

Annex 2

WORKING PAPER
on

Review of Zambia's Current System of Phytosanitary Management

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**Prepared
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LIST OF ABBREVIATIONS AND ACCRONYMS

ADF	African Development Fund
ADSP	Agricultural Development Support Program
AFB	American Foul Brood
APS	American Phytopathological Society
ARC	Agricultural Research Council (South Africa)
ARO	Agricultural Research Officer
BCPC	British Crop Protection Council
BMNH	British Museum of Natural History
CABI	Commonwealth Agricultural Bureau International
Cap.	Chapter (Abbreviation used in describing an Act of the Zambian Parliament)
CARO	Chief Agricultural Research Officer
CFA	Chilled Food Association
CODEX	<i>Codex Alimentarius Commission</i>
COMESA	Common Market for Eastern and Southern Africa
GM	Genetically Modified
CPA	Crop Protection Association
DEFRA	Department for Environment Food and Rural Affairs
EA	European co-operation for Accreditation
EAP	Emergency Action Plans
EBZ	Export Board of Zambia (EBZ)
EPPO	European Plant Protection Organization
EU	European Union
EUREP-GAP	European Good Agricultural Practices
FAO	Food and Agriculture Organization (of the United Nations)
FAPAS	Food Analysis Performance Assessment Scheme
FEPAS	Food Examination Performance Assessment Scheme
FPC	Fresh Produce Consortium
GLP	Good Laboratory Practice
HMSO	Her Majesties Stationary Office
IAF	International Accreditation Forum
IAF	International Accreditation Forum
IAPC	Inter-African Phytosanitary Council
ILAC	International Laboratory Accreditation Cooperation
IPPC	International Plant Protection Convention
IRA	Import Risk Assessment
ISA	International Standards Association
ISPM	International Standards for Phytosanitary Measures
KEPHIS	Kenya Plant Health Inspectorate Service
KPA	Key Performance Area
LGB	Larger Grain Borer
MACO	Ministry of Agriculture and Co-operatives

MATEP	Market Access Trade and Enabling Policies
MMRS	Mount Makulu Research Station
MOH	Ministry of Health
NPPO	National Plant Protection Organization
OIE	<i>Office International des Epizooties</i>
PAN UK	Pesticide Action Network
PCE	Phytosanitary Capacity Evaluation
PMS	Pest Management Strategy
PPQD	Plant Protection and Quarantine Division
PQPS	Plant Quarantine and Phytosanitary Service
PRA	Pest Risk Assessment
PRC	Pesticide Residue Committee
PS	Permanent Secretary
PSD	Pesticides Safety Directorate
RNG	Royal Netherlands Government
SADC	Southern African Development Community (previously SADCC)
SADCC	Southern African Development Coordination Community (now SADC)
SANAS	South African National Accreditation Scheme
SPS	Sanitary/Phytosanitary
TA	Technical Assistance
TBT	Technical Barriers to Trade
TOR	terms of reference
UKAS	United Kingdom Analytical Standards
US	United States
USAID	United States Agency for International Development
USDA-APHIS	United States Department of Agriculture – Animal and Plant Health Inspection Service
WTO	World Trade Organization
WTO TBT	World Trade Organization - Technical Barriers to Trade
ZARI	Zambia Agricultural Research Institute

CHAPTER ONE

INTRODUCTION

1.1 Background

In March 2006 following a request from the Ministry of Agriculture and Cooperatives (MACO), the World Bank conducted a sanitary and phytosanitary (SPS) needs assessment in Zambia¹. The objectives of the needs assessment were to identify where SPS and standards issues were currently constraining trade and then recommend areas where further in-depth work was required. The first mission concluded that currently there were only a few significant SPS and standards issues that were constraining trade. However, it did identify areas where trade might be constrained in the future and that these should be evaluated further. In response to this observation, a larger mission² was organized to work on the following specific areas

- The functions and performance of Plant Quarantine and Phytosanitary Services (PQPS).
- Food safety standards in agro-processing factories and restaurants/hotels.
- The current state of laboratories supporting the agriculture and food sectors and the plans for future investment.
- The demand for establishing a certification system for good agricultural practices for farmers supplying the high-end of the local horticultural market.

This Working Paper reports on the evaluation of the functions and performance of PQPS and makes recommendations to improve its efficiency and effectiveness.

1.2 The role and importance of National Plant Protection Organizations

National and international phytosanitary legislation does not have the restriction of trade as their primary objective, but they can sometimes act as barriers to trade. The specific aim of phytosanitary legislation is the protection of plant life from pests, diseases or disease-causing organisms and the prevention or limitation of other damage to a country from the entry, establishment or spread of pests and diseases. This legislation is implemented through the Government's nominated National Plant Protection Organizations (NPPOs), in the case of Zambia, its NPPO is PQPS. The main aims of an NPPOs and the legislation that it implements include –

- **Protection of its national industries against imported pests and diseases.**
- **Fulfilling international inter-government obligations to ensure that its exports do carry any specific pests and diseases that may harm the importing countries.**

1 The first mission, between 13 and 31 March 2006, consisted of Dr Andrew Sergeant of Accord Associates, an agri-business specialist, and Mirvat Sewadeh, consultant for the International Trade Department of the World Bank.

2 The second mission, between 15 and 30 May 2006, consisted of Steven Jaffee from the International Trade Department of the World Bank (team leader), Dr Andrew Sergeant, Dermot Cassidy (plant health expert), Mulat Abegaz (food safety specialist) and Tom Deeb (laboratory expert).

The increased mobility of plant materials, produce and people has been a major factor in the spread of many diseases and pests. Despite the efforts of NPPOs and their inspectors at ports of entry, many pests and pathogens cross national borders. For example, multinational companies produce seed in countries that have favorable climate and inexpensive labor and then market them in throughout the world. Seed can sometimes carry pathogens that become established and cause severe disease outbreaks in a country where the climate is favorable³. Perhaps one of the most spectacular cases of the introduction of a plant disease and its impact on a country was potato blight (*Phytophthora infestans*) which led to the death of a million people and the emigration of two million others from Ireland between 1846 and 1851. The disease was brought into the country on fresh potatoes from America carried on one of the first trans-Atlantic steamship. This, and other plant health events, lead to a series of international agreements. The first treaties originated in the late 1800s and were eventually formalized in the 1950s. These agreements have now been collected into a voluntary treaty known as the International Plant Protection Convention (IPPC) which outlines the activities of an NPPO and standardizes the procedures and rules for NPPOs to interact with each other.

The SPS Agreement, to which Zambia is a signatory, identifies the IPPC as the organization that provides international standards for measures implemented by governments to protect their plant resources from harmful pests. The Convention is a legally binding agreement but the standards adopted by IPPC are not legally binding. **The purpose of IPPC is to secure common and effective action to prevent the spread and introduction of plant pests and plant products, and to promote appropriate control measures.** It also requires member countries to put in place appropriate checks, certification and disinfection procedures and to make information available to any interested party.

1.3 The cost of failure to comply with SPS standards.

Zambia has suffered from imports of pests and disease affecting its staple food crop, maize and dried cassava. Recently, phytosanitary failures led to the introduction of the larger grain borer (LGB) beetle (*Prostephanus truncatus*), which causes very significant losses at farm and village level impacting on food security at household and national levels. It was introduced accidentally into Africa from meso-America in the late 1970s and was first reported in Zambia in 1993. It was initially restricted to the Nakonde District of Northern Province bordering Tanzania. However, in the autumn of 1995, large quantities of LGB-infested maize were imported from Tanzania and distributed as famine relief along the line of road/rail to areas bordering Zimbabwe, Botswana, Namibia and Mozambique. To aggravate the situation, maize marketing had been recently liberalized and this led to an influx of traders, many of whom knew nothing of procedures and regulations to prevent the spread of pests and diseases. LGB is now present throughout Zambia.

In response to the introduction of the LGB, Government established the National LGB Containment and Control Program to develop an Integrated Pest and Commodity Management Strategy to enable small-scale farmers to control LGB and other storage pests, but with very limited success⁴. The pest can destroy about 30% of stored maize over an 8 month period. It is estimated that the losses and the

3 Agrios, George N., Plant Pathology, ISBN 0-12-044564-6

4 Zambia battles insect pest threatening staple food crops, FAO News and Highlights, 11 July 1997

cost trying to control this pest amount to USD 5 million/year⁵. Given the high cost of the response and the ongoing losses to Zambia one can see the value of an effective NPPO; this highlights the value of effective NPPO controls⁶.

To put into perspective the economic importance of failing in plant health and disease control, the cost to Zambia of some “SPS and standards failures” include;

- Recurrent cost of control and losses due to LGB of more than USD 5 million annually.
- If Zambia could prove it is free of American Foul Brood, the value of current sales of honey to South Africa could increase by as much as USD 700,000 a year. Higher prices would stimulate more production, which would lead to a further increase in sales.
- Freshmark estimates that the inability to import grapes and stonefruit into Zambia causes a loss of USD 50,000/year.
- More detailed pest scouting could reduce the number of plant inspections on cut flowers entering Holland from 10% to 5%, which could save as much as USD 25,000 annually.

It is a common perception amongst the private sector that an NPPO’s actions can constitute an unfair barrier to trade. However, as the costs noted above demonstrate, they have a vital role to play to actually protect the private sector. Too often, frustration associated with the slow processing of applications for import permits and phytosanitary certificates and an NPPO’s lack of understanding of the commercial world leads to some “misunderstandings”. In under-resourced NPPOs such as the PQPS in Zambia, some essential phytosanitary functions are not carried out at all and others are too often undertaken at a frustratingly slow pace. This does not constitute an argument for dispensing with its operations, but because they are so vital, that it is important to upgrade and streamline them. If resources are limited, it is essential to ensure that priority is given to the most important areas.

MACO is concerned that resources are inadequate for the task of managing and monitoring of the SPS risks associated with importing new pests and diseases as well as meeting the obligations of Zambia’s trading partners. Therefore, specific donor support has been sought to help address these issues. For example, the Dutch Government is helping build phytosanitary capacity specifically for horticultural and floricultural exports to the European Union (EU). The United States Agency for International Development (USAID), through its Market Access Trade and Enabling Policies (MATEP) project is helping address issues affecting regional trade. In addition, MACO, through the Zambian Agricultural Research Institute (ZARI) has requested help from the World Bank’s Agricultural Development Support Program (ADSP) in order to upgrade equipment and overall capacity of PQPS.

1.4 The objectives of the assignment

MACO has recognized deficiencies the service and functions of the SPS support offered to importers and exporters. To ensure that the most urgent and appropriate SPS issues are addressed, MACO asked the World Bank and USAID to undertake a study to prioritize actions that are needed to ensure that trade is not constrained whilst maintaining the integrity of its borders. The specific objectives of this assignment include;

5 Assumes that the average size of Zambia’s maize crop is 1 million tons.

6 So far South Africa has successfully prevented the introduction of LGB by strict border controls and procedures.

- To identify short to medium-term priorities for PQPS and recommend specific measures to address these priorities.
- To recommend actions and apportion responsibilities to carry out most important recommendations.
- To develop a longer-term vision for the creation of an efficient, sustainable and effective NPPO to support international trade.
- To review of Zambian phytosanitary legislation and treaty obligations and make recommendations to allow for the freer movement of agricultural produce whilst reducing the risk of introducing new pests and diseases.
- To estimate the costs of any recommendations and develop an action plan.

While these objectives are sensible, it is recognized that they have to be achieved in stages and as part of a longer-term vision. ZARI's longer-term vision is the establishment of a quasi independent organization that can set its own internal standards such as salary structures and operate in a more businesslike model while still fulfilling its legal obligations as the nominated organization to meet IPPC commitments.

The full terms of reference (TOR) for this assignment are appended (Appendix 7).

In order to complete the assignment, a review of the operations of PQPS were undertaken by -

- A series of interviews with staff of PQPS, MACO as well as other stakeholders to review existing, management, structures, personnel, equipment, procedures and facilities.
- Case studies were undertaken to highlight the strengths and weaknesses of the existing phytosanitary services. These focused on issues currently impacting on Zambian trade with South Africa, e.g. exports of honey and imports of deciduous fruit. These studies developed a series of recommendations to eliminate SPS constraints. In developing these case studies, the South African phytosanitary services were interviewed.

In addition, interviews were held with other government departments, industry associations and a range of farmers and exporters. During the research, the consultants visited and interviewed PQPS staff at Lusaka airport and Chirundu border post.

1.5 Structure of the report

The next Chapter concentrates on reviewing the existing operations of PQPS starting with comments on the legislation that governs its actions. All the 12 main functions that an NPPO is expected to undertake have been evaluated.

Following on from the review of its operations, a series of specific recommendations have been made to improve the efficiency and effectiveness of PQPS in Chapter Three. The final Chapter estimates the cost of implementing these recommendations.

1.6 Acknowledgments

The consultant wishes to acknowledge those who freely gave their time and input into gathering of data for this report. In particular, special thanks are due to Dr Watson Mwale (Director of ZARI), Arundal Sakala (Head of PQPS) who were always constructive and helpful despite their other work commitments. All the members of staff of PQPS were exceptionally cooperative, but special thanks are due to Doreen Chomba and Justin Kalaba who cheerfully gave a considerable amount of their time to answer the many questions.

CHAPTER TWO

REVIEW OF PQPS

2.1 Review of current legislation

The main law currently governing the activities of PQPS is Chapter (Cap) 233. The salient points of this legislation have been summarized (Appendix 2). Observations on the current legislation include:

- Some aspects of the legislation are technically obsolete. For example, a “subsidiary” to Cap 233 lists “injurious organisms with view to their control” – this list arises from a series of government notices published between 1958 and 1963 and names the organisms to be controlled. However, most countries have now recognized that actually including the names of organisms in the legislation is not sensible because the list is too dynamic. Another example is the regulations regarding dahlias, which are probably obsolete and would, in any case, be difficult to enforce.
- Parts of the legislation do not fully cover Zambia's obligations in terms of some Articles of the International Plant Protection Convention (IPPC). For example, the requirement to maintain up-to-date lists of regulated pests⁷, which if maintained properly assist in the reduction of compliance costs of phytosanitary requirements of trading partners⁸.
- Some of the responsibilities that currently fall under PQPS should really be devolved to other departments within ZARI. For example, the plant protection section should administer the parts of Cap 233 relating to cotton destruction dates.

2.2 Proposed new legislation

A recent technical assistance program funded by the Food and Agriculture Organization of the United Nations (FAO)⁹ helped with the preparation on a new Act, provisionally entitled the *Plant Protection Act, 2005*, which is expected to replace Cap 233. The main aims of the new Act are

- To prevent the introduction and to control the spread of plant pests.
- To provide for the protection of plant resources.
- To regulate trade in plants and plant products.
- To continue the existence of the PQP.
- To provide for the implementation of international plant protection instruments.
- To repeal the Plant Pests and Diseases Act, Cap 233.

7 Article VII 2 (i) of the IPPC

8 Article VIII 1. (c) of the IPPC

9 Plant Protection Act, 2005 prepared under the FAO project number TCP/ZAM/2904.

The proposed new Act is a substantial improvement on the existing legislation and would bring Zambia into line with its IPPC obligations. The provision of an emergency fund for phytosanitary emergencies is a crucial element of the new legislation. However, before finally submitting the proposed Act to the legislative process there are two areas where it could be modified to improve it. In particular, the institutional framework that PQPS operates in should be reconsidered so that, in the longer-term, PQPS can be re-defined as quasi-independent organisation that can operate more independently from MACO to provide a better service to the private sector and secondly, there should be provisions to make it less dependant on government finance. Clear recommendations are given in the next Chapter to help establish a more independent PQPS.

2.3 Review of PQPS functions – a scorecard based on IPPC’s core functions

A standard method of reviewing the performance of NPPOs is to evaluate each of the 12 core functions as identified by the IPPC¹⁰ and each function has been evaluated for PQPS (Table 1). The scoring is on a simple 1 to 5 basis where 1 is poor, 3 is adequate and 5 is world class. The scoring was done after the interviews with PQPS, other ZARI staff and a range of stakeholders. It should be stressed that this scoring is subjective, but it does give a very important indication of how PQPS is performing against each of its functions. This methodology of scoring is particularly useful because it can be done every 6 or 12 months and the progress of improvements can be monitored. Currently, the average rating is 2.3 – which is between “adequate” and “not adequate”. The inference being that a considerable number of the functions need to be improved.

