

GUIDE

FOR THE

IMPLEMENTATION OF

GENERAL PLANT PEST

SURVEILLANCE

SYSTEM



Inter-American Institute for Cooperation on Agriculture (IICA), 2017



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ABOUT THIS GUIDE

This guide was developed as a result of the STDF/PG/502 project “COSAVE: Regional strengthening of the implementation of phytosanitary measures and access to markets”, which objectives are to improve the regional capacity to implement phytosanitary measures, as well as the coordination and joint work, to contribute to the optimization of phytosanitary status and facilitate market access and maintenance.

The project strategy considers a work dynamic geared towards the technical training of the National Plant Protection Organizations (NPPOs) officials of the Comité de Sanidad Vegetal (COSAVE) member countries, and the participatory development of innovative tools with national impact, such as application guides and regional coordinated computer systems.

In this context, the purpose of this document is to provide information that contributes to improving the implementation of general plant pest surveillance within the framework of the official plant pest surveillance system carried out by the NPPO of each country, in compliance with the obligations established by the International Plant Protection Convention (IPPC) and in accordance with the International Standard for Phytosanitary Measures (ISPM) No. 6 and related standards (mainly ISPMs Nos. 5, 8 and 17).

Its contents were agreed by all COSAVE countries (Argentina, Bolivia, Brazil, Chile, Paraguay, Peru and Uruguay). The IPPC document “Plant Pest Surveillance. A guide to understand the main requirements for surveillance of national plant protection organizations” was used as the basis for its development, and information and experiences provided by NPPO representatives from each country were incorporated.



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ACRONYMS AND ABBREVIATIONS

AOP	Annual Operational Plan
CEPM	FAO Committee of Experts on Phytosanitary Measures
COSAVE	Southern Cone Plant Health Committee
CPM	Commission on Phytosanitary Measures
CS	COSAVE Coordination Secretariat
FAO	Food and Agriculture Organization of the United Nations
IPM	Integrated Pest Management
IPPC	International Plant Protection Organization
ISPM	International Standard for Phytosanitary Measures
NPPO	National Plant Protection Organization
PRA	Pest Risk Analysis
RPPO	Regional Plant Protection Organization
STDF	Standards and Trade Development Facility
WTO	World Trade Organization



IPPC DEFINITIONS USED

Pest risk analysis

The process of evaluating biological or other scientific and economic evidence to determine whether an organism is a pest, whether it should be regulated, and the strength of any phytosanitary measures to be taken against it [ISPM 2, 1995; revised IPPC, 1997; ISPM 2, 2007]

Pest status (in an area)

Pest status (in an area) Presence or absence, at the present time, of a pest in an area, including where appropriate its distribution, as officially determined using expert judgement on the basis of current and historical pest records and other information [CEPM, 1997; revised ICPM, 1998]

Pest record

Pest record A document providing information concerning the presence or absence of a specific pest at a particular location at a certain time, within an area (usually a country) under described circumstances [CEPM, 1997]

Surveillance

Surveillance An official process which collects and records data on pest presence or absence by survey, monitoring or other procedures [CEPM, 1996; revised CPM, 2015]

Specific surveys

Specific surveys Procedures by which NPPOs obtain information on pests of concern on specific sites in an area over a defined period of time (ISPM 6)

General surveillance

General surveillance A process whereby information on particular pests which are of concern for an area is gathered from many sources, wherever it is available and provided for use by the NPPO (ISPM 6)

Section 1

Introduction

Plant pest surveillance is one of the essential aspects of plant protection, especially in an increasingly connected world, which needs to ensure safe trade between countries. For this reason, the International Plant Protection Convention (IPPC, 1997), establishes in Article IV.2.b. that the NPPO of each country is responsible for “the surveillance of growing plants, including both areas under cultivation (inter alia fields, plantations, nurseries, gardens, greenhouses and laboratories) and wild flora, and of plants and plant products in storage or in transportation”. This responsibility can not be delegated, regardless of its organizational structure and working modalities.

Glossary of phytosanitary terms (ISPM 5), defines plant pest surveillance as “an official process which collects and records data on pest presence or absence by survey, monitoring or other procedures [CEPM, 1996; revised CPM, 2015]”.

There are two strategies for approaching plant pest surveillance, which necessarily complement and coexist permanently, called general surveillance and specific surveillance.

GENERAL SURVEILLANCE: is a process whereby information on particular pests which are of concern for an area is gathered from many sources, wherever it is available and provided for use by the NPPO (ISPM 6).

SPECIFIC SURVEYS: are procedures by which NPPOs obtain information on pests of concern on specific sites in an area over a defined period of time (ISPM 6).

Although many points are shared between both approaches, this guide will focus on general plant pest surveillance, exposing both conceptual aspects and operational procedures and models of associated documents (forms, files, notes, etc.) to strengthen its implementation in all COSAVE countries.

It is aimed mainly at the agents who perform functions in the NPPOs of the countries of this Region, carrying out directly the general surveillance actions.

It may also be useful to other actors linked in different ways, according to their role regarding crops and plant protection in each country, such as institutions that intervene in the scientific-academic field, universities, researchers, extensionists, advisers, producers, etc., and to any person or entity interested in learning about the subject and in identifying possible ways of participating in the system.

This document will also be published and will be available to NPPOs and RPPOs from other regions, as well as the Secretariats of the STDF and the IPPC, and can thus be globalized.

Section 2

Plant pest surveillance objectives

The official plant pest surveillance system collects, generates, records and analyzes information on pests with the objectives of:

- determine the pests status (absence or presence and distribution) in an area;
- conduct early detection of new pests.
- The development of plant pest surveillance systems and the availability of this information allow NPPOs:
- compile host and commodity pest lists (taking into account the particularities related to the application of specific cultural practices) and distribution records;
- identify changes in the population of a pest;
- validate statements of absence or limited distribution of quarantine pests;
- support the declaration of pest free or low pest prevalence areas;
- establish phytosanitary requirements to prevent entry, establishment or dispersal of pests;
- plan and improve contingency plans and pest management and eradication programmes at national, regional or international level;
- prepare to reduce the negative impact on certain productive sectors or to avoid environmental damage;
- determine the levels of losses caused by the pests, according to the control measures applied;
- conduct a pest risk analysis (PRA) on non-quarantine pests in its own territory, with the aim of regulating them;
- conduct a PRA on pests present in another country;
- provide the information necessary for potential trading partners to conduct a PRA to open or maintain their markets for export products;
- support phytosanitary certifications, enabling compliance with requirements established by importing countries;
- strengthen international cooperation by reporting to other organizations (other NPPOs, Regional Plant Protection Organizations (RPPOs) and the Food and Agriculture Organization (FAO)), the presence, outbreak or spread of pests Immediate or potentially dangerous;
- have work teams, organized and trained, that can respond quickly to situations of phytosanitary emergency.

Although the objectives of general and specific surveillance are shared, general surveillance actions often allows for covering a larger area and a wider range of crops or products, with lower costs, but also with less detail and accuracy.

