agriculture, land reform & rural development

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Department of Agriculture, Land Reform & Rural Development

# The South African Emergency Plant Pest Response Plan

General guidelines for rapid response and effective control of emergency plant pests.

Plant Health Early Warnings
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General guidelines for rapid response and effective control of emergency plant pests.

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## LIST OF ACRONYMS AND ABBREVIATIONS:

APA: Agricultural Pests Act, 1983 (Act 36 of 1983)

ALOP: Appropriate Level of Protection

DAFF: Department of Agriculture, Forestry and Fisheries of South Africa

DFIES: Directorate Food Import and Export Standards

DIS: Directorate Inspection Services

DOE: Department of Education

DPH: Directorate Plant Health

EPP: Emergency Plant Pest

EWS: Early Warning Systems

FAO: Food and Agriculture Organization

GIS: Geographical Information Systems

GPS: Global Positioning System

IPPC: International Plant Protection Convention

IAEA: International Atomic Energy Agency

ISPM: International Standard for Phytosanitary Measures

MTEF: Medium Term Expenditure Framework

MEC: Member of the Executuve Council

NEPPC: National Emergency Plan Pest Committee

NGOs: non governmental organisations

NPPO: National Plant Protection Organization

NPPOZA: National Plant Protection Organisation of South Africa

PDA: Provincial Department of Agriculture

PFA: Pest Free Area

PFMA: Public Finance Management Act

POE: Port of Entry

PRA: Pest Risk Analysis

RSA: Republic of South Africa

SADC: Southern African Development Community

SAEPPRP: South African Emergency Plant Pest Response Plan

SPS: Sanitary and Phytosanitary

WTO: World Trade Organization

WTO STDF: World Trade Organization, Standards and Trade Development Facility

## TABLE OF CONTENTS

## EXECUTIVE SUMMARY

International travel and trade occur at higher levels than ever before and, as people and commodities move around the world, organisms that present risks to plants travel with them. Pest introductions and outbreaks cost governments, producers and consumers billions of Rand every year. Once a pest has established in a new area, its eradication is often impossible, and pest control takes up a significant percentage of the input cost to produce food.

A pest is an organism with characteristics that are seen as damaging or unwanted, as it harms agriculture in all its dimensions through feeding on crops or parasitizing livestock. The term “pest” is mostly used to refer to harmful animals or insects, but it also relates to all other harmful organisms, including fungi, bacteria and viruses as well as weed plants. A plant pest is defined by the International Plant Protection Convention (IPPC) as: *Any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products*. The introduction and establishment of a destructive plant pest could have devastating consequences to cultivated and wild plants.

The early detection of plant pests aims to prevent the introduction and spread of pests. A rapid response is critical to limit the economic, social, and environmental impacts of pests. For the purpose of this document the term “emergency response” refers to a series of coordinated activities involving one or more organizations, in order to respond to a plant pest of concern and to bring the emergency situation under control. Emergency response actions can include the following: delimiting survey activities, specific pest control activities, quarantine, eradication, public outreach and education and inter-organisational communication and coordination.

The South African Emergency Plant Pest Response Plan (SAEPPRP) aims to outline effective rapid response to the detection, identification and mitigation of an emergency plant pest incursion in South Africa. This is to prevent the establishment and spread of such a pest before the population becomes established; to provide effective and timely communication between local, national and international government agencies, academia, and plant industry professionals when response actions are needed; and to protect and maintain production and business continuity in unaffected areas during a plant pest emergency.

One of the included proposals is the establishment of a centralised, national Emergency Plant Pest (EPP) Fund. This is as EPP management has distinct budgetary needs and may not necessarily

constitute a national disaster. It should be managed separately from the National Disaster Management Fund.

*Emergencies brought about by the outbreak of plant pests may occur anytime without warning. Preparing before an emergency incident occurs plays a vital role in ensuring that role players have the necessary tools and know how to respond to such an emergency. The information in this document serves as a guide to both execution and control, to facilitate communication among stakeholders and to help achieve quality in deliverables.*

# 1. INTRODUCTION

## 1.1 Background, problem statement and purpose

With the global economy rapidly integrating, South African trade is expanding much faster than its Gross Domestic Product. The inclusion of an Agreement on Agriculture within the World Trade Organisation (WTO) framework also facilitated an increase in trade in agricultural products. The gross agricultural value of production for horticultural and field crops was well above R60 billion in 2011. In the same year, R45 billion worth of agricultural produce was exported and R38 billion worth of produce was imported.

Although such trade is healthy in terms of economic benefits it also poses additional risks as new pests may be introduced to the country which, in turn, will affect production volumes, input costs and export opportunities. The occurrence of new pests in the Republic of South Africa (RSA) could result in unacceptable losses in local and especially rural production of food, feed and fibre It may also have serious economic consequences as export markets may be affected. The risk that the country may lose export markets is high if an effective plant commodity import regulatory system is not maintained and international standards and obligations are not adhered to. The RSA government needs capacity and expertise to respond timeously and effectively to the outbreak of such new exotic plant pests across various agricultural communities, especially those with poor resources.

As a signatory member of both the World Trade Organisation (WTO) Agreement on Sanitary and Phytosanitary Measures (SPS Agreement) and the IPPC, South Africa applies the principles as set out in the IPPC's International Standards for Phytosanitary Measures (ISPMs). The National Plant Protection Organisation of South Africa (NPPOZA), as is required in terms of the IPPC, is positioned within the Department of Agriculture, Forestry and Fisheries (DAFF) to regulate the import and export of plant products and aims to reduce the pest and/or disease risk associated with these products. According to Article IV of the IPPC (Revised Text: 1997), the NPPOZA is responsible for conducting surveillance of cultivated and wild plants to determine the status of pests in the country with the objective of reporting the occurrence, outbreak and spread of such pests and their control. Article VIII of the IPPC describes the importance of the obligation to notify pest occurrences and the status of such pests to trading partners.

Currently, the NPPOZA comprises three directorates, namely: Plant Health (DPH), Inspection Services (DIS) and Food Import Export Standards (DFIES). Amongst other functions and objectives,

these three directorates jointly, each with defined functions and responsibilities, aim to facilitate safe trade of plants and plant products by means of effective international communication, conducting pest risk analysis, conducting surveillance for pests, managing effective inspection services, creating plant pest awareness and safeguarding the country from regulated pests through effective legislation, a plant health permitting system and port of entry control as well as the national control of plant pests. Therefore, it is essential that the NPPOZA has access to the best resources and training opportunities in order to reduce the risk associated with plants, plant products and regulated articles through the development and execution of relevant policies, regulations, standards and control measures in compliance with the international principles and standards in order to support a globally competitive agricultural sector, sustainable development and national food security.

The WTO SPS Agreement defines the concept of an 'appropriate level of protection' (ALOP) as the level of protection deemed appropriate by a WTO Member establishing a sanitary or phytosanitary measure to protect human, animal or plant life or health within its territory. Among a number of obligations, a WTO Member should take into account the objective of minimizing negative trade effects in setting its ALOP. Member countries may implement regulations to protect humans, animals and plants in their territories from the entry of harmful foreign organisms provided that Member countries base these regulatory measures on scientific data. The WTO accepts three standard setting bodies: the OIE (World Organisation for Animal Health), Codex Alimentarius (food safety standards for humans), and the IPPC (plant health standards). The purpose of the IPPC is to prevent the introduction and spread of plant pests, and to promote appropriate control measures.

Governments should be able to respond to new pest invasions through the development of early warning systems to enhance detection, rapid response and eradication. The concept of early warning systems is normally well understood in the context of major natural disasters such as earthquakes, floods and droughts. However, it is equally important to be able to respond to agricultural pests.

Expert capacity for critical decision making on some of the potential pest problems is diminishing in the South Africa. Many institutions are experiencing a generational gap, with most of the experienced agricultural entomologists and plant pathologists of the past having retired, or planning to retire in the foreseeable future, with very few trained and expert capacity available to replace them.

Early warning systems for plant pest should include all possible role players so that an integrated, multi-tactical approach can be developed, including participation by affected communities. Depending

on the circumstances surrounding a specific pest incursion, community involvement can be voluntary or can proactively benefit communities through employment of community members in specific areas within various fields of expertise. These could uplift communities to an extent that communities directly benefit from research, sustainable development projects, education and training and the development of secondary agricultural activities or industries.

Early warning systems should be expanded to regional level to ensure cross border response to a pest occurring in border areas, or in an area forming part of two or more countries. Surveillance, early detection and response as well as good regional support benefit the production of food, fibre and feed on a local and on a regional level.

To initiate an early warning system for a specific pest or group of pests, sufficient information needs to be gathered. Furthermore, such an early warning system must be motivated by the technical evidence illustrated in a pest risk analysis. The pest risk analysis will indicate the economic importance of the pest. Depending on the pest and the circumstances, a cost benefit analysis may be carried out to validate possible detection and response systems. Early detection should also be supported by an awareness campaign which sensitizes and informs the public about a specific pest and about the early warning system itself.

*Responding to an outbreak of a new exotic or regulated plant pest will require the coordination of multiple role players.*

The SAEPPRP covers the management process to respond to Emergency Plant Pest (EPP) incidents.

An EPP is a plant pest that has a potentially significant economic or environmental impact which was detected in an area where it was previously not known to occur. An EPP is one of the following:

- A regulated plant pest.
- A variant form of a plant pest already established in the country or an area.
- A new pest species or previously unknown pest in the country or area but may have the potential to be categorised as a regulated plant pest.

A regulated plant pest is a quarantine pest or a regulated non quarantine pest.

The IPPC defines a quarantine pest as: *a pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled.*

A regulated non quarantine pest is defined (IPPC ISPM 5, 2012) as: *a non-quarantine pest whose presence in plants for planting affects the intended use of those plants with an economically unacceptable impact and which is therefore regulated within the territory of the importing contracting party.*

The purpose of this document is, therefore, to provide a guideline for effective rapid response to the detection, identification, and mitigation of EPPs and consistent management of such detections or incursions in order to prevent the establishment and spread of such plant pests.

This guideline further aims to provide effective communication between local, provincial and national government agencies, the relevant agricultural industries, research organisations and trading partners when response actions are needed, and to ensure the least possible interruption of trade in affected areas as well as to protect and maintain uninterrupted trade from unaffected areas after the detection of an EPP.