Table 1 Evaluation of PQPS’s based on IPPC’s 12 core functions

¹⁰ Article IV International Plant Protection Convention. Food and Agriculture Organization of the United Nations, New Revised Text, Rome 1999.

SPS - Twelve Core Functions			
	FUNCTION	SCORE*	NOTES
1	Designate an Official National Plant Protection Organization (NPPO)	3	Not all requirements of IPPC have been met
2	Issue of Certificates	3	Mistakes being made due to need for a document control system
3	Surveillance of growing plants	2	Activity is focused on a few crops for export near Lusaka only partial compliance with A VIII para 1 (a) of IPPC
4	Inspection of consignments	3	Requires upgrading especially of casually traded items
5	Disinfestation or disinfection of plant consignments	3	Document control needed e.g. identification manuals
6	Protection of endangered areas and surveillance of pest free areas	2	Activity is focused on export horticulture near Lusaka
7	Conduct of pest risk analysis	2	Must be founded on other activities and information which are not being carried out
8	Ensure through proper procedures phytosanitary security after certification	2	No procedures manual e.g. at border post
9	Information dissemination within Zambia on regulated pests	1	No manuals or information leaflets
10	Research and investigation in the field of plant protection	1	No staff
11	Issuance of phytosanitary regulations	3	Partial
12	Submit a description of NPPO to IPPO secretariat	3	IPPO Website OK but not all data has been submitted
	Key		
	1 = Poor		
	2 = not adequate		
	3 = adequate		
	4 = good		
	5 = represents best practice		

Source – Consultant’s estimates based on interviews and observations

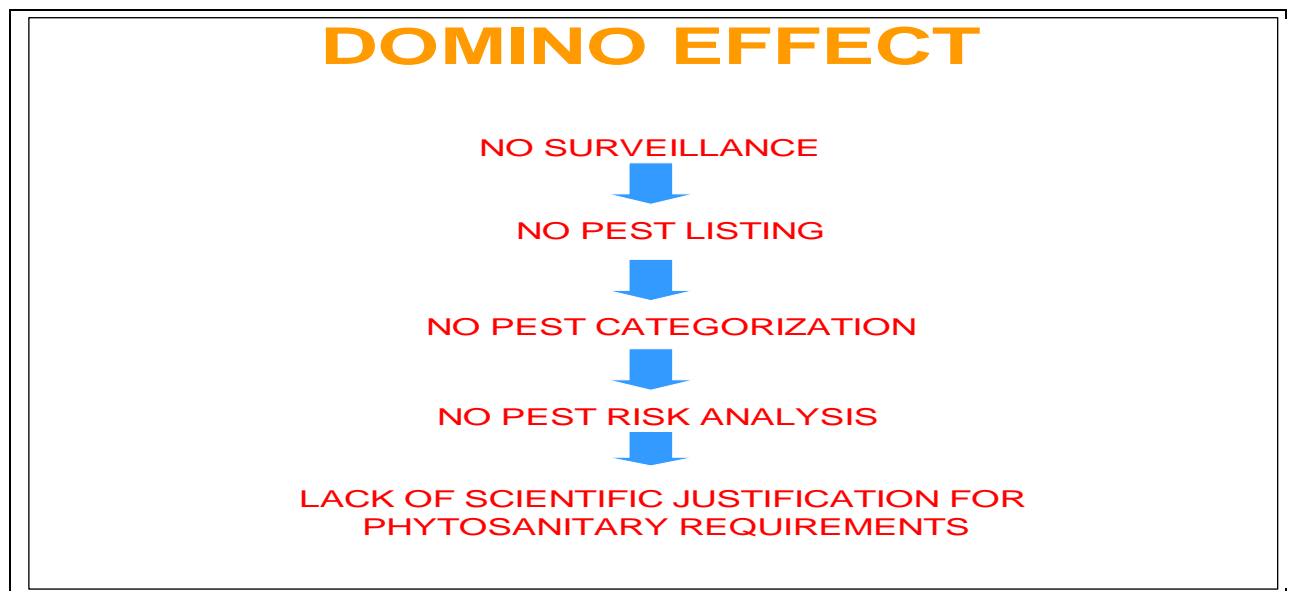
More detailed observations made on PQPS’s performance against each of the 12 core functions are

- 1. Designate an official NPPO.** This has been done, however the designated organization, ie PQPS, is unable to fully carry out all the core functions due to institutional factors and has to rely on outside help e.g. customs to fully cover its responsibilities.
- 2. Issue of certificates.** This function is adequately carried out. However there were a significant number of instances of poor document control at PQPS that have led to mistakes causing significant problems (and, hence, financial losses) for, particularly, the fresh produce importers.
- 3. Surveillance of growing plants.** This function is almost entirely limited to Lusaka and its immediate environs. Where done it is done, the work is to a high standard.
- 4. Inspection of consignments.** The inspections at Lusaka International Airport were very thorough. Retained paperwork on inspections of incoming goods at Chirundu border post was at best “minimal” and there was no written commentary on phytosanitary interceptions, though the official was able to give a comprehensive verbal report. Many of the interceptions appeared to be genetically modified (GM) grains rather than pests and diseases¹¹. A discussion of phytosanitary issues with a Customs official revealed a complete lack of understanding (or

¹¹ GM products are not allowed into Zambia.

- interest) of the function of PQPS at the border post.
5. **Disinfestation or disinfection of plant consignments.** These are carried out by registered private companies at the expense of the importer, a system that works well.
 6. **Protection of endangered areas and surveillance of pest free areas.** Apart from the program funded by the RNG which is concentrated around Lusaka, there is virtually no coordinated national pest and disease surveillance program. However, it was reported that a survey for the presence of *Bactrocera invadens* had been completed. This appeared to be a “one off” and had not been coordinated with regional surveillance programs.
 7. **Conduct pest risk analysis (PRAs).** This function was recognized as important by PQPS staff, but it is not certain if the scientific data on which PRAs are based are fully understood. For example, there was no knowledge of the status of the national pest list - A1 and A2 which identifies quarantine pests for Zambia and “list 3” which identifies the presence, or absence, of quarantine pests for other countries present in Zambia. Fig 1 illustrates the issue and demonstrates the reason for the low score.
 8. **Ensure through proper procedures phytosanitary security after certification.** There is no procedure or manual for how to ensure phytosanitary integrity of consignments after they have been certified.
 9. **Information dissemination within Zambia on regulated pests.** None.
 10. **Research and investigation in the field of plant protection.** None
 11. **Issuance of phytosanitary regulations.** Outside of “addendums”, there are none.
 12. **Submit a description of NPPO to IPPO secretariat and ensure data is current.** A check of the IPPO website confirmed that all the information posted there for Zambia was current. Some information required of members was absent but in that instance Zambia is no less compliant than the vast majority of members.

Fig. 1 Domino effect on NPPO functions where information is lacking¹²



12 Source http://www.wto.org.English.tratop_e/sps_e/sem_nov02_e/cpe.ppt

Even though the overall score for the performance of PQPS is “less-than-adequate”, there are some functions that are being undertaken well. These coincide with a clear line of responsibility within the service or with external intervention, e.g. the support by the Dutch Government for PQPS’s operations at Lusaka airport, where inspections are done to the highest standards. However, this contrasts with the performance at certain critical land border posts where they are the responsibility of Customs officers. At these border posts, the technical performance is not good enough; for example casual imports of produce bought for personal consumption are not inspected and are allowed to enter the country. The officers regard their role as to inspect only the goods that are being formally transported across the border. This is a dangerous action since one of the main reasons for the existence of an NPPO is to intercept potential new pests and diseases not already occurring in the country. This is particularly concerning for Zambia because the casual trans-border movement of mangoes bought by lorry drivers for personal consumption is responsible for the rapid spread of *Bactrocera invadens* from Kenya to Senegal in less than two years. This pest is now present in southern Tanzania and represents a significant threat of being introduced into Zambia, which is heightened if officials do not check on the food carried by lorry drivers and passengers crossing borders¹³.

2.4 Review of PQPS performance – based on categories used in a PCE

Another method of evaluating the performance of PQPS is use some of the categories in a formal Phytosanitary Capacity Evaluation (PCE), which is a tool normally used **internally** by NPPOs for benchmarking performance. It is a technical tool involving the self-diagnosis of weaknesses and the identification of priorities by a group of experts with validation at the national level. It must be stressed that a PCE was not undertaken, but some of the categories it uses were evaluated. However, it did prove extremely useful in getting an indication of the specific actions needed to improve performance of PQPS (Table 2).

Using the PCE categories a list of the areas where PQPS was weak was highlighted and the following list of required actions was generated;

- a. The proposed new legislation needs further revisions.
- b. An emergency action plan needed to be established (this is required for the control of newly introduced pests or diseases where eradication is the best means of control).
- c. Establish a system of document control.
- d. Produce 'A1', 'A2' and 'List 3' lists using the following initiatives
 - Establish PPQD as an inter-service help-center.
 - Use MACO extension services to collect pest and disease samples for identification.
 - Establish links with the Commonwealth Agricultural Bureau International (CABI) or other taxonomic resources for pest and disease identification.
 - Formalize using the Entomology and Pathology Sections of Plant Protection in PPQS as

13 A new species of pest fruit fly (Diptera: Tephritidae: Dacinae) from Sri Lanka and Africa
R.A.I. Drew, K. Tsuruta & I.M. White. African Entomology 13 (1): 149–154 (2005)

- a resource base for PQPS.
 - Undertake some carefully targeted taxonomic and other in-service training for key PQPS staff.
- e. Bee and bee products to become a responsibility of PQPS
 - f. Recruit personnel to fill vacant posts.
 - g. Develop a long-term vision for PQPS to become an organization that is more independent from government and more responsive to serving the private sector whilst still fulfilling its public sector obligations as an NPPO.
 - h. Up-rating of PQPS's computer network which should include internet access for its technical staff as well as most of its inspectors.
 - i. Establish subscription to an appropriate range of scientific journals.
 - j. Input from PQPS is needed to assist with the development of Inter-African Phytosanitary Council (IAPC), Southern African Development Community (SADC) and Common Market for Eastern and Southern Africa (COMESA) committees on SPS and other standards relating to plant health.

Table 2; Scorecard for specific phytosanitary weaknesses

AREA	ITEM	Sub Item	ACTION	
Legislation (Including regulations)	National Level		Notes	
	Not in line with the relevant international agreements (SPS/WTO, IPPC/FAO)		New legislation has been written and is being reviewed	
	Lack of holistic approach		Current legislation is piecemeal.	
	Weak punishments and fines		Revised in the new legislation	
	Lack of emergency funds and provisions		Legislation plans to set up fund	
	Lack of specifications about the procedures for the adoption of phytosanitary requirements		Proposal (in this report) to set up system of document control	
	Regional Level			
	Not harmonized		Need to introduce legislation together with proposed amendments and to produce 'A1', 'A2' and 'List 3' lists	
	Pest Diagnostic Capabilities	National Level		
		Supporting laboratory facilities inadequate		Basic isolation facilities plus linkage to CABI or other taxonomic resource
Lack of integration			Propose to involve Entomology and Pathology Sections of Plant Protection in PPQS	
Lack of trained specialists			Taxonomic and other in-service training	
Lack of standardized documented procedures			Proposal for introduction of formal document control	
Regional Level				
Lack of harmonized procedures		Example of bee and bee products which falls under OIE Office International of Epizootics but in South Africa is a 'Plant Health' responsibility.		
Pest Risk Analysis	National Level			
	Lack of documented procedures		Proposal (in this report) to set up system of document control	
	Insufficient human resources		Recruitment plus proposal to restructure as parastatal	
	Insufficient access to information sources		Internet access plus subscription to journals	
	Lack of surveillance information		Targeted programs	
	Lack of legislation		Legislation written but needs further input	
	Regional Level			
Lack of regional body in charge		Work needed on IAPC, SADC and COMESA structures		

Table 2. (continued)

AREA	ITEM	Sub Item	ACTION
Surveillance	National Level		
		Lack of documented procedures and computerized information storage/retrieval systems.	Input on computerization and document control
		Insufficient human resources	Recruitment plus proposal to restructure as parastatal
		Lack of inter-institutional co-ordination	Plans to involve PPQD as an inter-service help center and co-ordination with MACO extension services.
Import Requirements and Inspection	Phytosanitary requirements not based on PRA		Creation of pest lists
		Lack of documented standardized procedures and computerized systems	Proposal (in this report) to set up system of document control

Table 2. (continued)

AREA	ITEM	Sub Item	ACTION
Surveillance	National Level		
		Lack of documented procedures and computerized information storage/retrieval systems.	Input on computerization and document control
		Insufficient human resources	Recruitment plus proposal to restructure as parastatal
		Lack of inter-institutional co-ordination	Plans to involve PPQD as an inter-service help center and co-ordination with MACO extension services.
Import Requirements and Inspection	Phytosanitary requirements not based on PRA		Creation of pest lists
		Lack of documented standardized procedures and computerized systems	Proposal (in this report) to set up system of document control
Emergency Action Plans (EAP)		Lack of personnel	Recruitment plus proposal to restructure as parastatal
	National level	Inadequate/non-existent	Provided for in new legislation but also needs to be sat as a KPA for an individual
		Lack of provisions for EAP	Provided for in new legislation
	Regional Level	No EAP	Provided for in new legislation but also needs to be sat as a KPA for an individual
Documented Procedures		Lack of provisions for EAP special funds	Provided for in new legislation
	National Level		

Lack of documented processes and managers for supervision of staff

surveillance

Proposal (in this report) to set up system of document control

pest listing

Proposal (in this report) to set up system of document control

pest diagnostic

Proposal (in this report) to set up system of document control

exotic pest response

Proposal (in this report) to set up system of document control

Lack of operational manuals

Proposal (in this report) to set up system of document control

Lack of internal audit systems

Proposal (in this report) to set up system of document control

Lack of computerized systems

Proposal for computers

Table 2 (continued)

AREA	ITEM	Sub Item	ACTION
Training	National Level		
	No regular training programs		Involvement of MACO extension services in training for surveillance
	Inconsistent/inadequate/unco-ordinated training of PQPS staff		Involvement of MACO extension services in training for surveillance

2.5 Internal perceptions of strengths and weaknesses of PQPS

Management and staff at PQPS were particularly helpful in identifying the organisations strengths and weaknesses and it is gratifying to note that many of the issues identified in the previous section were also recognised by PQPS themselves. In particular, the Head of PQPS presented a list of strengths and weaknesses and equipment needed. Also, a list of priority actions was prepared. These have been summarised as

Strengths

- Well-trained human resources.
- Internet access at Mount Makulu.
- Good equipment.
- The new legislation is a significant improvement on existing Act.

Weaknesses

- Difficulties in retaining staff; the poor pay-structure often means good personnel often leave for more highly paid jobs. It is estimated that 40% of the posts within ZARI are vacant.
- Some of the equipment needs to be modernized.
- Inspections at many of the border posts are weak or non-existent¹⁴.
- Lack of transport to undertake work activities.
- Inadequate sampling and identification equipment.
- Insufficient training.
- The current management structure within ZARI is confusing and outdated, which does not facilitate proper prioritization of work activities within PQPS.

Priority actions

- Restructure PQPS along similar lines to the Kenyan equivalent - Kenya Plant Health Inspectorate Service (KEPHIS).
- Training of officials from MACO and Ministry of Health (MOH) abroad in use of equipment for testing for toxin and pesticide residues (6 staff members for 2-3 months).
- The provision of chromatographic and other equipment for pesticide residue testing, so produce destined for the EU can be tested.
- Local training in PRAs and awareness in Food and Feed regulations.
- Sensitization of the private sector on SPS issues (workshops and training).
- Training in inspection and certification of premises.
- Training in pest identification.
- Training of staff in Information Communication Technology, e.g. website design.

Management and staff are well aware of many of PQPS's weaknesses, especially those rooted in the institutional and financial framework of ZARI. In general, many of these observations substantiate the weaknesses identified in the previous two sections. However, some of the observations are a bit

¹⁴ The inspections at Lusaka Airport is an exception to this observation

confusing, eg the request for pesticide residue measuring equipment together with training displays a misunderstanding of NPPO functions. There is no legal reason why PQPS or even ZARI needs to undertake pesticide residue analysis for the EU market (this is the responsibility of the importer and exporter). In addition this equipment is expensive and difficult to maintain, needs to be operated according to very specific and demanding standards (Appendix 5). Currently, there is no clear need for such a service in Zambia.