The inclusion of one or another form of approach or both simultaneously in the design of a surveillance programme will depend on the use that the NPPO needs to give to the information generated.

Sometimes, findings of general surveillance may result in the implementation of specific surveillance systems.

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Elements for plant pest surveillance

The last revised text of the IPPC (IPPC, 1997) establishes in Article IV the responsibilities of an NPPO as a body competent and legally responsible for regulatory functions in relation to plant protection. These responsibilities include plant pest surveillance.

In order to comply with them, each COSAVE country has developed an NPPO, following the model that is effective and efficient for the fulfillment of its mandate, according to its capabilities and availability of resources.

Irrespective of the differences in the national organizational structures adopted, there are key elements which must in all cases be defined and available when establishing an official plant pest surveillance system to ensure its proper functioning.

This section describes these basic key elements.

3.1. CONCEPTUAL ORGANIZATION

▶ 3.1.1. NATIONAL ORGANIZATION

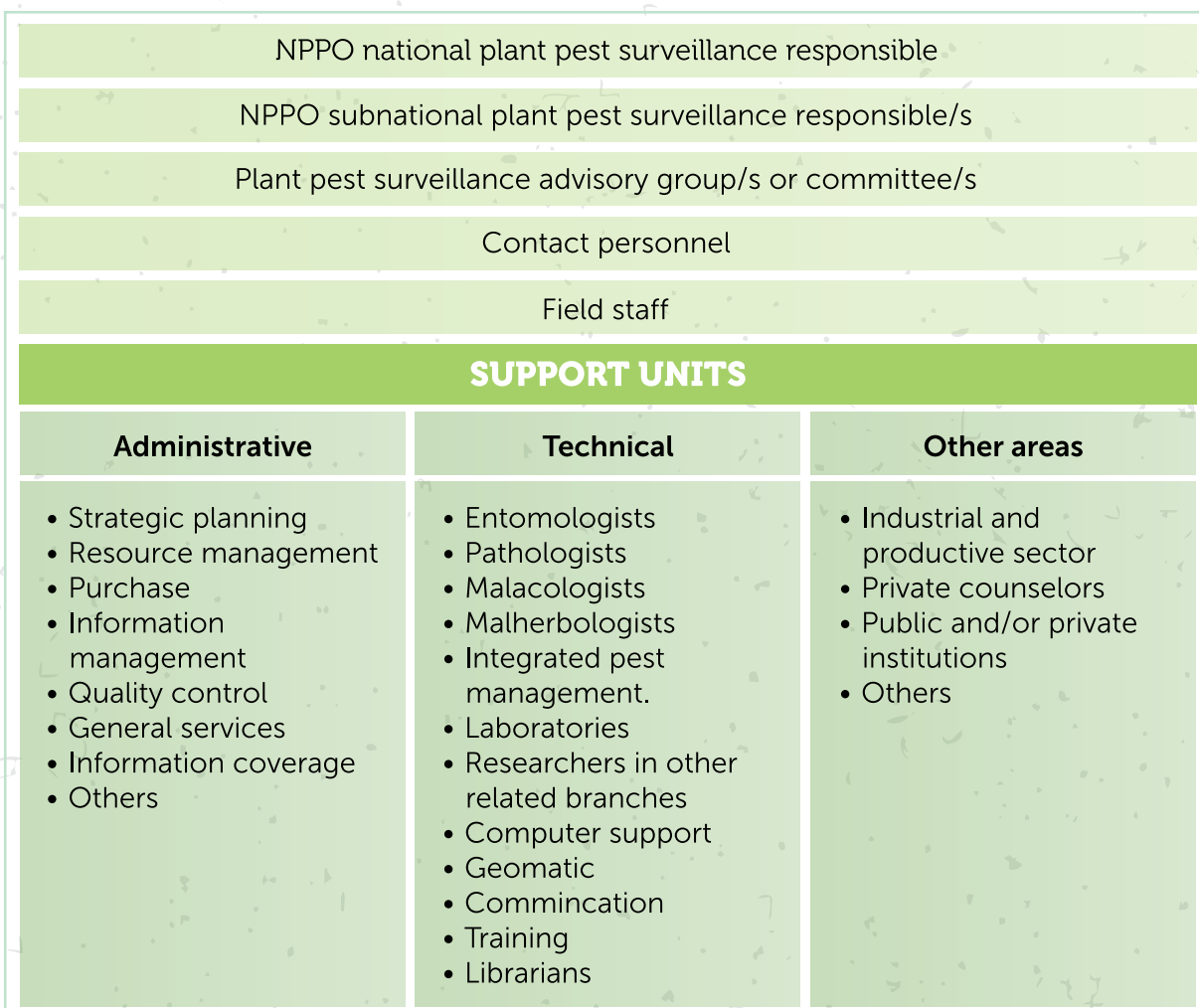
The establishment of a plant pest surveillance system requires that certain roles are defined in the organization of the surveillance system, no matter what the functional structure established by the NPPO is. Conceptually, the system must have a national plant pest surveillance responsible with authority to establish goals or premises to comply and give orders, and with an appropriate command line that is distributed territorially, involving, depending on the country's extension, supervisors or coordinators at subnational level (regional, state, departmental, provincial, etc.), contact personnel and field staff, with defined hierarchies, with clearly established roles, powers and responsibilities, and with an adequate flow of information between the different levels.

It is also essential the existence of administrative, technical and other areas support units. The administrative support unit must manage available resources, including human resources, deal with the purchase of inputs required for different activities, facilitate the management of information generated by phytosanitary surveillance, ensure adequate information coverage, etc.

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The technical support unit can be made up of specialists in the different branches of plant health or other related branches (providing technical support in the definition of goals and in the development of procedures within its area of responsibility), laboratories, experts in computer science and geomatics, etc. Likewise, support should be provided in the areas of communication, training and librarianship. It is also important that the system has the participation of the productive and industrial sectors (processing plant, storage, cold-storage, etc.), private consultants and public and/or private institutions that provide support in different areas voluntarily or that carry out certain activities for the NPPO or on its behalf. In some countries it may be appropriate to establish one or more plant pest surveillance advisory groups coordinated by the NPPO and integrating key sectors.

Figure 1. National conceptual organization of a plant pest surveillance system.



This conceptual organization or roles can be adapted to the institutional structures established in each country.

Section 3

▶ 3.1.2. REGIONAL ORGANIZATIONS

Regional Plant Protection Organizations (RPPOs) are intergovernmental organizations that function as coordinating bodies for NPPOs at the regional level. Not all contracting parties to the IPPC belong to a RPPO, nor are all RPPO members contracting parties to the IPPC. In addition, some contracting parties to the IPPC belong to more than one RPPO.

The functions performed by the RPPOs are set out in Article IX of the IPPC, and they comprise.:

- coordination and participation in activities among their NPPOs in order to promote and fulfill the objectives of the IPPC
- cooperation between regions to promote harmonized phytosanitary measures.
- collection and dissemination of information, particularly in relation to the IPPC..
- cooperation with the Commission on Phytosanitary Measures (CPM) and the Secretariat of the IPPC in the development and implementation of international standards for phytosanitary measures.