The SAEPPRP serves as a framework or baseline to develop standards and standard operating procedures for policy and operational personnel involved with EPP detection and control which also serves as a guideline to ensure funding arrangements, role player establishment, training and the development of pest specific action plans and for proper pest detection and monitoring systems.

Contingency plans required in the case of EPP must be executed in a coordinated fashion. Adequate pest awareness and research should be initiated to improve technical validity in the development of strategies to respond to EPP incursions and executed as proactive measures for pest incursion management. These actions would require proper training programs for all personnel involved.

With the introduction of new pests, there would be an expected or potential economic impact in the specific affected or incursion area. With the introduction of regulated pests, the economic impact is expected to be high, as it has already been so determined in a pest risk analysis, namely that the pest qualifies as a quarantine pest or a regulated non-quarantine pest. Some regulated pests may, however, have a severe effect on the local production of food, and on market access, to such an extent that it could be disastrous to the country.

The objective of Early Warning Systems (EWS) is to enable the NPPOZA to react rapidly to emerging pests so that the affected area does not lose its favourable pest status with regard to specific identified EPPs. This will allow for trade to continue with minimum imposition of additional restrictions or measures.

## 1.2 The role of trade and travel on the introduction of plant pests

Plants and plant products are associated with a variety of potential pests of every taxon. Agricultural, forestry and ornamental plants, including flowers and curios, may be a major source of plant pests.

Plant pests may be introduced to new territories through the following:

- natural migration from other countries
- unintentional introduction aided by travellers crossing international borders with host commodities in their baggage
- the legal commercial trading of host commodities
- pests acting as hitch hikers or contaminants on cargo or packaging material
- smuggling of plants and plant products containing pests
- introduction as an act of terrorism.

The root causes of vulnerability to a new EPP in South Africa may be due to:

- an increase in trade and tourism
- ill-informed traders and travellers regarding the risks of carrying pests
- plants or plant products not being detected at the points of entry (POE)
- new pests not being identified as regulated pests in the pest risk assessment (PRA)
- regulated pests not being identified in the PRA as pests associated with the particular plant commodity.

EPPs may enter and establish due to:

- Slow detection rates and a lack of surveillance, causing pests to establish and increase population numbers to such high levels that it is difficult or impossible to control, with resulting high or undesirable economic costs
- Slow pest response as a result of inadequate or no response plans, funding or capacity
- Lack of pest awareness materials for the broader public and small- as well as subsistence producers
- Lack of available diagnostic methods and expertise for effective and quick identification of EPPs.

## 1.3 Strategic objectives

The South African Emergency Plant Pest Response Plan (SAEPPRP) describes the components required for the relevant actions to be taken, namely:

- The institutional arrangements to involve all possible role players to execute control plans
- Emergency actions taken upon the detection of an EPP in a new area, posing a phytosanitary threat of high economic impact
- Surveillance systems, such as delimiting surveys, following the initial detection of an EPP that may have a high impact on the economy and food production
- The requirements for the establishment and maintenance of quarantine and pest free areas as risk management options to contain EPPs in a specific area, or to prevent the pest from spreading into a pest free area
- Legislative mandates to enforce emergency, containment and eradication actions
- Pest eradication programs which can lead to the official establishment or re-establishment of pest absence in an area
- The institutional arrangements to provide funding to execute the eradication and control plans.

It is expected that the NPPOZA will follow actions that must include the following:

- The imposition of quarantine in an area where the pest/s in question occur in order to ensure that such pests do not spread to other important production areas

- Pest population control or eradication measures in a specific area
- The declaration of pest free areas and continuous surveillance and monitoring.
- The notification to the WTO, IPPC and neighbouring countries as well as possible trading partners of the occurrence of the pest in the country and to the specific areas infested.

## 1.4 Legislation

The NPPOZA administers the Agricultural Pests Act, 1983 (Act 36 of 1983) or APA. This legislation and its subordinate legislation provides for measures by which agricultural pests may be prevented and combated and for matters connected therewith. The APA mandates the NPPOZA to regulate plants, plant products and other regulated articles when imported into South Africa. This is mainly to prevent the introduction and spread of regulated plant pests. Phytosanitary import requirements are drafted after a pest risk analysis process is followed, in accordance with the relevant international standards. These regulations form part of the conditions of entry as set out in an import permit. Point of entry control is executed to ensure that compliance with the import conditions is achieved. Interceptions of phytosanitary non compliance result in either consignments being treated against specific pests, sent back to the country of origin, or being destroyed. Import control, therefore, forms the first line of defence against the introduction of EPPs and is mainly a preventative measure.

As all plants, plant products and related materials are capable of harbouring regulated pests, these pests may enter South Africa unnoticed. Some travellers carry plants and plant products with them during their travels, which may be the source of a new pest incursion. The NPPOZA does have the right to search baggage and also to deploy sniffer dogs to detect illegal plants and plant products in luggage. If regulated pests enter South Africa with imported commodities and establish, they will endanger the South African agricultural, horticultural or forestry sectors and biodiversity. Similarly, pests that occur in South Africa may endanger territories of trading partners and therefore threaten market access opportunities. The APA enables the NPPOZA to implement control measures for the containment or eradication of regulated pest incursions. In executing this mandate, a comprehensive approach to plant pest risk management is applied. To be effective, such an approach needs to appropriately balance prevention, mitigation, preparedness, rapid response and control.

# 2. INSTITUTIONAL ARRANGEMENTS

## 2.1 Role players

Response to an outbreak of an EPP, will require the coordination of multiple role players within government and the private sector. Personnel of all role players and at all levels will to work together in a coordinated fashion, but the official authority lies with the NPPOZA, based on inputs from, as well as communication and coordination with the stakeholders.

The NPPOZA, together with other relevant directorates within DAFF, provides leadership, overall direction, and guidance from the national perspective. Although a multiple organisational approach is followed, the obligation and accountability to manage EPP response and control as well as all decisions taken, lies within the NPPOZA. Therefore, the NPPOZA is responsible to pursue regulatory and operational strategies in order to control an EPP.

The NPPOZA must ensure that an adequate communication strategy is in place to network the best possible solutions to the diversity of different pest incursion problems. Each pest will necessitate a specific communication strategy as role players would differ, although there are existing pest or trade related forums and working groups within the NPPOZA, which would greatly enhance such communication between role players. Figure 1 illustrates a generalised interaction between possible role players for an integrated approach regarding an emergency plant pest response.

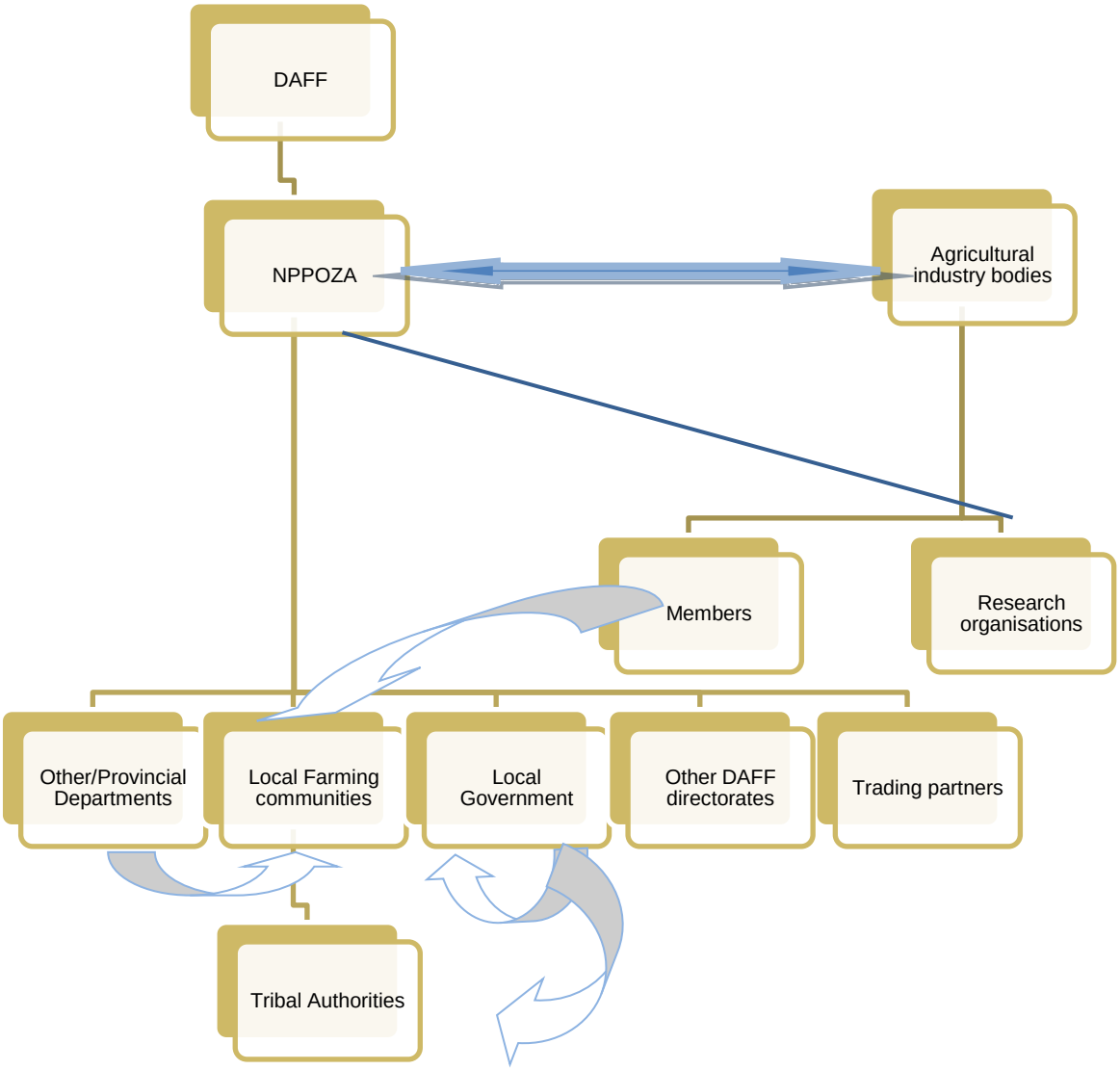


**Figure 1.** Integrated approach for emergency plant pest response including several role players.

## 2.2 Roles, responsibilities, support and management systems

### 2.2.1 National, regional and international cooperation

The synergies required among various authorities can be achieved if common approaches are sought. This should be achieved through robust discussions and engagement with policy developers, as an EPP is the responsibility of national, provincial and local government together with the private sector, primarily farming communities, organized agriculture as well as academic and research institutions. Emergency plant pests may be of regional or international importance which would

require bilateral or multilateral agreements with regard to cross border or regional control actions, depending on the location, dispersal or distribution and rate of spread of a particular pest.