CHAPTER THREE

CONCLUSIONS AND RECOMMENDATIONS

3.1 Introduction

The analysis in the previous Chapter highlighted a number of weaknesses in the operations of PQPS. A series of recommendations have been made that, if implemented, will improve the service it offers. Some of the recommendations cut across the weaknesses highlighted in the previous Chapter. The specific recommendations will address the following

- The legislation that affects the structure and organization of PQPS, including funding.
- The management of specific functions that PQPS performs.
- Pest and disease surveys.
- The documentation that needs to be updated to facilitate PQPS's performance.
- Establishing good communications within PQPS and with relevant external bodies.
- Regular updates of the performance of PQPS – both internally and externally.

3.2 Legislation

The proposed *Plant Protection Act, 2005*, which is expected to replace Cap 233 presents an opportunity to address some of the institutional issues that are inhibiting the performance of PQPS. It has been suggested that PQPS should be remodeled along similar lines to KEPHIS. This is a worthy **long-term** goal, but it must be recognized that the requirements of Kenya are different to Zambia. The current structure of KEPHIS has been designed to support the country's horticulture and floricultural industries – which actually finances its operation through a small levy. It must be recognized that Kenya's horticulture and floricultural exports are at least 10 times larger than Zambia's and are expanding rapidly, whilst Zambia's perishable exports are, at best, static. In addition, it is important that PQPS does not get too focused on supporting horticultural and floricultural exports to the EU, because many of the deficiencies in its performance affect imports, regional exports as well as the protection of local industries and the country's flora and fauna.

There are a number of reasons for the poor performance of PQPS. Whilst it is easy to identify failings, it must be understood that there are issues that are rooted in its institutional framework and structure. **The biggest failing that cuts across many of the functions is the issue of staff retention and motivation.** The solution to this problem can only be addressed by the creation of special pay scale and conditions that is only likely to happen if PQPS is taken out of the normal governmental salary and remuneration structure.

Therefore, it is strongly recommended that a study of best practice of other NPPOs, particularly KEPHIS, should be made. It is assumed that the best practices would encompass the following principles so PQPS could;

- Independently raise funds to finance its services.
- Independent hiring and firing of staff outside existing government structures.
- A separate salary structure.
- Ability to provide incentives to key staff such as in-service vocational M.Sc. and PhD programs at the University of Zambia.
- Allow it to become quasi-independent in terms of institutional structure and functions but still interact with other units e.g. training, equipment and access to taxonomic services

In order to make the necessary recommendations to add to the new legislation, it is proposed that a senior policy advisor within MACO visits KEPHIS to develop an appropriate model for the restructuring of PQPS. An addition to KEPHIS, another potential model for basing any changes of PQPS is the Agricultural Research Council (ARC) in South Africa.

One specific change in legislation that is recommended is that for some commodities, notably bees and bee products, can represent Zambia at the *Office International des Epizooties* (OIE). This is particularly important because currently the SPS responsibility for bee and bee products falls on three organisations, ie the Department of Veterinary and Livestock Development (DVLD) and PQPS in MACO and the Forestry Department. Currently, this product has a low priority in DVLD and Forestry and as many of the issues for easing trade constraints fall closely into the proposed recommendations to improve the effectiveness of PQPS¹⁵, it is sensible to concentrate the responsibility within PQPS.

It will also be necessary to undertake a legal and technical review of the proposed Act to make sure that all the issues concerning changes in the structure of PQPS that have been suggested are incorporated. The issue of incorporating OIE obligations into the new Act requires an understanding of international law and therefore would require input from a specialist well versed in the technical aspects of the OIE and possibly IPPC¹⁶ to be available for consultation by a Zambian lawyer. Much of the review, in terms of Zambian law would relate to the legal framework of how a parastatal body might operate within the framework of MACO. The technical expert would probably not need to travel to Zambia but be available for consultation with the lawyer.

At present, the revenues generated for issuing permits and certificates are sent to the Ministry of Finance and do not directly benefit PQPS. The retention of funds by PQPS for the services they perform was requested by the Dutch Government as a condition for its support of the activities at Lusaka Airport. As yet, this condition has not been implemented – it is strongly recommended that Government fulfills the condition. It is important that PQPS is able to attract funds from;

- Inspection and certification together with the issuance of phytosanitary certificates and plant import permits.
- Donor finance either for specific projects or for general capacity building.

¹⁵ The issues and solutions to the Zambia's honey trade constraints are discussed in detail in Appendix 1, but as the main problem is a mite parasite (AFB) and that part of solution to helping trade is preparing a PRA, it would be very sensible to include these within PQPS. This follows the format that has been adopted in South Africa.

¹⁶ One source of such a specialist would be the FAO.

It is recognized that the provision for the retention of inspection and certification fees may not be allowed in terms of Zambian law and therefore it might need to be included in the new Act.

3.3 Restructuring of technical support.

If the benefits of reviewing the new legislation to facilitate the restructuring of PQPS are to be fully realized, it is important that there are some changes to the technical and management structure. It is recommended that there are changes in two key areas;

- The formal allocation the responsibilities for the core NPPO functions to named individuals. These individuals, or “champions”, would responsible coordinating the compliance for the specific core functions – and would be responsible for activities in these key performance areas (KPAs)¹⁷.
- Formally increasing inter-service and interdepartmental co-operation within ZARI/MACO to achieve NPPO objectives (such as national surveys and surveillance for pests and diseases).

The concept of allocating responsibility for specific IPPC core functions is to ensure that someone takes ownership of the activity and ensures that it is undertaken diligently. This takes some responsibility away from management (allowing them to concentrate on policy and strategic decisions) and ensures that technical training can be carefully targeted at the individual responsible for distinct activities. This would be achieved by designating each of the IPPC core functions as a KPA. The responsibility for a KPA would not necessarily fall within the PQPS, but could be part of another section within ZARI. For example, the co-ordination of a national insect surveys could reasonably be a function of the Entomology Service. The success of this initiative would be dependent on inter-service co-operation and funding within the overall remit of PPQD. Once these KPAs and their champion have been established, they can be reviewed regularly in management meetings. It should then be possible to develop indicators for these KPAs which then could be measured. Motivation of technical staff then becomes easier where they have clear responsibilities and achievements more clearly identified.

The concept of developing the technical skills of individuals (ie, the champions) who are responsible for specific KPAs is vitally important to ensuring that all the core functions are undertaken efficiently. It is recommended that external technical support is contracted to train the champions. It is suggested that a specific organization is contracted to supply the appropriate technical support. It is envisaged that the external consultants will visit Zambia to give on-the-job training to the champions and help establish the necessary systems to ensure that functions are performed to the highest standard. After the first visit, it is assumed that the external consultants will be available to help direct further inputs without the need to visit Zambia. Among the organizations that could provide this support are xxx.

¹⁷ It is proposed that individuals within PPQS (as opposed to PQPS alone) be allocated responsibility for coordinating compliance in each of the core areas described in Article IV of the IPPC so as to bring more focus to these areas.

The existing strategic framework at MACO is conventional and works reasonably well. However, there needs to be a more formal integration of certain functions within the Ministry so as to co-operate on areas where PQPS is resource poor in certain areas. In particular the technical field officers in the extension service need to be formally involved in the national pest and disease surveillance program. These extension officers are potentially an excellent resource base to help with pest and disease surveillance. If they are integrated to help with SPS issues, it will be necessary to supply them with documents including pest and disease identification manuals and also materials for collecting and sending specimens to ZARI for identification.

It is also recommended that some functions currently within the mandate of PQPS should be delegated to other sections in PPQD. For example, the Pathology and Entomology Sections of the Services within PPQD should help PQPS maintaining the relevant pest lists as well as helping write identification and procedure manuals.

3.4 Pest and disease surveys.

One of the key purposes for establishing an NPPO is to maintain the knowledge of the existence of pest and diseases within a country in order to insure that the issuing of import permits and phytosanitary certificates is based on current scientific knowledge. Currently in Zambia, the maintenance of pest lists and the preparation of PRAs are totally inadequate. Without accurate knowledge of the distribution of pests within Zambia, it is not possible to undertake PIRAs. As Zambia does not have accurate and up-to-date knowledge of the distribution of pests, it cannot prepare import risk assessments (IRAs) – and indeed, neither can countries that want to import from Zambia¹⁸. It is therefore necessary to improve this deficiency before it impacts even further on Zambia's trade.

PQPS are proud that they have undertaken PRAs to allow exports of a very limited range of horticultural crops to the USA, which actually have very little commercial interest. However, it is doubtful whether this privilege will be continued if the pest lists are not being maintained. In order to complete the PRAs, considerable input was provided by the United States Department of Agriculture – Animal and Plant Health Inspection Service (USDA-APHIS) to train a few individuals within PQPS, but the benefits of this training are being lost as the individuals leave the service or carrying out other functions. If PQPS is going to implement a strategy to undertake more taxonomic studies, the issue of staff retention must also be addressed.

It is recommended that a series of pest surveys are carried out as part of a program of in-service training. By combining the preparation of pest surveys with specific training inputs, it solves two problems, ie the problem of out-dated pest lists and ensures that permanent staff are trained to maintain them.

A number of specific activities are required to ensure that Zambia has the knowledge and credibility to support obligations of its trading partners and to maintain the integrity of its own industries. These are

- The creation of a list of existing and potential quarantine pest using a series of targeted surveys

¹⁸ Honey is a case in point – if Zambia could demonstrate that it was free of AFB (which it probably is), then it could be exported to South Africa without being irradiated.

which have been selected based on immediate priorities for trade. The surveys should cover the distribution and status of AFB, *Bemisia* spp and *Trialeuroides vaporariorum*, *Thrips palmi* and *T. hawaiiensis*, and *Ceratitis capitata*, *Bactrocera invadens*, *B. cucurbitae*, *B. dorsalis*, *B. zonata*, and citrus canker (*Xanthomonas campestris* pathovar *citri*). If AFB status is surveyed, it will considerably help the trade in honey to South Africa (Appendix 2), the *Trialeuroides* will simplify imports of fruit from South Africa whilst the work on *Trips* should reduce the cost of flower inspections in Holland.

- The border controls and procedures must be strengthened so that **all** material is inspected and not merely commercial consignments. In addition, simple monitoring of key pests, including some of those listed for national surveys should be introduced using simple manuals and procedures so, where necessary, customs officers can help prevent the entry of restricted pests.
- When the accurate and up-to-date pest lists are established and proper border controls are instigated, it should be possible to establish certain areas in Zambia, or indeed the whole country, to be free of certain pests and diseases to the satisfaction of trading partners.

In order to carry out the necessary taxonomic work that would be needed to undertake the pest and disease surveys, it is recommended that the services of CABI are contracted to support the in-country training programs¹⁹. CABI's services could then be used by "champions" within PQPS to help with the formal identification of pests and diseases. The champions would be the contact points where samples that have been correctly collected would be sent. In addition to CABI, there are other taxonomic services that could be accessed free of charge e.g. Tephritids can be identified by USDA-APHIS in Pretoria.

3.5 Document control and preparation of manuals.

It is recommended that a formal document control and business management system is introduced at PQPS²⁰. The FAO project that helped establish the draft for the new Plant Protection Act did initiate a program of manual writing but this has yet to be finished. It is essential that it is completed and that there is a full review of the procedures and manuals for the movement of plant material into and out of Zambia²¹. It is therefore proposed that

- There is a review of document control systems within PQPS and that updated information on pest and disease status is published in forums such as the IPPC and international scientific journals. As controlled documents, policies, procedures, manuals and lists are created to ensure compliance with the IPPC policies and to ensure that national legislation and international treaties are adhered to correctly.
- Requirements to implement policies such as the creation and maintenance of National A1 and

19 Appendix 6

20 As a simple example manuals, procedures and quarantine pest identification manuals need to be reviewed and/or created so as to tighten up border controls (see also footnote 22)

21 Border posts not manned by staff from PQPS should have staff from customs specially trained in relevant procedures and with up to date pest identification and procedure manuals. As there is no formal document control system in place at PQPS this is a cause for concern as the possibility of errors and introductions of new pests are greater. As important as formally traded produce, are goods bought for personal consumption, which often transport pests, diseases and noxious weeds.

A2 lists as well as ensuring that a list of pests present in Zambia of concern to neighboring countries and trading partners are maintained and updated (i.e. List 3).

- Procedures and manuals need to be written for the following
 - procedure manuals for the movement of agricultural produce in and out of Zambia for border inspectors, including customs officials to use.
 - identification manuals for quarantine pests on all three pest lists for use by all branches of PQPS and where necessary customs officials
 - procedures for the writing and review of the Addendums, which in turn need to be controlled documents. The Addendums need to be written in a transparent manner and should only contain species on the A1 and A2 list. Other species can be listed as requiring control, i.e. species already present in Zambia, but only where justified by a full IRA.

The production of appropriate documents needs to be the responsibility of the champion of the relevant KPA.

An important area of documentation is to ensure sensitization of the importance of plant health regulations. This awareness campaign should be focused at critical points, i.e. border posts. This could take the form of pamphlets to be attached to import permits and licenses granted by PQPS, posters at airports and border posts backed up by training of inspectors and other personnel.

3.6 Improvement in information communication technology.

An improvement in the communications is crucial to the efficient operation of PPQS. All technical staff and inspectors should have access to computers and the internet. Where appropriate, the technical staff should have subscriptions to scientific sites such as the American Phytopathological Society (APS) publications and other relevant electronic journals. Equipment for taking and transmitting digital photographs should be trialed at certain border points e.g. Chirundu and Lusaka International Airport and, if successful, introduced at all borders.

3.7 Instigate regular updates of the performance of PQPS – both internally and externally.

If PQPS is going to be a truly effective body, it is important that there are regular reviews of its performance. It is recommended that its performance in the 12 IPPC core functions is evaluated annually by an external consultant until the average score shows that its performance is above adequate. In other words, the same scoring system as used in Table 1 is evaluated annually. When its performance is above adequate, the reviews could be done internally using the PCE system used in Table 2.

It is also important that its performance is monitored by interviews with the NPPOs of Zambia's major trading partners. Some of its trading partners were interviewed as part of the field work for this study, which provided valuable insights into areas where PQPS was deficient. It is recommended that the external consultant used for the review of performance against the 12 core functions also undertakes these interviews with officials in the major trading countries.

3.8 Equipment.

The laboratories at Mount Makulu have almost all the equipment that is needed to support PQPS's activities. Some supplementary equipment is needed; it is recommended that a small amount of equipment is purchased for the first isolation of fungal and bacterial plant pathogens along with growth cabinets, freezers, basic reagents and laboratory consumables. More complex identifications of, for example *Phytophthora* to species level, should be done by specialist laboratories.

Transport is required for head office technical staff as well as inspectors at border posts. Currently the department has only one dedicated pickup, which makes surveillance work difficult. The inspectors are hampered at some border posts because of the long queues of lorries and their work would be made easier by the provision of motor bikes.

CHAPTER FOUR

COSTS OF IMPLEMENTING RECOMMENDATIONS

4.1 The World Bank's Agricultural Development Support Project (ADSP).

In May 2006, the World Bank and the Government of Zambia signed the ADSP. One of the beneficiary organizations of this grant is ZARI who requested support to improve the performance of PQPS. In order to determine the priorities for funding, a review of PQPS was undertaken. In the previous Chapter, a number of recommendations were made to improve POPS. The costs of implementing these recommendations have been developed (Table 3).

4.2 Cost of reviewing and modifying the legislation.

Legislative review is costed assuming one Zambian lawyer and IPPC specialist are needed for 1 man week each. It is assumed that the IPPC specialist would not need to travel to Zambia but be available for consultation by the lawyer and may need to spend time helping draft documents.

It is assumed that the review of organization of KEPHIS and ARC would be by two officials from ZARI. An allowance for two weeks has been made for this so that it can encompass other aspects of KEPHIS such as Kenyan legislation, document control systems etc.

In total USD 20,000 has been allocated for reviewing and modifying the legislation that controls Zambia's NPPO; USD 15, 000 for TA and USD 5,000 for ZARI staff expenses.

4.3 Restructuring of PQPS and training of technical staff.

There are two main actions for restructuring PQPS and staff training. The first is an internal review to allocate responsibilities and the second is the provision of technical assistance to help with on-the-job training of the nominated champions. It is assumed that five man-months of TA will be needed – most of the time will be provided in Zambia, but a small amount of time should be retained for internet communications and input from the consultant's home-base.

The cost of providing technical training is USD 100,000 – which will be used to cover the cost of TA.