Also, RPPOs can be linked to each other, constituting forums for coordinating actions of common interest.

3.2. NATIONAL LEGISLATION

The national legislation (including laws and regulations) of each country should provide the appropriate framework to enable the NPPO to fulfill its non-delegable responsibility for the establishment and conduct of plant pest surveillance established by Article IV.2 (b) of the IPPC.

In order to do this, it is necessary to have general rules which allow for:

- clearly identify the phytosanitary authority and its powers at the national, state, provincial and district levels, taking into account the NPPO and entities authorized to carry out surveillance activities (eg inspections, sampling) on its behalf. In this case, there must be elements that support this linkage, such as the signing of letters of agreement, memoranda of understanding, contracts, agreements, etc. These engagement mechanisms should include the recognition and settlement of conflicts of interest and corrections in cases of loss of confidence or breach of contract;

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- define the organizational structure that will support the surveillance system, establishing the hierarchical relationship between the different levels that make the territorial coverage;
- assign responsibilities and clarify the roles of each actor in the system (not only the phytosanitary authority but also other members and stakeholders, such as scientific institutions, universities, productive and industrial sectors, etc.);
- define sources of funding and provide the necessary resources for the proper implementation of plant pest surveillance actions;
- provide legal protection to those who perform functions within the framework of surveillance systems (either own or contracted staff) during the performance of their tasks (eg against accidents, property infringement charges, physical attacks), including Right to enter establishments;
- maintain confidentiality in the use of data.

Provincial or state legislation, where applicable, must be consistent and support national legislation, to avoid impediments in the implementation of surveillance activities.

On the other hand, it is recommendable to establish specific rules, which support the implementation of plant pest surveillance systems and in particular, of general surveillance actions, establishing, for example:

- report on the detection of new pests or biological controllers or changes in the present pest situation;
 - mandatory reporting on certain pests under surveillance or under program;
 - procedures or protocols for specific areas, crops or products;
 - communication of suspicious phytosanitary situations;
- existence of advertising on the subject of general surveillance.



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3.3. ORGANIZATIONAL MANAGEMENT

The national plant pest surveillance strategy should be directly related to national strategic aims or priorities in relation to trade and the protection of plant resources and the environment and should present a clear vision that will achieve the necessary support and participation for its proper functioning.

The NPPO is the only responsible for the direction and coordination of official plant pest surveillance, but may delegate its authority at different levels (national, state, province, department, district, etc.) through a clearly defined command line, or may authorize other institutions to implement actions on its behalf.

The activities carried out within the framework of official plant pest surveillance must be planned and consistent throughout the national territory, that is, based on documented, standardized procedures with the same level of supervision. There should also be adequate information management, diagnostic and quality control systems.

It is essential to know the need for resources, their suppliers and their availability over time, so that the allocation of available resources is carried out rationally and based on the activities required according to the identified priorities.

To achieve the commitment of the different stakeholders to the system, appropriate information must be provided to ensure that the surveillance strategy is understood and that the roles of each are clearly defined.. There are also mechanisms to strengthen this commitment, such as memoranda of agreement, contracts, etc..

To ensure the strength of the surveillance programme, it is necessary to carry out regular supervision, according to its purposes, objectives and goals, on staff and methods used, to verify the reliability, quality, relevance and timeliness of the adopted procedures and technology and the performance efficiency. These supervisions can be both internal and external, when a trading partner is interested in verifying the quality and effectiveness of a surveillance programme that affects it.

On the other hand, it is also necessary, at the management level, periodically to evaluate whether the funds were used as scheduled, if the programme follows the established path, meets the times and is focused on the objective and what its impact was.

3.4. ACTORS OF THE SYSTEM

The plant pest surveillance programme involves not only NPPO staff across the country but also numerous external participants, who intervene in different ways, according to their role regarding crops and national plant health (research, advice, production, etc.),

▶ 3.4.1. NPPO STAFF

It is essential that the NPPO count, sustained over time, with sufficient human resources to fulfill its plant pest surveillance responsibilities effectively. The implementation of the system involves many and varied activities of both general and specific surveillance, which require the availability of personnel to allow efficient territorial coverage at the national level.

NPPO staff must also have different profiles, training and capacities to cover the different aspects of plant pest surveillance. Depending on the organizational structure of each country, it can include:

- management personnel with solid technical background to underpin their decisions, but also with capacity for staff management, team building, negotiation and resources management and ability to link with different levels of the command line;
- technical personnel trained in agronomy, forestry, biology or similar sciences, including specialists in the different branches of plant health (entomology, phytopathology, malacology, malherbology, IPM), to support the development of pest data sheets and their hosts, studies on their biology and surveillance procedures, in their areas of responsibility;
- laboratory personnel specialized in the different branches of plant health, to perform the diagnosis of samples obtained under the plant pest surveillance program.
- administrative support staff, to deal with administrative tasks, management of physical resources (storage, distribution, maintenance) and human resources, purchasing management, etc.
- staff trained in the area of communication, involved in the design of information dissemination projects, both internal and external to the NPPO, linked to surveillance;

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- personnel prepared in the area of training, to support the organization of appropriate activities for the development of the necessary capacities in each target group;
- personnel trained in the area of librarianship, to assist in the organization of bibliographic records;
- personnel with computer skills to develop and maintain computer systems to support plant pest surveillance, working closely on the one hand, with technical surveillance staff who can identify and transmit needs and, on the other hand, computer personnel at a higher level, which may have a more holistic view of the NPPO computer systems.
- personnel trained in geomatics, who support plant pest surveillance system, in the management of geospatial information.

It is important to pay special attention to the selection of personnel, to dedicate the necessary time to this task and to be supported by trained personnel. The selection should be oriented to the profile to be covered, and positively value the following qualities:

- professionalism;
- commitment;
- technical capabilities;
- ability for interpersonal relationships and communication.

All staff involved in general plant pest surveillance should be adequately trained in accordance with their functions. To this end, it is important that there is a continuous training programme that identifies the needs of each area and adjusts the design of each activity to the demand, clearly specifying its foundation and the expected contribution, for the improvement of the Organization.

In particular, technical personnel should be trained in both the specific fields of plant protection and other supporting sciences, as well as in different strategic areas, which are essential for the development of the necessary skills for the proper functioning of the surveillance system.

