually to 10kg of active ingredient or enough to be applied to five hectares (10 acres) of crop area (whichever is less) for agricultural pesticides. For public health pesticides, the limit is 2kg of active ingredient or 20kg of finished product (whichever is less). Once the ceiling for quantity is reached, any person wishing to seek importation of this pesticide must apply for and obtain registration for the product under the normal registration procedures for pesticides.

3.3.3.5 *Approved Pesticides*

The term "approved" pesticide is not defined in the act or regulations, but is frequently used in the Register of Pesticides to refer to those registered pesticides which are neither "restricted" nor "minor use". Looking at the Register of Pesticides, "approved" pesticides appear to be mostly for household and public health use (roach bait, insect sprays, rat bait, flea and tick killers) whether they fall into WHO Hazard Category Type II or Type IV. Some "approved" pesticides which are WHO Hazard Category Type II or Type IV are for use on bananas, citrus, coffee, mangoes, ornamentals, fruits and vegetables, yams, sugar cane and indoor plants. This author can certify that several of these products are available in supermarkets and other premises not likely to be in the Register of Premises. It would appear that the word "approved" means that the pesticides are considered safe enough to be sold over the counter with appropriate warnings and instructions on the labels, for use around humans and other animals.

The Minister of Health has the authority to amend these lists only after consultation with the Authority.

3.3.4 Procedures for obtaining pesticides

When someone wishes to import or manufacture a pesticide that is not listed in the Register of Pesticides, then the importer/manufacturer must first apply for registration of the pesticide. The PCA provides an application package that includes a list of all the information concerning the pesticide that the PCA will require to process the application. These include:

- Detailed literature with respect to the chemistry and composition of the product (including percentages of all ingredients), and precautions to be observed before, during and after use; an assay report may be required on a recent batch of the product (only required if the active ingredient is unregistered);
- A statement specifying the crops and pests to be covered, application rate and re-entry and pre-harvest periods where applicable;
- A copy of the Material Safety Data Sheet (MSDS) or Product Data Sheet (PDS);
- A duly authenticated legal certificate of free sale from the competent authority with whom the product is registered in the country of origin, and the conditions under which it may be sold in that country. Also a copy of the label stamped as being approved by that authority;
- Six sample copies of the label proposed to be used in Jamaica in connection with the new pesticide, along with samples of the packaging materials and inserts to be used for trade packages;

- A statement showing the countries in which the product is registered for free sale (other than the country of origin) and any country in which the product has been refused registration or free sale and the reasons for refusal;

3.3.4.1 *Registering a pesticide*

A J\$10,000 registration fee is required along with the completed forms. If the Authority requires additional information from the applicant they will be notified and given sixty days to provide that information. If the application is approved the applicant is recognised as custodian and issued with a certificate of registration which is valid for five years, and the pesticide is entered into the Register of Pesticides. Once the five year period is over, the product must be re-registered. If the agro-chemical is banned during the five-year period, the PCA then alerts the registration holder, however the PCA has discretion to ban the agro-chemical during the five-year period if it is banned internationally. A pesticide may be banned once attention is drawn to it due to a ban by other countries (and Prior Informed Consent (PIC) Procedures). Once the PCA becomes aware of a ban, they will find out the reason and act accordingly. The PCA also looks out for "exports-only" pesticides that are not registered in Country of Origin.

3.3.4.2 *Importing a pesticide*

Once a pesticide is registered, anyone (not only the person who paid the registration fee and went to the trouble of having it registered) can apply to the PCA for a license to import it, using "Form 4". Large importers and distributors can seek registration for a pesticide and then negotiate an exclusive dealership arrangement with the manufacturer.

"Form 4" requires information such as: importer's name and address, the product name, manufacturer, supplier, packet size and quantity to be imported. Completed forms are submitted to the PCA for approval, usually within 24 hours, and forms are approved and stamped by the PCA and the agent orders the shipment. New importers are required to undergo an inspection of their facilities in which the product will be stored and sold. If approved, their name will then be entered in the Register of Premises. If approval for importation is given, the importer will be issued with a License, and his name entered in the Register of Licensees. Once the goods arrive, the invoices and bill of lading (in duplicate) are submitted to the PCA, appropriate duties are paid and the PCA stamp the form, which is required for release of the shipment by C&E.

That license may only be used to import the quantity specified in the application or a lesser amount. A separate license will need to be obtained each time the pesticide is imported. The PCA charges a 1% fee on the total CIF for processing. A record of the total amount of all pesticides that are imported (and manufactured) is maintained by the PCA; this is what is used to guide the Authority in issuing licenses to limit the quantities of restricted and minor use chemicals entering Jamaica. If the Authority refuses an import application, the applicant will be informed in writing, including the reasons for refusal. The PCA publishes an Annual Report which details lists of registered agro-chemicals, active ingredients, use and consignee. Details of Annual Reports and the import/registration database (1994 – June 2000) are available on the PCA website.

For new importers and new pesticides, the PCA actually goes to the airport or docks and supervises the initial importation. The PCA does not usually supervise every subsequent importation. The guidelines for safety and packaging of pesticides for

international transportation are set by GIFAP (the trade association for the manufacturers of agrochemicals). The PCA is currently preparing its own guidelines for transport and handling of pesticides. The sealed packaging is cleared from the wharf unopened and taken to the importer's storage facility. All premises used for this kind of storage are inspected and entered in the Register of Premises.

3.3.4.3 *Pest control operations*

Persons who operate Pest Control businesses must be certified and their names entered in the Register of Pest Control Operators. They must complete and submit "Form 9". There are several categories of certificates and applicable fees that are dependent on the type of pest control operation, and the chemicals and method of use. These certificates will be valid for three years. The Authority must inspect and certify all premises to be used for storage of pesticides to be used in the operation, and these will then be entered in the Register of Premises. All Pest Control Operators and their servicemen and assistants must be certified under the Food Storage and Prevention of Infestation Act. All pest control applicators and servicemen employed by operators must be certified by the PCA. The fee for servicemen is \$600 while fees for applicators range from \$600 to \$4,000 depending on the category of application. Assistant servicemen must also be certified, for a fee of \$500. The licenses are valid for a period of two years from the date of issue, and the same fees are payable upon renewal.

The Authority reserves the right to suspend or cancel any license or certificate at any time or require the licensee to provide any additional information if required. Licenses may be renewed on application up to thirty days before the expiration of the license. The reasons for refusal or cancellation of licenses include the discovery of any false information that was provided in the application, if the licensee contravenes any of the terms or conditions of their license, or ceases to manufacture that pesticide.

A training programme for pest control operators was in fact initiated in 2001 (CGPC, 2002) and this is when the certification programme also started.

3.3.4.4 *Trade in pesticides*

Wholesalers or retailers who store pesticides for sale must have their premises inspected by the PCA and certified for that purpose, and if approved, entered in the Register of Premises. The names of the retailers themselves must be entered in the Register of Authorized Persons. Each premises should be inspected annually.

However there are several small scale retailers who are not registered and therefore are not inspected. Importers and distributors are:

- Not limited to the amount of any approved or restricted pesticide that they can sell to any single customer;
- Not required to determine whether persons who are purchasing pesticides are doing so for their own use or for resale;
- Not required to determine whether retailers to whom they sell are registered;
- Not required to report large purchases to the PCA.

At the present it cannot be said with absolute certainty that all those involved in importation and manufacture of pesticides are registered and monitored, so the PCA is not really in a position to determine the total volume/weight of every pesticide that enters the country. The system does not contain enough safeguards to ensure that all retailers are registered and therefore inspected and certified safe.

All dealers (wholesalers and retailers) must comply with the Safety Regulations outlined in the Drug and Poisons Act administered by the Jamaica Pharmacy Council. The regulations are primarily designed to regulate trade in pharmaceuticals, but does apply to pesticides since they are (by definition) poisons. The PCA is currently drafting regulations to require all dealers in pesticides to register and meet their inspection criteria. They hope to begin review of draft legislation in 2001. A Training Manual for the Safe Handling and Use of Pesticides is published by the PCA but retailers are not required to sell or distribute it to all users.

In the 1999 PCA Annual Report, a target is set for 2000 as follows:

"To plan licensing programme for retailers of restricted pesticides".

This suggests that so many years after the passage of the Pesticides Act, implementation is not complete.

3.3.4.5 *Inspection of premises used to store pesticides*

One of the mandates of the PCA under the Pesticides Act 1975 is the inspection of premises where pesticides are manufactured, stored, kept for sale or disposed of. Limited staffing has made inspections difficult, but the PCA reports that premises have been inspected annually since 1999. A detailed report on the results of these inspections is not available to the public, but according to the 1999 Annual Report of the PCA,

"in 1999, a total of 39 premises were inspected for proper and adequate storage conditions ... None of the inspected premises met the standards stipulated by the Authority."

However, the report continues, "improvement has been achieved through continuous dialogue and co-operation between the operators and the PCA".

To standardize the inspection process and to ensure that it is comprehensive, the PCA has prepared an eight-page checklist to guide their inspectors. Some of the subject headings of the checklist are:

- Location and building
- Warehouse management
- Occupational health, hygiene, safety and security
- Fire, explosion prevention and emergency planning
- Waste management disposal

3.3.4.6 *The end-user of pesticides*

The PCA does not require any member of the general public who purchases or uses pesticides to be registered or licensed or trained in any way. Consumers do not need to satisfy any conditions of use, storage or safety contained in the pesticides parent act or regulations.

However they are required to conform to the relevant provisions in the Drug and Poisons Act, a fact that is not well known.¹⁰ This act requires all users of poisons to take basic precautions, such as to ensure that poisons are stored in appropriate containers, with the correct labels, and are kept out of the reach of children under lock and key.

¹⁰ Espeut and Hay, 2002

These provisions are inadequate, and there is no reason why stronger provisions could not be included in the Pesticides Act. The Drug and Poisons Act primarily addresses medicaments and pharmaceuticals, and insect baits and sprays, usually held in homes in small quantities. The trade in pharmaceuticals is much more controlled than the trade in pesticides, so large quantities are not usually to be found in the average home. Agricultural and household pesticides are much more easily obtained, in much larger quantities, and there is little or no regulation of conduct at the household level.

3.4 Importation procedures for fertilisers in Jamaica

Currently there is no legislation designed specifically to regulate the importation and use of fertilisers in Jamaica. Certain chemical ingredients of most fertilisers are regulated under the Precursor Chemicals Act, 1999. This Act is designed to control and monitor the use of chemicals called Precursor Chemicals. Precursor Chemicals are defined in the Act as, "can be used in any of the chemical processes involved in the production, manufacture or preparation of narcotic drugs, psychotropic substances or substances having similar effect; and incorporates its molecular structure into the final product making it essential for those processes." This Act is administered by the Pharmaceutical Services Division of the Ministry of Health.

3.4.1 Pharmaceutical Services Division (PSD)

The powers, duties and functions of the PSD are prescribed in the Third Schedule of the Act, and are to:

- a) monitor and control any prescribed activity, this refers to the manufacture , import, sale, storage, transport of prescribed substances;
- b) issue permits and licences to persons involved in the prescribed activities and for import of export of these substances.
- c) advise and assist the Minister of Health on all matters generally related to policy with respect to specified chemical substances.
- d) promote public awareness of the possible illicit uses of specified chemicals.

