

Early Warning Systems[®]

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As movement of plants and plant products is on the increase worldwide, so is the risk of foreign organisms entering new countries. The development of early warning systems can support a country's National Plant Protection Organisation to respond to any new introduction by means of transparent communication, eradication programs, and control measures. This task requires cooperation with the private sector, research institutes, and the public to maximize the efficiency of this responsibility in order for the impact of the foreign organism to be as low as possible.

INTRODUCTION

Countries worldwide are experiencing an increase of invader pest species and all sectors are negatively affected due to the increased damage caused. This increase of pests is directly resulting from the increase in international air traffic, tourism, and trade in plants and plant products. Effective early detection and eradication systems need to be developed to safeguard trade, agriculture, and biodiversity against organisms associated with international movement of plants and plant products.

TRADE CONTROL AND SAFEGUARD

Theoretically, the best way to combat the situation would be to reduce the movement of plants and plant products by reducing trade and travel (Glantz, 2004).

This however, is in conflict with most organizational and governmental trade goals as well as the World Trade Organization's (WTO) agreement on Sanitary and Phytosanitary Measures (WTO SPS) of which South Africa is a signatory member. This agreement ensures that countries follow international standards for phytosanitary measures (ISPMs) to promote safe trade. These standards are set by the International Plant Protection Convention (IPPC) of the FAO and are acknowledged by the WTO. South Africa being a signatory of both the IPPC and WTO, is obliged to follow prescripts of these organizations.

The IPPC requires contracting parties to make provision for an official National Plant Protection Organization (NPPO), taking ownership of specific responsibilities (IPPC Convention).

Plant products are imported into South Africa in accordance with a permit system and import regulations. Early warning systems (EWS) can be developed as a tool of the NPPO to detect certain predetermined pests as they enter the country and to respond officially to such an introduction. Pests are identified for EWS through a Pest Risk Analysis (PRA) (ISPM, Pub. No. 2). Early warning systems are not developed for all quarantine pests but only for those with the highest chances of introduction and establishment without detection with normal port of entry pro-

cedures and with the highest potential economical consequences. Pests do not only include pathogens and insect pests but also weed plants (International Standards for Phytosanitary Measures Pub. No. 11, Rev 1). In trade, regular changes are needed for economic growth and consequently the risk of certain pest groups will change. An increase in the ornamental and cut flower trade e.g., will bring forward an increase in the risk of introduction of pest groups associated with the particular industry (Kiritani, 2001). The risk to export the same pests to other countries will also increase proportionally.

BASIC STEPS OF EARLY WARNING SYSTEMS

Early warning systems need to be developed to detect and eradicate exotic pests as they enter the country before they have the opportunity to establish. This will involve procedures to detect a pest, response from the NPPO whenever a pest is detected, a delimiting survey to determine the spread of a pest, as well as eradication programs and control measures for pests that cannot be eradicated. Detection, response, delimiting surveys, eradication, and control measures are some of the basic components of an EWS. Once a pest is detected and eradicated, the EWS would need to stay in place to prove that infestation is not recurring.

Detection. Detection would mainly focus on the more likely places of introduction of an exotic pest. This would be port of entry (POE) focus points, through the detection of hidden plant material in passenger luggage by sniffer dogs, or the usage of X-ray machines. Mail could completely be scanned by X-ray machines. Port of entry detection with sniffer dogs and X-ray machines would be methods of detection additional to the physical inspection of cargo and passenger luggage by the POE inspectors. When there is a suspicion or uncertainty that a pest exists in a country, surveys need to be done. This can also be an extended POE detection. A general survey can be conducted if it had not previously been done as part of the pest risk assessment to determine that a pest has not been detected previously, based on collection information, published articles, and notes as well as unpublished data from research institutes and universities (ISPM. Pub. No. 6). An official detection survey can also be conducted in the POE area as well as adjacent production areas (orchards, fields, nurseries, and greenhouses). An effective EWS should always include good communication and awareness programs and a good relationship with importers, growers, and traders within the industry, which would assist and ensure pest reporting by stakeholders. Growers are familiar with the common pests on nursery material and will quickly notice anything strange or abnormal and can notify the NPPO. The general public can also increase the pest report potential if awareness and education programs reach them and they know how and where to report new pests. End users are usually aware of their product's condition and quality and could therefore detect unwanted pests. Foreign pests can also enter the country, establish, and be exported on plant material without any one noticing them, but then be intercepted in another country. Detection through interceptions to exporting countries must be avoided at all costs, as this can negatively influence trade relations.

Response. After detection of a foreign pest in a country and verification of pest identification, the NPPO must respond immediately through a report to the IPPC,

neighbouring countries, trading partners internationally and nationally, on the occurrence of the pest. An update report after delimiting and monitoring surveys (International Standards for Phytosanitary Measures. Pub. No. 6), should be provided to all mentioned parties. The NPPO must also respond with contingency plans for all the relevant actions following detection and response (International Standards for Phytosanitary Measures. Pub. No. 9).