The addressed training areas may include:

The addressed training areas may include:

Table 1- Training requirements of personnel involved in general surveillance

TRAINING	
Strategic	Specific
<ul style="list-style-type: none"> • Strategic planning • Communication • Information management • Report writing • Negotiation • Supervision • Resource management • Interpersonal relationships • Personnel management • Decision making • Librarianship 	<ul style="list-style-type: none"> • Surveillance procedures • Pests (diagnostic, biology, etc.) • Epidemiology • Surveillance methods and good practices (general and specific surveillance) • Methods of collection, storage, transportation and registration of samples • Data management and maintenance and associated databases • Biostatistics • Geomatics Tools

▶ 3.4.2. ENTITIES OR PERSONS AUTHORIZED OR CONTRACTED BY THE NPPO

External entities or persons may perform functions delegated by the NPPO on their behalf or be contracted by the NPPO to cover the wide range of activities required by the plant pest surveillance program. For example:

- Laboratories with specific skills can make the diagnosis of certain pests;
- universities and research institutes can conduct surveillance programs according to ISPMs and make the resulting information available to the NPPO, develop pest datasheets, protocols and procedures manuals, provide training;
- industrial or productive sectors can collaborate in monitoring tasks;
- specialists can carry out specific activities, such as administrative support, communication, training, development and maintenance of computer systems, geomatics, etc..

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The authorization of entities or individuals for specific tasks, involves the definition of the requirements to be met, identification and evaluation of potential suppliers (checking that there is no conflict of interest), and supervision to verify compliance with established requirements.

As NPPO staff, external staff should receive adequate training for their functions, as well as manuals and protocols to ensure the consistency of the information gathered or generated.

It is recommendable that the authorization be formalized through instruments of commitment, such as letters of agreement, agreements, contracts or memorandums of understanding, which assign functions and legal responsibility.

▶ 3.4.3. ENTITIES OR PERSONS COLLABORATING WITH THE NPPO

General surveillance requires the involvement of everyone (especially those related to phytosanitary issues). Numerous individuals or entities are part of the surveillance system voluntarily, acting as sources of information according to their training, skills and link to agriculture and national plant protection.

3.5. FUNDING

The implementation of an effective phytosanitary surveillance system can be very costly, so it is essential to have different stable sources of financing that allow its continuity over time. These sources include not only the government but also different stakeholders and national, regional or international agencies that can provide additional resources.

It is important to take into account the availability of the necessary economic resources not only for the development of the planned activities, but also for the establishment or intensification of surveillance actions in the event of phytosanitary emergencies (eg introduction of a quarantine pest, detection of pest outbreaks) or other situations that can not be predicted.

Among the main sources of funding for the national plant pest surveillance system, can be found the following:

▶ 3.5.1. NATIONAL AND SUBNATIONAL GOVERNMENT BUDGET

A government can assume the full cost of the national plant pest surveillance programme by allocating the necessary budget to the NPPO, when it is seen as a public good. Although general surveillance activities are often less costly than specific surveillance activities, it is imperative that they also be considered in the allocation of resources and incorporated in this way into the budget.

The risk in having this solely source of funding is that the NPPO must compete with other official institutions for the resources available, and these resources may also be reduced when a reallocation occurs due to a change in national priorities. On the other hand, this financing is usually linked to prior approval of a budget, at defined periods of the year, which limits its flexibility for the allocation of funds for contingency situations.

▶ 3.5.2. USERS FEES OR TARIFFS

The collection of fees or tariffs allows the NPPO to recover all or part of the costs generated by the provision of different services with social and economic implications (issue of phytosanitary certificates, conduct of pest risk analysis, actions for the maintenance of pest free or low pest prevalence areas, monitoring, etc.). The resources generated can help to solve the national plant pest surveillance system, either directly or through its contribution to the national budget.

▶ 3.5.3. PRIVATE SECTOR

Strong and well-established industrial and productive sectors can contribute to the funding of surveillance when they can identify themselves as direct beneficiaries, through access to markets improved food quality. This funding may fully cover the development of a particular program, or may be shared with the government by signing appropriate agreements. Contributions can be financial or in-kind (surveillance actions, supervision, distribution of information, personnel, etc.).

▶ 3.5.4. OTHER COUNTRIES GOVERNMENTS

An importing or potential importing country may provide technical cooperation to facilitate trade of a product on which it has a strong interest, when the exporting country lacks the resources to establish plant pest surveillance as an additional measure to adequately manage risk.

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▶ 3.5.5. LOANS OR GRANTS

Where monitoring objectives can be clearly stated and the benefits of implementation are significant for the country, the government or NPPO can obtain a loan or grant from a donor country or a national or international lending institution.

▶ 3.5.6. TECHNICAL ASSISTANCE PROGRAMMES

Article 9 of the SPS Agreement provides that WTO Members agree to facilitate the provision of technical assistance to other Members, especially developing country Members, on a bilateral basis, by financing specialized institutions or by allocating funds to relevant international organizations, both multilateral and regional. These programs can be directed to strengthening national plant pest surveillance.

Technical assistance can take the form of advice, credits, donations and grants, training and equipment. It may include expenses for the acquisition of expertise, travel, training, workshops, meetings, computer or laboratory equipment and other pieces of equipment, project management, general operating expenses, hiring of experts, dissemination of project information, etc

It may also require the contribution of own resources of the counterpart to the project in the form of financial contributions or in-kind contributions such as staff time, use of facilities, vehicles or other pre-existing assets.

▶ 3.5.7. CONTINGENCY AND OTHER EMERGENCIES FUNDS

Whenever possible, it is advisable to establish a contingency fund with resources from external sources, government, industry and other sectors, to deal with emergency situations.

3.6. INFORMATION MANAGEMENT SYSTEM

Given the enormous amount of data collected under the plant pest surveillance program, it is essential that NPPOs define a flowchart to clarify the channels and appropriate order for its transfer from different sources and from any point in the national territory, as well as its storage and retrieval mode. The frequency for information delivery will depend on the type of surveillance and its requirements.

Data should be standardized in order to be easily comparable, analyzed and shared (eg between surveillance programs or between countries). The use of forms, either in paper or in digital format, specifically designed for the recording of data during each general surveillance activity, collaborates with the accomplishment of this objective, having certain fields and clear indications for their filling.

The use of computer and geomatics tools to support general surveillance, provides the information management system with a basis that facilitates the centralization, organization, standardization, visualization, analysis and availability of information in a timely manner, favoring the decision-making process, traceability and transparency.

3.7. COMMUNICATION STRATEGY

Taking into account the number and diversity of actors involved in the phytosanitary surveillance system, it is essential that the NPPO organize a two-way communication strategy, with appropriate messages to the different target groups, with the aim of raising awareness, support, commitment and participation and providing relevant information in a clear and precise manner.

To achieve an effective communication, the message must be clear, precise, objective, timely and attractive to the recipient.

The communication strategy should cover both the national (internal and external to the NPPO) and international scope, and consider the following points:

- information needs of the different target groups;
- opportunity of communication;
- impact of the communication strategy on plant pest surveillance;
- cost of implementing the communication strategy.

The designation of focal points for the different communicative processes to develop can facilitate their effectiveness.



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▶ 3.7.1. COMMUNICATION AT NATIONAL LEVEL

At the national level, may be developed internal communication processes directed to organization's staff (managers, supervisors, technicians, field staff, support staff) and external communication processes directed to different audiences outside the organization (governmental authorities, entities authorized by the NPPO, different stakeholders, media).