3.4.1.1 Registers kept by the PSD

The Precursor Chemicals Act does not specify the registers that must be maintained by the Division, however all licenses or permit holders are required to keep a register containing the information set out in the Second Schedule of the Act. These registers are in turn subject to inspection by the Division and must be kept for a period of five years after the end of the calendar year of the date of the final entry. It is presumed that the Division would need to maintain records of all permits and licences that they issue.

3.4.1.2 Importation procedures

There are currently no import duties or taxes required for the importation of fertilisers. A permit is required from the Pharmaceutical Services Division of the Ministry of Health. In the exceptional circumstance where the components of the mixture intended to be used as a fertiliser contains a biological (usually microbial) component then a permit will also be required from the Natural Resources Conservation Authority (NRCA).

The individual or company must first obtain a licence to conduct a prescribed activity. A permit is required every time a fertiliser is to be imported or exported. A fee of \$200 is payable and an additional \$200 for every ten items. In addition to the completed application form and fees the Division may require that the form be accompanied by additional information about the product. This information includes brochures and information from the manufacturer or dealer of the fertiliser including proposed uses and any other information that the Division may request. A separate application is required in respect of each chemical substance to be imported or exported.

Where permits are required from the NRCA, a permit application must be completed. A completed Project Information Form and an application fee of \$1000 must accompany that application.

3.4.1.3 The end-users of fertilisers

As of 1995, there were 19 distributors and an island wide network of more than 200 dealers. These local dealers purchase from distributors (or they may be local branches of dealers). They transport in bulk to their local storage facilities from where they retail, usually to local small farmers.

3.5 Manufacture procedures for pesticides in Jamaica

Manufacture procedures were investigated by means of a series of meetings with the PCA and other relevant institutions, such as C&E, Agricultural Boards and the Rural Agricultural Development Authority (RADA) between November 2000 and June 2002. The information on manufacture procedures was compiled and illustrated by means of a flowchart (Figure 3.3), which was subsequently validated by cross check with the various institutions responsible for manufacture procedures.

Any person who wants to manufacture a pesticide in Jamaica must complete application "Form 5", and provide a \$7,500 application fee. "Form 5" requires information such as: manufacturer's name and address, the product name, composition (active and inert ingredients), detailed manufacturing process, and the packet size in which the pesticide will be sold. Also required is a copy of the Material Safety Data Sheet (MSDS) or Product Data Sheet (PDS), samples of the labelling and an assay report on a recent batch of the product. Completed forms are submitted to the PCA for approval. The Authority then requires him to provide any additional information within three months. All the manufacturing processes that have been licensed in Jamaica so far have utilized active ingredients that are imported; that active ingredient must also be registered before it can be imported. In addition to the requirements of the PCA, the labelling must conform to guidelines set by the Jamaica Bureau of Standards.

The factory itself should comply with the requirements and guidelines of The Factories Act. The Natural Resources Conservation Act addresses matters of effluent discharge, and the factory should comply with the provisions and guidelines of this act. The factory must also be inspected by the PCA. If approved, their name will then be entered in the Register of Premises. If the PCA issues the license to manufacture, it will be valid for five years and restricts the manufacturer to produce only that particular pesticide in that particular packaging. A separate license must be obtained for each chemical to be made. If the license is refused, the applicant will be informed in writing including the reasons for refusal.

According to the 1999 PCA Annual Report,

"A meeting was held on November 16 with local pesticide manufacturers and repackagers at which the Hon. John Junor, Minister of Health, established June 2000 as the final deadline for pesticide manufacturers including repackagers to obtain licenses. At the meeting, there were complaints from pesticide repackagers on the extent of the requirements for obtaining a license. As a result, the Minister instructed the PCA to review the requirements for obtaining a license to repackage a pesticide".

This hints at the fact that several manufacturers are not licensed.

Agro-chemicals manufacture - Jamaica

Administration Processes

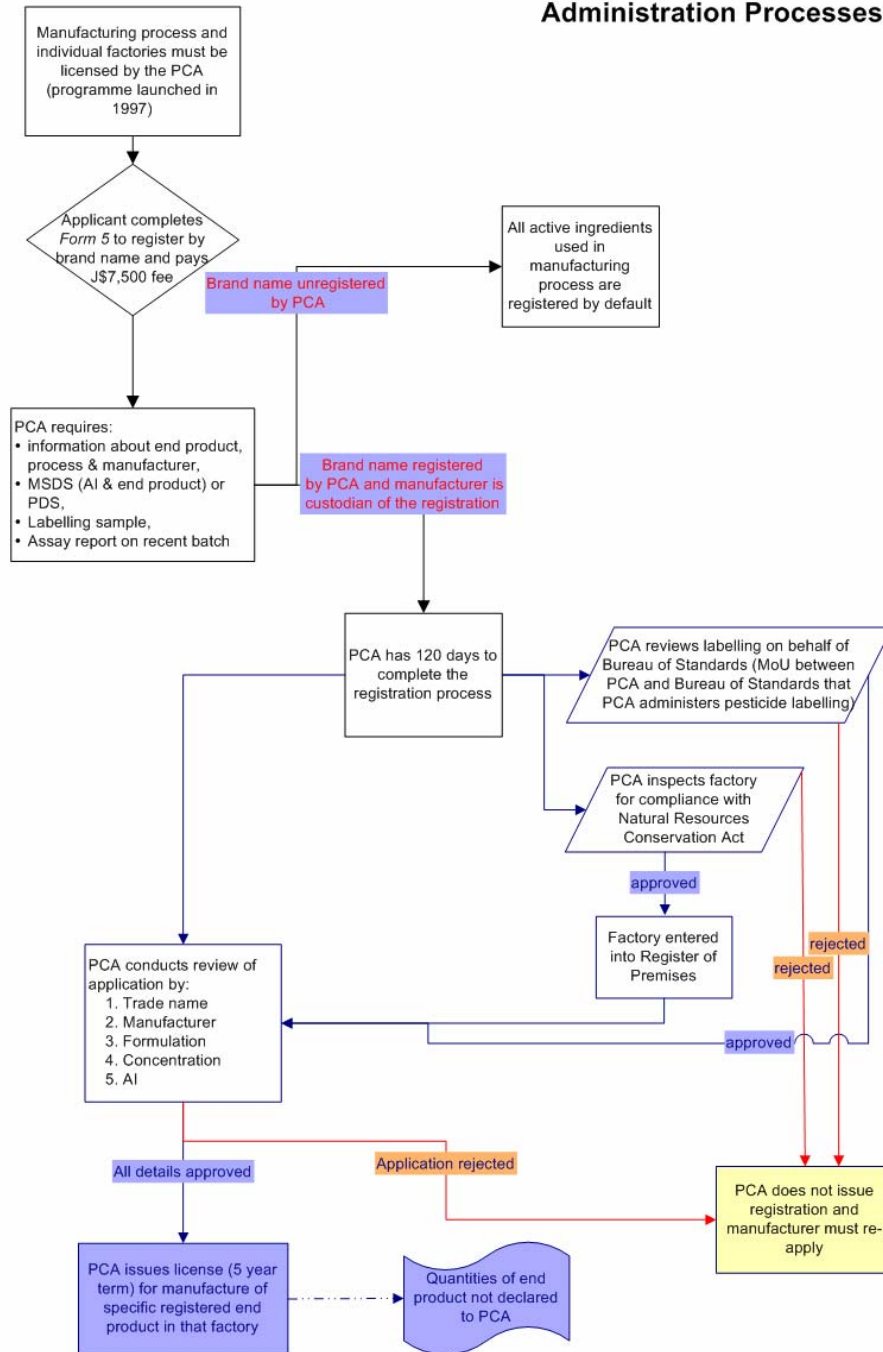


Figure 3.3 Flowchart to illustrate administrative arrangements for manufacture of pesticides in Jamaica.

3.6 Manufacture procedures for fertiliser in Jamaica

The inorganic fertiliser used by Jamaican Farmers is imported, mainly from Canada. There is one bulk fertiliser processing facility in Jamaica which imports stores and blends fertilisers. They have a capacity to process 100,000 tonnes per year but actually produce between 60,000 to 80,000 tonnes. They blend approximately 60% of the imported raw materials. The change in quantities of fertiliser produced by the processing facility may account for the huge inter-annual variation in imports of fertiliser to Jamaica (see Table 4.5 in Section 4.3.1).

4 QUANTIFICATION OF IMPORT AND MANUFACTURE OF AGRO-CHEMICALS

4.1 Regional situation

A comparison of pesticides imported to several Caribbean territories for the period 1996-1999 indicates that there is a considerable fluctuation in volumes of imports and there is no significant pattern amongst the different territories. Total imports of pesticides to five Caribbean countries are summarised in Table 4.1 and the figures show that there was a dramatic increase in the total pesticides imported in three of the four countries for which 1999 data were available. This increase continues until 1999 and then the trend reverses in 2000 with declines to levels closer to 1998 import figures.

A review of inter-annual change illustrates considerable flux in all countries for which data were available, in particular St Vincent and Grenadines and Grenada. These differences may be influenced by annual agricultural production due to economic factors (e.g. change in banana tariffs) or environmental factors (e.g. variations in rainfall and periods of drought) or may be influenced by the introduction or outbreak of a new pest or disease (e.g. pink mealy bug outbreak in St Kitts, 1997; and giant African snail outbreak in St Lucia, 2000).

Table 4.1 Total imports of pesticides into selected Caribbean countries (1996-2000)¹¹

Country	Total Pesticide Imports (kg)				
	1996	1997	1998	1999	2000 ¹²
Antigua & Barbuda			272,446	533,680	104,369
Dominica	574,200	499,323	410,496	4,783,153	608,722
St Vincent & Grenadine	679,365	1,480,189	783,703	2,109,236	
Grenada	114,945	65,891	150,538	76,475	68,983
Suriname	6,271,481	15,946,805	7,894,401		

The overall regional trend of increasing imports of pesticides is reflected in country data for St Lucia and Jamaica, as described in the next two sections.

4.2 St Lucia

Information about import and manufacture data was collected through a series of visits (November 2000, June 2001, November 2001, June 2002) to institutions responsible for imports and manufacture on the island. Data processing and management is highlighted on the flowchart to illustrate administrative arrangements (Figure 3.1).

4.2.1 Import data

Data were available for both imports of fertilisers and pesticides. Amongst the institutions responsible for agro-chemical imports, SLASPA does not hold import records and both C&E and STATIN collect import data through the automatic registration of shipping and air- freight consignments (in fact, copies of the C&E forms are regularly sent to STATIN for data management purposes). Although details

¹¹ Source: Dasgupta and Perue (2002)

¹² Source: CGPC (2001)

of products contained in each consignment are entered on the C&E forms, in both cases, permanent records for imports are categorised in accordance with international tariff codes¹³. The individual brand names or active ingredients of imports of fertilisers and pesticides are therefore not captured in databases managed by STATIN. Although only summary data were available for fertiliser imports, the PCB holds records for pesticide imports.