2.2.1.1 National

The internal institutional arrangements among the three spheres of government, public entities and the private sector, play a pivotal role in driving processes and management of EPP response.

Other role players such as the private sector, organized agriculture, producers, research institutions, nongovernmental organisations (NGO's), tribal authorities, ascend the stage as supporting structures to trigger action.

A broad outline of the roles and responsibilities regarding the EPP response in South Africa is indicated below. However, the biology and severity of an EPP may require alternative and more specific responsibilities.

**(i) Department of Agriculture, Forestry and Fisheries (DAFF)**

DAFF (NPPOZA) assumes a leadership role in EPP response. It makes the following strategic interventions to reduce the introduction and effects of establishment of EPP:

- Develops, implements and reviews pest regulatory services/policies
- Develops and implements priority early warning systems for specific pests for risk reduction
- Takes overall management responsibility for the program and puts emergency actions into place
- Sets up and maintains comprehensive emergency plant pest action plans for specific pests and a system for information management, monitoring and evaluation
- Develops, implements and reviews pest management programs, standards and operational procedures
- Determines specific pest risks and draft management options with regard to importation of plant products
- Is responsible for making decisions in eradication programs
- Allocates funding to reduce the risk of introduction establishment and spread of specific pests
- Provides on-going technical advice and risk management recommendations
- Conducts awareness programs and technology and skills transfer
- Monitors the impact that exotic pests have in the agricultural sector
- Identifies and supports research with regard to specific pests

- Solicits exotic pest relief assistance from National Treasury for pest relief programs
- Assists in the implementation, monitoring and evaluation of the pest assistance schemes
- Outlines the criteria for pest relief assistance
- Actively participates in pest management at national, provincial, regional and international levels.

**(ii) Other Government Departments**

There is a need for an integrated approach to EPP response and for on-going evaluation of the effectiveness of the measures established to achieve aims outlined in the plan. A monitoring and evaluation system that can track the progress of EPP response measures, and that can provide timeous feedback, is a key element in ensuring that measures are able to achieve their intended goals.

The precise institutional arrangements and required government departments will be dependent on interdepartmental and provincially negotiated arrangements, the severity of the EPP incursion or outbreak, the geographical location of the EPP, the existing climate and available hosts of the EPP at the incursion point/s and the biology of the EPP itself.

Proactive arrangements with regard to the facilitation of a response to an EPP may precede actual pest incursions if an early warning system is developed for a predicted EPP after a pest-initiated risk assessment.

Formal coordinating mechanisms regarding pest management must, therefore, be developed to ensure proper pest management. Identified arms of government will have important roles to play in pest management programs at the implementation/ incursion point. An early warning system should describe possible organs of state involved for a specific EPP.

**(iii) Provincial Departments of Agriculture**

The Provincial Departments of Agriculture (PDAs) have the competence to assist with EPP incursions. PDAs can use their resources (human and financial capacities) to coordinate and monitor pest activities.

A PDA should:

- Assist with awareness campaigns
- Assist with pest monitoring and compile reports
- Provide advice to farming communities to implement risk reduction measures
- Measure vulnerabilities of communities to target priority areas for assistance
- Ensure enough capacity to assist with exotic pest management
- Implement pest assistance schemes for affected farming communities
- Determine and establish the severity and magnitude of exotic pest outbreaks in the province
- Assist with the implementation of pest management plans
- Advise farming communities to adhere to Best Farming Practices
- Design own model(s) to assist with detection and control of disastrous exotic pests within the Disaster Management Framework prescribed by the Disaster Management Act, 2002 (57 of 2002)
- Prepare a provincial emergency plant pest response plan.

Provinces should observe the following norms and standards:

- All EPP pest information dissemination must comply with the norms and standards of Advisory Services (Extension Services)
- Information must be of high quality, emphasising risk reduction
- Early warning information must reach beneficiaries through community libraries, the internet, agricultural development centres, Extension Services points, information days, producers' days, media (e.g. radio, TV) including social media such as Face book etc
- The PDA must keep all information in hard copies and electronic formats
- Monitoring and evaluation must be effective.

**(iv) Local government**

Local government is at the coalface of service delivery and should play a critical role in assisting the NPPO with EPP control after an incursion in a specific area is identified, particularly in the mobilisation of local resources. Local government should act as a conduit for information concerning pest incursions in the municipal area.

Emergency plant pests may first be detected in municipal areas and specifically urban dwellings or gardens. Pest eradication programmes for instance will have to rely on assistance from the local municipalities to ensure that pest control workers have access to premises, local resources etc.

Control actions, such as the implementation of movement control measures of host plants and plant products of a specific EPP, would need to be initiated and the municipal district can assist with actions such as the setting up of road blocks. This will greatly help to contain a specific pest in an area. Collaboration with DAFF (NPPOZA), and participation in provincial department of agriculture meetings, is crucial for the success of the coordination process.

**(v) Farming communities**

Farming communities are a high risk for the incursions of pests and diseases due to the production of host plants. However, it is vital that good management measures are taken to minimise the impact of EPP incursions within local production areas. Strategies to achieve this include enhanced on-farm biosecurity control through the following:

- Efficient pest monitoring/ surveillance
- Good agricultural practices (cultural control such as orchard- and field sanitation)
- Cooperation with plant quarantine inspectors
- Staff training
- Applying best management practice after pest incursion, specific to an identified EPP
- Reporting unidentified pests/ diseases.

**(vi) Other organisations, institutions**

Organized agriculture, private sector, NGOs, research organisations etc. are strategic partners of the DAFF or the NPPOZA as they form supporting structures to trigger action and to provide expertise regarding specific EPP management strategies. These institutions will be able to provide guidance as well as technical support and assistance for national implementation, monitoring and reporting progress depending on the organisation and the pest.

The NPPOZA shall develop and keep a database of experts available within the country on the different groups of potential pests, e.g. fruit flies, aphids, thrips, plant mites nematodes, fungi, bacteria, viruses and phytoplasms. A national inventory to allow information and access to existing expertise will assist to rebuild capacity and to fill emerging gaps. This database should also include experts in the field of application of agricultural chemicals, spatial information systems, climatic modelling, agricultural economics and other required skills.

To provide a higher level of proactive planning, the NPPOZA and the relevant role players shall:

- Ensure pest risk analysis is conducted

- Regulate the importation of plants and plant products through legislation and a permitting system
- Maintain an effective import regulatory and risk management system at points of entry
- Coordinate and manage early warning and monitoring systems
- Develop emergency response systems
- Set norms and standards for EPP management
- Evaluate the status of EPP outbreaks in an area
- Gather information, interpret and disseminate it to all stakeholders and beneficiaries
- Maintain an updated database of all EPP detections and disasters
- Encourage the provision of training, information and technology support from service providers
- Conduct research and development trials
- Encourage farming communities and producers to adhere to pest surveillance and control initiatives and reporting of new pests as well as control measures in case of pest incursions
- Put in place food security programmes/plans to provide for severe EPP outbreak situations
- Ensure a proper pest notification system.

#### 2.2.1.2 Regional

Emergency plant pests cross over international borders when they spread naturally from one country to another. This may lead to a need for cross border control to ensure pest freedom in one or several countries in a specific region. Not all countries in the Southern African Development Council (SADC) may have expertise to deal with EPP incursions as specific species may require scientific expertise which may not be readily available. Surveillance for the early detection of EPP in a country may also be more successful if a regional approach is carried out to monitor the spread or rate of spread from one area towards another. Research may have to be carried out in more than one country in a region. Organised agriculture also has regional business interests. Regional organizations, NGOs and the private sector will be able to provide guidance as well as technical support and assistance for regional implementation, monitoring and reporting progress. The NPPOZA will serve as a primary country coordinator to deal with the pest protocols that may arise and to take responsibility for the implementation, maintenance and all technical issues relating to the EPP response.

#### 2.2.1.3 International

South Africa demonstrated its commitment and preparedness to share an international stage with global players when it became a signatory to the relevant international agreements, conventions and protocols.

South Africa is a signatory member of the IPPC and the WTO SPS Agreement and is obliged to comply with the objectives for safeguarding agricultural resources and the natural environment. In terms of the IPPC, Contracting Parties shall designate a contact point for the exchange of information. The NPPOZA serves as an international plant health contact point and is responsible for managing bi-lateral and multilateral plant health (phytosanitary) agreements and standards.

International cooperation ensures the exchange of information regarding EPPs as well as participation in the global campaign to combat identified plant pests and provide technical and biological information for conducting PRAs. The IPPC facilitates international cooperation in controlling pests of plants and plant products and in preventing their spread and introduction into endangered areas. As a member of the IPPC, South Africa undertakes to implement common and effective measures on the national and international levels to prevent the distribution of pests of plants and plant products as well as to promote methods for the control of pests.

## 2.3 Management and command

New pests can enter the country at any time and at any place. The impact may be negligible, or severe and even disastrous. Proper command structures to establish and maintain sufficient capacity, expertise and funding is, therefore, critical. Such a command centre should be established in DAFF. It may have to involve other role players as well. New EPP incursions should be managed on a policy as well as operational level. This can be achieved by the establishment a National Emergency Pest Policy Committee (NEPPC) to address policy issues and a Pest Steering Committee (PSC) to address operational issues.

The NEPPC shall be comprised of different governmental, private and research stakeholders established and shall be led by DAFF.