3.7.1.1. NPPO INTERNAL COMMUNICATION

It is essential to develop effective communication systems that allow easy contact between all NPPO officials at different hierarchical levels and from all points of the national territory, with the objectives of:

- distributing information on plant pest surveillance (basis, importance, general concepts, etc.) among all NPPO agents, highlighting their opportunities to participate in the system;
- unifying the criteria for the implementation of operational procedures throughout the national territory, distributing, among the personnel involved, manuals, protocols and worksheets;
- encouraging the exchange of information and experiences among field agents, to encourage their mutual recognition as part of a team, to improve their training and to identify possible solutions to common problems;
- exchanging information between the responsible for surveillance, supervisors and administrative support personnel, in relation to budget, procurement, maintenance and distribution of resources, personnel matters, etc..
- sending gathered data from the points where they are generated towards the central level.

3.7.1.2. NPPO EXTERNAL COMMUNICATION

The external communication strategy must ensure that all parties directly or indirectly involved in the program:

- keep informed;
- understand the role of the surveillance programme in relation to:
 - national security of food and other agricultural raw materials such as fuels, fibers, etc .;
 - access and maintenance of markets;
 - protection and improvement of plant resources;
- identify possible ways of intervention.

The NPPO therefore needs to educate the different stakeholders on:

- national role and obligation of the contracting parties for plant pest surveillance, as described in the IPPC;
- costs and benefits of conducting this function;
- problems in export markets access or maintainance due to lack of information and credibility;
- implications and consequences of a quarantine pest introduction for national and local economies, food security and the environment;
- communication obligations and needs for certain pests groups (in accordance with current national legislation) and the established channels.

Large target groups which should receive different messages, depending on their participation and interests, can be distinguished among external public: government authorities, surveillance committees, entities or individuals related to plant pest surveillance through different commitment mechanisms (entities or persons authorized or contracted by the NPPO), groups and individuals who participate voluntarily or must fulfill specific legislative obligations (scientific-academic field, industrial and productive sector, public in general) and media (press).

Communication strategy and styles should adjust to each recipient, in order to achieve the following objectives:

- government authorities:
 - provide to high-level government officials who may have an influence on policy-making and budget planning process, information on the direct benefits to the country generated by plant pest surveillance system (access to export markets, protection of national natural resources, human health and employment), to achieve their support through the allocation of resources and sustained funding;

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- surveillance committees:
 - inform on strategic points and results for decision-making;
- entities or persons authorized or contracted by the NPPO:
 - make available to authorized persons or entities, all information related to the tasks to be carried out (relevant international standards, objectives, goals, operating procedures, deadlines);
 - receive progress reports;
 - timely communicate the results of activities monitoring and review;
- media:
 - disseminate relevant information;
- scientific-academic field:
 - publicise the importance, scope, goals and benefits of the surveillance programme, its main operations and the need and way of support and participation for its proper operation;
 - disseminate the legislative obligations that reach this group (for example those aimed at achieving the report on the identification or suspected occurrence of specific or new pests) and receive the reports generated from their compliance;
 - disseminate information that may be interesting to this group (for example, relevant information that the network partners wish to transmit, different activities organized by the NPPO or other bodies such as conferences, seminars, workshops, congresses, etc. .).
- industrial and productive sector, general public:
 - implement educational programs to publicise the importance, scope, goals and benefits of the surveillance program for each sector, its main operations and the need and way of support and participation for its proper operation, generating when appropriate, local plans;
 - disseminate the legislative obligations that reach this group (for example those aimed at achieving the report on the detection of symptoms or specimens linked to specific pests of mandatory reporting) and receive the reports generated from their compliance;

- transmit the importance of communicating relevant phytosanitary situations (possible occurrence of new pests, significant changes in the present pests populations);
- communicate to industrial and productive groups directly involved or affected by the results of surveillance, problems that may arise from the strategies and procedures implemented and their findings;
- disseminate information that may be interesting to different groups (eg different activities organized by the NPPO or other bodies, such as conferences, seminars, workshops, congresses, etc.).

The communication strategy aimed at these last two groups is especially relevant for the achievement of the objectives of the general surveillance system.

▶ 3.7.2. COMMUNICATION AT INTERNATIONAL LEVEL

Each NPPO is responsible for reporting the results of surveillance activities, in particular the presence, outbreak or spread of pests which may constitute an immediate or potential threat, to other NPPOs, their RPPOs and the IPPC (Articles IV-2 .by IPPC VIII (1)) in support of transparency and cooperation to prevent the spread of pests.

It will also present the reports requested by interested commercial partners, regarding the phytosanitary condition of specific crops or pests, in order to facilitate the opening and maintenance of their markets.

3.8. DIAGNOSIS CAPACITY

Some findings of general surveillance, especially those related to the detection of new pests or pests of particular interest to the NPPO, require their verification through laboratory diagnosis from official samples. It is therefore essential to have diagnostic capacity to support general surveillance, covering the different areas of plant health (entomology, phytopathology, malacology, malherbology).

Diagnostic capacity includes not only the availability of the necessary facilities, laboratory equipment and instruments, but also qualified personnel, consistent diagnostic procedures to ensure accurate identification, verification and archiving of specimens, specific inputs required by each protocol, adjusted techniques, taxonomic keys, pattern specimens or positive controls when applicable.

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This can be difficult considering the huge range of pests to cover and the unpredictability and novelty of the findings of general surveillance. In this sense, the NPPO can use not only its own laboratories but also external laboratories with technical competence recognized by the NPPO (accredited, certified, approved, authorized, etc.) at national level (universities, research institutes, private laboratories). It may also be beneficial to know the diagnostic capacity of laboratories in other countries (mainly in the region) that can provide assistance in specific situations.

3.9. PHYSICAL RESOURCES

It is necessary that the NPPO have a series of physical resources for the development of a plant pest surveillance system, either their own or made available through the signing of various instruments of commitment. According to the particularities of each country and the surveillance system, these resources, may include:

- infrastructure:
 - offices for staff in adequate conditions of safety and hygiene, strategically located and ensuring a national territorial coverage;
 - meeting or conference rooms;
 - stores that ensure the necessary conditions for the correct storage and conservation of inputs and samples;
 - communications infrastructure;
 - waste facilities;
 - Laboratory infrastructure (including processing and preparation areas, and adequate physical space for breeding specimens when this is a requirement for identification);
- vehicles:
 - domesticated draft animals;
 - bicycles;
 - motorcycles;
 - all-terrain vehicles;
 - water craft;
 - aircraft;
- fuel;
- safety equipment;
- laboratory equipment and instruments;

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- equipment for data collection, sending and processing:
 - digital cameras;
 - GPS units;
 - smartphones, tablets (and applications for easy transfer of information, towards the NPPO);
 - desktops computers and/or laptops (with appropriate software);
 - drones;
- material to support dissemination activities:
 - graphic material (brochures, posters, leaflets, cards, calendars, etc.)
 - short videos on general surveillance
 - other items (cups, caps, t-shirts, etc.)
- basic elements for obtaining and preparing samples:
 - pests datasheets;
 - worksheets,
 - gloves;
 - hand magnifier (conventional or smartphone application);
 - pliers
 - entomological umbrella;
 - nematological hammer;
 - insect suction device;
 - sieve;
 - stairs;
 - spade;
 - pruning shears;
 - planchetas;
 - absorbent paper;
 - tape;
 - styrofoam coolers;
 - cooling gels;
 - tubes;
 - jars;
 - polyethylene and paper bags;
 - labels;
 - permanent marker/brush / permanent pencil, pencil, pen;
 - alcohol;
 - traps / lures;
 - knife / pruning shears.
 - others.