Table 4.2 Import of fertilisers to St Lucia (1981-2000)¹⁴

Year	Import quantity (mt)
2000	5300
1999	5300
1998	2160
1997	13647
1996	12995
1995	11000
1994	9000
1993	7000
1992	6500
1991	6500
1990	6757
1989	7380
1988	2600
1987	1700
1986	1700
1985	1878
1984	1736
1983	1418
1982	1613
1981	1076

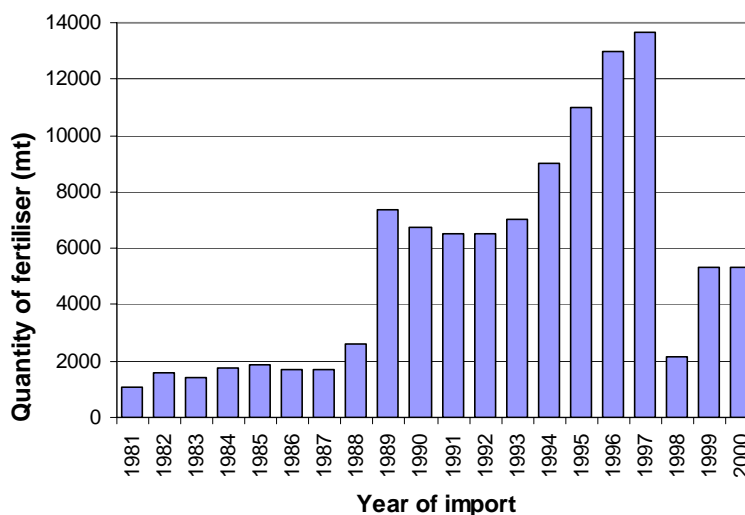


Figure 4.1 Import of fertilisers to St Lucia (1981-2000)

Data for quantities of fertilisers imported to St Lucia are recorded by STATIN and submitted to the FAO agricultural database. The imports of fertiliser have significantly changed during the past 20 years (Table 4.2 and Figure 4.1) and dipped enormously in 1998, probably due to the increase in production by SCIC. This suggestion is corroborated by data presented in the 1996 Agricultural Census (MAFF, 1996) which show an increase in number of holdings using fertiliser between 1986 and 1996. During this period, the number of holdings decreased, yet the number of holdings using fertiliser increased from 35 to 1638 (using lime), from 6215 to 7875 (using NPK) and from 1385 to 2424 (using sulphate of ammonia). It does not seem that organic manure and urea were used (or not recorded) in 1986, however a large number of households used organic manure in 1996 (1558) and a smaller number used urea (479).

With reference to pesticides, it is necessary for an importer, or their agent, to obtain a license from the PCB for the import of registered pesticides. The PCB issues licenses for all imports of registered pesticides and therefore holds records of all pesticides

¹³ For example,

51 = organic chemicals; 52 = inorganic chemicals; 56 = fertiliser, manufactured; 59 = chemical materials.

¹⁴ Source: FAO online database (2001) on www.fao.org/waicent/portal/statistics_en.

that are licensed for import. At the current time, most licenses are obtained once the consignment is en route and therefore license records provide an accurate representation of imports of pesticides. Data for all pesticide imports during 1999, 2000 and 2001 were obtained from the PCB Secretary (Mathurin, pers. comm.) in order to quantify imports of pesticides to St Lucia. The data also include non-agricultural use pesticides and in particular pesticides for household use and include rodenticides, molluscicides and tickicides which are shown separately in the table. It is important to note that these data include only registered pesticides. By default, it does not include data for pesticides brought into St Lucia illegally. The detailed active ingredients import data for St Lucia for the period 1999 through 2001 have been simplified by assuming that one litre of active ingredient is equal to one kilogram. Although this simplification does not allow for rigorous statistical analysis, it provides an overview of the quantities and volumes imported and the errors introduced are marginal enough to allow us to make simple conclusions.

Table 4.3 Summary of pesticide imports into St Lucia (1999-2001)¹⁵

Field of use	Import quantity (kg)		
	1999	2000	2001
Insecticide	299,919	238,445	571,846
Nematicide	187,384	68,532	36,730
Fungicide	171,710	11,896	6,410
Herbicide	281,079	69,613	80,988
Rodenticide	4,993	6,466	956
Molluscicide	825	0	159
Tickicide	86	70	68
Total	945,995	395,023	697,156

Pesticide data are first summarised by field of use (Table 4.3). Data show that there was a large decrease in pesticide imports between 1999 and 2000, in fact, with the exception of rodenticides, imports of all categories greatly decreased. It might appear that 1999 was an unusual year as imports in 2000 dropped significantly and import levels in 2001 increased again significantly. There also appears to have been a huge increase in imports between 2000 and 2001 for insecticides although there was a consistent decrease in many of the other categories from 1999 through to 2001.

It is important to mention that a lot of the household pesticides are imported in bulk (active ingredients) and then repackaged and formulated, which usually results in a bulkier package/container. These formulations are included in the totals and therefore the amounts of pesticides may be considerably higher than they would be if they were reported solely in active ingredients.

¹⁵ Source: PCB St Lucia (Mathurin, pers. comm.)

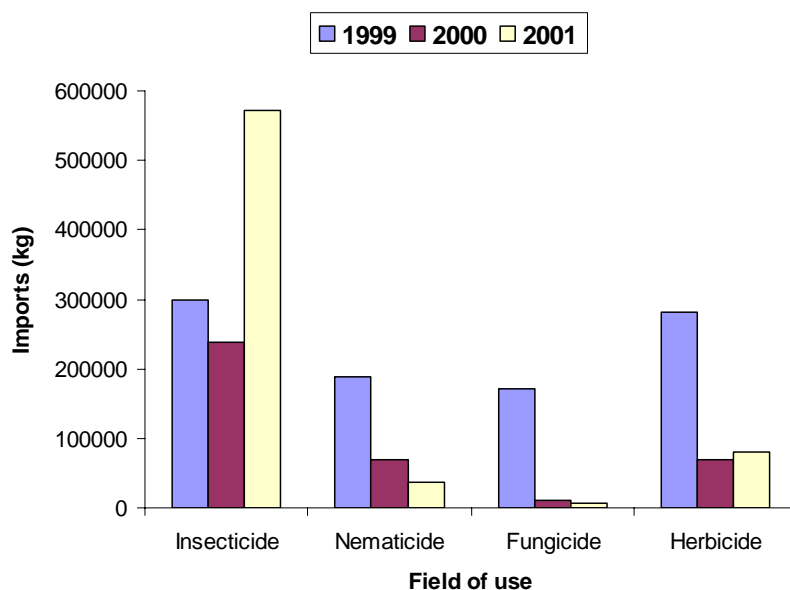


Figure 4.2 Summary of pesticide imports by field of use to St Lucia (1999-2001)

The variations in imports of pesticides over time are shown more clearly in Figure 4.2 where it is evident that the increases in pesticide imports between 2000 and 2001 are largely due to increases in insecticide use (almost double from 1999 to 2001) and less so by herbicides. A review of monthly figures shows an extremely high volume of imports of insecticides in October 2001 (representing almost 50% of the annual imports) and this may be a data entry error. This increase in insecticides may be due to an increased use of aerosols used for household insect control (especially mosquitoes).¹⁶

The fungicides consist mainly of those used for crown rot control on exported bananas and nematicides are also heavily utilised within the banana industry. The recent decrease in imports of both fungicides and nematicides (Figure 4.2) may be attributable to the decrease in banana production in St Lucia over recent years (from export value of US\$38.25 million in 1992 to US\$18.79million in 1997) (MAFF, 1998).

We have also looked at imports of different pesticides (by active ingredient and not by brand name) to ascertain patterns of import and types of pesticides used in St Lucia. The volumes of imports of selected agricultural use pesticides are detailed in

Table 4.4.

¹⁶ Source: PCB St Lucia (Mathurin, pers. comm.)

Table 4.4 Quantities of selected pesticides imported into St Lucia (1998-2000)¹⁷

Field of use	Active ingredient	Import quantity (kg)		
		1998	1999	2000
FUNGICIDE	Benomyl		5.9	6.0
	Copper Oxychloride	3.8	0.7	
	Copper Sulphate Pentahydrate	0.2	13.7	1.0
	Cupric Hydroxide		44.5	4373.8
	Hexaconazole	1.2	36.3	1.4
	Imazalil	1620.0	11932.0	2018.9
	Mancozeb	1651.8	138.9	45.2
	Metalaxyl	200.0		
	Propiconazole		682.5	
HERBICIDE	2,4-D Amine			89.7
	Asulam		1291.1	2512.5
	Diquat (Dibromide)	12	1216.8	21.6
	Diuron	1477.6	4666.8	1299.2
	Fluazifop-P-Butyl	12.8	3.0	6.0
	Glyphosate	2857.0		1557.7
	Glyphosate-Trimesium	3913.0	14517.1	9442.6
	Imazaquin			11.1
	Paraquat	8775.2	22556.2	7876.2
INSECTICIDE	Abamectin			0.2
	Amitraz			1.0
	Carbaryl	262.8	139.6	343.9
	Chlorpyrifos	0.3	34.5	281.3
	Cypermethrin	80.5	16.4	218.8
	Diazinon	87.8	199.3	233.7
	Endosulfan		4.5	
	Ethoprophos	6480.0	102085.2	3024.0
	Fenpropathrin			0.3
	Imidacloprid	1.3		
	Lambda-Cyhalothrin	10.9	6.8	11.9
	Malathion	90.5		82.1
	Methomyl		15.7	6.3
	Permethrin	2.7	0.1	299.0
Piperonyl Butoxide	0.9			

¹⁷ This table contains preliminary figures obtained from the PCB in St Lucia (Mathurin, pers. comm.) although they need to be reviewed.

Field of use	Active ingredient	Import quantity (kg)		
		1998	1999	2000
	Pirimiphos-Methyl	28.0	42.0	790.0
	Profenofos	805.2	163.8	136.8
NEMAT-ICIDE	Cadusafos		1080.0	180.0
	Carbofuran	9000.0	9280.3	4620.0
	Isazofos	7330.0	2220.0	
	Oxamyl	2744.4	1865.0	1922.5

When imports are summarised graphically, it is evident that the 1999 imports were dominated by the high volume of imports of the insecticide Ethoprophos¹⁸ (Figure 4.3). The graph was thus redrawn excluding Ethoprophos (Figure 4.4) for a more representative picture.

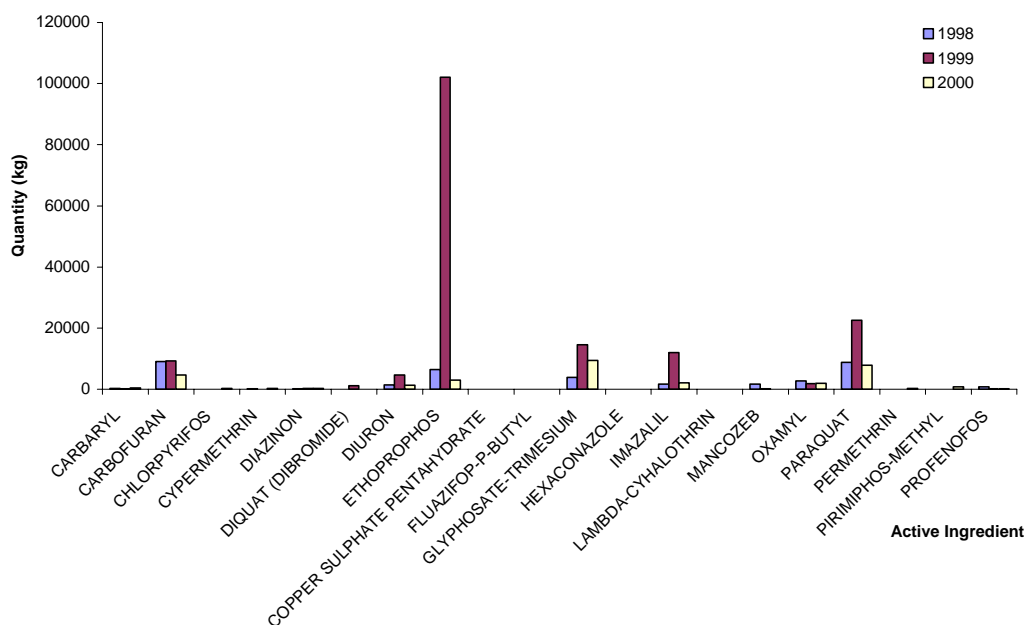


Figure 4.3 Imports of selected pesticides to St Lucia (1998-2000)

¹⁸ Since completion of this report, it has been found that the 1999 import figure for St Lucia is erroneous. A shipment of 9,720 kg of Mocap 10G (Ethoprop 10%) was recorded as 927,000kg by a member of the PCB and therefore the figures in Table 4.4 may need to be reviewed.