4.4 Identification of pest and diseases and preparation of pest surveys.

The first step will be the restructuring of some of the responsibilities within ZARI and using some of the extension officers to help with the collection and identification of pests and diseases. One of the outputs of the training of technical staff will be the capability to update the main list of pests that are

part of Zambia's commitment to the IPPC. To assist with ongoing pest surveys, an allowance of USD 30,000 has been made to cover the cost of taxonomic vouchers and one weeks TA to help with training.

4.5 Improve documentation control and prepare manuals and other documents.

An allowance has been made to hire TA from KEPHIS to help establish the PQPS's document control system. It is assumed that when ZARI staff visit KEPHIS as part of the reviewing the management and structure of a model NPPO, they would also evaluate its document control system.

Resources need to be made available for the writing of policies, procedures and manuals. These could be written as part of the on-the-job training by brining in external specialists to help PPQS champions to write many of the specialist documents e.g. pest identification manuals and training manuals. Printing costs have been allowed for.

As part of these recommendations, the cost of printing posters and pamphlets to promote public awareness of plant safety issues for use at borders and airports have been included.

The total budget for preparation of a document control system and manuals is USD 62,500 – all of which will be for TA.

4.6 Equipment and other capital costs.

Communications, especially internet access at ZARI and the critical border posts is seen as essential. PQPS needs access to databases and information outside Zambia, eg much of the relevant information on IRAs and PRAs is in the public domain. The computers to facilitate access to on-line journals for identification and distribution of pests and diseases have been allowed for. Also, digital cameras to convey images from border posts for pest and disease identification have been costed.

It is recommended that some of the budget is spent on a pool vehicle for PQPS to be based at Mount Makulu to enable field staff to undertake pest surveys and surveillance work. Motor bikes for border are also needed.

Software is necessary to help with PRAs and IRAs. One of following should be available to PQPS; Climax, @risk, GIS.

Limited laboratory equipment is necessary, mainly for the isolation of fungi and bacteria for sending off for identification. Other equipment that is needed includes a water distiller, some freezers, reagents and growth cabinets.

Total capital costs are USD 120,000.

4.7 On-going reviews of PSPQ.

An allowance has been made monitoring the performance of PQPS. It is assumed that it would have three annual reviews to monitor the performance of meeting the 12 core functions as listed by IPPC. In addition, it is recommended that at the same time as these reviews, a survey is made of the NPPOs of Zambia's major trading partners to evaluate the quality of its service supporting international trade.

An allowance of USD 50,000 has been made for this action.

4.8 Total costs.

The total cost of supporting PQPS is estimated at USD 402,500. Much of this has been allocated for TA (USD 247,500), which emphasizes the importance of staff training. USD 120,000 has been allocated for capital expenditure. The remaining funds are allocated for the purchase of vouchers for taxonomic identification (USD 30,000) and expenses of ZARI staff to visit Kenya (USD 5,000).

Table 3 Estimated costs of implementing recommendations to improve the effectiveness of PQPS

Recommendation	Objective	Actions	Detail of input	Cost (USD)
Review of legislation	Review of new Act	Technical review by Zambian lawyer and IPPC specialist	1 man-week	15,000
	Review of another NPPO Allow PQPS to retain funds	Review of KEPHIS & ARC Lobby Govt to support the Dutch initiative	1 man-week 2 man-weeks by ZARI	5,000
Restructure of support to technical staff	Ensure coverage of all core functions – appoint champions Provision of TA for on-the-job training	Internal ZARI review		
		Appoint an organization to provide consultants	5 man-months of TA	100,000
Improve capability to identify pests and diseases and update A1, A2 and List 3	Complete list of quarantine pests Initiate inter-service co-operation within ZARI to help with pest & disease identification Establish access to taxonomic resources via publications & internet Train technical staff in taxonomic identification	An end-product of TA support to champions		
		Internal review of ZARI management		
		Negotiate with CABI, IIBC & BMNH for taxonomic vouchers	1 week TA and cost of vouchers	30,000
		Basic courses	1 month TA	20,000
Improve document control and prepare manuals	Introduction of document control system	TA, possibly supplied by KEPHIS	2 weeks TA	12,500
	Writing of policies, procedures & manuals	On-the-job training to write specialist documents by regional specialists – possibly from KEPHIS	4 man-months TA	50,000
Equipment and other capital costs	Internet access at ZARI	Computers and running costs	5 computers	15,000
	Internet access at main border posts	Computers and running costs	5 computers	15,000
	Transport for border post inspectors	Provide motor bikes	5 motor-bikes	10,000
	Transport for surveillance and field inspections	Provide 4 wheel drive van	1 vehicle	35,000
	Communication between ZARI and border posts	Provision of digital cameras for main border post inspectors	5 digital cameras & microscopes	20,000
	Software to facilitate PRAs & IRAs	Provide software – either Climax, @risk or GIS	1 program	5,000
	Laboratory equipment & consumables	Eg, water distiller, freezers, chemicals, growth cabinets		20,000
On-going reviews of PQPS	Ensure that PQPS continues to improve its service	TA for annual review of core functions	2 man-months TA	50,000
		Evaluation by major trading partners		
TOTAL				402,500

APPENDICES

Appendix 1

CASE STUDY

APPLICATION FOR THE MOVEMENT OF ORGANIC HONEY FROM ZAMBIA TO SOUTH AFRICA WITHOUT THE NECESSITY FOR IRRADIATION

1. Introduction

The North-Western Province in Zambia has been producing honey and beeswax for many years. This province is an accredited producer of organic²² and “Fair Trade” honey and can therefore command premium prices in the export market. The private sector estimates that total honey exports are about 600 to 700 tons, worth about USD 1.5 to 2 million each year, i.e. higher than both the Central Statistics Office data and Export Board of Zambia (EBZ) data (Table 1.1).

Table 1.1 **Zambian honey exports, 2002 to 2005**

	2002	2003	2004	2005
tons	127	234	564	389
USD (thousands)	227	423	929	626

Source - CSO²³

There are two main exporters of honey from Zambia, Forest Fruits and North Western Bee Products who, along with Honey Bee Farms, have formed the Zambia Bee Products Association. Despite the impressive growth of honey exports and establishing a good name in the EU market, the Zambian honey industry reportedly operates on small margins.

Even though most of the exports are to the European Union (EU), South Africa represents a large market opportunity for Zambia because, between 2000 and 2004, its imports of honey increased from just over USD 500,000 to USD 2.5 million. Zambian exporters have made a considerable effort to develop this market opportunity.

Honey exports are certainly constrained by SPS issues. Not being able to access the South African market is a very large missed opportunity. This issue needs to be resolved at the bilateral level between the Zambian authorities, and their South African counterparts.

Discussions with the South African National Department of Agriculture (NDA) on behalf of the World Bank were held in Pretoria early in May 2006 about the SPS issues involved in this instance and how they might be resolved

22 Certified by Ecocert

23 Taken from “Zambia Export Opportunity Study” produced by Alexander Valeta and Chiwama Musonda of the International Trade Centre, February 2006

2. The South African position

Currently imports of honey into South Africa from Zambia are required to be irradiated for the elimination of the possible presence of American Foul Brood. American foul brood (AFB) is a serious disease of honeybee brood. The disease is caused by the spore-forming bacterium *Paenibacillus larvae larvae*. The spores can survive for many years in scales (from diseased dead brood), hive products and equipment, and they are resistant to heat and chemicals. Normally, colonies with clinical symptoms of AFB in capped brood cells will die if treatment is not carried out.

Due to these requirements Zambian honey is moved to South Africa in bulk 200 liter containers and irradiated in Johannesburg before release by International Plant Health (IPH) of the NDA for sale. The use of irradiation darkens the honey and nullifies the organic certificate. It is then blended with South African honey and marketed as originating from South Africa.

These conditions are applied because it is unclear to the South African National Department of Agriculture (NDA) what the status is, in Zambia, of AFB. There are wider concerns here relating to the ongoing monitoring of the overall animal and plant pest and disease status of Zambia which, if addressed, will change the current position of the NDA. A number of species of wild bees exist in South Africa, many of them of importance in the Cape Floral region. This floral region is one of six in the world and the only one that is confined to a single country. It is a significant reason why South Africa is the third most bio-diverse country in the world, after Brazil and Indonesia. The possible introduction of AFB could have a significant impact on indigenous South African bees and thus constitutes a legitimate concern of the South African government.

There is evidence that AFB is a disease that only affects social bees and as such poses a low risk to solitary species. However South Africa lacks detailed knowledge of its own indigenous bee habits and behavior and lacks knowledge of the risk to these species posed by AFB. Thus a decision has been taken by the NDA to assume the worst possible scenario and ban imports of untreated honey – and this will remain in place until an exporting country demonstrates that there is no significant risk of infection from AFB. Under IPPC rules this is a legitimate concern, and therefore rule, on the part of South Africa but the reason for exclusion must be confirmed by an in-country survey. This is being undertaken within South Africa by the NDA.

A further issue which needs to be addressed is that of the overall understanding by the Zambian Ministry of Agriculture and Cooperatives (MACO) of the pest and disease situation in Zambia. As an example the current insistence by PQPS that Zambia is free of Mediterranean fruit fly, *Ceratitis capitata* (Wiedemann) is a significant problem for IPH. It has been recorded Zambia before and has been reported in every neighboring country as well²⁴. This casts doubt, in turn, on assertions by MACO as to the status of AFB

24 http://creatures.ifas.ufl.edu/fruit/Mediterranean_fruit_fly.htm *Ceratitis capitata* (Wiedemann) (Insecta: Diptera: Tephritidae) Featured Creatures, University of Florida Institute of Food and Agricultural Sciences. Department of Entomology and Nematology, Division of Plant Industry, Electronic Data Information Source

within Zambia. NPPO's must ensure that any Technical Barriers to Trade (TBT) are based on scientific

However, the NDA are prepared to look at proposals by MACO on alternatives to irradiation provided the scientific argument was valid, that they had been accepted by a third Government where standards were perceived as being high, and where MACO could reassure the NDA as to its own internal standards on achieving the required mitigation protocol.

3. Parallel situations elsewhere in the world

There are two cases in other countries where a similar situation exists and which if adapted can address the current problems. These are the status of AFB in New Zealand and Australia and the strategies adopted by these governments to contain or eliminate the problem.

3.1 New Zealand

The disease is present in New Zealand but under official control (i.e. a National Pest Management Strategy under the Biosecurity Act 1993) and listed on the unwanted organisms register as a reportable organism²⁵. The disease and phytosanitary implications together with internationally accepted mitigation protocols are reviewed in some detail in this Import Risk Analysis (IRA). In essence although the disease is present in New Zealand, the country has adopted mitigation protocols to reduce or eliminate AFB from imported honey. Internally in New Zealand there is program of monitoring and, where detected, of hive destruction.

3.2 Australia

The status of AFB in Australia is that it is present in the east but absent in the west. As such Western Australia has instituted measures to stop the movement of AFB westwards which include restrictions on the movement of honey and bee products from infected areas plus a monitoring program of hives in their own region. The Western Australian Beekeepers Act 1963 provides the legal framework for the Department of Agriculture to eradicate AFB disease from apiaries²⁶.

25 New Zealand Animal Biosecurity Biosecurity Authority, Import risk analysis: Honey bee products 15 December 2004

26 Government of Western Australia Department of Agriculture; A guide to the Western Australian Beekeepers Act and eradication of American foul brood disease

4. Assessment of risk and possible mitigation protocols

In terms of a summary risk analysis the issue of AFB being imported into South Africa can be summarized in terms of the process outlined below. This follows a three step process to determine the justification or otherwise of including an organism as a pest of quarantine concern.

The steps are;

- Hazard identification
- Risk assessment
- Risk management

Step	Question /Issue	Answer	Action
1.1	Organisms of potential concern: <i>Paenibacillus larvae larvae</i> (American foul brood)	This is an OIE B list organism. There are legitimate concerns that introduction of this organism will affect the economy, the people, and the environment of South Africa	Consider further
1.2	Is the organism associated with the animal species concerned?	Yes	Consider further
1.3	Is the organism likely to be associated with the commodity?	Yes	Yes, consider further
1.4*	Is the organism exotic to South Africa?	Yes. There is however one report of presence/introduction but disputed by South African NDA ²⁷ . A study has been commissioned by the NDA to review the status of this disease in South Africa.	Yes, consider further
1.5*	Are strain differences reported in other countries?	Yes. There are reports of strains resistant to antibiotics	Yes, consider further
1.7	Is there a control program in South Africa?	No as disease is considered to be absent	Not applicable

**If the answer to any one of questions 1.4, or 1.5, is yes then Risk Assessment is necessary (Table 4.2)*

27 DAVISON S. et al (1999) Bee Diseases in South Africa I: EFB, AFB, chalkbrood and bee viruses. South African Bee Journal 71, 84-87.

On the basis of the answers to the questions in Table 4.1 it is clear that a hazard is present and therefore it is necessary to proceed to both of the next two steps; the Risk Assessment and the Risk Management.

Table 4.2 AFB in export of honey from Zambia to South Africa - Risk Analysis Process.			
2. Risk Assessment			
Step	Question	Answer	Action
2.2	Release assessment. How likely is the agent to be introduced in the commodity?	Highly likely	Consider further
2.2	Exposure assessment. How likely are susceptible animals to be exposed?	Likely	Consider further
2.3	Consequence assessment. What are the likely consequences of exposure?	Serious	Consider further
2.4	Risk estimation What is the assessed level of risk?	High	Consider further

Table 4.3 AFB in export of honey from Zambia to South Africa - Risk Analysis Process.			
3. Risk Management			
Step	Question	Answer	Action
3.1	What is the acceptable level of risk?	Low	Consider mitigation actions
3.2	How does the assessed risk compare to the acceptable level of risk?	The assessed risk is high and the acceptable level is low	Mitigation is required
3.3	What safeguards are available?	There are several options that have been developed	Review mitigation options
3.4	What is the effect of each safeguard on the level of risk?	These have been reviewed recently (2004) by New Zealand Animal Biosecurity as cited above	Review options and initiate dialog between Plant Quarantine and Phytosanitary Service (PQPS) in Zambia and International Plant Health (IPH) in South Africa which are the responsible organizations in the

Table 4.3 AFB in export of honey from Zambia to South Africa - Risk Analysis Process.

3. Risk Management

			respective countries
3.5	Apply safeguards that reduce risk from assessed level to acceptable level	Options are summarized in section 5	Alternatives to existing mitigation protocols agreed and implemented

A detailed assessment of AFB in respect of honey, honey products and bee products is incorporated into the New Zealand Biosecurity IRA (cited above). The above tables are an overview in regard to the specific case of trade in honey between Zambia and South Africa. In this instance South Africa is justified in maintaining mitigation protocols on two grounds;

The presence of AFB in South Africa is currently a matter of dispute. However as the NDA are currently unsure of the status of the disease they have started a national survey to determine presence or otherwise of AFB within South Africa. At present the South African National Beekeepers Association are fairly confident that the disease is absent and have been monitoring the situation themselves and the situation at present is an assumption that AFB is not present in South Africa. There are legitimate concerns with regard to a potential impact on indigenous bees, in particular, those associated with the Cape Floral Kingdom.

5. Mitigation protocols and or proposed 'addendum's'

The following is a summary of the relevant section of the New Zealand IRA as cited above and is adapted to the specific case of honey exports from Zambia to South Africa.

Options available

Although the latest OIE Code (OIE, 2004) for the first time includes recommendations for honey in regard to American foul brood, the treatments and their technical justification for the measures are not yet included in the Code. Moreover, when they are completed, the treatment recommendations for the destruction of *P. l. larvae* in these commodities will apply to importing countries that are officially free from American foul brood. This may or may not be the case in South Africa but until the surveys are complete the benefit of the doubt must lie in favor of South Africa.

Testing

Culture testing of adult bees may be used to predict whether a honey bee colony is likely to have clinical signs of American foul brood. More than 85% of honey bee colonies that produced more than 100 *P. l. larvae* colonies per plate exhibited clinical symptoms of American foul brood. Specific PCR-based detection tests have been developed for fast and reliable diagnosis of American foul brood Commercial ELISA kits for the detection of diseased larvae are available²⁸, but not for the detection of spores in bee products.