Section 3

3.10. SUSTAINABILITY

Effectiveness of the plant pest surveillance programme depends on its sustainability. This point must therefore be considered in its design, to ensure the achievement of the desired results.

Factors that contribute to surveillance system sustainability include:

▶ 3.10.1. AVAILABILITY OF RESOURCES AND FUNDING MECHANISMS

The sustained availability of physical and economic resources at the required level over time is essential. For this, it is important to achieve the prioritization of the surveillance program at the governmental level, to have a regular and adequate national budget. But it is also essential to establish contingency plans in case of changes in the political context. It is necessary a flexible system and an NPPO with the ability to access, when necessary, external funding that guarantees the minimum indispensable resources and that allow to face emergencies and phytosanitary crises.

▶ 3.10.2. ADEQUATE STAFF RETENTION PRACTICES AND TRANSITIONS PLANNING

The formation of a solid plant pest surveillance team, with sufficient personnel and the required levels of competence, demand a lot of investment in resources and time, so it is essential that once this objective is achieved, an effort is made to support their permanence in the organization. This can be encouraged through:

- salaries commensurate with tasks assigned;
- attractive incentives and benefits;
- conducive working conditions, including availability of appropriate resources (infraestructure, tools, transport);
- career development programmes;
- safety at work (protective equipment, personal security gear, adequate health care and medical coverage, first aid equipment, proper personal and means of transport identifications)
- awareness of the importance of their tasks to national development;
- continuous training of the team on general surveillance issues.

When necessarily a staff change should occur, the transition must be planned, so that relevant information and experiences are transferred to the new individuals who will assume the tasks.

▶ 3.10.3. Relations with different stakeholders

Beyond the financial contribution, it is essential that the different stakeholders and key actors engage, participate and support the implementation of the different plant pest surveillance activities, so that the system meets its objectives. This support may include:

- communicate the presence of new pests or pests of interest (comply with current legislation);
- respond to inquiries carried out by the NPPO within the framework of general surveillance;
- provide information on specific pests;
- collaborate in the training of NPPO personnel in the field of their specialty;
- facilitate the access to the lots, to the NPPO officials who need to confirm any report.

To achieve this participation, it is essential that communication and awareness programmes be prioritized as fundamental elements of plant pest surveillance system.

The involvement of key stakeholders contributes to the flexibility necessary to enable the program to adapt to changes in the availability of resources.

▶ 3.10.4. Security protocols in the storage of information

Whatever the defined information management system is, it is imperative to ensure the security of the stored data, so that it is preserved and available and accessible over time, thus allowing NPPO officials to make decisions based on historical series. It is therefore necessary that the information management system planning include appropriate security protocols.

▶ 3.10.5. Development of adequate documentation

It is necessary to develop appropriate documentation to ensure uniformity, quality and availability of developed procedures and information gathered, throughout the national territory and over time, and its consistency with the defined surveillance strategy.

It may be included:

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- strategic documentation::
 - strategic plan;
 - management plan;
 - prioritization document;
- operational documentation:
 - annual operational plan;
 - general surveillance and good practices manuals;
 - specific procedures (protocols, manuals and standard operating procedures);
- pest records: considering basic information suggested in point 2.1. of ISPM 8;
- reports:
 - technical reports;
 - dossiers / reports by crop;
 - pest status in an area;
 - studies and evaluations.

This documentation should be made available, as appropriate, to NPPO staff involved in plant pest surveillance (either through decision-making or the implementation of operational tasks), for government authorities to allocate the budget and for entities or persons authorized by the NPPO.

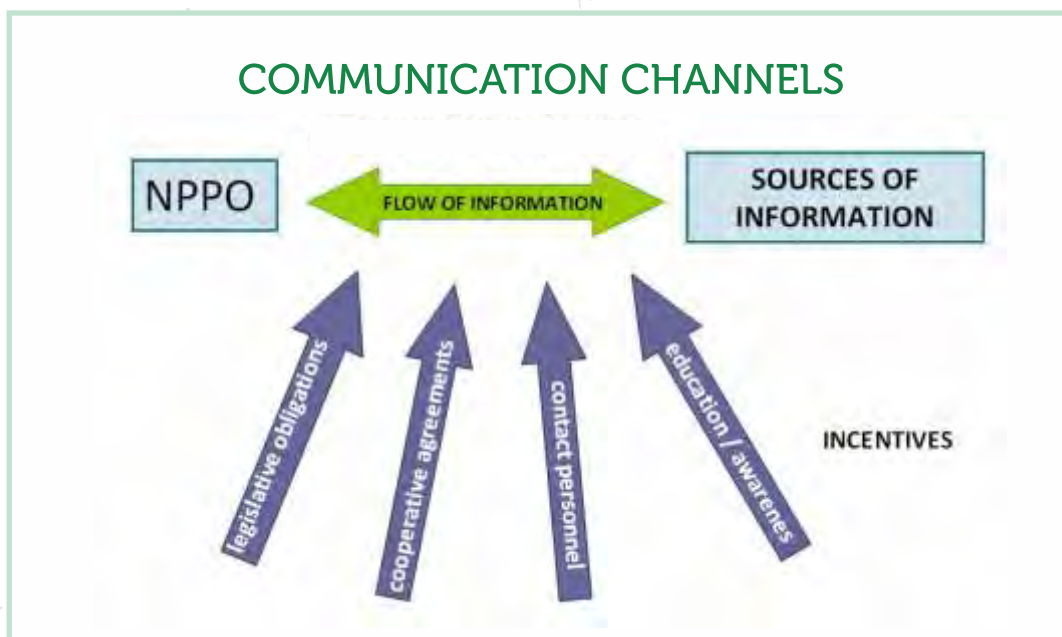


Section 4

General surveillance design

The general plant pest surveillance system is based on the identification of sources of information and the generation of communication channels that allow an agile flow of data from them to the NPPO. In order to encourage their participation in the system and promote exchange, legislative obligations, cooperative agreements, contact personnel to enhance communication channels, education and public awareness programs, etc. can be established. The varied approaches offered by all the members of the system allow to assess the phytosanitary status of the main crops in each country and to support the phytosanitary prevention system.

Figure 2- Components on which the development of general surveillance systems is based



4.1. NATIONAL PLANT PROTECTION ORGANIZATION

The NPPO (or a designated institution) acts as a national repository for plants and their products pest records and biological controllers, centralizing the information collected through the general surveillance system. To do this, it must define the information management system, and have procedures to verify the gathered data.