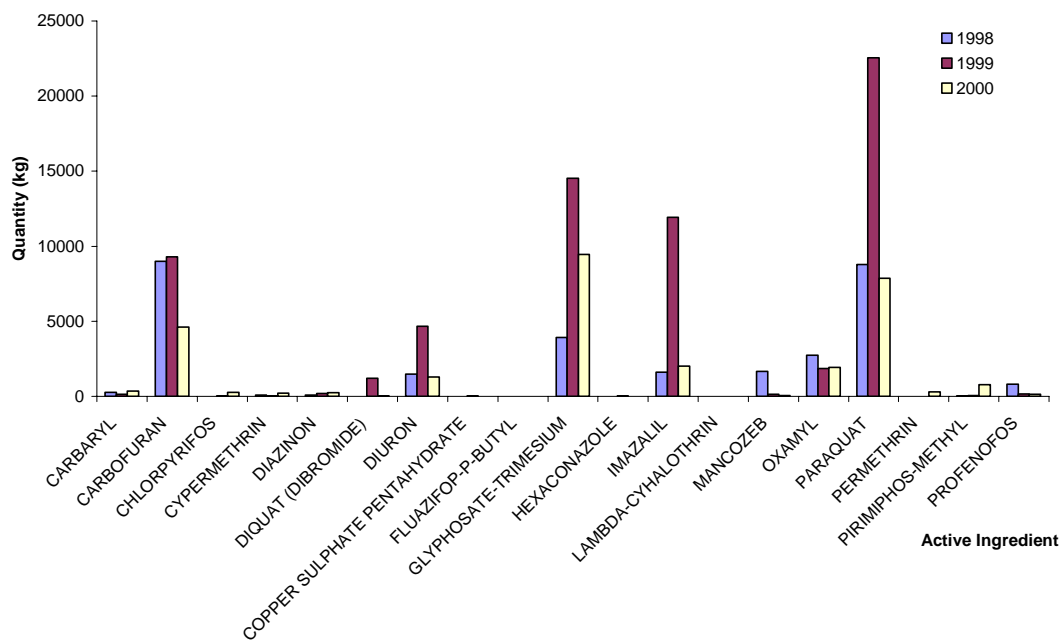


Figure 4.4 Imports of selected pesticides (excluding ethoprophos) to St Lucia (1998-2000)

4.2.2 Manufacture data

No figures for manufacture of fertilisers were available from SCIC although it was reported that sales had reduced by 70% in 2000 (Palmer Martin, pers. comm.). As previously stated, there is no production of pesticides in St Lucia.

4.3 Jamaica

4.3.1 Import and Manufacture data

Although there are currently no import duties or taxes required for the importation of fertilisers, a permit is required from the PSD of the Ministry of Health every time a fertiliser is to be imported or exported and therefore import data were available. The volume of fertilisers imported to Jamaica is recorded in the annual External Trade journals published by the Statistical Institute of Jamaica. A summary of data on fertilisers is shown in Table 4.5. It was impossible to obtain information on the volume of fertiliser that is manufactured in Jamaica and, as it is believed to be significant (Burton, pers. comm.), the data may be unrepresentative.

With respect to pesticides, the PCA issues licenses prior to import of any registered pesticide to Jamaica. License details are recorded on a Geref database and annual reports are published. The PCA kindly provided the authors with details of all imports between 1998 and 2000 (Chin Sue, pers. comm.).

The volume of fertilisers imported to Jamaica during the past 20 years is shown in Table 4.5 (Espeut and Hay, 2002). Imports have changed considerably as over 40,000kg of fertilisers were imported in 1980, imports then halved in the mid 1980s to early 1990s and then increased again during the 1990s, returning to levels higher than in 1980. This pattern suggests an increase in domestic production of fertiliser during the mid 1980s. Although the inorganic fertiliser used by Jamaican farmers is imported, mainly from Canada; there was only one company producing organic

fertiliser during this period and their operations have now ceased (Burton, pers. comm.), perhaps contributing to the recent increase in fertiliser import.

Table 4.5 Volume of fertilisers imported to Jamaica (1980-2000)

Fertiliser type	1980	1985	1990	1995	2000
	Kilos				
Nitrogen (N)	26,195,566	15,520,274	14,191,987	21,848,061	26,241,372
Phosphorus (P)	10,669,848	807,497	12,702	224,085	62,970
Potassium (K)	2,603,044	166,036	362,920	13,026,587	13,264,092
NPK	0	2,722	430,060	53,614	316,757
PK	0	0	0	68	0
NP	716,767	3,110,224	907	12,633,669	11,258,763
NK	0	41,736	12,702	0	0
Other	3,629	2,570,381	3,018,587	7,847,313	178,039
Total	40,188,854	22,218,870	18,029,866	55,633,397	51,321,993

There is one bulk fertiliser processing facility in Jamaica (run by the Antilles Chemical Company Ltd) importing raw materials and blending fertilisers on the island so that there is generally no advantage to importing the finished product. They have a capacity to process 100,000 tonnes per year but actually produce between 60,000 to 80,000 tonnes – greater than the volume of fertilisers imported to Jamaica in 2000. They blend approximately 60% of the imported active ingredients. Additionally, the sugar cane farmers have recently found a cheaper source so imported more fertilisers during the last few years and imports of fertilisers may therefore have increased temporarily. However, this product was dumped on the market at artificially low prices therefore imports would be expected to decrease again in the near future.

Table 4.6 Summary of pesticide imports into Jamaica (1997-2002)¹⁹

Field of use	Import quantity (kg)				
	1997	1998	1999-0	2000-1	2001-2
Fungicide	192,850	230,674	1,006,288	1,056,017	877,236
Herbicide	649,836	529,554	689,194	719,800	963,200
Insecticide	597,229	760,503	728,657	796,512	1,256,889
Nematicide ²⁰	-	-	208,840	158,455	93,563
Other	57,450	126,777	106,698	86,292	84,111
Total	1,497,365	1,647,508	2,739,678	2,817,076	3,274,998

¹⁹ Source: PCA (2002) Summary Annual Report April 2001 - March 2002. Paper presented to CGPC in St John's, Antigua. June 2002.

²⁰ Note: In 1997 and 1998, nematicide imports in Jamaica were grouped with insecticide imports and are therefore included in the 1997 and 1998 figures for insecticides.

It is important to mention that a lot of the household pesticides are imported in bulk (active ingredients) and then repackaged and formulated, which usually results in a bulkier package/container. These formulations are included in the totals and therefore the amounts of pesticides may be considerably higher than they would be if they were reported in solely in active ingredients.

As shown on Table 4.6 and Figure 4.5, there has been a marked increase in total imports of pesticides (all types of pesticides not only agro-chemicals); from a total of almost 1500 metric tonnes per year in 1997 to approximately 3300 metric tonnes in 2001-2. Recent data shows that 57 % of the total pesticides imported into the country are for the agricultural sector.²¹ Insecticides are clearly the most important type of pesticide, accounting for 35% of the total average imports during the period, followed by fungicides (28%) and herbicides (30%). This is largely due to the fact that many of the insecticides are household pesticides which are greatly used in Jamaica. Imports of fungicides increased in 1999-0 and 2000-1 and decreased in 2001-2 and the increase may have been due to the post El Nino increased rainfall and the corresponding increase in fungal diseases.

It should also be noted that nematicides were recorded as insecticides prior to 1999 and the change in classification is noticeable by the dip in insecticides imported in 1999-0. At the same time, the reporting year changed from calendar year to financial year (April-May) in 1999 so data for January-March 1999 are not included in the dataset.

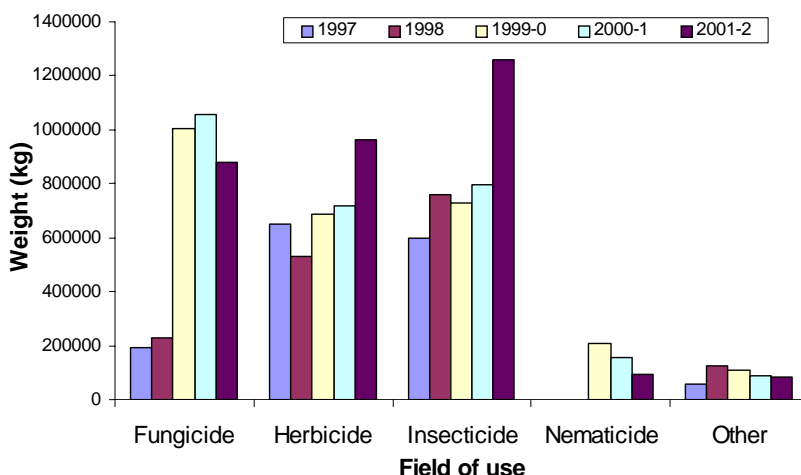


Figure 4.5 Summary of pesticides imported to Jamaica by field of use (1997-2002)²²

Quantities of agricultural pesticides (by active ingredient) imported during this period are shown in Table 4.7. By looking closely at the figures in this table, and the corresponding graph (Figure 4.6), it is possible to isolate the pesticides which contributed most to the increase in imports in Jamaica. Thus, for the three year period 1998-2000, the following pesticides were the largest contributors to the total quantity of pesticides imported: mancozeb, 2,4-D amine, diuron, glyphosate, paraquat, and terbutryn. The statistics do not suggest that mancozeb is important to

²¹ Source: PCA (2003) Summary Annual Report April 2002 - March 2003. Paper presented to CGPC in St Vincent & Grenadines. June 2003.

²² Source: PCA (2002) Summary Annual Report April 2001 - March 2002. Paper presented to CGPC in St John's, Antigua. June 2002.

explaining the dramatic increase in 1999 imports, since the quantity of mancozeb imported in 1999 did not increase significantly over that imported in 1998, nor did it decrease significantly in 2000 as was the case with the other pesticides named (except for terbutryn which increased further in 2000). For the other pesticides, the quantities imported increased over the previous year as follows: 2,4-D amine (91%), diuron (41%), glyphosate (253%), paraquat (106%), terbutryn (145%). These latter pesticides are all herbicides. An increase in acreage planted, replanting of cash crops, or heavy rains could all have created this demand for herbicides.