The following shall be ensured by the NEPPC to make provision for the sound management of EPP incursions:

- broad participation and an integrated approach
- availability of funds
- proper and quick allocation and application of funds
- proper and speedy procurement of goods and services necessary for EPP control
- proper communication channels are kept between identified stakeholders eg. different government departments
- proper research projects are allocated
- Evaluation of EPP response and progress
- validation of operational actions such as the establishment of the PSC for specific pests, verification of diagnostic samples, verification of the change in pest status, research outcomes
- Approval of pest status reports which will be communicated to trading partners/ media through the relevant channels.

The National Committee shall meet regularly (according to its agreed Terms of Reference) to review the existing EPP pest management programmes, and the frequency will be dependent on the number and severity of detections, incursions and outbreaks.

In the event of a new pest detection, which is or has the potential to be an EPP, or a pre-identified EPP with a high likelihood of introduction, a PSC will be initiated for a specific pest.

The NPPOZA will determine the members of the PSC which will vary in terms of the EPP, location of the incursion and the severity of the incursion. The names of members of the PSC will be forwarded to the NEPPC for documentation purposes. A PSC is a technical committee as well as an executive committee and is initiated to ensure that a pest response for a specific pest is managed in the most appropriate way. The PSC will, however, provide regular progress reports to the NEPPC.

The designated PSC must have the executive power to ensure that resources are mobilised quickly for a specific pest while the NEPPC must ensure that resources and service providers are available to enable the PSC to fulfil its commitments.

Each EPP will require a species specific action plan, a communication strategy and an implementation plan, if this is not included in the action plan. The implementation plan will not

only be species specific but will consider factors such as available expertise, capacity, infrastructure and the implementation area. The implementation plan will also identify the relevant role players. These plans should be approved by the PSC. The PSC will ensure the development of pest specific action plans and the coordination of management actions. Such a committee will be compiled and chaired by the NPPOZA. The committee will consist of decision makers and pest experts from DAFF as well as research bodies and the private sector. The NPPOZA will provide standards and standard operating procedures for the management of new pest detections. The PSC allows decision makers to meet the complexities and demands of the specific pest and its impact. The PSC may be constututed to address pests on a regional level.

# 3. PLANT PEST RESPONSE

## 3.1 Criteria for emergency pest response

The SAEPPRP is activated by the NPPOZA to ensure effective control of an EPP. This will entail the compilation of a PSC.

Criteria for such a pest response would be when:

- A plant pest of high risk (i.e. EPP) is detected for the first time in South Africa or in a new area in South Africa where a regulatory response is recommended to control the pest.
- The likelihood of the introduction of a specific pest is in the near future, based on its current rate of spread in the region or based on the rate of interceptions of a particular pest from commercial consignments or from travellers.

In the event of a pest of regulatory concern being discovered in South Africa, the NPPOZA will determine the necessity to implement emergency response actions. The criteria for different thresholds of governmental intervention or interaction must be explicitly defined for different pests. Although the mere detection of a new exotic pest calls for NPPOZA intervention, the level of intervention may differ depending on the potential risk of a specific pest or the actual damage the pest is already causing. The NPPOZA must develop clear guidelines to inform all possible affected parties as to what to do during the EPP prevention and response programs.

The NPPOZA would intervene when the risk of a pest is of such nature that it is considered a harmful or potentially harmful pest. Criteria for the involvement of other State bodies, such as the

PDAs and other organs of State, will depend on the severity of a pest outbreak, the geographical area and whether it is beyond the capabilities of the NPPO to address this on its own. Pest impact should be analysed in terms of the epidemiology of the pest, damage caused in areas affected and the economic impact it would have if left to spread and multiply. Some pests will not warrant continuous State intervention as the long term impact may be addressed by standard or routine agricultural practices, or as it does not have a significant economic impact on producers or traders.

Varioue pest species may affect individual farming communities in different ways. For example, a new emerging fruit fly pest may initially affect export fruit producers more than it would affect producers who produce for the local market. However, it may affect small scale producers in the long term by preventing their potential entry the export market and could also, if established, lead to food insecurity of specific commodities, either directly through smaller harvests, or indirectly through loss of income. New EPPs may, however, have a severe impact on food security and devastating economic impact in large scale monoculture plantings. This would not only affect commercial farmers economically but may lead to food shortages in a very short time, mostly affecting the end user. Crops such as commercial potato and maize fields are especially vulnerable to new plant pathogen incursions/ outbreaks. The EPP response should also be extremely quick in order to be effective.

In general, however, a new EPP will affect resource poor producers more than commercial producers simply because the resource poor cannot readily afford additional crop losses as they depend on virtually the whole crop for survival. Government intervention needs to be informed by the results of a needs-analysis of the farming communities at risk. Commercial farmers are also increasingly under pressure to produce cost effectively in order to compete on the international market.

The priority of EPP mitigation is the protection of the critical resources, export markets and systems on which communities and human lives depend, The government would consider providing assistance on condition that mitigation procedures or control measures are followed. The aims of controlling new pests are to promote food security and long-term sustainability of economic production as well as to ensure market access and good trade relations.

## 3.2 Response framework

Responding to an EPP will trigger a sequence of events. These may differ between pest species and would be dependent on the local circumstances in the outbreak or area of detection and available

capacity. However, identification and verification of identification will follow detection. A risk assessment stage needs to be implemented in cases of new pest identifications which is followed by control actions. Control consists of containment or eradication, or a combination of both, subject to management measures and the declaration of quarantine areas. The possible latent phases of pests before an incursion is detected should also be considered.

The NPPOZA must ensure that proper legislation, awareness and incentives are in place for the notification/ reporting of new EPPs by the general public, researchers etc.

## 3.3 Detection survey

A detection survey is conducted in an area to determine if a specific pest is present. Pest detection for a specific pest could be conducted nationally, provincially or in specific areas depending on the likelihood of the pest being present in a specific area. Detection programmes are developed by the NPPOZA and serve as an early warning system to ensure rapid response to an EPP. Detection of EPPs will lead to rapid response with control measures to reduce the spread and establishment of that specific pest. Early detection helps to control the pest before it spreads. Surveys for specific pests will provide information to be used mainly to support official NPPO declarations of pest freedom.

Reasons to conduct a detection survey for EPPs include the following:

- For developing pest and host lists for specific pests
- Establishment of pest free areas, pest free places of production and pest free production sites
- Early detection of pests, to minimise the chance of pest incursions and permit crop and forest management
- To detect quarantine breaches.

## 3.4 Monitoring Survey

A monitoring survey is an on-going survey to verify the characteristics of a pest population. The survey applies where a pest is known to be present and the survey is planned to examine aspects of the pest population such as the prevalence of the pest and changes in pest prevalence over time.

Survey results should be regularly updated and the information should be kept on a database where the information will be retrievable. Movement of plants and plant products will have to be monitored to reduce the spread of the pest. No movement of plants and plant products should occur through, into or out of regulated areas without a permit obtained from the DAFF depending on the risk and specific pest circumstances.

Reasons for conducting a monitoring survey in South Africa would be as follows:

- To assist with pest management
- To develop and maintain Area of Low Pest Prevalence status
- To control movement of plants and plant products from and into a quarantine area
- To determine whether a pest was successfully eradicated.

## 3.5 Identification and confirmation

Introductions of new pests may also need speedy identification. In most cases, it would be useful to ensure rapid identification systems before laboratory verification to allow for rapid response. For both general and specific surveys, images of the diagnostic features of the pest and any symptoms on host plants would be useful for reports. Hand-outs with illustrations and photographs of pests, symptoms and damage can be used in the field to make speedy decisions. Such hand-outs can be prepared after the development of pest datasheets.

The NPPOZA is responsible for pest diagnostic services. After new pests are detected, either via a survey or any other means, samples need to be collected for identification or testing. The NPPOZA is responsible for collecting samples of possible pests. Samples must be taken and sent to Plant Health (PH) Diagnostic Services, according to an accepted protocol, for identification. Morphological identifications must be verified by a recognised taxonomist or expert in the relevant field, or via chemical or genetic analysis.

If the pest cannot be identified in South Africa, samples or cultures need to be sent to a taxonomist or expert in a specific field in another country. Actions to be taken must be justified by factors such as the extent of or potential damage to host plants. In cases where inadequate diagnostic capacity is available to ensure continuous quick identifications, an alternative body responsible for doing this can be decided upon between the PSC and PH Diagnostics Services. The PH Diagnostics Services

would be responsible for developingand maintaining a diagnostic network. The PHDiagnostic Services are responsible for producing an official diagnostic report.

After the detection of an EPP, a diagnostic team must be made available which would consist of at least two officers from the PH Diagnostic laboratories. A technical expert should be accompanied by a senior officer to ensure that the sampling protocol and all details associated with the pest incursion/detection are recorded, including the source of planting material and movement of plants, plant products and machinery from the property.

The diagnostic team must ensure that requirements for the collection and dispatch of samples are satisfied. This requires the appropriate security measures and documentation procedures to be followed at all times. It is important that all samples collected during surveys are identified and confirmed by relevant taxonomists or specialists in the relevant fields. The pests may be known or they may be pests that have not been previously categorized. Laboratory resources may become overwhelmed if large numbers of samples continually require identification or confirmation. A range of contingency and support plans should be developed for laboratory support.

### 3.5.1 Unknown pests

If economic damage is noticed by a user of land, an executive officer should be notified who in turn should notify the NPPOZA. The executive officer concerned must ensure that samples are taken and recorded appropriately. The samples must be sent to the Diagnostic Services within one working day after collection. Morphological identification of the pest must be verified by means of molecular techniques or by a recognized taxonomist in that specific field. If the pest cannot be identified, samples need to be sent to an expert in another country without undue delay. As soon as the pest identity is known, the NPPOZA must conduct literature searches and gather information and expert opinion on the pest. After doing a thorough literature search, a data sheet, survey plan and a contingency plan for the pest must be drafted. Contingency actions must be initiated as soon as possible if the pest continues to cause significant damage.

### 3.5.2 Known categorized pests

If a pest is detected in an official survey, samples should be taken by the executive officer involved. The samples must be taken to PH Diagnostic Services immediately after collection. Morphological identification must be verified by means of molecular techniques or by a recognized taxonomist in that specific field. Diagnostic services can make use of services of experts in other countries if the

pest cannot be identified. If the pest is identified as a quarantine pest or a regulated non-quarantine pest for South Africa, contingency measures must be activated as soon as possible.