Section 4

4.2. INFORMATION SOURCES

Various sources can provide information that contributes to achieving the objectives of phytosanitary surveillance.

These include national experts linked to plant health (researchers in the field of plant health or other areas of study, extensionists, consultants, leader producers, etc.) both independent and belonging to different public or private institutions (other areas of the NPPO or its functional structure, other national bodies, local governments, research institutes, universities, scientific societies, museums, etc.). Its participation is formalized through the formation of a national plant pest surveillance system network of collaborators.

The system also has the input of other actors related to agriculture, the general public and national databases.

International sources of information, such as other NPPOs, RPPOs, international organizations, universities, reference research centers, researchers in different fields or disciplines, international databases, etc. can also be used.

Figure 3- General surveillance sources of information

Sources of information	
National	
<ul style="list-style-type: none"> national and local government agencies research institutions universities scientific societies(including amateur specialists) leader producers consultants museums 	NETWORK OF COLLABORATORS
<ul style="list-style-type: none"> other areas of the NPPO or its functional structure agricultural producers in general general public scientific and trade journals databases unpublished data and contemporary observations 	
International	
<ul style="list-style-type: none"> internacional organizations Regional Plant Protection Organizations (RP PO) other NPPOs universities reference research centers researchers in different fields or disciplines databases 	

4.3. COMMUNICATION CHANNELS

The channels for receiving and transmitting data between the NPPO and the different sources must be clearly defined for each type of information, so that the communication is effective. The value of a notification depends on whether it reaches the right recipient at the right time.

Communication channels can be formal or informal.

Formal channels are carefully planned and designed according to the needs of the system. The advantages of using them include their effectiveness (reaching the target audience in a timely manner), they limit the message to meaningful information by avoiding non-relevant data, and they collaborate in supervising surveillance activities.

Informal channels, usually allow greater speed in the flow of information and may have additional utility, but they should never replace official channels.

Communication channels may include:

- personal communication
- telephone
- fax
- mobile phone
- e-mail
- ruled report
- WEB form
- videoconference
- mass media (radio, newspapers, newspapers, television, web pages).

The current technology and the use of virtual means, facilitate an agile communication between all the members of the system and a rapid exchange of information between different points of the country.

In particular, the use of an informatics tool to support the general surveillance system makes it possible, on the one hand, to conduct on-line consultations with network partners and, on the other hand, to receive spontaneous notifications on suspicion or detection of new pests or mandatory reporting pests. It also makes available information on pests status and the phytosanitary situation of crops in each country.

Section 4

4.4. INCENTIVES

The components of the general surveillance system may also include actions that favor the flow of information, such as the establishment of legislative obligations and cooperative agreements, the involvement of contact personnel, the development of dissemination and awareness programs, etc.

► 4.4.1. LEGISLATIVE OBLIGATIONS

Each country may be interested in rapidly knowing the detection of new pests, specific pests, quarantine pests, changes in present populations, etc. in its territory, according to its national strategy and the objectives of the surveillance program.

Whatever the case, it is important for the NPPO to generate national legislation to ensure this report, clearly indicating:

- the recipients of the legislation (eg. research organizations, nurseries, producers of certain crops, etc.);
- the target of the legislation (eg new pests, quarantine pests, changes in the population of a particular pest, suspected symptoms of a particular disease, etc.);
- the objective (eg mandatory reporting on detection, application for authorization for investigation, etc.);
- the timing (eg, prior to publication, within a specified period of time since detection or identification, prior to the application for research funding, etc.);
- implications of the legislation (eg whether or not authorization from the NPPO must be requested for publication, recognition of authorship, co-responsibility of the body in which a researcher performs functions, etc.).

The list of pests to be communicated may vary over time, depending on the evolution of the phytosanitary scenario and the study of available information.

Rapidly counting on this information allows the NPPO to take appropriate initiatives, according to the risk that the reported pest represents for production, trade, population health and the environment.

▶ 4.4.2. COOPERATIVE AGREEMENTS

A cooperative agreement or memorandum of understanding is a written document that allows the formalization between parties of their cooperation in a given project or to achieve a certain objective. This instrument can be useful for formalizing and facilitating the exchange of information between the NPPO and scientific and academic institutions, government agencies or other organizations of interest. It should also refer to exchange mechanisms, the use and ownership of shared information, and the responsibilities and benefits of each party. Funds and resources may or may not be committed.

▶ 4.4.3. USE OF CONTACT PERSONNEL

The contact personnel is key to achieving an effective flow of data, due to its performance in a local level, very close to the sources of information, but with strategic functions, to support the organization of plant pest surveillance in the area of its responsibility, and with a holistic view of the system. They may be officials from the NPPO subnational offices or from other agencies working closely with the NPPO and acting as plant pest surveillance referrals in their area.

This contact personnel plays a fundamental role in maintaining a direct contact with the different sources, favoring the understanding, the commitment and the sustained participation in the time of those who can make contributions, through their accompaniment and through the identification and implementation of different actions that strengthen the linkage.

▶ 4.4.4. DIFFUSION AND PUBLIC AWARENESS PROGRAMS

The development of planned dissemination and awareness programmes aimed at promoting the knowledge and understanding of those who can act as sources of information or support the compliance of legislative obligations is essential to encourage cooperation and support to the general surveillance system.

These programs should distinguish between network of collaborators and other publics, adapting the messages to each recipient and the type of information that can provide.

Section 4

Awareness programs may include the following activities:

- expositions in scientific or related to agriculture congresses, conferences, seminars, etc.;
- participation in review panels and editing committees of scientific conferences and publications;
- notes addressed to managers of scientific and academic institutions;
- notes aimed at possible sources of funding for research;
- participation in scientific societies;
- meetings with specialists;
- participation in university classes;
- work days in the field of rural education;
- assistance in sanitary education programmes;
- intervention in radio or television programmes, newspaper and other mass media;
- distribution of communication material (graphic material and others) in different areas.

The messages to be transmitted may cover:

- general concepts of plant pest surveillance (importance, objectives and actions) with an emphasis on general surveillance, aimed at all public;
- national legislative obligations, among its addressees;
- invitation to participate in the network of collaborators to whom are considered to be able to contribute valuable information;
- importance of communicating the observation of suspicious phytosanitary situations (aimed at the detection of new pests), between groups directly linked to field tasks and between the general public.



Section 5

Planning, prioritization and budget

5.1. PLANNING A SURVEILLANCE PROGRAMME

The plant pest surveillance programme requires careful planning, consistent with government policies, NPPO functions and current legislation, to predict the availability of resources throughout its implementation and to achieve efficient development.

It must also be consistent with the strategic aims defined at national and / or regional level. These aims may include:

- support for the opening and maintenance of export markets;
- prevention against the entry of pests;
- protection of plant resources;
- protection of biodiversity;
- environmental protection;
- food security;
- human health.