Table 4.7 Quantities of agricultural pesticides imported into Jamaica (1998-2000)²³

Field of Use	Active Ingredient	Import Quantity (kg)		
		1998	1999	2000
FUNGICIDE	Benomyl	1302.5	1802.5	1076.6
	Carbendazim	7353.4	5404.7	12813.1
	Chlorothalonil	8732.4	11687.8	6048.2
	Copper Hydroxide	2038.4	502.6	26152.5
	Copper Sulphate Pentahydrate			1.3
	Diuron	36695.8	51843.9	35106.5
	Fosetyl Al	1680.0	288.0	
	Hexaconazole	16.2	260.0	112.1
	Imazalil	1153.8	559.0	596.3
	Mancozeb	92001.9	95661.0	94981.4
	Maneb	77.8	80.0	
	Metalaxyl	266.4	480.0	234.1
	Propiconazole	1511.3	1372.5	715.0
	Zineb		80.0	
HERBICIDE	2,4-D Amine	34456.5	65705.1	48407.9
	Ametryn	22889.0	16886.4	15126.4
	Asulam	8400.0	10640.0	11200.0
	Atrazine	4992.0	6345.9	1552.0
	Bromacil	1177.2	940.4	470.4
	Diquat (Dibromide)	1432.0	3750.4	2921.6
	Fluazifop-Butyl	455.5	1705.5	405.0
	Glyphosate	23091.5	81622.4	57843.4
	Glyphosate-Trimesium	6846.7	6007.7	7407.4
	Hexazinone	723.7	851.5	851.7
	Imazaquin	5.0	0.1	
	loxynil	1680.0	3260.0	1920.0
	Linuron	594.5	1360.5	726.0

²³ Source: PCA pesticide registration Geref database (Chin Sue, pers. comm)

Field of Use	Active Ingredient	Import Quantity (kg)		
		1998	1999	2000
	Metolachlor	460.8		
HERBICIDE	Metsulfuron		2.2	1.1
	MSMA (Sodium Hydrogen Methylarsonate)	274.8	2040.0	4080.0
	Paraquat	50243.3	103557.7	76339.7
	Sethoxydim	250.0	250.0	250.0
	Terbutylazine	1836.0	408.0	1224.0
	Terbutryn	24120.0	59040.0	73180.0
INSECTICIDE	Abamectin	5.7	4.9	3.2
	Amitraz	222.6	331.0	989.0
	Carbaryl	10209.2	14289.3	14252.8
	Chlorpyrifos	3704.7	3474.8	4295.0
	Cypermethrin	977.2	2505.0	2069.3
	Cyromazine			15.0
	Diazinon	8465.8	10235.5	9705.4
	Endosulfan	2800.0	2100.0	1400.0
	Fenpropathrin	100.0		200.0
	Imidacloprid	78.3	39.6	
	Lambda-Cyhalothrin	229.1	245.4	504.3
	Malathion	6412.5	9975.0	12725.5
	Methomyl	2209.1	1850.4	2263.8
	N-Octyl Bicycloheptene Dicarboximide	1.0	1.1	9.8
	Permethrin	1304.4	597.5	1405.3
	Piperonyl Butoxide	1316.4	2538.8	1359.8
	Pirimiphos-Methyl	648.0	972.0	324.0
Profenofos	2447.7	2405.4	3605.3	
NEMATOCIDE	Cadusafos	5832.0	10368.0	2916.0
	Carbofuran	3600.0	7400.0	9600.0
	Ethoprofos	154.5	1296.0	864.0
	Isazofos	1237.5	112.5	4882.5
	Oxamyl	3779.0	4360.3	872.3
PLANT GROWTH REGULATOR	Chlormequat Chloride			0.4
	Ethyl 1-Naphthalene Acetate			9.2
	Mepiquat Chloride	5.0		
	Paclobutrazol			0.1

Following on from the detailed data presented in Table 4.7, it was reported that a total of 1,816,623kg of agricultural pesticide products (representing 56% of the total

pesticide imports) were imported during the 2000-1 year (annual reporting year changed to April-March) (CGPC, 2001). Household pesticide products (mainly insecticides) were the next largest group of pesticide products with 1,093,706kg or 34% imported. Raw material or technical grade products used for the manufacture and formulation of pesticide product locally formed the third largest category with the importation of 239,205kg or 7% of the products imported. It is thus clear that agricultural use pesticides remain the dominant field of use and continue to increase in quantity each year.

Agro-chemicals in St Lucia and Jamaica

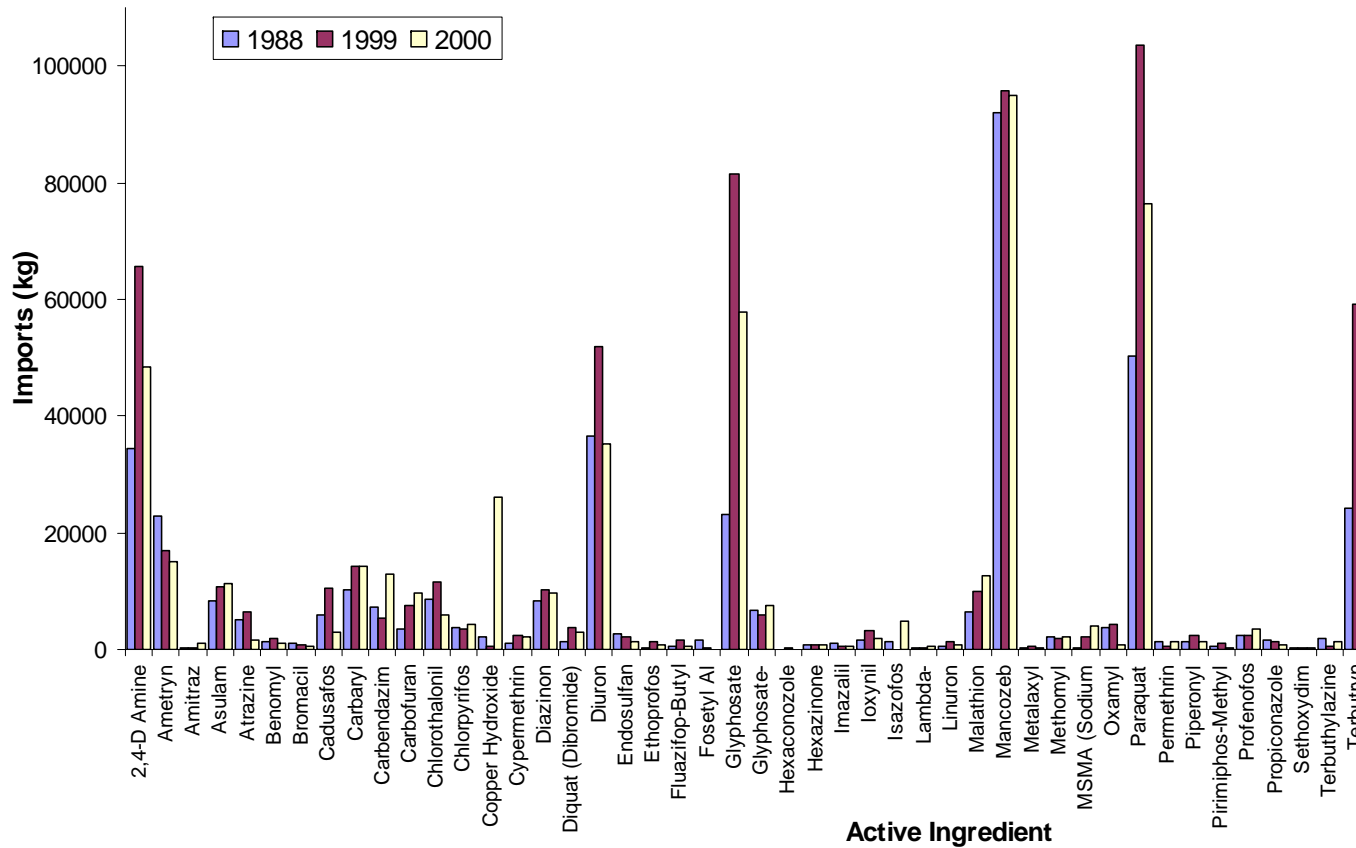


Figure 4.6 Imports of selected pesticides to Jamaica (1998-2000)²⁴

²⁴ Source: PCA (Chin Sue, pers. comm.). Note that pesticides with imports <200kg in a year were excluded from the graph but are included in the full dataset on Table 4.7.

Finally, in order to give an overview of the trend of imports of pesticides to Jamaica, summary data from the past five years have been presented (Figure 4.6). In order of importance, the predominant pesticides that were imported were paraquat, mancozeb, glyphosate, terbutryn, 2-D amine, diuron, copper hydroxide, ametryn and carbaryl. There was an increase in the use of paraquat, mancozeb and diuron after 1998. Increased use of the herbicides and fungicides may be related to increased rainfall in the late 1990s following the end of El Nino and a corresponding increase in weed growth and fungal diseases, such as coffee berry borer and banana sigatoka disease.

4.3.2 Manufacture data

The PCA issues licenses to factories to manufacture pesticides but does not monitor the quantities of pesticides that are either sold on island or exported. Equally, there is no monitoring of raw materials imported for pesticide manufacture. It was not possible to find information pertaining to fertiliser manufacture.

4.4 Comparison of agro-chemical import and manufacture in St Lucia and Jamaica

4.4.1 Findings

A survey of the quantities of agro-chemicals imported into Jamaica and St Lucia during the period of 1999-2001 illustrates the urgency and importance of consideration of the fate of agro-chemicals in the environment, particularly with regard to pesticides. Long term trends indicate that total pesticide use is increasing in both countries, and that agricultural pesticides form a large proportion of the pesticides in use. This section compares the figures for both countries, although it is important to note that data was recorded in Jamaica according to the calendar year in 1997 and 1998, to being recorded according to the financial year (April-May) from 1999-0, and therefore comparisons with St Lucia are perhaps not completely exact.

In Jamaica, recent data shows that 57 % of the total pesticides imported into the country are for the agricultural sector.²⁵ There has been a marked increase in total imports of pesticides from a total of almost 2700 tonnes per year in 1999 to approximately 3300 tonnes in 2001-2. The quantity of pesticides that are manufactured in Jamaica is unknown but it is apparently increasing due to an increase in licenses (Chin Sue, pers. comm.), suggesting that the total quantity of pesticides in use may still also be increasing.

Imports of pesticides to St Lucia also fluctuated substantially during the same period of research, from 945,995kg in 1999 decreasing to 395,023kg in 1999, and increasing back in 2001 with imports of 697,156 kg (Table 4.3). The high value in 1999 is largely due to high imports of the insecticide Ethoprophos (102,085kg) and, as this pesticide was not imported in 1998 or 2000, it is possible that this record is erroneous, however the quantity of imports were much larger in 2001 (in particular insecticides) so perhaps this record is true. In any event, the huge increase in the use of insecticides (to a level similar to the insecticides imported to Jamaica in 1997) is of great concern.

²⁵ Source: PCA (2003) Summary Annual Report April 2002 - March 2003. Paper presented to CGPC in St Vincent & Grenadines. June 2003.

Comparative graphs for 1999 and 2001/2 imports (2001 for St Lucia) are shown below to illustrate both the large increase in volume of imports to St Lucia and Jamaica, as well as the proportional increase in St Lucian use of pesticides compared with Jamaica, in particular with insecticides and, to a lesser extent, herbicides.