Sterilization

The standard US industry practice for pasteurization of honey is heating to 76°C and holding for about 5 minutes. This is adequate to destroy fungi and yeasts but it is not adequate for bacterial spores, such as *C. botulinum*, which requires heating to at least 120°C under pressure and holding at this temperature for at least 3 minutes. However,

28 VITA® (Europe) Limited, Basingstoke, Hampshire, UK. <http://www.vita-europe.com/company.htm>

heating honey to such high temperatures causes unacceptable changes to its flavor and texture.

Certification

An equivalent level of protection to that achieved under the New Zealand National Pest Management Strategy (PMS) for American foulbrood could be achieved by requiring official veterinary certification from the country of origin that the bee products were not derived from hives that were known or suspected to be clinically affected by American foulbrood.

For equivalence to the PMS, such certification would have to be backed by an annual inspection of hives by a person certified as competent to make the diagnosis of American foulbrood, following the guidelines set out in Appendix 3.4.2 of the OIE Code. However, few countries have either control programs for American foulbrood or tracing systems to allow certification of the origin of bee products. It is possible to test honey for *P. l. larvae* to estimate spore concentration²⁹, and to dilute contaminated honey with other honey so that the final concentration is less than the lowest reported to cause infection when fed to bees – that is, 50 million spores per liter³⁰. If an additional safety margin of two orders of magnitude were applied for spore levels in honey, then honey with less than 500,000 spores per liter could be considered safe. PCR protocols have been developed for the direct detection of *P. l. larvae* spores in honey samples, although these do not differentiate between *P. l. larvae* and *P. l. pulvifaciens*³¹ (Bakonyi et al., 2003; Lauro et al., 2003).

29 Hansen H (1984). The incidence of the foulbrood bacterium *Bacillus larvae* in honeys retailed in Denmark.

Danish Journal of Plant and Soil Science 88, 329-336.

Hornitzky MAZ, Clark S (1991). Culture of *Bacillus larvae* from bulk honey samples for the detection of

American foul brood. *Journal of Apicultural Research* 30(1), 13-16.

Alippi AM (1995). Detection of *Bacillus larvae* spores in Argentinian honeys using a semi-selective medium.

Microbiologia Sem 11, 343-350

30 Sturtevant AP (1932). Relation of commercial honey to the spread of American foul brood
Journal of

Agricultural Research 45, 257-285.

31 Bakonyi T, Derakhshifar I, Grabensteiner E, Nowotny N (2003). Development and evaluation of PCR assays

for the detection of *Paenibacillus larvae* in honey samples: Comparison with isolation and biochemical

characterization. *Applied and Environmental Microbiology* 69, 1504-1510.

Lauro FM, Favaretto M, Covolo L, Rassu M, Bertoloni G (2003). Rapid detection of *Paenibacillus larvae*

from honey and hive samples with a novel nested PCR protocol. *International Journal of Food Microbiology* 81,

Summary of mitigation protocols (Addendums)

The approach to the movement of honey from Zambia to South Africa could then be guided by the following conditions

Recommended sanitary measures for honey

Each consignment must be either:

(i) from a country or part of the territory of a country free from American foulbrood, or

(ii) from hives that were inspected for American foulbrood within the previous 12 months, by a person certified as competent to diagnose the disease (following appendix 3.4.2 of the OIE Code), and found not to be clinically infected or suspected to be clinically affected by American foulbrood. See also guidelines developed in Western Australia for hive inspection³², or

(iii) tested and found to have a *P.l. larvae* spore count of less than 500,000 per liter, or

(iv) irradiated with 10 kGy, or

(v) heated to 120°C and then held at that temperature for 24 hours.

195-201.

32 A guide to the Western Australian Beekeepers Act and eradication of American foul brood disease, Government of Western Australia, Department of Agriculture.

6. Terms of Reference for Zambia Bee Pest and Disease Survey

6.1 Introduction

In terms of the case study written as part of a World Bank SPS Needs Assessment³³ in May-June 2006 it is apparent that it is necessary to carry out a survey bees, hives, and honey in Zambia in order to compile a National Pest List of bees in Zambia. This is necessary for three reasons.

- To provide information for Zambia's trading partners about potential quarantine organisms
- The formulation of corrected and up to date Addendums for import regulations
- To develop a national strategy on bee pest and disease management and certification of exports

The overall aim is to build capacity within the relevant sections of MACO (Ministry of Agriculture and Co-operatives) as part of an overall strategy to update lists of regulated pests, both present and absent, within the borders of Zambia. A further aim is to train entomologists within the Plant Protection and Quarantine Division to interact with equivalent organizations around the world charged with implementing International Office of Epizootics (OIE) conventions. In the specific case of South Africa the situation is simplified because the responsible section within the National Department of Agriculture (NDA) is actually International Plant Health (IPH) which is the South African equivalent of Plant Quarantine and Protection Section (PQPS).

6.2 Species to be considered in the survey

There are three bee pests/diseases listed by the OIE i.e., American foulbrood, *Paenibacillus larvae larvae*, European foul brood, *Melissococcus pluton* and the Varroa mite, *Varroa destructor*. The survey will determine the presence or otherwise of these three species in Zambia.

6.3 Methodology

A sampling will be devised by a statistician to determine an appropriate sampling and field survey method that can be analyzed statistically e.g. a stratified survey. The survey will take into account the following;

- geographical production areas in the context of the whole territory of Zambia
- relative concentration of producers (as opposed to number of hives)
- honey collection and blending points
- honey and honey products for sale at various places in Zambia – possibly including informal markets.

33 Case Study; Application for the Movement of Organic Honey from Zambia to South Africa without the Necessity for Irradiation

The field survey must be designed so as to be complete within 10 working days. The field survey team will consist of the Technical Assistant (TA) who will be a person or organization acceptable to the PQPS after they have consulted with the relevant NPPOs in the importing countries (RSA and Europe), and a local counterpart on secondment from Plant Protection and Quality Department (PPQD).

6.4 Testing and Taxonomy.

Samples of honey and insects will be sent to a designated laboratory for testing for the diseases and (if necessary) samples of mites or other organisms found living in hives will be sent for identification in a suitable institution or specialist if necessary e.g. Commonwealth Agricultural Bureau International (CABI). This can be determined by the TA.

6.5 Work Plan

Two to three day input from a statistician working with the PPQD counterpart consisting of consultation with honey producers organization, followed by the production of a detailed survey and sampling plan. This plan to be approved by honey producing organizations as possible in terms of access, and available TA time

Two week survey by PPQD counterpart and TA to carry out;

- field survey – one week
- sending off samples to the appropriate laboratories and taxonomists
- drawing up of an ongoing surveillance program to be the responsibility of the counterpart
- report (one week) consisting of a summary of the outcome of the field work coupled with national distribution maps of OIE pests if necessary
- drawing up of import regulations for the exclusion of OIE listed pests found to be absent in Zambia
- Publication of survey data in a refereed journal or suitable website
- Drafting of letter (sample attached) to send to honey importing countries that request information on the current status of OIE listed bee organisms in Zambia

6.6 Inputs and Costs

Inputs are summarized in Table 1 below. Costs are a guess at this point – particularly in relation to laboratory and taxonomy fees. TA costs include flights. Some costs may be borne by the honey marketing organization. Suitable apiculturists may be found regionally at lesser cost

Table 6.1 Inputs and Costing for Bee Pest and Disease Survey

	Units	Amount	Cost (US\$)	Total	Notes
Regional TA (Apiculturist)	Days	14	20000 month	10000	Cost of overseas TA for sake of argument
Local TA (Statistician)	Days	4	1000 day	3000	From Zambia
Transport	Km	7000	0.5/km	3500	May be paid by Honey producers
Accommodation	Days	21	150	3150	Includes travel costs for local Counterpart
Laboratory (microbiology)	Each	200	30	6000	Using kits and reagents brought into Zambia
Insect/mite taxonomy	Each	50	30	1500	CABI or similar
Consumables	10.00%			2715	
TOTAL				29865	

Appendix 2 LEGISLATIVE SUMMARY

1 Introduction

The purpose of this Appendix is to summarize the suitability of Zambia's current and proposed plant health legislation in terms of its conformity with international good practice, treaty and trade obligations, and in facilitating the implementation of phytosanitary management functions. PQPS are responsible for the administration of two pieces of legislation, ie the Plant Pests and Diseases Act (Chapter 233) and the Noxious Weeds Act (Chapter 231). A draft bill entitled the Plant Protection Act, 2005 has been prepared under a Food and Agriculture Organization (FAO) project number TCP/ZAM/2904.

2 Plant Pests and Diseases Act

The principal act governing phytosanitary matters in Zambia is the 'Plant Pests and Diseases Act' commonly referred to as Cap (Chapter) 233. It dates from 1958 and incorporates Acts 11 of 1958, 13 of 1994, Government Notices 90 of 1964, 497 of 1964, and Statutory Instruments 57 of 1965 and 176 of 1965.

2.1 Summary of *Plant Pests and Diseases Act (Chapter 233)*

- Provides regulatory powers to eradicate pests and other infestations
- Provides powers to inspect, fumigate and disinfect
- Gives the Minister to make different regulations
- Gives powers to enforce destruction of pests by owners of land or premises
- Defines powers of plant health inspectors
- Regulates the importation of organisms and growing media
- Provides for the destruction of unlawfully imported organisms and growing media
- Requires licenses for premises handling or storing cured tobacco, other than growers.
- Allows for revoking of tobacco handling and storing licenses as well as other regulations on infested cured tobacco.
- Allows complaints against nurseries by purchasers of plant material and for a range of measures including the destruction of infected nursery plants
- Provides for the appointment of inspectors
- In terms of the Act the Minister may issue regulations and statutory notice or statutory orders relating to plant pests and diseases.

2.2 Summary of Section 2 (2) *Plant Pests and Diseases (Pests and Alternate Hosts) Order*

This is a 'Subsidiary' to CAP 233 and lists injurious organisms with view to their control and spread. The list dates from a series of Government Notices between 1958 and 1963. This includes species such as *Helico verpa armigera* Hübn and *Bemisia tabaci* (sic).

2.3 Summary of Section 4; *Plant Pests and Diseases (Pest Control) Regulations*

This section provides for a range of measures against pests or alternate hosts listed in 'the schedule'. The schedule appears to be SCHEDULE (Regulation 2) of Section 2 (2) *Plant Pests and Diseases (Pests and Alternate Hosts) Order* though this is not entirely clear. The schedule was drawn up in 1962. A number of special conditions require inspection of crops in the exporting country during active growth.

2.4 Summary of Section 29. *The Plant Pests and Diseases (Coffee) Regulations*

These regulations date from 1958 and 1964 and are aimed at the control of the coffee berry borer (*Stephanoderes hampei* Ferr.)

2.5 Summary of Section 29. *The Plant Pests and Diseases (Kromnek) Regulations.*

These regulations date from 1958 and 1964 and regulate the growing, sale and movement of dahlia plants and tubers and if they are infected with *Lycopericum* virus 3. (Smith) what measures must be taken.

2.6 Summary of Section 29. *The Plant Pests and Diseases (Nursery) Regulations*

In this section the laws relating to pests and diseases in nurseries in Zambia are given. Most of the law dates from 1961, 1962, and 1964 but one section was amended in 1994. In summary;

- All plant nurseries must registered by the Ministry of Agriculture
- No plants may be sold by unregistered nurseries
- Infested nurseries (as declared by an inspector) are not allowed to sell plants etc until permitted by the inspectors
- Infested plants may be ordered to be destroyed by an inspector.
- Fumigation, if appropriate may be required.
- Fumigation schedules are given as well as designs for labels accompanying plants sold by registered nurseries

2.7 Summary of Section 29. *The Plant Pests and Diseases (Potato and Tobacco Growing) Regulations*

This section forbids the growing of tobacco and potatoes on the same farm at the same time. Any grower suspecting the presence of tobacco vein browning virus is required to inform the Minister immediately.

2.8 Summary of Section 29. *The Plant Pests and Diseases (Tobacco) Regulations*

Regulations regarding destruction dates for tobacco and tobacco seedbeds are given in this section together with requirements for a license to store tobacco. Designs for forms for applying for a license to store tobacco and a Tobacco Premises License are given in schedules. Rules for the storage of tobacco are given together with authority for the Minister to order the destruction of infested product.

2.9 Summary of Section 31, *The Plant Pests and Diseases (Cotton) Regulations*

This section dating from 1960 and 1964 outlines the requirements for dates by which cotton shall be destroyed after harvest and before which it is forbidden to plant. It allows the Minister to modify these if necessary.

2.10 Summary of Section 31; Plant Pests and Diseases (Importation) Regulations

Much of this section dates from 1958 and 1964 though parts of it were amended via a Statutory Instrument in 1972.

- This section sets out the conditions for the import of growing medium, injurious organism, invertebrate or plant.
- A permit must be applied for
- This can be issued, denied, canceled or amended at the discretion of the PS
- describes the powers of the inspectors
- Certain items do not require a permit e.g. fruit from 'Convention'³⁴ Countries or cut flowers
- Several schedules are incorporated into this Section including the design of an Import Permit application form, fees (some in ngwee), prohibited plants, designs for Phytosanitary Certificates, designated Ports of Entry, list of plant products and seeds for which a permit is required, and some special conditions for certain plants.

3 Noxious weeds Act

PQPS has some responsibility for oversight of the Noxious Weeds Act (Cap 231) though it is not a major part of the work of the Service as local councils are mainly responsible for implementation of the provisions of the Act. The main parts of the Act date from between 1953 and 1969 though there are later sections from 1994 mostly relating to jurisdiction of courts and penalties.

3.1. Summary

The Act declares the following species noxious weeds;

- *Lantana camara* in most cities and towns in Zambia.
- The water hyacinth (*Eichhornia crassipes*), *Salvinia auriculata*, *Argemone mexicana*, and *Xanthium Pungens Wall* (sic) in the entire country.

34 “Convention” means the Phytosanitary Convention for Africa south of the Sahara signed at London in the United Kingdom on the 28th July 1954 or any other international Phytosanitary Convention for Africa south of the Sahara to which the (Zambian) government may be a party.

4. The Plant Protection Act, 2005

This draft bill was written as part of a FAO input into phytosanitary management in Zambia entitled 'Strengthening Phytosanitary Capabilities' under donor project number TCP/ZAM/2904. The aim of the act is to prevent the introduction and control the spread of plant pests, provide for the protection of plant resources, regulate the importation and exportation of plants and plant products continue the existence of the Plant Quarantine and Phytosanitary Service (PQPS), provide for the implementation of international plant protection instruments to which Zambia is party and repeal the Plant Pests and Diseases Act Cap 233. The title is the ***Plant Protection Act, 2005***. The following is a paraphrased summary of the key parts of the Act which is still in the review stage.

4.1 Defining the Plant Quarantine and Phytosanitary Service

The function of the Service is to prevent the introduction and control the spread of any plant pest and to protect plant resources via the following measures:

- formulate measures to prevent and control the entry, establishment and spread of pests;
- set and implement measures to protect plant resources from any pest;
- set and implement standards for phytosanitary measures;
- issue phytosanitary certificates and ensure the phytosanitary security of any consignment;
- regulate the import and export of any plant and plant product;
- conduct pest risk analyses to regulate pests and determine applicable phytosanitary measures;
- conduct pest risk analyses to regulate pests and determine the strength of any phytosanitary measure;
- inform the general public on the risk, danger and impact on the environment, animal, plant and human health caused by pests;
- carry out surveillance of any growing plant, any area under cultivation, wild flora, any plant or plant product in storage or transit, so as to determine the occurrence, outbreak or spread of any plant pest;
- inspect and treat any consignment of any plant, plant product and any other article for the purpose of preventing the introduction or spread of pests;
- protect any endangered area and designate, maintain and survey any pest free area and area of low pest prevalence;
- provide justification to other countries concerning any phytosanitary measures applied, either through pest risk analysis or by reference to applicable international standards;
- establish auditing and trace-back procedures for any plant, plant product and regulated article for phytosanitary certification;
- provide information regarding any pest and the means of prevention and control of any pest;

- serve as the national plant protection organisation and implement international plant protection instruments to which Zambia is party;
- represent Zambia in bilateral, regional and international fora related to phytosanitary matters;
- develop pest diagnostic, investigative and analytical capabilities and establish laboratories and quarantine stations at such places as may be considered necessary;
- establish procedures for accreditation of any quarantine station, official analyst, official laboratory or any other person or institution from the public or private sector involved in phytosanitary matters;
- collaborate with other institutions and organisations in the prevention, containment and eradication of pests and invasive alien species; and
- carry out such other activities relating to plant protection as are necessary or incidental to the performance of its functions under this Act.