### 3.6 Pest initiated risk assessment

A Pest Risk Analysis (PRA) is defined by the IPPC as: 'the process of evaluating biological or other scientific and economic evidence to determine whether a pest should be regulated and the strength of any phytosanitary measures to be taken against it'. The pest risk assessment procedure can be used to develop early warning systems and as a result of a pest incursion to determine the most likely pathways of introduction, places of introduction, areas of establishment and areas of highest economic or environmental impact within a country or regulated area in a country. Factors such as the climatic threshold of a particular pest, the rate of reproduction and host plants in an area should be evaluated. Phytosanitary measures are implemented for the control of a pest on a national level after introduction or as a precautionary measure. The aim of such phytosanitary measures is to eradicate or to contain a pest in a specific area and they must be technically justified.

Pest risk analysis for quarantine pests consists of the initiation, assessment and pest management stages.

If the same process is to be used to initiate early warning systems and to manage new pest incursions, it must take into account that the organisms in question are probably already regarded as quarantine pests, but the PRA must continue in order to determine the need for an early warning system, thus a new initiation stage must start. The specific measures or steps put into action by a regulatory authority must be risk based. The need to develop an early warning system or phytosanitary measures for newly identified pests may arise from a sudden increase in trade of specific host commodities, high interception rate from certain hosts or countries or interceptions and incursions of a specific pest. Pathways other than commodity imports such as natural spread, mail, galley waste, passenger baggage, may motivate the development of an early warning which should be supported by a PRA. Large once-off, specific events, such as world summits and word sport tournaments can also trigger the need to develop early warnings for specific pests.

A new PRA can be initiated when new information about a specific pest becomes available. That information may be of such a nature that the PRA area may be at risk and an EWS may need to be established. It can also be a new pest close to the PRA area, or a pest with little or no information available to the existing PRA.

Many organisms may be associated with imported plans and plant products. Such organisms may be saprophagous (feeding on decaying organic matter), phytophagous (feeding on live plants), and predators of plant pests or “hitch hikers” (contaminants). Organisms intercepted during the importing process may be EPPs. The identity of the organisms may not have been determined yet nor the pest risks associated with such organisms. It is, therefore, imperative that interim and/ or contingency risk mitigation measures are put in place which will ensure the required ALOP is achieved until the identity and/ or risk of such organism is determined. The trading partners involved should be notified immediately to assist with the possible identification or risk determination.

Stage two of the PRA will include the gathering of technical information about the pest’s biology, distribution and damage it causes. The outcomes of the assessment stage will enable risk assessors and regulators to determine which management options can be used to regulate the movement of produce from affected areas and continue trade with the provision that it is feasible, effective and that the least restrictive measures are applied.

Quarantine risk consists of two major components, namely the probability or likelihood of a pest entering, establishing and spreading in a specific area of a country and the consequences as well as the impact it may have should this happen.

The assessment stage may also examine the impact that a pest would have on social and economic factors in terms of production losses and loss of export markets.

Economic impact may also be expressed in terms of a possible environmental impact a pest may have.

Pest risk should be determined by taking into consideration the following factors:

**Pest Risk** = (probability of introduction) x (magnitude of impact)

When **probability of introduction** = (probability of entry) x (probability of establishment) x (probability of spread)

And when **magnitude of impact** = (Social impacts) + (economic impacts) + (environmental impacts).

The ratings for likelihood and impact should be placed in a matrix to assist with the decision making process. Information from existing PRA’s should be included in a risk assessment as indicated in Figure: 2

| Likelihood of pest entry establishment and spread | | | | | |
|---|---|---|---|---|---|
| | High | Negligible | Low | Medium | High |
| | Medium | Negligible | Low | Medium | High |
| | Low | Negligible | Low | Low | Medium |
| | Negligible | Negligible | Negligible | Negligible | Negligible |
| | | Negligible | Low | Medium | High |
| | | Consequences of pest entry establishment and spread | | | |

Figure:2 Risk Estimation Matrix indicating likelihood of entry establishment and spread multiplied with the consequence of entry establishment and spread.

Whenever a PRA is conducted, the last stage would be to develop sufficient risk mitigation measures to ensure that safe trade continues. To conduct a PRA as the initiation phase of an early warning system, the management stage is the implementation stage of the early warning system and it may require legislation as phytosanitary measures have to be implemented.

Taking the overall risk into account, management measures must be drafted in terms of the risk ratings of the different pathways which were identified in stage two of the PRA. The risk should be managed to obtain the required degree of protection in a justifiable and feasible way.

Corrective actions, and quarantine measures and actions, must be developed in the case of new incursions in order to isolate a potentially infested area from the rest of South Africa. This is essential to prevent the spread of a pest and to ensure uninterrupted trade as best as possible. Control measures should be implemented to contain and eradicate *a new pest* after it has been detected in a specific area.

## 3.7 Contingency plans

Preparedness or contingency planning forms an essential part of rapid response. It allows the NPPOZA to safeguard the territory of South Africa against the potential threat a new detection of a pest with major economic consequences may hold. Such plans are pest specific but can also be generic when an unexpected pest or a pest with no specific contingency plan is detected. Knowledge

gained from previous successful control programmes can be used to develop contingency plans. Contingency plans are useful to ensure rapid action when emergency control measures must be implemented.

Contingency plans need to include early detection methods, confirmation of identification procedures, possible role players, and quick and comprehensive reporting lines to allow for immediate decision making processes in order to activate immediate and coordinated management procedures.

Generic contingency plans should form the framework for the development of pest specific contingency plans based on higher taxa which would include a number of species or groups of species. An example is the official response to an incursion of a new fruit fly species using control actions which would be effective for the majority of species in the insect family in question. The details within the plans would be responsive as they follow the detection of a pest not predicted or without any pest specific plan. Generic contingency plans should include communication lines and agreements for diagnostic and confirmation of identification methods, possible role players, reporting lines and generic management measures.

Pest specific contingency plans contain background information on biology, surveillance, control measures and destruction strategies for exotic plant pests or emergency plant pests. The information is derived from pre-developed datasheets for specific pests and assists the NPPOZA in developing speedy and effective response plans in the event of an incursion for a specific affected area. A pest steering committee needs to be established to facilitate the development and operational management of contingency plans.

Pest specific contingency plans for an EPP can be developed in cooperation with identified role players, such as a specific crop commodity industry. These industries can assist in determining the prevailing pest threats to the industry for better priority determination. High priority pests can be identified by each industry and pest specific contingency plans can be developed for such pests.

Management actions after a new detection will most likely include measures which would contain a pest in the affected area. The NPPOZA may also have to announce a quarantine area for the known affected area. This may be only a temporary arrangement or may have to be expanded after a delimiting survey is conducted.

Eradication measures may have to be implemented immediately and would form part of the contingency measures, especially for pests that would be able to multiply quickly and can disperse

rapidly. In such cases, stockpiling of specific agricultural chemicals may need to form part of the contingency measures.

The need to take rapid action should be determined. This may outweigh the benefits of first undertaking more detailed analyses and planning. Thus, action should be taken towards eradication with limited information available, other than the current localized distribution and the immediate/ potential economic damage.

Awareness, information dissemination and education form a critical part of any agricultural system. Prior to, or at the time of, the implementation of control measure, awareness must be raised about the pest with broader audiences such as growers, residents and local governments, to improve the overall effectiveness of control measures against the pest.

Producers should be encouraged to develop a range of flexible contingency plans that can immediately be implemented after the detection of an EPP. Contingency measures should also include funding arrangements. Funding needs to be in place for rapid response actions designed to contain an EPP or to initiate eradication immediately.

## 4. CONTROL

Control refers to either the containment or the eradication of a plant pest after the detection of such a pest. If the pest is considered an emergency plant pest (EPP), then contingency measures should be implemented immediately. The NPPOZA will put in place appropriate interim quarantine measures on affected areas/properties and will implement procedures to minimise possible spread of the pest while identification and delimiting surveys are undertaken. A control programme is developed to prevent establishment and or spread of a pest following its recent entry (re-establish a pest free area) or a measure to eliminate an established pest (establish pest free area).

The feasibility of the control actions needs to be estimated by the NPPOZA. This can be done in conjunction with the relevant industry or research organisations. The PSC will assist with the decision making process and depending on the available information about a pest at the time, the pest can either be considered to be contained or eradicated. A delimiting survey must be conducted to determine the affected area (spread) of a specific pest after the first detection. Without a proper delimiting survey, pest control is bound to be unsuccessful.

Factors to be considered when determining the most appropriate pest control method include the following:

- Size of the affected geographic area
- Estimated size of the pest population
- Pest life cycle stage
- Whether the affected area is urban, rural, flat or mountainous
- Time of year
- Cost relative to the effectiveness of the strategy.

Because of the distances new pests can travel, particularly along roads and rail corridors, the co-operation of the controlling agencies must be sought. Joint programmes with other agencies with similar responsibilities and interests must also be pursued

## 4.1 Containment

Containment will involve a multitude of strategies to prevent the pest from spreading from a confined area, or to maintain a specific status of the pest in the area, such as an area of low pest prevalence. Containment measures should also be applied as an immediate step after the pest was first detected and would form part of the contingency plans for a pest. If eradication is not feasible or has failed, then containment can be applied on a permanent basis so that the pest is excluded from some areas, where it would cause economic damage. Containment measures may form part of a systems approach or could be a simple measure targeting the movement of pest free host plants. Owners of the affected plants, plant products and other regulated articles should be notified of the containment measures in an affected area. Arrangements should be made for the release of the plants, plant products or other regulated articles from the quarantine area, by clearance following verification of compliance with phytosanitary measures such as inspection, treatment or destruction. Provision should be made for the withdrawal of regulations when an eradication programme has been declared successful.

### 4.1.1 Delimiting survey

A delimiting survey is a survey conducted to establish the boundaries of an area considered to be infested by, or free from, a pest. This will involve an intensification of surveillance actions close to the original detection or infestation point of an EPP. It may, for example, involve additional sampling or the placement of additional surveillance traps in a predefined minimum delimitation area. The size of the delimitation area is based on the perceived rate and distance the pest can disperse naturally within a set period of time. This may be influenced by the specific geographic and climatic conditions at the incursion point forming natural barriers.