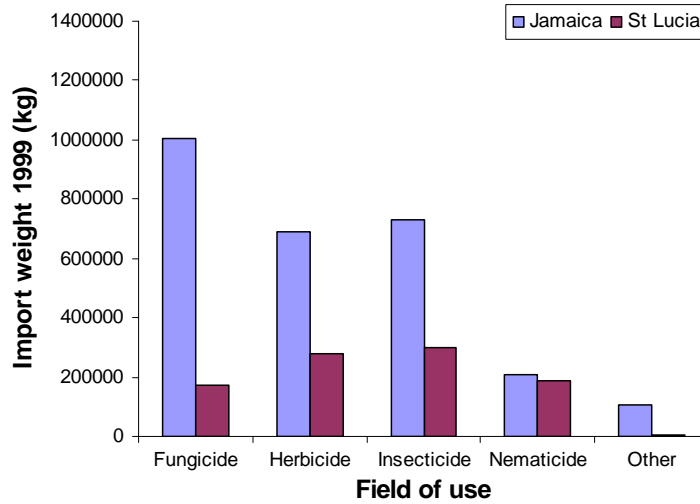


Figure 4.7 Comparison of pesticides imported to Jamaica and St Lucia in 1999

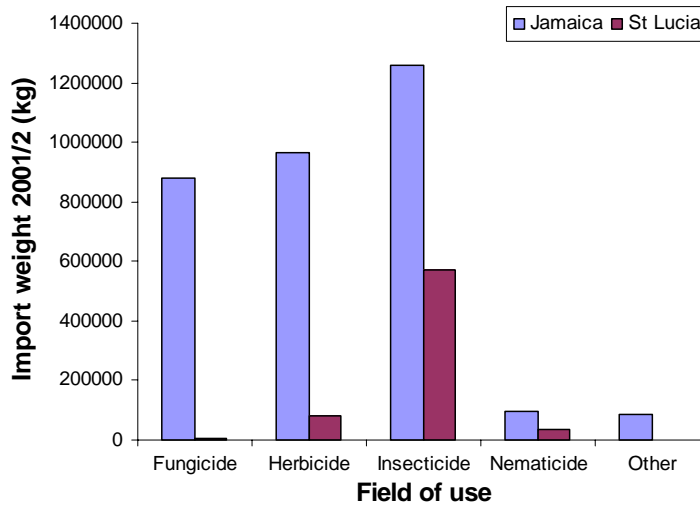


Figure 4.8 Comparison of pesticides imported to Jamaica and St Lucia in 2001/2

4.4.2 Discussion

The findings from the survey of agro-chemical use confirm the belief of many members of the agricultural industry and environmental watch groups throughout the Caribbean, that increasing quantities of pesticides, and agro-chemicals in general, are being used in the Caribbean, both within St Lucia and Jamaica, as well as in other countries cited in the report. It is not easy to explain definitively why this increase occurred.

Data from STATIN Jamaica (1996) indicate that there is a total of 407,434ha of land available for farming in a total of 187,791 holdings or farming units, including landless farmers. Data from the Planning and Statistical Unit of MAFF St Lucia (1996) report that there was a total area available for farming of 51,323 acres (20,786ha) with 13,366 holdings or farming units and cultivated land representing 76% of 38,999 acres (15,795ha). These data indicate that the land available for farming in St Lucia is 0.05% of the land available in Jamaica and that the number of holdings in St Lucia is 7% the number of holdings in Jamaica. With these data in mind, it is possible that agro-chemical use in St Lucia could be 0.05% that used in Jamaica. The quantification shows otherwise and, in fact, agro-chemical imports in St Lucia (697mt) in 2001 amounted to over 20% of the volume imported (3275mt) to Jamaica in 2001/2 (CGPC, 2002).

In St Lucia, a large proportion of the pesticide imports are used to protect bananas (still their main export crop) rather than sugarcane (Jamaica's main export crop). The largest increase by far was in the imports of the nematicide ethoprophos (1475% between 1998 and 1999). The quantity of ethoprophos (102,085kg) imported in 1999 was greater than the total quantity of all pesticides imported into St Lucia in 1998 (50,089kg) and in 2000 (50,605 kg). The ethoprophos data was excluded in a second graph in this section so that the other pesticides which also contributed to the spike could be more easily identified. Imports of carbofuran, another nematicide, did not increase significantly over 1998 in 1999 (3%), but remained high, decreasing by 94% of the 1998 value in 2000. Imports of imazalil, used in fungicidal formulations, increased by 636% and was the fifth largest contributor to the spike. Imports of herbicides also increased significantly and contributed to the spike: diuron (216%), glyphosate-trimesium (271%) and paraquat (157%).

What this data suggests is that St Lucia, and perhaps the other banana-growing Caribbean territories (for which we have no detailed data but the regional data in Table 4.1 for other Windward Islands such as Dominica and St Vincent and the Grenadines imply a similar situation), had to battle with increased nematode infestation and weeds in 1999. Additional data is needed in order to make more definitive explanations. Besides increased nematode and weed infestation, generally speaking, there are several as yet unmentioned possible reasons for dramatic increases in agro-chemical imports:

- **Changes in legislative arrangements** - amendments to legislation in Jamaica in 1996 and 1999 have resulted in an increased number of controlled pesticides which therefore increases the number of imports of registered pesticides.

Table 4.8 Number of pesticide registrations and licenses in St Lucia (1992-2002)²⁶

Period	New registration	Number license
July 92 – June 94	23	125
July 96 – May 97	47	225
June 97 – May 98	11	230
June 98 – May 99	19	365
June 00 – May 01	8	486
June 01 – May 02	15	564

The number of registered pesticides have increased in both St Lucia and Jamaica during recent years (see Table 4.8 and this means that the pesticides monitored and recorded by the PCB and PCA have increased therefore resulting in an apparent increase in pesticide imports.

- **Changes in recording** – administrative changes will affect quantification. One such example is changes in classification, e.g. nematicides used to be classed as insecticides by the PCA prior to 1999 when they were placed in their individual category.
- **Dumped agrochemicals** will temporarily reduce import figures. For example, dumping of fertilisers in Jamaica from the Dominican Republic in 2000-2001 affected prices of fertilisers and an associated change in import figures (as described previously).
- **Changes in incidence and type of pest** – a concerted drive to eradicate a particular pest will cause increased imports or manufacture of pesticides. For example, there are currently increased efforts underway in Jamaica to eradicate screw-worm (Dasgupta and Perue, 2002). Other prevalent pests include the giant African snail found in St Lucia in 2000 (CIPMNET, 2002) and the pink mealy bug found in the Windward Islands in 1997 (CIPMNET, 2002) - a parasitic wasp was found to be a partially effective bio-control but insecticides were also imported for controls. Various factors are responsible for change in pests and diseases, including variation in climate between Jamaica and St Lucia (responsible for difference in types of pesticides imported, e.g. coffee borer disease in Jamaica whereas no coffee grown commercially in St Lucia) and efficiency of quarantine at C&E.
- **Changes in crop type** will naturally influence agro-chemical imports and manufacture. Banana exports from St Lucia accounted for over 90% of agricultural exports in 1996 (MAFF, 1996) so that bananas accounted for a high proportion of agro-chemicals used in St Lucia. The recent decrease in import of fungicides (Figure 4.2) may be attributable to the decrease in banana production in St Lucia over recent years (from export value of US\$38.25 million in 1992 to US\$18.79million in 1997) (MAFF, 1998).
- **Changes in agricultural practice** in St Lucia have also occurred as a result of the St Lucian government's agricultural diversification programme to improve the general performance of the country's agricultural sector and reduce its dependence on bananas. Within this programme, the Government initiated the Programme for restoration of the viability within the banana-based agricultural sector. It has targeted non traditional fruits and vegetables which has now begun to impact on export earnings. In fact export earnings for breadfruit, hot pepper, plantain, grapefruit, ginger and orange increased considerably between 1993 and 1996, although many exports decreased in 1997 (MAFF, 1998). On the other

²⁶ Source: Proceedings CGPC (CGPC, 1994, 1997, 1998, 1999, 2001, 2002).

hand, few farmers have moved out of areas deemed unsuitable for banana cultivation (slopes greater than 30°) and when they have changed crop type, the new crop is often as unsuited for the land. This means that the problem of soil loss is still of major concern.

Agricultural exports from Jamaica far exceeded those of St Lucia during the period research. In Jamaica, export values for agricultural produce decreased from \$321.09million in 1997 to \$296.17million in 1999 (Ministry of Agriculture, 2003) and the five most important export crops were sugar cane, bananas, coffee, citrus fruits and cocoa. At a 1998 value of US\$22,349million (STATIN, 1998), Jamaican bananas alone valued more than the export value of St Lucian bananas (which represent over 90% of their agricultural exports) which were worth compared to US\$18.79million in 1997 (MAFF, 1998). After comparison of agricultural export differences, the fact that the insecticides imported to St Lucia in 2001 amounted to >50% of the quantity of insecticides imported to Jamaica is alarming.

5 SUMMARY AND RECOMMENDATIONS

5.1 Possible improvements to administrative and legal systems for agro-chemicals

This review and comparison of the administrative and legal systems for agro-chemicals in St Lucia and Jamaica have revealed various possible improvements at national levels. Based on this review, recommendations that are both specific to each country, as well as generic to the region are described below (see also Espeut and Hay, 2002).

5.1.1 General Recommendations

5.1.1.1 *General*

- Conduct an institutional analysis and evaluation of the capacity and resource needs of PCBs and other relevant executing agencies (e.g. extension services, monitoring and research agencies, medical laboratories) throughout the wider Caribbean. Duplication of effort should be rationalised.
- The PCBs should include dedicated full time staff to administer and implement national legislation relating to agro-chemicals. The composition of the Board of Directors should include representation from the private sector and persons with experience in ecological issues and the fate of agro-chemicals in the environment.
- Investigate what must be covered at a national level and what can be achieved regionally to avoid duplication of effort and cost (e.g. training; communications and promotional material; promotion of harmonised legislation).
- Sustainable financing and cost recovery mechanisms must be investigated, and where necessary novel and creative means found, to develop capacity, and to fulfill all the functions of the various institutions involved in all aspects of agro-chemical management including administration / funding of PCBs (e.g. via a registration and licensing system; penalty schemes). External sources of funding must be explored and fully utilised.
- The greater regulation of the sale of pesticides to end-users and their responsibilities for them should be explored.
- More emphasis should be placed on enforcement and adequate provision made for inspectors to undertake this.
- Training/awareness raising of Port Authority and Customs and Excise officers is needed in respect of the register of permitted and banned substances.

5.1.1.2 *Legislation*

- The Annex IV on Agricultural Non-Point Sources of Pollution of the LBS Protocol to the Cartagena Convention, should be widely ratified and adopted throughout the Caribbean.
- Requirements under the LBS Protocol for a national plan of action (NPA) should be developed by each State throughout the wider Caribbean. Other States can learn from model plans currently being developed for Jamaica and St Lucia.

- Model plans for Jamaica and St. Lucia should incorporate requirements specified under Annex IV for pesticides and fertilisers, IPM / IMPP (as appropriate), and the recommendations of this project. All relevant stakeholders including the PCA/PCB should be consulted in drafting the plan.
- Legal advice is needed in the further development of legislation, its incorporation into national laws, implementation and enforcement.
- Training/awareness raising of the public and staff of implementing agencies of the requirements of the legislation is needed.