4.2 Inspectorate

An Inspectorate is formally established with the necessary technical staff and facilities required to administer, monitor and enforce measures for the protection of plant resources from any pest.

The Service may delegate duties to a customs officer or other public officer.

4.3 Regulation of Imports

No imports of plants, plant products or other regulated article are allowed without a permit and must be through an approved point of entry. They must be inspected by a designated inspector

Prevention of introduction of invasive alien plant species

4.4 Declaration of phytosanitary emergency

Powers are granted to the Minister of Agriculture to declare a phytosanitary emergency where –

- an introduced pest is capable of rapid dispersal;
- the presence, impact and extent of the infection of a pest, the potential for spread and its rate of spread requires emergency eradication measures to eliminate the pest;
- a pest is of immediate or potential danger to the environment, plant, animal or human health; or
- a quarantine pest or potential quarantine pest is detected in any area in Zambia.

4.5 Quarantine Station

The Service may designate any place as a plant quarantine station where any plant, plant product or regulated article may be kept for phytosanitary observation, research, inspection, testing, treatment, detention or destruction.

4.6 Duty of customs or other authorised officer

Customs or other authorised officer at a point of entry, shall notify an inspector of the importation of any plant, plant product or regulated article detain the plant, plant product or regulated article until an inspector takes custody of them and is deemed to be an action taken on delegation from the Service. Wide powers of search and seizure are given to the inspectorate and delegated authorized officers.

4.7 Containment and Eradication of Pests

An owner or occupier of any premises on which, or a local authority in whose area, a quarantine pest is present or is suspected is required to immediately notify the Service. The Service is empowered to Declaration an area a quarantine area and/or to declare an area infested. Owners of infested areas are required to eradicate pest

4.5 Pest Free Areas

The Minister may declare an area a pest free area where the Service -

- determines that a pest is not present in the area;
- adopts phytosanitary measures to keep the area free of any pest;
- and
- institutes a surveillance system to ensure that the area remains free of any pest.

4.6 Phytosanitary Certification for Export

No exports of any plant, plant product or regulated article are permitted;

- without a permit and a phytosanitary certificate; and
- unless the goods comply with the import conditions of the importing country.

4.7 Phytosanitary Emergency Fund

A Phytosanitary Emergency Fund is to be established which shall be supplied with all necessary resources to enable the Service to respond to a phytosanitary emergency.

Funds will come from Parliament plus 75% of the inspection fees plus 50% of the fines collected from persons convicted of offences under this Act. Resources of the Fund shall

be made available to the Service immediately upon declaration of a phytosanitary emergency.

4.8 Enforcement and Miscellaneous

Powers of inspectors are defined and provisions are made for amending the workings of the Act. These include reviewing via Statutory Instrument legislation and practices in line with;

1. Current international good practice
2. Treaty and trade obligations
3. Facilitating the implementation of phytosanitary management functions.

5. International Treaties and Obligations

5.1 OIE.

The OIE's objectives are the harmonization of health requirements for international trade in animal and animal products and the adoption of internal recommendations in the animal health field. The OIE International Animal Health Code was published in 1968. The OIE informs countries about the occurrence and control of animal diseases, coordinates global studies of monitoring and control of diseases, and harmonizes import and export regulations concerning animal health. OIE activities are complementary to those of Codex Alimentarius on diseases such as brucellosis, tuberculosis and bovine spongiform encephalopathy, which are or might be transmitted to human beings through the food chain.

It is also concerned about residues in food arising from the administration of biological agents such as vaccines (including recombinant vaccines) or due to emerging drug – resistant bacteria.

OIE recommendations enjoy the same status as the Codex Standards under the SPS Agreement. A priority function of OIE is to inform Governmental veterinary services of the occurrence and course of epizootics that could endanger animal or human health.

5.2 IPPC.

The SPS Agreement identifies the International Plant Protection Convention (IPPC) as an organization that provides international standards for measures implemented by governments to protect their plant resources from harmful pests (phytosanitary measures). The Convention is a legally binding agreement but standards developed and adopted by IPPC are not legally binding. IPPC has also a dispute settlement provision in the instance where measures may be challenged as unjustified barriers of trade. The purpose of IPPC is to secure common and effective action to prevent the spread and introduction of plant pests and plant products, and to promote appropriate control measures. It also requires member countries to put in place appropriate checks, certification and disinfection procedures and to make information available to any

interested party. Like in the case of Codex, IPPC standards are not compulsory. The IPPC was created in 1952 to facilitate the adoption of international sanitary and phytosanitary standards. The Convention is an international treaty, which obliges its signatories to take measures that ensure the safety of imports and exports of plants and plant products likely to contain pests or diseases. The IPPC Secretariat was established in 1993 and the standard setting activity started the same year. The IPPC is responsible for setting phytosanitary standards and the harmonization of phytosanitary measures affecting trade.

5.3 Overview of the WTO Agreement³⁵

The World Trade Organization (WTO) was established in 1995 following the completion of the Uruguay Round of negotiations. Its functions include:

- administering and implementing multilateral trade agreements;
- providing a forum for multilateral trade negotiations;
- seeking to resolve trade disputes;
- contributing to transparency of national trade policies in cooperation with other international institutions involved in global economic policy –making.

The adherence to the WTO/SPS Agreement of 1995 is based on the assumption that codes, rules, recommendations, guidelines and standards will be adopted and recognized by the signatories to the agreement. The SPS Agreement creates legally binding obligations for WTO member countries to ensure that any food safety measures they adopt, which affect international trade are scientifically justified and based on appropriate risk assessment.

The WTO Agreement on SPS covers all measures concerned with the protection of: (a) human or animal health from food borne disease risks; (b) human health from animal or plant carried diseases; (c) animals and plants from pests or disease (SPS, 1996). The SPS Agreement is not a single edict, but consists of a set of laws, decrees and regulations, procedures, processes and production measures, as well as testing and inspection.

The WTO SPS standards are drawn up by international bodies, and these standards serve as benchmarks for all countries including the member states of SADC. The Food and Agriculture Organization (FAO), World Health Organization (WHO), the International Office of Epizootics (OIE) and the International Plant Protection Convention (IPPC) are international organizations that serve as reference points for these standards. These international organizations have complementary mandates to protect the health of the consumer, to prevent spread of disease and to ensure that procedures followed in the trade of food products are fair.

SPS measures consist of the following components:

35

http://www.satradehub.org/CXA_html/docs/reports/Moz%20202%20final%20with%20disclaimer.pdf

1. testing, inspection, certification, and approval import and export products;
2. quarantine treatments including relevant requirements associated with the transport of animals or plants or materials necessary for their survival during transportation;
3. provision for relevant statistical methods of risk assessment;
4. packaging and labeling requirements directly related to food safety;
5. permission to use specified additives;
6. restriction of levels of pesticides to be used;
7. procedures for recognition of disease free zones or areas;
8. requiring products to come from disease-free areas and
9. import bans based on the precautionary principle;

According to the activity and the concerned commodity, a specific SPS matter of concern can be handled by Codex, OIE or IPPC through the mandates given to those organizations under the WTO/SPS Agreement.

Appendix 3. Current System of Phytosanitary Management in Zambia

1. Introduction

Zambia's phytosanitary management is one part of the functions of the Zambia Agricultural Research Institute (ZARI). This section (Appendix 3) reviews the current system of phytosanitary management in Zambia and covers overall management, priority-setting, and the performance of specific regulatory, surveillance, and other functions, as well as the underlying human, physical, and financial resources available

2. Management Structure

The Zambia Agricultural Research Institute (ZARI) is directed by Dr. Watson Mwale and its headquarters is at Mount Makulu Research Station (MMRS) 15 km out of Lusaka on the road to Kafue. The Institute is divided into Research Services and Technical Services each with its own Deputy Director. Research Services are responsible for the research stations around Zambia of which one is Mount Makulu itself. This section is headed by Dr. A. Sakala, Deputy Director, Research Services. Technical Services is the responsibility of Dr. M. Mwale and comprises of four divisions each headed by a Chief Agricultural Research Officer (CARO). Mrs. M. Zulu heads the Plant Protection and Quarantine Division (PPQD) and reports direct to Dr. Mwale (Fig. 2 below).

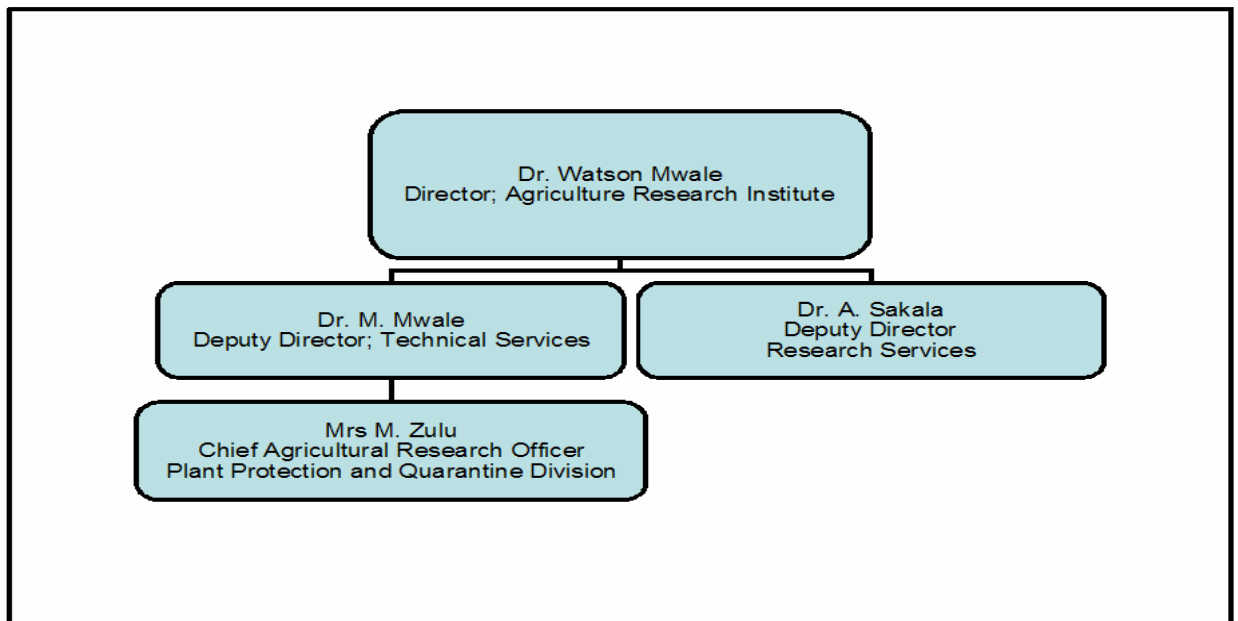
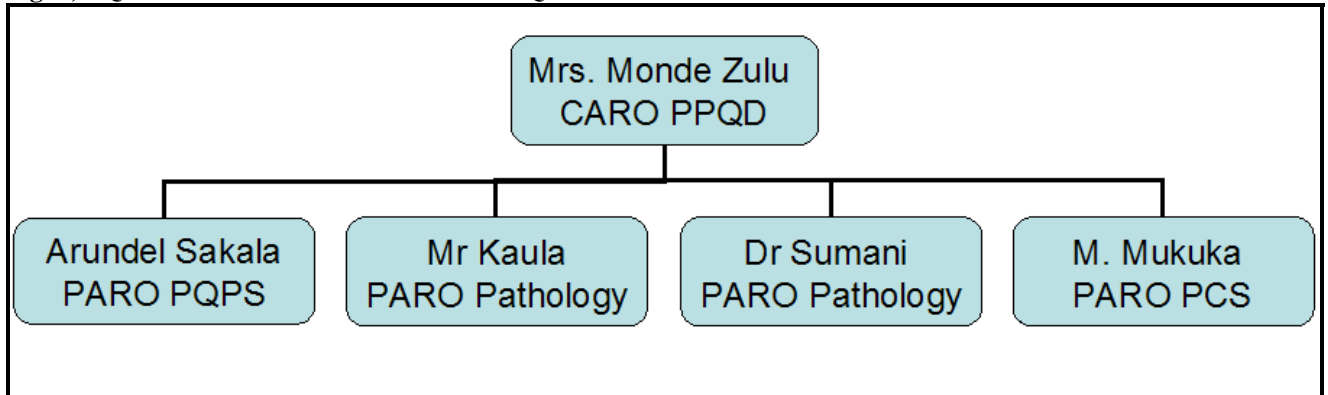


Fig. 2; The position of the Plant Protection and Quarantine Division within the Zambia Agricultural Research Institute.

Thus the position of the Plant Quarantine and Phytosanitary Service (PQPS) within the Ministry of Agriculture is as follows;

Ministry of Agriculture and Cooperatives (MACO)
 Agricultural Research Institute (Research and Specialist Services)
 Plant Protection and Quarantine Division (PPQD)
 Plant Quarantine and Phytosanitary Service (PQPS)

Fig. 2; PQPS within the Plant Protection and Quarantine Division



(CARO, Chief Agricultural Research Officer, PARO, Principal Agricultural Research Officer)

The Plant Protection and Quarantine Division (PPQD) into which PQPS falls is subdivided into four sections which are shown in the figure below;

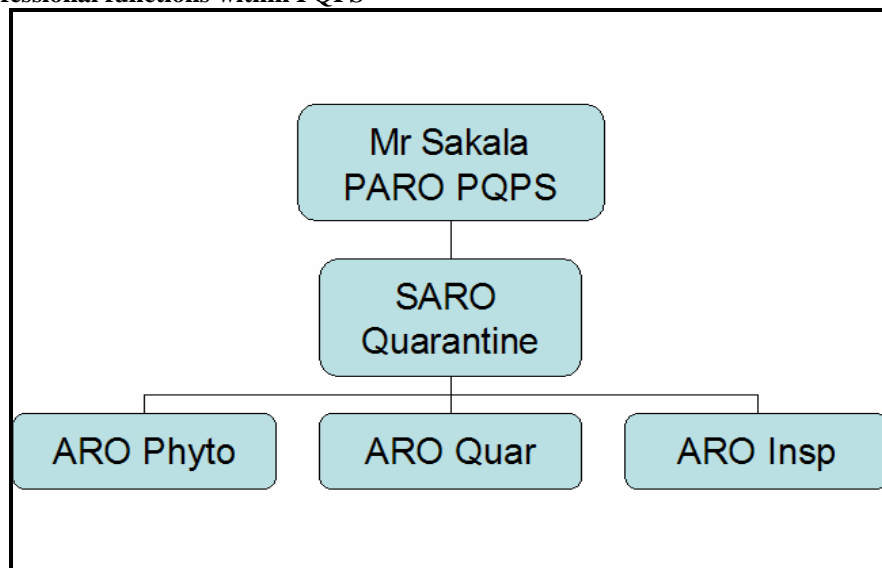
Within PPQD functions are divided into four services as shown in Table 1.

Table 1. Functions of the Plant Protection and Quarantine Division of the Agricultural Research Institute

<i>Plant Protection and Quarantine Division</i>				
Service of PPQD	Pathology including fungi, nematodes and viruses	Entomology	Plant Quality and Phytosanitary Service	Storage and post harvest protection (storage pests)
Function	Research and Taxonomy	Research and Taxonomy	Administration of Cap 233 and Cap 231	Grain storage research and extension

Within PQPS the professional functions are organized as shown on Figure 3. Essentially functions are divided into the following three; Phytosanitary (Phyto), Quarantine (Quar), and Inspection (Insp), each the responsibility of a B.Sc. Graduate with the grade of Agricultural Research Officer (ARO)

Fig. 3; Professional functions within PQPS



* (PARO, Principal Agricultural Research Officer, SARO, Senior Agricultural Research Officer, ARO, Agricultural Research Officer)

Professional grades are shadowed by a technical service similar to a university scientific structure. A senior Technical Research Assistant with a Technical Research Assistant post exists for each of the three ARO sub-services (Phytosanitary, Quarantine and Inspection). There is also a Principal Technical Research Officer for PQPS.

Finally there are posts for 9 Border Inspectors with the grade of Technical Research Assistant.

3. Responsibilities

PQPS divides its responsibilities into three main areas not necessarily matched by the ARO areas of responsibility. These are the implementation of the Plant Pest and Disease Act of Zambia Cap (Chapter) 233 and the Noxious Weeds Act Cap 231. In terms of both acts there is a list of notifiable pests and diseases which are required to be reported to the nearest Plant Health Inspector or Agricultural Research Officer. The Service also carries out research on specific pests and diseases, in particular the Larger Grain Borer.