Once a pest is considered a potentially significant threat, a delimiting survey may be conducted to determine the extent and distribution of the pest incursion and to determine if it is eradicable. Delimiting should last for a specified period of time which will then be followed by a monitoring survey if no more detections occurred. The delimiting survey may include trace back actions such as a pathway analysis to identify the source of the pest and its possible spread, as well as the inspection, of host or pathway associated material, inspection of conveyances and buildings and the movement of plants and plant products historically into the area through commercial trade, agricultural production and travellers.

The NPPOZA will be responsible for the following:

- Developing and conducting the delimiting survey
- Applying, developing or amending legislation with regard to an EPP when necessary to conduct the delimiting survey and apply containment measures for the duration of the delimiting survey
- Documentation of spatial and all other data and actions.

The Information that needs to be made available during delimitation of the area:

- Detailed maps or (Global Positioning System) GPS coordinates showing the boundaries
- Knowledge of existence of natural barriers
- Entry points and host area locations
- Buffer zones.

This information should be updated and verified by NPPOZA regularly.

### 4.1.2 Quarantine Area

When an EPP is detected, a quarantine area must be established. The quarantine area is determined through the surveys and inspections at the incursion point. The NPPOZA will collaborate with other relevant role players to coordinate initial inspections and surveys at the incursion point to determine the need and extent of the quarantine area. Such a quarantine area may comprise several properties from several land owners/users where the organism has been detected and may include properties which have come into direct or indirect contact with infected/infested plants and plant products or is adjacent to affected properties. Land may also be parastatal, or state owned, may form part of a communal farm or be urban or tribal.

The declared quarantine area/s is determined by the extent of the pest incursion and would cover the actual infested area as determined by the delimiting surveys plus an estimated area in terms of the immediate dispersal capability of the EPP. After the detection of an EPP within the quarantine area, precautionary measures should be implemented to prevent the spread of the EPP from the quarantine area. The quarantine measures aim to minimize the possible spread of the pest to unaffected areas while the delimiting surveys are undertaken. Measures should be technically justified as far as possible.

#### 4.1.2.1 Quarantine measures

Most pests do not move significant distances unaided; however they can be hitchhikers (contaminants) on plants, people, vehicles, etc.

The NPPOZA is responsible to:

- Implement, amend or draft regulations to declare a quarantine area and the measures related to it for a specific pest. Such measures can be implemented in terms of section 6 of the Agricultural Pests Act, (Act No. 36 of 1983), the Minister may by Notice in the Gazette prescribe the control measures, which shall be complied with or carried out by a user of land, in order to prevent and combat the spread of pests

- Inform land users/owners about EPP detections in the quarantine area

- Declare the area placed under quarantine via personal notification to land users, and issue a press release in the Government Gazette

- Provide advice to land users regarding measures, activities and procedures to be adhered to

- Serve official orders to the land user, in terms of section 7 of the Agricultural Pests Act, 1983 (Act No 36 of 1983), by written notice, to observe or carry out the provisions of a particular control measure on the determined quarantine area, or to do or omit to do any other act to such quarantine area until all measures are observed

- Initiate awareness in consultation with the land owners/ users and other role players of the affected area regarding the pest and consequences of the pest

- Indentify host material or other regulated material on properties in the affected area

- Place signposts and notices along boundaries and on roads to alert the public and to facilitate awareness and identification of the boundaries of the quarantine area.

General measures to maintain the quarantine area may include:

- Surveillance such as establishing a buffer zone around affected areas

- Inspection of host material

- The control of the movement of vehicles, plant/host material and other regulated material into through and out of the affected (quarantine) area(s)

- Corrective actions aimed at restoring official status of an area before the incursion such as a pest free area or an area of low pest prevalence. Corrective actions can be the same as containment or eradication measures but with a predefined objective.

4.1.2.2 Determination of a quarantine area

The quarantine area is determined by the NPPOZA in terms of the delimiting survey results and the biology of the pest. The affected area will be discussed with role players involved such as the local producers, local community, industry experts and the local or provincial department of agriculture. The size of the quarantine zone will be determined by a number of factors, including the location of

the incursion, the climatic conditions at the time, the biology of the EPP and the proximity of the infected property to other infected properties.

4.1.2.2.1 Methods used

A radius delimiting the minimum size of the quarantine area should be drawn starting from the incursion point as the middle point of the radius to form a circle. The established quarantine area extends to a predetermined radius centred from the original pest finding point/site. The size of the quarantine circle will differ between different pests and locations. In the case of more than one pest incursion point, several (possibly overlapping) circles should be drawn accordingly.

**i. Mapping/GIS (Geographic Information System)**

- ✓ Locate each sample collecting site with a GPS to collect the geographical coordinates of the pest find point. The visual map is then developed from the Global Positioning System (GIS) with the zoomed in area with a circle of a specific radius containing grids of specific square meters.
- ✓ All the land users within the circle are then placed under quarantine and follow all the quarantine measures within that area.

**ii. Physical method**

- ✓ Locate each sample collecting site by the GPS to collect the geographical coordinates of the incursion point. Drive from the collection point to a specific point/ distance. Perform this task for about 8 points and connect them to make a circle.
- ✓ All the land users within the circle are then placed under quarantine and follow all the quarantine measures within that area.

4.1.2.3 Quarantine status

The demarcated area will remain under quarantine until the measures implemented have the required results or a new management decision has been made by the PSC. For example: The eradication of the EPP from a quarantine area should meet the criteria for reinstatement of pest free area. If no further EPP is detected within the affected area, the quarantine will be revoked and control measures shall be lifted. The official pest free status of the area will therefore be reinstated. If the control measures are not effective and the pest becomes established in the area, the pest free area status is lost. The status of the area will be re-assessed and the new status established. The area

could either still be officially controlled after the area is declared as an area of low pest prevalence or if the pest could be contained in the area to prevent it from spreading to other areas where the pest would be prohibited.

### 4.1.3 Detection of the origin of an EPP

Trace back and trace forward information may also be used to define a quarantine area. The NPPOZA will collaborate with relevant role players to coordinate survey teams to conduct trace backs to determine where the pest might have originated from and trace forward exercises to identify where the pest may spread in future.

Consultation with land users/owners and/or managers of affected properties will be conducted to identify the following:

• Movement of plants and products into through or out of an affected area that may facilitate spread of the pest

• Agricultural items of equipment shared between properties

• Personnel or contractors such as seasonal farm workers that may have moved from affected to unaffected properties.

NPPOZA pest surveillance will be deployed in the area. Surveillance teams will consist of technical personnel as well as plant pathologists and entomologists to coordinate and audit operational actions. The results may be used to justify the establishment of a quarantine area around the incursion point/s and to decide which control options are the most feasible. These options will be submitted to the PSC for further evaluation.

## 4.2 Eradication

Depending on the biology of the pest, the eradication programme will be triggered by the detection of an EPP as confirmed by specialists/experts and the PSC. Eradication will be an action decision

taken in a PSC. The total area of coverage will depend on the extent of the spread/infestation and is subject to the delimiting survey conducted and the surface area which was placed under official control ( quarantine). The biology of the pest, availability of host material and climatic conditions will determine the minimum duration of eradication which would also be the period after the last specimen was detected in a demarcated quarantine area.

Accurate identification of the EPP or potential EPP is essential so that the appropriate means of eradication can be selected. The most feasible eradication techniques needs to be identified and proposed to the PSC for decision making purposes.

Effective eradication will require proper logistics, resources and management. Good management, record keeping, auditing and periodic overall programme review principles are essential during the eradication process.. The area under eradication will be reported through the International Phytosanitary Portal (IPP) of the IPPC in accordance with South Africa's reporting obligations. The pest incursions and phytosanitary measures to control the pest will also be communicated to trading partners and neighbouring countries. After completion of the eradication of the pest, the monitoring survey should continue for at least 2 full years to verify the success of eradication.

Eradication will be triggered after the threshold determined by the pest risk assessment for a specific EPP has been reached and the pest's identification was confirmed by a recognised taxonomist, specialist or via molecular techniques. Eradication will be include measures to contain the EPP in the affected area. A multitude of strategies to control, manage and eradicate the pest may be implemented. An effective and swift control of the EPP is necessary to prevent the pest from dispersing quickly to affect larger geographic areas.

Factors to be considered when determining the most appropriate pest management method include the following:

- Size of the affected geographic area
- Estimated number of pests
- Pest life cycle

- Topography and climate of the area
- Land use in the area (urban, mining, conservation, rural, farming, abandoned farms etc)
- Time of year
- Cost relative to the effectiveness of the strategy.

Large eradication programmes may require an advisory group additional to the PSC, including the various pest experts. It may also become necessary to consult with trading partners as to the progress of the eradication and some of the eradication measures implemented to ensure a continuation of trade from the affected area. The minimum period of time to verify eradication will vary according to the biology of the pest.

The progress of the eradication, programme should be subject to periodic review to analyse and assess information gathered, to check that objectives are being achieved and or to determine if changes/amendments are required.

The success of the eradication would be reported through the International Phytosanitary Portal (IPP) of the IPPC in accordance with South Africa's reporting obligations.

### 4.2.1 Physical methods

The NPPOZA may choose to manage an EPP using manual methods to remove or kill the pest, or alter growing conditions for infested/ infected plants. Such methods should have a minimal environmental impact and are appropriate for socially and ecological sensitive areas. Physical methods are relatively expensive and labour intensive, and may need to be used repeatedly or in combination with other management methods.

### 4.2.2 Chemical methods

Using agricultural chemicals to manage invasive EPPs can be used alone or in combination with biological and physical methods. It is also important to ensure that any chemicals used have legislative backing and are valid and registered according to relevant legislation such as the Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947) and that notices are served to land owners or occupiers of affected land or premises, according to the Agricultural Pests Act, 1983, (Act No. 36 of 1983). Emergency registration of pesticides may need to be motivated for EPPs as the pests are not known to occur in the country and there may be no registered agricultural chemical to control them.