5.1.1.3 *Harmonisation of Legislation /Administration*

- Harmonisation of administrative procedures must be vigorously pursued and promoted through the CGPC and at a national level. The CGPC should continue to take a lead in prioritising necessary future actions based on work already initiated:
 - Harmonised legislation on Pesticides and Toxic Chemicals should be ratified and adopted throughout the wider Caribbean.
 - Systems for appropriate selection of chemicals based on their benefits, human and environmental health threats and international agreements should be regionally established and applied. In doubt, a precautionary principle should be applied.
 - It is recommended that all countries of the CGPC adopt a Prior Informed Consent procedure to give importing countries the tools and information needed to identify potential hazards and exclude chemicals they cannot manage safely.²⁷
 - Harmonised guidelines for pesticide registration should be promoted.
 - Harmonised guidelines for certification of pesticide control operators should be promoted including legislation for all agro-chemical users and their responsibilities.
 - The need / desirability for common licensing arrangements, definition of standards, promotion of alternatives to pesticides, and other matters should be explored at a regional level and prioritised. Terms and conditions of licensing should be used as a mechanism to ensure compliance with requirements for packaging, labelling, storage and distribution.
- 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. It is recommended that the CGPC endorses a recommendation to develop a project for a locally owned and managed database, which includes:
 - A detailed inclusive user requirements analysis.
 - An assessment of the institutional constraints and capacity and resource needs to ensure success of the database.
 - An evaluation of alternative funding mechanisms.
 - Database development.

²⁷ Jamaica has ratified the Rotterdam PIC Convention and has access to information on hazardous chemicals and pesticides.

- Capacity building to support the database nationally and if necessary at the regional level, and training in the use of the database.

5.1.2 Country Specific Recommendations

5.1.2.1 *St Lucia*

- The Pesticides and Toxic Chemicals Act is very recent and so provisions under this Act have not yet been put into place. It is recommended that the Minister places emphasis (in terms of budget and human- resources) on implementing provisions of the Act.
- The PCB should ensure that SLASPA and C&E have updated lists of banned substances so that consignments are not allowed to be taken off ship.
- A system similar to Jamaica is recommended whereby importers/agents are required to have a license before ordering a pesticide or toxic chemical (and are obliged to pay a stiff penalty if they do not keep to regulations). This would prevent banned products from entering St Lucia and also the accumulation of unlicensed (and/or unregistered) products in the Dangerous Goods shed by SLASPA.

5.1.2.2 *Jamaica*

- Section 21 of the Jamaican Act states that an appeal may be made directly to the Minister against any decision made by the PCA and these appeals are handled by the Minister and sent to court if not resolved. The time frame or actual process for this however is often not defined.
- Enforcement needs to be added to the list of objectives of the PCA.
- Unlike St Lucia, where the PCB is voluntary and unpaid, in Jamaica, the PCA have a full time staff. To achieve their mandate, the PCA also needs further full-time inspectors for enforcement.
- The classes into which registered pesticides are placed are not clear. In particular, the category referred to as "approved" needs to be clearly defined in the Act and regulations, in addition to other terms that appear in the Register of Pesticides, such as "local restricted" and simply "local". The relationship between the WHO Hazard Categories and the PCA categories needs to be clearly defined and rationalized (e.g. on page A42, there are two formulations - both approved in the Jamaican classification - where they have different WHO Hazard Category Types; and on page A18, Igran 500 FW is restricted while being WHO Hazard Category Type IV, yet on page A11, Sanazil 800 EC is WHO Hazard Category Type II and is approved).
- The maximum amounts of restricted pesticides, especially those products that are being phased out like methyl bromide and endosulfan, permitted to be imported annually into Jamaica should be made publicly available. The permitted levels and actual levels should be published annually although it is important to mention that in Jamaica limits are not set on quantities of pesticides imported.
- Although the Act and its regulations require registration and licensing, the penalties are too small (J\$50,000 or US\$1,100) to act as a deterrent. The sanctions for illegal operation should be greater including higher fines and seizure of illegal factories, equipment and material.
- There does not appear to be the political will to focus on the private sector that may often breach the law.

- For certain restricted pesticides, it may be useful to consider a scheme where users have to be registered to use them, and must obtain special training as a pre-requisite.²⁸ The PCA has very recently started to register sellers of restricted pesticides, through an agreement with the Pharmacy Council who previously licensed farm stores as sellers of poisons, although this does not yet include special training as a pre-requisite. Currently certification determines who have access to restricted pesticides.
- The PCA should consider maintaining a spill management team that would respond to emergency spill events (accidents) with clean-up and disposal operations.
- The PCA should advertise that they accept used, waste, or expired pesticides and contaminated materials from the public. They should, as a part of their regular operations, undertake the proper disposal of these materials.

5.1.2.3 Combined

- In both St Lucia and Jamaica, the legislative arrangements for pesticides and toxic chemicals control, gives a large amount of authority to the relevant Minister who is able to over-ride or repeal any PCB/PCA action or decision if it is necessary. There must therefore be full transparency and explanation should such action take place. According to the law in both countries, appeals are handled by the Minister and sent to court if not resolved.
- In both St Lucia and Jamaica, the composition of the PCB/PCA should be broadened to include more staff with experience in ecological issues. Currently in Jamaica, the Board includes representatives from the public health sector, 3 representatives from the Ministry of Agriculture (Vet Division, RADA and Research), a Government Chemist, the Head of the Chemistry Department at the Bureau of Standards, a NEPA Representative, a private veterinarian and a representative from Trade, Standards and Regulations from the Ministry of Health. In addition there are outside experts who are used for assessing documents for registration.
- The regulations under the Pesticide Acts in each country (both Jamaica and St Lucia) should include a schedule specifying the maximum permissible levels of contamination by each pesticide (or group of pesticides) allowed in the environment for sound ecological and/or human health, particularly for restricted use chemicals. There should be a mechanism for reducing the permitted levels of pesticide importation if these permissible levels of contamination are exceeded.
- The Natural Resources Conservation Authority (NRCA) and the PCA in Jamaica and the Ministry of Agriculture, Forestry and Fisheries (MAFF) in St Lucia should set maximum permissible levels of contamination for each pesticide, and along with the NRCA Pollution Control Unit (in Jamaica) or Pollution Control Unit (in St Lucia), monitor and enforce these standards on users.
- Registered persons who are in breach of the terms of their license do not appear to be subject to any penalty. The Acts and regulations do not make it

²⁸ The PCA has very recently started to register sellers of restricted pesticides, through an agreement with the Pharmacy Council who previously licensed farm stores as sellers of poisons, although this does not yet include special training as a pre-requisite. Currently certification determines who have access to restricted pesticides.

an offence to deliberately or improperly store or manufacture any pesticide. Breach of the terms of the license need to become strong offenses under the Acts and/or regulations, and the relevant penalties provided.

- Importers and distributors must be required to perform due diligence when they sell pesticides to retailers. They should be required to determine whether purchasers of pesticides are doing so for their own use or for resale, and if the latter, they should be required to ensure that the retailers are properly registered. They should also be required to report annual sales to any one person/entity above a certain quantity to the PCB/PCA.
- Any pesticide vendor selling to the public must provide the purchaser with locally produced educational material along with explanations on the content. The total quantity of pesticides used in St Lucia and Jamaica may be reduced, if users were more sensitised to a minimalist application regime (and they also might save money).
- The promotion of biological pest control strategies, integrated pest management (IPM) and organic farming techniques by the PCB/PCA, may also reduce the total quantity of pesticides used in Jamaica and St Lucia.
- Users of pesticides who improperly use, apply, or dispose of pesticides are currently not guilty of any offence under the Pesticides Act of either St Lucia or Jamaica, although they can be arrested under the regulations of other Acts, such as the NRCA Act of Jamaica. The suggestions made for disposal of used containers and the handling of spills contained in the PCA Training Manual are useful, but their implementation is not mandatory. End users of pesticides need to also be included under the Pesticides Act. A Code of Conduct (similar to the Road Code) needs to be prepared for the public under the Pesticides Act, and breaches of this code would be punishable.

5.2 Agro-chemical import and manufacture

There is clear evidence of a long term increase in the quantities of imports and manufacture of agro-chemicals, not only in St Lucia and Jamaica but also in the wider Caribbean. This fact illustrates the urgency and importance of consideration of the fate of agro-chemicals in the environment, particularly with regard to pesticides, and confirms the belief of many members of the agricultural industry and environmental watch groups throughout the Caribbean, that increasing quantities of pesticides, and agro-chemicals in general, are being used in the Caribbean (Dasgupta and Perue, 2002). Besides this long term trend, the data show that there is a lot of inter-annual variation in the use of different fertilisers as well as pesticides.

Various factors have influenced the quantity of agro-chemicals in use and are described in Section 4.4.2, including changes in legislative arrangements, dumping of agro-chemicals, increased pests and diseases, changes in agricultural practices and changes in crop types. Possible external factors affecting agro-chemical import and manufacture are highlighted below.

5.2.1 International trade

Import and use of agro-chemicals is clearly influenced by the export trade and, in St Lucia and Jamaica, the most important crops are export crops, in particular bananas in St Lucia and coffee, sugar cane, citrus fruits and banana in Jamaica. One obvious example of impacts of international trade on use of agro-chemicals is related to the

banana industry. Preferential access used to be granted to Caribbean bananas coming into the EU and a preferential market for the African Caribbean and Pacific States (ACP) bananas was created through an import regime established in 1993 following the coming into force of the Single European Market (enshrined in the Lomé Convention first signed in 1975). However, European regulation was condemned by the World Trade Organisation in 1997 and again in 1999 following over five years of “banana war” between the EU and the US and the WTO ruled that the import-licensing system contravened WTO rules because it unfairly discriminated against companies importing and marketing Latin American bananas. In July 2001, the EU’s new banana import regime came into force following agreements with the US and Ecuador and the regime has to be changed from a “tariff and quota” regime to a “tariff-only” regime by 2006 at the latest.

Table 5.1 Banana export production in St Lucia (1996-2001)²⁹

Year	Banana Production (mt)
1996	104,805
1997	71,397
1998	73,039
1999	65,231
2000	70,281
2001	34,205

Export production figures for St Lucia are shown in Table 5.1. Banana production for export in the Windward Islands was in steady decline between 1996 and 2000 due to the export industry and change in tariffs, after which there was another sharp decline brought about by local banana politics as well as drought conditions that further impacted on farm viability.

The influence of international trade policy is therefore reflected in the agriculture industry of the Windward Islands and the downward trend in recent banana export production will have unknown and most probably negative consequences for small farmers. Indeed, the number of growers associated with WIBDECO has decreased from approximately 24,000 (mid 1990s) to 8,000 (in 2002)³⁰. As a result, the impact of reduced banana exports, together with lack of farmer confidence who do not care to re-invest their limited earnings into farms, has clearly influenced amounts of fungicide being imported into St Lucia, as fungicide imports have decreased in recent years compared with all other pesticide imports which have increased, as discussed in Section 4.4.1.

5.2.2 Climatic variation

Rainfall variation is particularly important in influencing outbreaks of pest and diseases and it has been suggested that increases in use of fungicide have been caused by increased rainfall during certain years, particularly post El Nino. Generally, the Windward Islands experience heavier rainfall than the central Caribbean which may explain why there are more pesticides used in St Lucia than in Jamaica. Drought in St Lucia in 2000 may also have reduced agricultural output and hence demand for agro-chemicals and climatic factors should therefore be considered in comparison of agro-chemical use.

²⁹ Source: WIBDECO data, 2002 (Fagan, pers. comm.)

³⁰ Source: WIBDECO, 2003 (Pearce, pers. comm.)