3.1 Inspections

PQPS are charged with the inspection of various enterprises where there is significant opportunity for the introduction and spread of pests and diseases. These are;

- farms
- nurseries
- export growers
- imported plant material

3.2. Fumigation

Inspect, and if necessary fumigate, consignments in terms of export declarations as required by foreign import permits. This may be specified as a requirement of an importing country should an inspection detect the presence of a quarantine pest.

3.3 Quarantine facility and certification

PQPS Operate a Quarantine facility, issue Phytosanitary Certificates and import permits, monitor seed health (imports and exports) and are responsible for the detention/destruction of uncertified and or infested plant material

3.4 Border crossings

PQPS operate an Inspection Service at major border crossings and import and export points

These are;

- Nakonde (on the border with Tanzania)
- Lusaka International Airport
- Chirundu
- Livingstone
 - Sesele
 - Chavumba
 - Mufalira
 - Chilabombwe

The last four are not manned by PQPS personnel. Instead PQPS run annual Plant Health Inspection training courses for Customs officials being rotated into these posts. The 'Addendums' and list of Quarantine Species coupled with the relevant operating procedures are important to the operation of PQPS.

4. Addendums

Part of the function of the addendum is to provide a guide for the importer of the additional requirements that are determined as being necessary for the import of different species of plant material. The Addendums are effectively a list of pests of major quarantine importance that need to be excluded from Zambia. These are mainly grouped by their association with plant species but also include general categories such as soil.

5. List of Quarantine Species.

Outside of the controlled species listed in Cap 233 and 231 there appears to be no updated list of Quarantine pests. There is a list generated by the Food and Agriculture Organization (FAO) and the Southern African Development Coordination Community

(SADCC) but it is not sure what its status is at present³⁶. It is also not clear whether there is another list used by PQPS used as a reference for the Addendums, The FAO-SADCC list contains three types of quarantine pests;

- A1 List – species not present in the sub-region
- A2 List – species present in part of the sub-region
- List 3 – quarantine species of other regions present in the sub-region

6. Laboratories

Basic plant pathology laboratory facilities are available for the isolation and identification of bacteria and fungi. Viruses are more difficult but are normally identified by other specialist institutions. Insects are normally easier to identify.

7. Bees/Honey

This area is legally the responsibility of Veterinary Services. However PPQD represents the most significant entomological resource within Zambia so they assist where necessary. The Forestry Department is also involved in some way, most probably from a legal viewpoint. However in practical terms the PQPS are the most resourced and proactive.

8. Information transfer and access.

PQPS has no access to on-line and other services provided by CABI and USDA-APHIS. E-mails are via computers at other departments

36 FAO-SADCC, Pests of Major Plant Quarantine Importance in Southern Africa: A Manual for their Identification. FAO Regional Office for Africa - SADCC. Prepared by CAB International under FAO Contractual Services Agreement TCP/RAF/4566 (very unfortunately undated)

Appendix 4;

Review of FAO, RNG, COMESA and USDA-APHIS programs and further strengthening desired by PQPS

1 Introduction

Several organizations and countries have identified PQPS as a priority area for institutional capacity building in terms of training, equipment and information. The Food and Agriculture Organization (FAO) program is complete. There is no copy of the report at present, though a copy of the draft legislation has been made available³⁷. The COMESA and Dutch projects are underway (operational).

2 FAO

An FAO project was concluded in July 2005 entitled 'Strengthening Phytosanitary Capabilities' under donor project number TCP/ZAM/2904³⁸. The main objective of this assistance was to strengthen the phytosanitary capabilities of Zambia towards establishing an effective phytosanitary control system for enhancing agricultural production and increased market access for its agricultural products. This would be achieved through:

- Reviewing and modernizing its legal frameworks
- Training Government officers for effective functioning at various competency levels in the Phytosanitary Service
- Providing direct assistance in conducting pest risk analyses for high priority export commodities to the US
- Development of procedural manuals (e.g. for PRA, inspection and certification)
- Establishing appropriate surveillance systems to support PRA
- Establishing a Pest/Trade Data Management System to support regulatory decision making; Conducting a comprehensive Phytosanitary Capacity Evaluation, the results of which would provide the basis for prioritizing and initiating future development activities.

Attempts were made to get a copy of this report through the contact point given on the web page http://stdfdb.wto.org/trta_project.asp?prjcd=TCP/ZAM/2904&ctry=128 but no response has been received. The new Draft Bill which is the main output from this project has been reviewed elsewhere (Appendix 2).

2 Royal Netherlands Government (RNG)

In May 2003 the Dutch Ministry of Foreign Affairs And the Ministry of Agriculture, Nature and Food Quality held discussions with the Ministry of Agriculture and Cooperatives (MACO) in Zambia, the Zambia Export Growers Association (ZEGA) and the Plant Quarantine and Phytosanitary Services (PQPS) and other stakeholders to look at ways of improving market access for Zambian produce, particularly in industrialized

37 ZAMBIA Draft Plant Protection Bill -draft for circulation (2) (1)

38 http://stdfdb.wto.org/trta_project.asp?prjcd=TCP/ZAM/2904&ctry=128

countries. This initiated a process by which a working document has been created aimed at providing input from the RNG into PQPS³⁹

The main issues to be addressed are a general upgrade of phytosanitary procedures and regulations related to exported cut flowers vegetables and fruits mainly at Lusaka Airport. There were two issues identified by the RNG Project;

- The limited capacities at Lusaka Airport for product inspections
- The requirement for a second (import) phytosanitary inspection in Europe after the (export) inspection at Lusaka International Airport of roses and other cut flowers, vegetables and fruits adding to costs and reducing competitiveness.

The project aims to strengthen export inspection services by providing funds to hire and train four inspectors, build new offices and purchase equipment at the airport, supported by on-farm inspections. Improved document handling is to be addressed including electronic pre-clearance prior to departure from Lusaka. Improved traceability using existing systems set in place by growers is to be adopted.

Phytosanitary issues identified in the RNG report were the possible presence of *Thrips palmii* and whitefly (*Bemisia* spp). It was felt that with a proper survey, it would be possible to establish pest free areas in accordance with the International Standard of Phytosanitary Measures.⁴⁰ Establishment of these areas will further reduce the requirements of the Dutch Phytosanitary Service to conduct expensive inspections on Zambian produce.

Comment is made in the Dutch program of reducing the prevalence of *Helicoverpa* spp (*armigera*) as these moths are an EPPO quarantine pest. This pest is extremely difficult to control in some crops, notably peas, and the present upgraded inspection system from EUREP-GAP certified growers is currently the most practical approach.

Upgraded information sharing is required especially between Zambia and its trading partners.

Zambia's current monitoring and surveillance program is inadequate. The Dutch program has upgraded this so that horticultural exporters in the Lusaka area are regularly monitored

4 African Development Fund (ADF)-Common Market for Eastern and Southern Africa (COMESA)⁴¹

39 WSSD Partnership program on Market Access, Food Safety and Capacity Building (Zambia – the Netherlands); towards a sustainable market oriented horticultural sector in Zambia. Strengthening Phytosanitary Services for Export-oriented Horticultural Sector in Zambia. June 2005.

40 International Standards for Phytosanitary Measures; Requirements for the Establishment of Pest Free Places of Production and Pest Free Production Sites. ISPM Publication No. 10, 1999

41 African Development Fund (ADF) Multinational Common Market for Eastern and Southern Africa (COMESA). Agricultural Marketing Promotion and Regional Integration Project. Appraisal Report Agricultural and Rural Development Department, North, East and South Regions December 2003

This project is developing an approach for harmonizing regional SPS Measures. Key constraints to SPS harmonization in COMESA are identified as requiring input as inadequate information sharing and 'dialogue' among member states on SPS and limited analytical capacity lead to a failure to meet WTO requirements.

- The project will bring together technical focal points in the 20 member states to dialogue on steps taken to date in harmonizing SPS measures in their respective countries.
- Backstopping missions to provide technical guidance in the review of legislation, enhancement or establishment of SPS institutions and surveillance, emergency preparedness and trace-back systems.
- Upgrading pest/disease surveillance systems will be assisted.
- An inventory of risk management facilities
- The databases will accommodate traceability requirements necessary for products to enter EU markets, including origin of production, production regimes and certification.

It is not clear that there has been much input from this project beyond the production of a report. Funding is not significant and is, in any case, spread between many recipients.

5. United States Department of Agriculture Animal and Plant Health Inspection Service (USDA-APHIS)

This program centered on carrying out PRAs for edible podded peas, baby corn, baby carrots, baby zucchini and asparagus. The USDA-APHIS adviser who had been based in Botswana has now left and not been replaced. The PRAs were successful in the sense of getting (technical) access to the US market for a number of Zambian horticultural products, notably baby carrots, baby corn and edible podded peas. Not all the commodities submitted to USDA-APHIS were considered⁴². They were also useful as a training exercise for personnel in PQPS. It was not possible to see much continued interest by USAID in this program for the simple reason that logistical links to the US market are poor and thus expensive. Therefore it is not very likely that these PRAs, no matter how technically sound, would have any commercial benefit to Zambian exporters.

42 Giovanni, Daniele P.; Sterns, Patricia Aust; Eustrom, Michael; and Haantuba, Hyde. 2001. **The Impact of Improved Grades and Standards For Agricultural Products in Zambia**. East Lansing, MI: Michigan State University and United States Agency for International Development, PFID-F&V Report No. 3.

Appendix 5. Pesticide Residue and Microbiological Analysis

Introduction

During the course of the consultants visit to Zambia the issue of setting up laboratories for testing export crops for pesticides and for microbiology i.e. human pathogens was raised on a number of occasions. This appendix has been incorporated into the report in order to review issues relating to the overall practicality and desirability of setting up such facilities. Issues include, understanding what are the core functions of NPPOs and actual capacity within PPQD and PPQS. The purpose of this appendix is to review the technical requirements for pesticide and microbiological analytical laboratories in order to put in context the issue of capacity as dealt with in the main report.

The overall impression gained by the consultant of the written and verbal submissions by ZARI was that this capacity in terms of equipment and training was a key desire of the Institute. Actual recommendations do not include provisions for this facility. As such this appendix (Appendix 5) provides a partial justification for this view. It is also the opinion of the consultant that these activities are not a core function of an NPPO.

Many of the services reviewed below are accessed by exporters through their agents and as such it would be redundant to duplicate these within Zambia.

Laboratory Standards

UK and South African supermarkets require minimum standards from pesticide testing laboratories. Any pesticide laboratory must be capable, qualified or accredited to undertake pesticide residue analysis to ensure the reliability and consistency of the results. Laboratories are generally required to have with Good Laboratory Practice (GLP) status and United Kingdom Analytical Standards UKAS accreditation for pesticide analysis. In South Africa, the Ministry of Trade and Industry have a laboratory certification scheme called the South African National Accreditation Scheme (SANAS). SANAS and UKAS are 'cross-accredited' and recognize each others certification.

The laboratory chosen must be demonstrated to be capable, qualified or accredited to undertake pesticide residue analysis to ensure the reliability and consistency of the results. Laboratories with Good Laboratory Practice (GLP) status and UKAS accreditation for pesticide analysis and participating in the Department for Environment Food and Rural Affairs (DEFRA) Food Analysis Performance Assessment Scheme (FAPAS) achieving specified scores

Extreme care should be taken in the decision on what to analyze (test) for in a sample. There is sometimes a misconception over the term "multi-residue" which can give the impression that all possible residues are being tested for. In fact multi-residue analysis will vary between laboratories, therefore it is important that the laboratory is aware of the range of pesticides it needs to analyze and have the appropriate protocols in place. Some

important pesticides such as inorganic bromine and dithiocarbamates are not included in a general multi-residue test.

The residues should be compared to the current lists of legal MRLs as defined in *The Pesticides (Maximum Residue Levels in Crops, Food and Feeding Stuff) Regulations 1999 and subsequent amendments (2001)*, Statutory Instruments 1999 No. 3483 and 2001 No. 1113.

Reference Information for pesticides

Useful points of reference are:

<http://www.nda.agric.za/act36>

DEFRA Green Code: Code of Practice for Safe Use of Pesticides on Farms and Holdings (PB3528) Her Majesties Stationary Office (HMSO)

Code of Good Agricultural Practice for the protection of water

DEFRA

Code of Good Agricultural Practice for the protection of air

DEFRA

Code of Good Agricultural Practice for the protection of soil

DEFRA

Opportunities for saving money by reducing waste on your farm –

A manual for farmers and growers

DEFRA

Guidelines for the safe and effective use of crop protection products -

www.gcpf.org

Guidelines for personal protection when using pesticides in hot climates

www.gcpf.org

The Pesticide Manual – A World Compendium

BCPC

The Biopesticide Manual – A World Compendium

BCPC

The UK Pesticide Guide 2002 (Published annually) (The “Green Book”)

BCPC

www.bcpc.org

Pesticides Monitor (monthly)

DEFRA

Pesticides, Reference Book 500 (Published annually)

DEFRA

Pesticide Safety Directorate (PSD) www.pesticides.gov.uk

Pesticide Residue Committee (PRC) www.pesticides.gov.uk

Pesticides 2001 – Your guide to approved pesticides (The “Blue Book”) PSD

Fresh Produce Consortium (FPC) www.freshproduce.org.uk

The Control of Pesticides – a Code of Practice

FPC

Campden & Chorleywood Food Research Association Group
Chipping Campden,
Clousestershire
GL55 6LD
UK
Tel +44 (0) 1386 842000
Fax +44 (0) 1386 842100
www.campden.co.uk

SANAS/UKAS accreditation of the laboratory alone is generally not acceptable to UK supermarkets. A specific standard has to be met in terms of International Standards Association (ISA) standards for the microbiological determination of the following tests;

Escherichia coli
Listeria monocytogenes
Salmonella spp.
Yeasts and moulds (spoilage)

The laboratory and these tests must be certified annually to the ISA standard. Of particular importance is the requirement for the film test for *E. coli* which takes only 24 hours to produce a result. This method and the certification is regarded by supermarket chains as crucial in demonstrating 'due diligence' with regard to customer safety because there is time to react to a positive result before much of the product has been sold and consumed.

In practice the South African supermarkets require a lower microbiological standard and are satisfied with SANAS/UKAS accreditation.

UKAS

The United Kingdom Accreditation Service is the sole national accreditation body recognized by government to assess, against internationally agreed standards, organizations that provide certification, testing, inspection and calibration services. Accreditation by UKAS demonstrates the competence, impartiality and performance capability of these evaluators

Usually the reason for getting something independently evaluated is to confirm it meets specific requirements in order to reduce risks. Obvious examples are product failure, health risks, company reputation or to meet legal or customer requirements. Anything or anyone can be evaluated - products, equipment, people, management systems or organizations

Accreditation by UKAS means that evaluators i.e. testing and calibration laboratories, certification and inspection bodies have been assessed against internationally recognized standards to demonstrate their competence, impartiality and performance capability. It is the ability to distinguish between a proven, competent evaluator that ensures that the

selection of a laboratory, certification or inspection body is an informed choice and not a gamble. UKAS accreditation means the evaluator can show to its customer that it has been successful at meeting the requirements of international accreditation standards. This means that the customer reduces the risk of selecting an incompetent evaluator and paying for, or more seriously, acting upon invalid results.

Trust is placed with suppliers in a variety of ways: past experience, recommendation, brand preference and so on. The greater the familiarity the more confident the purchasing decision. In today's large competitive business market it isn't always possible to buy from 'known' sources. Reassurance is needed to maintain trading confidence. Independent evaluation is the principle source of this reassurance and such confidence is underpinned by UKAS accreditation.

Accreditation by UKAS benefits its direct customers, their customers and purchasers by building confidence in a range of suppliers and enabling choice. It also encourages free, but trustworthy markets, enabling innovation and reduced regulation.

Accreditation by UKAS can also limit the need for government to regulate industry and the professions. It provides an alternative means of ensuring the reliability of activities that have the potential to impact on public confidence or the national reputation.

UKAS, where requested, assesses organizations and recommends to government their appointment as Notified Bodies as required by EU Directives and Regulations.

Accreditation and global trade

Accreditation is used worldwide. In most developed economies there is a body similar to the United Kingdom Accreditation Service. UKAS is the United Kingdoms signatory to European and international agreements to facilitate the breaking down of technical barriers to trade. It is important for goods and services tested are accepted in Europe and worldwide without the need for additional testing. Increasingly, accreditation is the means of achieving this.