### 4.2.3 Biological control

The NPPOZA may choose to manage an EPP using a suitable biological control agent or the sterile insect technique. Biological control can provide forms an important control strategy to ensure population control of EPPs in quarantine areas. Investment needs to be made in quarantine facilities and biological control research initiatives against selected EPPs and a biological control strategy must be developed to ensure swift but safe biological control release against EPPs from quarantine facilities together with the necessary research support.

### 4.2.4 Cultural control

Cultural methods that can be used may include the following:

- Soil sterilants
- Leaving land fallow
- Restriction of subsequent cropping
- Non chemical treatments of hosts and soil plant products such as steam or heat treatment.
- Destruction of potential host plants and plant products in an affected area
- Disinfection of equipment and facilities
- Use of resistant cultivars
- Crop rotation methods
- Mass trapping
- Processing of infested crops (fruit stripping).

## 5. NOTIFICATIONS AND COMMUNICATION

As a contracting party to the IPPC, South Africa is obliged to report the occurrence and outbreaks of pests that may be of immediate or potential danger, particularly to neighbouring countries or trading partners. Pest reporting encourages international cooperation and allows countries to adjust their phytosanitary requirements and mitigation options to take into account any changes in risk. It also

enables neighbouring countries, to which pests could spread naturally, to initiate or increase their surveillance efforts.

## 5.1 International Notifications and Communications

When a new pest has been detected and identified as an EPP, the contact point of the NPPOZA should report the pest incursion to trading partners using at least one of the following:

- Direct communication to official contact points of trading partners and neighbouring countries.
- Publication of the information in the departmental (DAFF) website and the International Phytosanitary Portal (IPP).
- Notification through the WTO SPS notification system.

The contact point should also issue notifications when the pest has spread and expanded its geographical distribution as well as when the pest has been successfully eradicated. These notifications should be provided without undue delay. The pest reports shall be compiled by the contact point and must clearly indicate the identity of the pest with its scientific name (at least to species level), the date of the report, hosts concerned, geographical distribution of the pest and the nature of the immediate or potential danger it poses.

## 5.2 Local and national communication

South Africa also has an obligation to distribute information within the country regarding regulated pests and their means of prevention and control. As soon as a pest has been detected and its identity confirmed, the Directorate Plant Health (DPH) must notify the Minister advising him/her of the recommended quarantine measures that need to be followed. The DPH should request the Minister to inform the MECs and heads of departments of the relevant provincial departments. The affected mayors and municipal managers should be informed as well.

As soon as the provincial and local government heads have been informed, the Directorate Food Import and Export Standards (DFIES) in collaboration with DPH and Directorate Inspection Services (DIS) must conduct stakeholder meetings/ workshops with the affected communities to explain the procedures that need to be followed in eradicating or containing the pest.

The Plant Health Promotion component of DFIES with assistance from the Early Warnings component of DPH must develop a pest information package using information from data sheets and other literature. This pest information package must be disseminated in various formats (e.g. posters, billboards, brochures, etc.) for public awareness purposes.

The information must also be used to develop a press release which should be released by the delegated official within the department. With assistance from EWS, the Promotions Division must develop educational programs to assist the public in understanding prevention and control mechanisms for EPPs.

# 6. ENABLERS

## 6.1 Information and communication

Information about exotic pests must be sourced from international references as these pests do not occur in South Africa. This will be initiated once an organism has been identified as a potentially harmful organism. Pest information is further collected to develop a data sheet regarding such a pest and will continue once a PRA is initiated. It may also be that a new pest or organism is detected in the country with little or no information captured regarding the pest, which will initiate an immediate response to gather information. Credible international sources should be used for pest information. Information such as the pest's taxonomy, geographic distribution, host range, biology and epidemiology as well as diagnostic methods, detection methods and control measures are captured. Each pest is studied individually and pests known to be spreading globally are monitored through the participation and networking with international counterparts.

Exotic pest detection programs are essential for pest early warning systems as enormous amounts of data are generated. Spatial data collected from surveys should be collected with a GPS device and captured and processed through the available GIS systems within DAFF. This helps in providing information at various stages after a pest incursion, delimiting and control program. Mapping survey results and detection points or quarantined areas can be stored on a centralized GIS system and be made accessible for scientists who need to evaluate the data as well as regulators who need to respond to data. It is important to link pest information systems and relevant role players to provide direct access to information but also to provide access to enter data on an internet based system.

Different levels of security can be permitted to various role players. Record keeping and access to information is an obligation for the NPPO to adhere to in terms of the IPPC.

### 6.1.1Promotional and awareness material

The NPPOZA will put in place awareness standards and operating procedures to develop materials and dissemination methods for effective and efficient awareness campaigns.

Awareness campaign programs form an essential part of EPP control programs. They form a critical part of pest early warning systems and are vital to ensure good cooperation from community members and role-players after pest incursions and during the control of a pest.

It is an essential tool to sensitize the public about the threats of trade and travel with regard to exotic pests in general as well as specific pests. Uninformed or ill-informed travellers often have plant and plant commodities on their person or in luggage, either carry-on or stowed. This forms a major pathway for exotic pests to enter the country. Plant commodities such as fresh fruit are often intercepted from travellers and pose a high risk for the introduction of EPPs.

However, the general public are the best possible partners to the NPPOZA for pest detection, the prevention of introduction of exotic pests. Accordingly, DAFF must invest in fostering a culture of good communicative interaction between DAFF and the public. Specific pest awareness programs can help the general public to identify the EPP of concern. A new pest of uncertain identity is best observed by producers who know the pests in their area and on their crops. With the help of extension officers or agricultural chemical representatives, these pests could quickly be reported to DAFF for rapid response, if necessary. Awareness programs can be used to educate all role players during the pre-pest incursion period so that they know how to respond in case of a pest incursion. This ensures that the different role players assisting or facilitating EPP control programs have proper information available before a pest incursion. Awareness programs will ease the execution of control measures and may contribute significantly to the success of the control measures as producers and the general public are often uncertain as to the extend and implications of such programs. Post pest incursion awareness is important to inform the public, producers and other role players, such as universities, about the success of the control measures and the follow up actions such as continuous monitoring and the identification of possible research needs.

Public participation and involvement is very important for ensuring containment or eradication of a pest. The only way to ensure that the public participation is maximised is to make the public aware and knowledgeable about the dangers of the spread of a pest of concern. For this reason, promotional road shows and the development of awareness material such as posters, pamphlets and road signage or billboards, need to be done for every EPP.

### 6.1.2 Media releases

For purposes of releasing information to the media, the departmental guidelines and procedures will be followed.

## 6.2 Education and training

The NPPOZA recognizes the significance of capacity building through training and development of relevant local, provincial, and national capacities in efforts to execute preventative and rapid response programs to effectively deal with new EPP incursions. The NPPOZA shall promote capacity-building by:

- Strengthening training and research capacity at the national level.
- Establishing and/ or strengthening support and extension services to disseminate relevant technology methods and techniques more effectively by training field agents.
- Training of decision makers, managers, and personnel who are responsible for the collection and analysis of data for the dissemination and use of early warning information on the probabilities associated with possible pest incursions.
- Introducing exchange visitor programmes to enhance capacity building in affected provinces through a long-term, interactive process of learning and study.
- Involving competent intergovernmental organizations, as well as non-governmental organizations, in undertaking and supporting public awareness and educational programmes in both affected and unaffected provinces to promote understanding of the causes and effects of new pest incursions as well as the spreading potential to other areas.
- Organizing awareness campaigns for the farming communities.

- Developing and distributing educational and public awareness material, where possible in local languages, and appointing experts to train personnel of affected provinces in carrying out relevant education and awareness programs.

The training framework regarding EPPs will be coordinated by DAFF in collaboration with the Department of Education (DOE). Emergency plant pest biology and taxonomy may fall into existing natural sciences curricula. This will increase knowledge on pests as well as awareness about pest impacts and the ways pests spread from one area to another. Pest surveillance should also form part of the relevant educational curricula as well as the principles of pest detection, reporting and control programs.

## 6.3 Research

Pest research is an on-going process. To enable proper research on EPPs, a proactive research initiative must be established. Research would normally be triggered by the emergence of a new pest in the country, or a new organism detected with an import consignment, but may be too late to contribute to significant pytosanitary treatments to prevent unacceptable losses. The development of quick, accurate and effective diagnostic methods to identify new pest detections and interceptions is critical. Quick yet accurate diagnostic methods cannot alone help to ensure that pests are detected before they establish, but contribute to ensuring proper import control regarding consignments. Research on postharvest treatments for certain commodities can be proactive and be done long before a pest is introduced into the country, or it can be a preventative measure for pest incursions. Collaboration with research institutions to obtain information on imminent incursions of significant pests forms an integral part of the success of a pest control programme. This will be achieved through continuous consultation with institutions, locally as well as internationally.

The proposed EPP fund, together with a national research fund, should ensure core research and operational capacity for EPP responses, along with the maintenance of operational facilities and administrative support.

A 'rapid response research team' comprising of critical DAFF officials, researchers from research organisations, as well as other expert representatives from the agricultural industry, needs to be built and made available to respond at short notice. This relatively small, but dedicated, team could build

expertise in how to respond effectively to EPPs and then could quickly adapt this knowledge to new EPP incursions to form research objectives.

Research required with regard to EPPs will be pest specific and will thus depend on the available knowledge about particular pests. Some pests have been researched for years by various scientists in other countries, but have not yet been introduced into the country, and may require very little additional research.

An EPP research project may have to start before the pest has spread to the country and research may have to start in foreign countries were the pest occurs. Research initiatives may also have to be extended to organizations or individuals willing to conduct proactive research in a foreign country or to research organizations of foreign countries. Pro-active research also involves investigating possible biological control methods against invasive pests.

New insecticides and modern application techniques need to be thoroughly evaluated in the field and registered under Act No. 36 of 1947. Registering new insecticide products in South Africa that are already available countries where the pest already occur should be evaluated. This process takes time, thus it is essential that a specialist pesticide application research team is tasked with evaluating and registering under Act 36 at least some of the promising compounds available.

Research is also critically required to build research capacity in pest survey and detection techniques, GIS mapping, climatic modelling and agricultural/resource economics. This capacity could be readily built by providing student bursaries for emergency pest response techniques.