5.3 Harmonisation of administrative arrangements

5.3.1 Harmonised legislation

Through the support of IICA and the CGPC, the OECS has led an initiative for harmonised legislation in the Caribbean and funded the drafting of model legislation on pesticides and toxic chemicals for the OECS countries. The model legislation was drafted by the OECS Legal Unit and has been considered by the CGPC at various annual meetings and specific workshops and has been taken on board by different member countries. The draft harmonised legislation was revised and agreed upon at a workshop in Barbados in February 2000) to incorporate the provisions of the recent international convention on the control of substances used in chemical warfare (refer to details in Section 3.1.3.1). The draft harmonised OECS legislation on Pesticides and Toxic Chemicals has already been ratified in St Lucia and is pending in other CGPC countries. It is believed that this legislation will be instrumental in the process of improving pesticides legislation and administration arrangements. A copy of the St Lucia Pesticides and Toxic Chemicals Control Act for St Lucia is attached for reference purposes regarding model legislation (see Section **Error! Reference source not found.**).

5.3.2 Regional web site

A regional web site was launched in June 2000³¹ by the PCA, Jamaica. To date, only Jamaica has entered administrative arrangements on the web site which means that local and overseas importers and agents are able to get information and download forms. The Jamaican database, Geref, forms the basis of the website as all registration and importation data came straight from Geref.

The benefits of the web site, and contribution to harmonisation of pesticide registration, will be the following (CGPC, 2000):

- If a distributor wishes to register a pesticide in more than one CGPC country, they would only need to submit one set of information. This information would be acceptable and made accessible to each member state for a decision;
- Each country's PCB could decide whether or not to register;
- The applicant would still have to meet each country's requirement with respect to the submission of an application and the payment of application fees;
- The assessment made by one country would be available to another for their consideration when making a decision;
- Information on a particular product would be updated with new or additional information received by another country; and
- Manufacturers would be more cooperative if they were only required to submit one set of information because they were now servicing a larger market than the individual markets of each CGPC member state.

³¹ Web site: www.caribpesticides.net

This web site was endorsed by the CGPC (CGPC, 2000) at their annual meeting as a source of information on pesticides in the region. It is believed that this website will initiate the harmonisation of registration of pesticides in the Caribbean and provide a means of exchanging information. Unfortunately, no information has yet been received by the PCA from member states for the website (CGPC, 2002). It was recommended at the annual meeting of the CGPC in 2002 that countries should put information on the web as soon as possible, either by paying a small fee to Jamaica for payment of their consultant or by putting the information on themselves. It is recommended that this website be actively used by members of the CGPC as a means of improving harmonisation of arrangements, reducing individual PCB workload concerning registration of pesticides and improving communication between PCBs about decision making over banned or restricted pesticides.

5.3.3 Financing administrative arrangements

It has been shown that the activities of a PCB are influenced by funding mechanisms and, although St Lucia is much smaller than Jamaica, there is a large difference in capacity and functions of the PCB in St Lucia (a voluntary board with no full time staff) and the PCA in Jamaica (a voluntary board with eight full time staff at the Registrar's Office). The PCA was developed through a technical assistance project between the Governments of Germany (GTZ) and Jamaica between 1993 and 1998 (CGP, 1999). Financing was provided by GTZ to have the registrar's office functional, establish inter-agency linkages, legislate and enforce regulations to the Pesticides Act, develop public awareness and institute an autonomous financial system (CGPC, 1994). The latter was important for sustainable and effective long-term administrative arrangements.

The financing arrangements for the PCA are evident through the cess that is paid by the importer to the PCA: 1% of CIF (item cost plus freight and insurance). This cess was increased on 9th March 1999 from 0.5% for further funding. Other fees are paid by the importers for registration of pesticides and these payments are used for the funding of PCA staff and activities, enabling the PCA to gain autonomy in its operations (CGP, 1999).

The new pesticides legislation for St Lucia provides for additional financing through the registration and licensing system and it is recommended that this funding be used for increasing the capacity of the PCB.

5.3.4 Prior informed consent

Governments started to address the problem of toxic pesticides and other hazardous chemicals that were killing or seriously sickening people with a voluntary Prior Informed Consent (PIC) procedure in the 1980s. This required exporters trading in a list of hazardous substances to obtain the prior informed consent of importers before proceeding with the trade.

In 1988, it was decided to strengthen the procedure for PIC by making them legally binding through the adoption of the Rotterdam Convention for the Prior Informed Consent (PIC) Procedures is in place for the control of international trade in certain hazardous chemicals and pesticides. This Convention forces exporters of certain dangerous chemicals to first obtain approval from importing countries like Jamaica or St Lucia before shipping chemicals to those countries. The CGPC discussed their endorsement of the PIC during their Annual Meeting in 2000 (CGPC, 2000) and indicated their grave concern over the continuing use of some pesticides including

those on the PIC list, i.e. pesticides that have been scientifically proven to be extremely toxic and have been banned or severely restricted in most countries. From this group, notable pesticides being used were:

- Monocrotophos in rice production in Guyana
- Insecticide Endosulphan in coffee production in Jamaica

These chemicals are still being used although alternative control measures and management systems are available which are less toxic and more environmentally friendly. Designated National Authorities (DNAs) are responsible for administrative functions relating to the exchange of information and decisions regarding import of chemicals included in the PIC procedure. Amongst CGPC member states, there are several countries with DNAs (PIC, 2003³²): Antigua and Barbuda (PCB), Barbados (Deputy Chief Agricultural Officer), Dominica (Director, PCB), Grenada (Produce Chemist Laboratory, PCB), Jamaica (Registrar, PCA), St Kitts and Nevis (Director of Agriculture), St Lucia (Chairman, PCB), St Vincent and Grenadines (Chief Agricultural Officer), Trinidad and Tobago (Registrar, PCB)

It is recommended that all countries of the CGPC adopt PIC as it gives importing countries the tools and information they need to identify potential hazards and exclude chemicals they cannot manage safely. If a country agrees to import chemicals, the Convention then promotes their safe use through labelling standards, technical assistance and other forms of support. It also ensures that exporters comply with the requirements.

5.3.5 CGPC

The formation of the CGPC was initiated through the efforts of the Inter-American Institute for Cooperation on Agriculture (IICA) to integrate the regulation of pesticides in the OECS countries. The group expanded to include the wider Caribbean in 1995. The major objectives of the CGPC are as follows (CGPC, 2000):

- To exchange information on pesticides;
- To harmonise the registration of pesticides in the region;
- To develop regional capabilities on quality and residue analyses;
- To improve awareness on the dangers of pesticides; and
- To improve the management of pesticides.

One of the main objectives of this group is to harmonise the registration procedures for pesticides in the region and this was one of the main reasons for the establishment of the group as a regional body of Windward Islands in 1987. This was in response to the import of a particular agro-chemical to St Lucia by an agent for the purpose of trials. The agro-chemical had already been banned elsewhere and was distributed to several farmers before the agent was asked to repatriate the agro-chemical. However, the agent then tried to export the agro-chemical to other banana growing countries (including St Vincent and Grenadines and Dominica) before St Lucia was able to advise these countries. This event motivated the Windward

³² Source: PIC website on www.pic.int.

Islands to organise annual meetings to ensure collaboration. The organisation was then enlarged to encompass all OECS member states and the annual meetings continued with increased membership (see Table 5.2). Upon acceptance of Barbados for membership in 1995, the meeting was renamed *OECS and Barbados Coordinating Group of PCBs*. Jamaica became a member in 1998 when the organisation was again renamed *Coordinating Group of PCBs in the Caribbean* (CGPC, 2000). Details of participating countries are shown in Table 5.2; however the meetings are open to all countries that are interested and additional members include CEHI who assisted at the 1993 meeting and then attended the 2000 and 2001 meetings.

Table 5.2 Summary of annual regional PCB meetings

Year	Name	Location	Funds	Participating countries	Details
1987	1 st meeting of PCBs in the Windward Islands	St Lucia	IICA	Windward Islands	All OECS MS became members
1988	2 nd meeting of OECS PCBs	Dominica	IICA	OECS MS	
1989	3 rd meeting of OECS PCBs	Antigua	OECS	OECS MS	
1993	4 th meeting of OECS PCBs	St Vincent	OUS/ USAID	OECS MS	Barbados started to attend
1994	5 th meeting of OECS PCBs	St Kitts & Nevis	NRMU	OECS MS	Barbados, Jamaica attended
1995	6 th meeting of OECS PCBs	Montserrat	NRMU	OECS MS	Barbados accepted as member
1996	7 th meeting of OECS and Barbados Coordinating Group of PCBs	Tortola, BVI	NRMU	OECS MS, Barbados	Jamaica attended
1997	2 nd meeting of OECS and Barbados Coordinating Group of PCBs	Barbados	NRMU	OECS MS, Barbados	Jamaica, Guyana attended
1998	3 rd meeting of OECS and Barbados Coordinating Group of PCBs	St Lucia	NRMU	OECS MS, Barbados	Jamaica accepted as member
1999	4 th meeting of Caribbean Coordinating Group of PCBs	Grenada		OECS MS, Barbados, Jamaica	Trinidad offered membership
2000	5 th meeting of Caribbean Coordinating Group of PCBs	Jamaica		OECS MS, Barbados, Jamaica, Trinidad & Tobago	Trinidad accepted as member, Cayman Islands attended
2001	6 th meeting of the Coordinating Group of PCBs	Dominica		OECS MS, BVI, Jamaica, Guyana, Cayman Islands	Guyana accepted as member. 1 st meeting that chemical companies attended.
2002	7 th meeting of the Coordinating Group of PCBs of Caribbean countries	Antigua		OECS MS, BVI, Jamaica	Chemical companies continued to attend.
2003	8 th meeting of the Coordinating Group of PCBs of Caribbean countries	St Vincent and the Grenadines		OECS MS, BVI, Jamaica	Chemical companies continued to attend.

The CGPC has accomplished several important goals during its 15 years of existence and include:

- Drafting of Model Legislation by the OECS Legal Affairs Unit, for the OECS on Pesticides and Toxic Chemicals (1994);

- Harmonised Guidelines for pesticide registration and control in the OECS and Barbados – FAO Project (1995/6);
- Establishment of a Working Group on pesticide laboratories;
- Agro-medical symposium on pesticide poisoning (November 1996) in collaboration with OECS/NRMU/ENCORE and the St Lucia Medical and Dental Association;
- Observance of Pesticide Awareness Day (27th September each year); and
- Drafting of Guidelines for certification of commercial pesticide control operators in the OECS (Dr Richard Brathwaite, UWI).

It is felt that the CGPC provides a valuable tool for information exchange and keeping the interest in sound pesticide management at the forefront of the mandates of national PCBs. The annual meetings also provide a means of invigorating the actions of the PCBs in their endeavours to improve agro-chemical management in the region for the benefit of the agricultural sector but also human health and safety and sustainable environment.

5.3.6 Pesticide registration and licensing on a regional basis

There was a regional initiative by the FAO to produce a regional pesticide database for registration, licensing and quantification. Improved pesticide control on a regional level is achievable by means of a regional database. Two databases are currently in use in the region. The first database was designed by an FAO project for OECS countries on Access 2.0 and there have been problems with the application so that it is not in wide use (CGPC, 2000; Pearce and Esteban, 2002). The second database is known as Gerefi and was designed by a GTZ project on Foxpro for Jamaica. Gerefi has been used by the Jamaican PCA since 1994 and is posted on their website. As part of the current project, MRAG has produced a review of the two databases and recommendations for a regional database based on a user requirement survey (Pearce and Esteban, 2002). The conclusion of this review is that a regional database could serve various functions, including *inter alia*:

- Assistance with, and reduction of workload for, the registration of pesticides;
- To monitor banned pesticides or those that are refused within individual Caribbean states; and
- An overall means of harmonising pesticides registration amongst Caribbean states.

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