UKAS is recognized internationally through European and world multilateral recognition agreements. This recognition enables government to use accredited bodies to meet obligations under world trading agreements e.g. compliance with EU Directives and the WTO TBT (World Trade Organization Technical Barriers to Trade) Agreement. UKAS represents the United Kingdom on three European and international bodies - the European co-operation for Accreditation (EA), the International Laboratory Accreditation Cooperation (ILAC) and the International Accreditation Forum (IAF).

There are currently about 88 procedures within the Food Safety & Quality, Microbiology and Pesticides Veterinary Medicine Groups that need to be accredited to the ISO/IEC 17025 standard by UKAS. In addition, two of the principal Proficiency Testing Schemes operated by CSL, the Food Analysis Performance Assessment Scheme (FAPAS) and the Food Examination Performance Assessment Scheme (FEPAS) have to be assessed by

UKAS, so as to be recognized as complying with the requirements of International Standard ISO/IEC Guide 43-1:1997, through assessment against ILAC Guide G13:2000.

Appendix 6. Edited Correspondence on Taxonomy

From: "Eric Boa" e.boa@cabi.org
plant.clinic@cabi.org

IDs for fungi, bacteria, nematodes, viruses, phytoplasmas are around GBP90 each. If we have to isolate any material the minimum charge is GBP180 plus the ID for the pest organism.

We don't do insect IDs ourselves but use the services of people such as the Natural History Museum NHM charges around GBP100 per specimen. There are other possibilities which would be less costly but best to stick with the GBP100 per specimen. We'd add a 10% handling charge for coordinating reports and making sure things were followed up.

CABI identifies fungi, bacteria and nematodes; viruses and phytoplasmas are done by CSL and Rothamsted Research, both members of the Global Plant Clinic Alliance (GPCHA).

We've just done a contract for Uganda via FAO along similar lines and this emphasized the need for more careful selection of what to send and how to prepare it. The most efficient way of getting the IDs done is to have someone working with the local services to ensure that quality of material is up to scratch. The danger is that material is sent which doesn't provide the information being sought.

Option one is that we agree a call-down contract with a minimum amount guaranteed. Not sure exactly how many samples they would be sending, but if it was more than say 50 we would offer a discount of 10% (in other words we would do 55 for the price of 50). If it was more than 100 we would increase that to 15%. Not sure how many samples we are talking about here.

Option two is to have someone come out from the GPC for short periods. I don't know if the grant would allow us to visit but if it did I would suggest one visit of five days (a year). That would cost around GBP4k, including direct costs. Rob Reeder can advise on all pest groups and do some short training in preparing material plus bring it back by hand. The cost for doing the samples would be on top.

We're happy dealing with small numbers of samples at any one time but this takes more time to deal with - another reason for coordinating what is sent.

Our administrative charge would be a minimum of GBP1000 for coordinating samples (given that some will be sent to other places), collating reports and providing additional background information on the pest. ID reports include a name, authority and other key information on the organism.

Dermot -

Your messages have been forwarded to me. I'm head of the Global Plant Clinic, an alliance of CABI, Rothamstead Research and the Central Science Laboratory. We provide identification services for all major pest groups and work with all crops.

You're right to be cautious about setting up labs since this is fraught with problems. Many previous investments have failed to flourish. It's difficult keeping up to date with the science and maintaining facilities. However, it's also important that there is local capacity since sending material outside is not easy. South Africa is very touchy about importing pests and diseased material. There's always going to be a need to use experts outside Zambia and we'd be happy to talk more about this. We already do this for 50+ countries under a variety of schemes, including projects and commercial clients. We can receive material from all countries and crops.

The main question I would have is how the pest identification service would serve the needs of quarantine and crop protection within Zambia. There is a big need for technical backstopping on both but training scientists and building labs is only the beginning. One other option is to link with the Southern African Loop of BioNET International though I still think there is a need to have local facilities.

Regards
Dr Eric Boa
Head of Global Plant Clinic
www.globalplantclinic.org

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Terms of Reference
Dermot Cassidy
Agricultural Standards and Zambian Trade

Background

With the decline in traditional barriers to trade such as tariffs and quotas, there has been heightened interest in the impact of technical standards on trade in agricultural and food products. These include sanitary and phytosanitary (SPS) measures as well as other technical requirements (i.e. labeling; environmental impact assessment). While not having the restriction of trade as their primary objective, there is evidence that many such measures can, in fact, act as a barrier to trade. The realization that these measures can affect competitiveness and impede trade has focused attention on SPS management capacity needs. There are concerns that lower income developing countries--such as Zambia--lack the technical and/or administrative capabilities to comply with emerging requirements. As a result, such countries may fail to fully realize the benefits from on-going trade reforms and from the expanding international and regional opportunities for trade in higher value food and agricultural products.

Zambia's Ministry of Agriculture and Cooperatives (MACO) is concerned that available technical, human, and financial resources are inadequate to enable the sufficient monitoring and management of SPS risks, as demanded by the country's trading partners. To address this concern, MACO has received some support from donors to address specific SPS issues. For example, support from the Dutch Government is addressing phytosanitary concerns related to horticultural and floricultural exports to the EU. USAID, through its Market Access Trade and Enabling Policies (MATEP) project is committed to address pertinent issues affecting regional trade. To ensure that the most pressing SPS issues are adequately addressed (and financed), the Zambian Agricultural Research Institute (ZARI) has sought assistance to undertake a focused SPS management needs assessment which would identify near-term priorities and recommend investments, reforms, or other steps to address these priorities.

In response, the World Bank and USAID have mobilized a team to (i) provide an assessment of major and secondary SPS-related challenges affecting Zambia's trade and of the underlying (public and private sector) capacities and strategies to meet these challenges, and (ii) lay out an Action Plan which highlights immediate needs and opportunities for capacity building. It is anticipated that core elements of this Action Plan would be supported under the new Agricultural Development Support Project of the World Bank, the MATEP project of USAID, or on-going projects of other development agencies. A preliminary mission was carried out in March 2006 which examined a broad array of current and potential constraints associated with food safety, agricultural health, and Zambia's trade and which identified selected areas for which considerable benefits could be achieved in the near-term via a program of technical assistance, training, equipment procurement, etc..

A follow-up mission is now being planned for May 2006 in order to provide further assessment and prioritization in selected areas and to identify several specific cost initiatives which could be supported under new or existing projects. One of the topical areas for which further assessment and sub-project planning is needed relates to Zambia's phytosanitary management capacities. As part of the larger World Bank/USAID team, Mr. Cassidy will undertake the assessment/intervention identification work in relation to plant health.

Specifically, Mr. Cassidy will:

- Review Zambia's current system of phytosanitary management, characterizing apparent strengths and weaknesses in overall management, in priority-setting, and in the performance of specific regulatory, surveillance, and other functions, as well as the underlying human, physical, and financial resources available for phytosanitary management;
- Review the suitability of Zambia's plant health legislation in terms of its conformity with international good practice, Zambia's treaty and trade obligations, and in facilitating the implementation of phytosanitary management functions;
- Highlight pertinent plant health 'events' (i.e. disease or pest outbreaks; disputes with trading partners) from recent years and draw lessons from how these were managed by the PQPS and other Zambian entities;
- Identify plant health concerns that Zambia's trading partners have had, either in relation to Zambian (potential) exports or (potential imports). Summarize the current status of these concerns/dialogues. This might relate to trade partners in the EU, COMESA, South Africa, or others;
- Review Zambia's policies, procedures, and requirements for addressing plant health matters in relation to imports and recommend modifications, where appropriate.
- Identify on-going or recent development assistance programs to assist Zambia's plant health management capacity and comment on the apparent or likely impact of such assistance, including the likely sustainability of the enhanced capacities;
- Review and comment upon any existing strategic framework that has been developed for Zambian phytosanitary management, noting the suitability of identified 'core functions', priorities, and resource commitments/mobilization;
- Recommend a re-defined set of core functions and priorities to manage trade-related plant health matters for which implementation would be possible within the next two to three years provided supplemental assistance were provided. Discuss the suitable responsibilities of different parties for the management, actual conduct, and financing of such functions. Consider whether current staffing patterns are sufficient to implement such core functions; and
- Develop a cost program for near-term support to realize this revised vision. This might involve support for management and staff training, limited equipment, short-term technical assistance, or other aspects.

Mr. Cassidy will report to Steven Jaffee (PRMTR). He will travel to Zambia for approximately two weeks and also correspond with plant health authorities of Zambia's trade partner countries, as appropriate.

Appendix 8; Review of plant health concerns of Zambia and its trading partners

The purpose of section is to review plant and other (honey) health issues that have been raised by Zambia and its trading partners in order to highlight the points brought out in the analysis of MACO, ZARI and specifically PQPS in the preceding section of this report.

1 Trading partners

There are a number of concerns expressed by Zambian trade partners and in part the aim of the proposed funding is targeted at addressing some of these concerns while simultaneously looking at some longer term solutions. Many of the detailed proposals in this report address concerns of Zambian trade partners. These issues do highlight areas where PQPS could assist in trade related matters by focusing on a relatively small number of areas of concern.

- Royal Netherlands Government (RNG); *Thrips palmii* and *Bemesia* spp.
- RSA Government; American Foul Brood (AFB⁴³)
- Zambian and RSA Governments; *Ceratitis capitata*.
- Inter-African Phytosanitary Council (IAPC) and National Department of Agriculture (NDA) *Bactrocera invadens*, *B. cucurbitae*, *B. dorsalis*, *B. zonata*, *Thrips hawaiiensis* and citrus canker (*Xanthomonas campestris* pathovar *citri*).

To illustrate the problem Figure 2 shows the last known distribution map for *Bactrocera cucurbitae*⁴⁴. Although this pest has, to the best of anyone's knowledge, not progressed beyond Tanzania in recent years there is enough uncertainty to raise doubts in the minds of some of Zambia's neighbors. Thus the pest surveys recommended in this report would be a necessity for ensuring that the plant health concerns of Zambia's trading partners are met by the generation of more recent and reliable pest lists and distribution maps.

Specifically it is felt that these surveys are necessary in order to achieve the following objectives;

Determining the absence of *Thrips palmii* (in Zambia) and *Bemesia* spp. (in the area of production) should ensure that expensive flower inspections in Holland are kept at the minimum level (5 – 10%) and thus minimizing costs to flower exporters.

The survey for the presumed absence of American Foul Brood in honey should open up free access to the South African market in terms of quantity and quality for organic and Fair Trade honey with opportunities for branding and consequent better prices.

43 Covered in some detail in Appendix 1

44 Source EPPO – 2003 - 06

A definitive answer on the presence or absence of *Ceratitis capitata* (Mediterranean Fruit Fly) is required for addressing complaints made to the NDA by Freshmark⁴⁵. At present it is perceived by the NDA that the mitigation protocols currently required by PQPS in respect of deciduous fruit imports are a deliberate attempt to interfere with South African fruit imports. These protocols have stopped all trade in stone fruit and added to the expense of pome fruit imports. It is not clear, for example, whether these rules are applied evenly to all of Zambia's neighbors, all of which are recorded as having *C. capitata* present. The current situation quite definitely harms the reputation of PQPS for scientific objectivity.

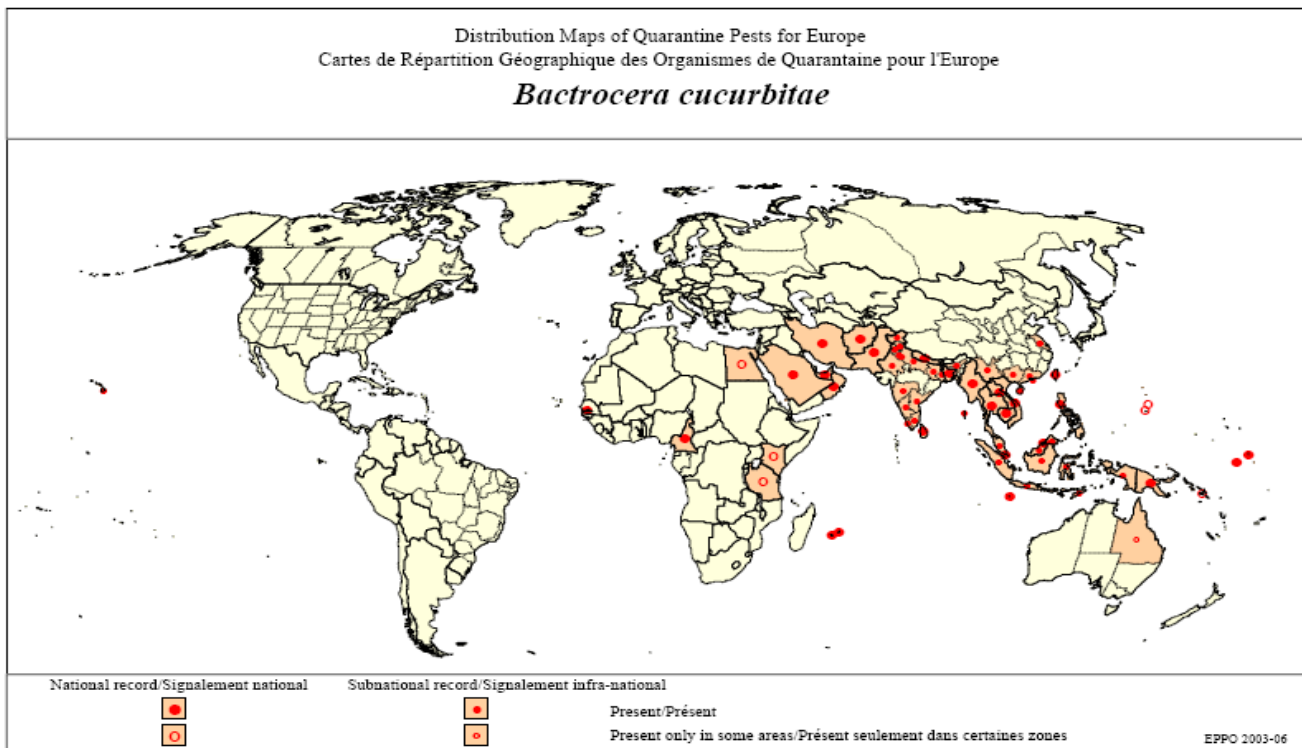


Fig. 1; Distribution map for *Bactrocera cucurbitae* - a major concern for South Africa (Source; EPPO)

Zambia needs to, if it has not already done so, provide a list of regulated pests to all regional and trade partners in compliance with of the IPPC requirements⁴⁶. Copies of equivalent lists produced by countries trading in agricultural produce with Zambia should

⁴⁵ Evidence was presented by Freshmark to show that Import Permit requirements for deciduous fruit had changed several times over the course of 2005/2006. These had led to several rejections of fruit deliveries by PQPS and the cessation of stone fruit imports. A formal complaint was made to the NDA was made by Freshmark. Doubts were raised among certain quarters as to the scientific validity of the changes to the Import Permit 'addendums', in particular, the supposed absence of *Ceratitis capitata* in Zambia. In many ways this mirrors the parallel debate on American Foul Brood and underlines the need for pest surveys (Fig 1)

⁴⁶ Article VII paragraph 2(i) IPPC

be maintained by PQPS. The species listed above should be surveyed for their presence or absence in Zambia and, if present, their distribution mapped, and an appropriate surveillance program instituted. For species absent from Zambia, border and market monitoring is necessary. Surveillance needs to be put in place at border posts to look for certain target pests including pheromone traps for *Bactrocera invadens*. Production areas of crop species should be monitored for pests already within the borders of the country. For example some Indian states are declared free of *B. cucurbitae* by EPPO (Fig. 1) and it may be possible to do the same for *Bemesia* spp.

2 Internal concerns of Zambia

It is crucial that a plan be drawn up by PQPS to create an updated national A1 List (quarantine species not present in the country). This is necessary in order to ensure that the 'addendums' are correctly drawn up and is in any case a necessary pre-requisite to carrying out Import Risk Assessments (IRA). The point here is that without such a list it is very difficult for Zambia to fully understand its own internal concerns of pests requiring exclusion and of how to ensure that trading partners such as South Africa can properly participate in ensuring the correct procedures and mitigation protocols for such pests. In essence the models used for the planned program of activities should in effect kick-start a continuing campaign of co-operation of various departments in MACO in an ongoing survey of the plant pest and disease status of Zambia's crops.