Research will continue once the pest has entered the country and if no expertise exists in the country, initiatives may have to be developed to encourage scientists from other countries to conduct research in South Africa.

There might also be research needs after a pest has been eradicated that may require expertise from various sources. Research will mainly be into areas such as preventing re- introduction, to develop better detection methods and eradication systems.

## 6.4 Funding arrangement for exotic plant pest control

Funding for EPP incursions is the responsibility of the Government and should cover port of entry and border control operations, pest risk analysis, pest surveillance, contingency operations, rapid response, control, quarantine, training, awareness and pest research. Inefficient and inconsistent provision of funding may lead to more pest incursions of various species which could lead to ineffective control which will, in turn, lead to a decrease in overall production, economic losses and reduced food security. However, additional funding may be identified by the PSC and may involve various role players from the private sector and international funding such as the WTO STDF.

The NEPPC must ensure that funding arrangements for EPP are maintained. In relation to EPP control, organs of State should have access to sufficient funding to be able to discharge their legislative responsibilities. One of the main challenges in South Africa is the lack of information on the costs associated with EPPs. If the direct and indirect economic impact of an EPP is not quantified, the benefits of risk reduction measures cannot be evaluated against the cost of an EPP. However, if risk reduction methods can avoid pest incursions they should be encouraged as preventative measures are the most cost effective.

As the SAEPPPR covers exotic pests not yet present in the country, it forces the NPPOZA to cost the possible or probable incursions based on the information from the PRA of each pest. This forces the cost estimates to be calculated on case scenarios in other countries before the pest enters South Africa. The PRA focuses on the economic impact of each plant pest which includes an environmental or social impact such a pest may have. Post entry assessments on the actual damage per area caused by a specific pest, for pest control for example, will have different results as damage may vary due to different climates and existing agricultural management processes. When an early warning system with contingency measures is already in place, the NPPOZA will have a much better chance to more accurately work out the cost of materials needed for pest control ahead of a possible or probable EPP incursion.

The NPPOZA must determine potential and actual economic impact of an EPP as far possible. This may not always be possible if there is a lack of available information about a pest or a pest is newly detected and no apparent economic loss could be determined. Pest impact should be determined with assistance from the PDA’s and local government. Funding in terms of allocating manpower from PDA’s and municipalities should be carried by such an organ of state. The costs of activities such as

public awareness programmes and the development of early warning systems are carried by national, provincial and local authorities as well as the private agricultural sector.

It is important to note that if the plant pest is not of national concern (i.e. officially controlled), the cost of control measures implemented would be the responsibility of affected producers. The public sector and farming communities should budget for the costs of these activities, whereas national, provincial and local governments should contribute to surveillance efforts and control actions. Funding programmes for awareness campaigns, capacity building, education and early warning information and research is on-going and must be budgeted for by the various role players and organs of state involved and on different levels of involvement. This will lower the cost of response once an EPP is detected in the country. However, it may be difficult or impossible to budget for most EPPs, as they may never occur, occur infrequently, may be a once off incursion or may be a severe outbreak with devastating consequences.

As EPP management has distinct, different budgetary needs and an EPP may not necessary constitute a national disaster, and should be managed separately from the National Disaster Management Fund. However, an EPP outbreak may be declared a national disaster. Rapid response to pest incursions is vital for successful eradication of an EPP and to the total costs of accumulative economic consequences throughout the value chain, which would affect social and economic recovery after pest introductions. If an EPP is not controlled, it may establish and multiply in the affected area and spread from there to other unaffected areas. Thus, funds need to be made available immediately for the execution of rapid response measures. The NEPPC will act as a facilitator to ensure the immediate availability of funds. New EPPs may require specialised agricultural chemicals and equipment to enable the NPPOZA to control it and would require the initiated of immediate procurement actions. Such actions should be facilitated by the NEPPC.

The disaster relief fund (Prevention and Mitigation of Disaster Risks fund) as well as disaster grants of various levels of organs of state should cater for the operational and service costs of, as well as the equipment and agricultural chemicals necessary to eradicate such a pest. Such funding should only be used for pests not yet established in the country or parts of the country and which was recently detected in the country or in a new area in the country in relation to EPP’s. The funding should be used for new incursions of pests previously eradicated in the country or an area in the

country. The funding cannot be used for established pests in the country or an area of the country unless eradication of a part of the country will be necessary as part of the eradication affords after detection in a new area in the country in relation to EPP's.

Disaster funding should cover the costs of post detection surveillance actions such as a delimiting survey and monitoring after management measures have been instated. The funding should cover the costs of establishing and managing a quarantine area and the enforcement of such an area, such as the movement control actions necessary to control the movement of plant commodities.

Some pests need to be controlled by means of destructive actions. This would be when a field, orchard or plantation is destroyed in order to eradicate a pest. The disaster relief fund would have to be utilised for the actions required to destroy such plantings as well as compensation or rehabilitation costs. Funding for destruction recovery and rehabilitation must be managed in such a way that it would be immediately available for affected parties, subject to the agreed criteria and controls.

The PSC will submit all funding needs to the NEPPC for approval. The NEPPC will drive the the funding and procurement process. Each organ of State involved would need to incur the following costs:

- Development of plans, sensitisation of role players thereto and reviews.
- Implementation of early warning systems and issuing of advisories.
- Awareness campaigns and education.
- Research needs and initiatives.

National Treasury should be approached for additional EPP response funding whenever the pest outbreak is of such a magnitude that the integrated effort of the different spheres of government are unable to gain control over the pest and existing forms of disaster funding is depleted. Such additional funding will ultimately depend on the approval of the Minister.

The development, implementation and dissemination of early warnings form part of the planning processes undertaken by DAFF and PDAs and must be funded by existing budgets. Capacity must be built and expertise ensured in the NPPOZA, and other role players, such as research institutions, to be able to respond in a timely and effective manner to mitigate EPP risks, funded by existing

budgets. However, funding should also have to be provided to maintain well trained expertise for certain pest groups within or outside the government sector.

The SAEPPRP must be included in the strategic plans of the DAFF and PDAs, municipalities and NGO's to ensure task driven strategic planning with regard to EPPs.

The cost of developing protocols and providing materials for surveillance and awareness is carried by the NPPOZA, but the cost of their dissemination is covered by the PDAs, local government and other identified role players. Successful awareness and surveillance greatly reduces the costs and impact of control programs. This forms the first part of the early warning system.

Education, training, public awareness and research are crucial to the success of EPP management. Accordingly, DAFF should:

- Mobilize substantial financial resources in order to support the implementation of rapid response.
- Promote the mobilization of adequate and timely financial resources, in conformance with the relevant provisions of the Public Finance Management Act (PFMA).
- Explore other innovative methods and incentives for mobilizing and channelling resources to reducing impacts of EPP invasions.
- Involve private sector funding sources and mechanisms, including those of non-governmental organizations.
- Rationalize and strengthen the management of resources already allocated for exotic pest control by using them more effectively and efficiently, assessing their successes and shortcomings, removing hindrances to their effective use and, where necessary, reorienting programmes in view of the integrated long-term approach.
- Promote multi-source funding approaches, mechanisms and arrangements and their assessment.
- Provide interested parties and relevant intergovernmental and non-governmental organizations with information on available sources of funds and on funding patterns in order to facilitate coordination among them.

- Establish and maintain a roster of independent experts with expertise and experience in different pest types. The roster shall keep information of available experts for each exotic pest or potentially disastrous pest. It is likely that these experts will have to be sourced from countries where the pest occurs or occurred previously.
- Utilize participatory processes involving non-governmental organizations, local groups and the private sector, in raising funds, in contributing to planning as well as implementing programmes, and in assuring access to funding by farming groups at the grass roots level. These actions can be enhanced by improved coordination and flexible programming on the part of those providing assistance.

## 6.5 Funding model for EPP response

Most of the existing infrastructure for responding to new EPPs is situated within central government, the private agricultural sector and research organisations. Thus, a significant proportion of the funding for this purpose is derived from the budgets of national government as well as the private sector and, to a lesser extent, from research organisations which are also funded by central government or /and the private sector. The obligation to respond to EPPs, however, is in terms of signatory membership of various international agreements as well as legislation within national government.

It is suggested that the disaster relief fund (Prevention and Mitigation of Disaster Risks fund) should be utilised to deal with EPPs. Funding would therefore be largely a combination of Government funding (derived from taxation and external funds) and, to a lesser extent, private funding and special project funds.

The details are as follows:

i. Annual fund/grant allocation from National Treasury – or through the Medium Term Expenditure Framework (MTEF) budgetary system for National Government.
ii. This can be supplemented with revenue derived through:
    - service fees derived from import permits, official inspections, diagnostic analysis phytosanitary certificates and so on;
    - taxation on importers and travellers or other potential sources of regulated plant pest introductions;
    - taxation on imported plant and plant product volumes sold by marketers and retailers.

iii. Production volume levies. A percentage of production volume levies collected by industry or through the fresh produce marketing chain or through the retailing system.

iv. Land user responsibility costs. The cost of controlling EPPs is carried by the land user on his/her portion of land if the National Government cannot carry such costs, or carry them further than a specific point.

v. Special project funds, such as for specific eradication programs, may be obtained from international funding sources. This may also often have a research and training component.

vi. Compensation funding in terms of the existing legislation.

## 7. MONITORING, EVALUATION AND DOCUMENTATION

From the notification of the first incursion to the finalisation of the control program, the NPPOZA is responsible for performance monitoring of all actions. This is necessary to ensure that the NPPOZA retains credibility as the process will be communicated internationally.

Scientific evaluation of the pest and management results would ensure proper information dissemination about the pest as well the correct official status. This will inform further action and lead to the most effective control system being implemented. As the control of an EPP may result in large economic expenditure, it is also necessary to monitor the procurement and implementation of materials, equipment and services required.

Proper documentation is necessary at each step and phase by each role player involved. Therefore, documentation and record-keeping procedures should form part of each pest specific action plan.

The management actions also need to be audited internally as well as from an independent source.

The NEPPC will ensure regular auditing of the EPP control actions. This would be supplemented by appropriate, transparent reporting to relevant role players and at public forums.

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