Delimiting Survey. A delimiting survey needs to be conducted by the NPPO to determine the boundaries of the area considered to be infested by the pest. This information will then be used to determine a quarantine area for the eradication plan and control measures (International Standards for Phytosanitary Measures. Pub. No. 6).

Eradication. After detection and response, a decision must be made by the NPPO based on a PRA to eradicate or to control the pest. Eradication as part of an EWS, needs to be 100% effective to declare a pest as an eradicated pest with no pest status in the country.

A management team needs to be established to provide direction and coordination of eradication activities, once it has been decided to undertake an eradication program. The size of the management team will depend on the scope of the program and the resources the NPPO have access to. An eradication program can fall across borders to other countries and cooperation from neighboring countries is then needed in this regard. The NPPO should conduct the eradication program through constant surveillance (monitoring surveys) after the quarantine area has been established based on a delimiting survey. This needs to be done to check the distribution or spread of the pest and to assess the effectiveness of the eradication program (International Standards for Phytosanitary Measures. Pub. No. 9). The pest needs to be contained in a specific area. The NPPO should define a quarantine area and can regulate movement of certain products into and out of the area. Owners of affected plants and plant products and other regulated articles should be notified of the regulations. Provision must also be made to withdraw regulations once the eradication program is declared as successful (International Standards for Phytosanitary Measures. Pub. No. 9).

The eradication options will be determined by the biology of the pest, resulting in different treatment methods that can be applied, like host destruction, trapping, toxic bait sprays, the use of biocontrol agents and sterile insect technique (International Standards for Phytosanitary Measures. Pub. No. 9).

Pest eradication needs to be verified by the management authority (NPPO). The NPPO must determine that the criteria established for successful eradication have been achieved. The eradication plan should specify the criteria for a declaration of eradication and steps for the withdrawal of regulations (International Standards for Phytosanitary Measures. Pub. No. 9).

The NPPO must also ensure that all records are kept of information supporting all stages of the eradication process. It is also valuable to maintain such documentation for information sharing purposes with trading partners (International Standards for Phytosanitary Measures. Pub. No. 9).

A declaration of eradication by the NPPO follows the eradication process. The status of the pest must be declared as absent in the defined area (ISPM. Pub. No. 8). Program documentation and relevant evidence supporting the declaration must be communicated to other NPPO's on request (International Standards for Phytosanitary Measures. Pub. No. 9).

Control. Eradication is not possible in all cases as factors such as the biology of the pest, the spread in an area, and the time of detection in relation to the population size, play a vital role. Control of the movement of material into and out of the area, would be necessary. Surveillance programs must determine the status of the pest in the area and control measures then be applied accordingly. Containment and suppression could then be a viable option in the quarantine area by implementing pest control programs including bait sprays, orchard sanitation, biological control, and nursery stock control. Areas outside the quarantine area could then be declared as pest free areas based on the supportive scientific evidence (International Standards for Phytosanitary Measures Pub. No. 4). The pest can then remain a quarantine pest as it will be officially controlled.

The EWS must remain in place during the whole eradication or control period and thereafter, as long as the organism poses the same risk that necessitated the EWS in the first place.

In Practice. There is a risk for the introduction of new pests into a country as long as plants and plant products are moved across international borders. New pests in a country may have a severe effect on export programs. The NPPO of the Republic of South Africa is responsible to minimize the risk of introduction and to detect newly introduced pests as soon as possible through implementation of legislation. This is a vast and labor intensive task and can only be successful through cooperation with the private sector, research institutes, and the public who would need to assist the NPPO to maximize the efficiency of this responsibility. A transparent but confidential relationship with all the role players needs to be developed by the NPPO, to get participation on EWS and information flowing, to focus on risk areas, and to detect already introduced pests. This will improve the general knowledge and awareness of all the role players which in turn will promote early detection of exotic pests. Knowledge of pests or pest components on a particular crop, will improve export certification as well as market access as it will improve the integrity of the country and support the PRA process of the importing country (International Standards for Phytosanitary Measures Pub. No. 11 Rev 1).

No EWS is perfect and it can be accepted that an EWS is idealistic in theory but can fail seriously in practice (Glantz, 2004). New pests could enter the country without early detection and could establish well before detection.

CONCLUSION

South Africa's ability to detect and respond to new foreign pests will determine the final effect and outcome of such events. In the end, it will be the economic impact of a pest on a crop that will be important to all the role players and consequently make it everyone's responsibility involved in imports and exports.

It is of utmost importance therefore that all role players accept the responsibility not to move any plant or plant product illegally from one country to another. All role players must take ownership of the EWS as a tool to protect South Africa's agriculture, horticulture, and environment to ensure a safe and sound trade in plants and plant products.

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