It is recommendable to reflect the planning in a management plan document that contemplates:

- purpose of the plant pest surveillance programme
- current or future benefit
- beneficiaries
- components
- goals to meet
- actions to be taken to achieve the goals throughout the national territory (both general and specific surveillance actions)
- required logistics
- training
- support services
- information management
- cost of the programme
- indicators to monitor and verify the progress of the programme
- audit / supervision

It is important to consider the results of previous experiences of other surveillance programs, whether local or from other countries, with similar goals in the definition of actions to be developed. In particular, when surveillance is targeted to specific pests, references may be made to their hosts, ecological niches, favorable environmental conditions, etc.

Section 5

The medium- or long-term management plan should be accompanied by Annual Operational Plans (AOPs), detailing the implementation of the activities, their territorial and temporal distribution, and the budget (resources and inputs) for its execution.

5.2. PRIORITIZATION

Since the resources available for the implementation of the phytosanitary surveillance program are generally limited, it is essential to prioritize pests, biological control agents and both agricultural and forestry crops to be included in the Annual Operational Plan (POA), which directs the allocation of resources.

Failure to define priorities can result in:

- delays in access to new markets
- unnecessary or unjustified import requirements
- prevent pest research before it establishes, leading to significant and devastating losses in agricultural and forestry crops.

It is important to periodically review the priorities, following criteria determined by the NPPO, that are aligned with the national strategic aims. These criteria may include:

- compliance with international agreements (bilateral or multilateral);
- the requirements of other ISPMs (Pest Free Areas, eradication or management programs, etc.);
- the presence of emerging pests at the local level;
- potential risk of introduction of absent quarantine pests or emerging pests at regional or international level;
- the need for information to facilitate access and maintenance of export markets or the establishment of justified import requirements;
- the requirement to gather information on the presence of biological control agents;
- the responsibility of the NPPO for agri-food security and sovereignty;
- the threat of pests that affect health or productions of local importance..

Tools such as pest risk analysis, modeling and incorporation of expert judgment may be important during the decision process.

Also, each country can use a weighting system, according to its strategic axes, that contributes to define the prioritization.

Once priorities for surveillance have been identified, the following points should also be analysed:

- cost-benefit analysis, considering:
 - importance to the local economy of the agricultural or forestry product at risk;
 - potential export economic importance of an agricultural or forestry product;
 - health and economic importance of an agricultural or forestry product for an importing country;
 - estimated economic damage and impact of a pest for a country's agricultural or forestry product;

- feasibility:
 - technical feasibility, including evaluation of the availability of relevant specialists, appropriate methodologies, positive controls and reference collections, at the national, regional or international level;
 - economic and financial feasibility, considering the availability of the necessary resources, in a timely manner;

- degree of difficulty in detecting and identifying the pest;
- level of interest, support and commitment of the sectors involved.

From the analysis performed, the prioritization document must be drawn up stating at least:

- name of the priority pest / crop / biological controller;
- justification (selection criteria, and other elements such as risk analysis, modeling, weighting system, etc., if applicable);
- target product or environment or specific location, as appropriate;
- general and specific surveillance actions to be delivered;
- actors involved;
- appropriate time;
- necessary resources;
- cost of implementation.



Section 5

5.3. GENERAL SURVEILLANCE BUDGET

General surveillance activities should be included in the NPPO budget, based on its programming.

Many actions can be carried out at no additional cost, with the awareness of all participants (NPPO surveillance and other areas staff, external actors), but others require the allocation of a specific budget.

The movement of personnel as part of strengthening the links with external participants and the organization of group activities in very large countries can be very costly, as well as the development of a solid communication campaign and the establishment and maintenance of effective communication channels.

Some general surveillance costs to consider in budget projection:

- travel allowances and mobility of NPPO staff;
- transfer and expenses of the external actors, for assistance to an activity organized by the NPPO;
- expenses for the organization of trainings and other group activities (salon rental, projection equipment, coffee breaks, teaching fees if applicable, library materials);
- material to support dissemination activities (graphic material and other elements);
- materials for the collection of samples;
- support laboratories.



Section 6

Participation of the different actors in the General Surveillance System

6.1. NPPO STAFF

- The NPPO staff (including managerial, technical, administrative, etc.) who performs functions at the central level has the following functions and responsibilities:
 - define the national and/or regional plans for the management of the surveillance programme;
 - lead the periodic review of the priorities for plant pest surveillance and the determination of the general surveillance actions to be developed;
 - according to the organization and distribution of functions in each country, it can be in charge of budgeting, obtaining sources of funding, purchasing and distributing the necessary physical resources;
 - to agree at the subnational level and coordinate the general surveillance actions, so that they can be delivered in a unified way throughout the country, promoting the formation of a team that integrates all the regions;
 - develop and document standardized procedures and supporting information material (eg pest datasheets) and disseminate them throughout the national territory;
 - manage and participate in training and dissemination activities across the country;;
 - support locally generated training and outreach activities;
 - promote the formation and strengthening of a network of collaborators at the national level;
 - establish formal links with scientific and academic institutions;
 - ensure access to external diagnostic support services;
 - search for information from written sources and databases;
 - attending congresses, workshops, seminars, etc., related to plant protection;
 - organize group activities to gather information (workshops / panels of experts);
 - ensure adequate information management systems and communication channels;
 - develop or generate the development of geographic information systems and predictive models of pest behavior;
 - supervise the uniformity and consistency of the procedures used throughout the country and verify the progress of the program, according to established criteria;;
 - make the diagnosis of the samples sent for consultation or for verification of communications received through the general surveillance (laboratories);
 - prepare the reports that fall under its responsibility;
 - make phytosanitary information official.

Section 6

- At the subnational level (provincial, state, etc.), the functions and responsibilities related to the general surveillance system may include:

Regional managerial staff

- define the regional management plan for the surveillance programme, consistent with the national plan, together with the central level;
- collaborate in the periodic review of the priorities, based on previous experiences and agree with the central level the general surveillance actions to be developed;
- according to the organization and distribution of functions in each country, participate in the preparation of the budget, obtaining of funding sources, purchasing and distribution of physical resources;
- assemble regionally the implementation of defined general surveillance actions;
- support the formation and coordinate a regional team in plant pest surveillance and particularly in general surveillance, with capacity to respond to emergency situations, optimizing the use of available resources;
- collaborate with the information at their disposal, for the development of procedures and supporting information material and disseminate standardized procedures and support material, regionally;
- manage and participate in local training and outreach activities;;
- promote the formation and strengthening of a network of collaborators at the regional level;
- encourage the establishment of formal links with local scientific and academic institutions;
- favor access to external diagnostic services in the region;
- attending congresses, workshops, seminars, etc., related to plant protection at the regional level;
- organize workshops with local collaborators, in coordination with the central level;
- provide experiences for the improvement of information management systems and communication channels;
- supervise the uniformity and consistency of the used procedures and verify the degree of progress of the program in the region..

Contact personnel

- support managerial staff in the implementation of general surveillance actions;
- collaborate in the organization of the regional work team, providing mainly elements that contribute to their training in general surveillance;
- propose and develop actions to establish and strengthen the link with network collaborators and promote their interaction with NPPO staff and entities or persons authorized by NPPO;
- identify potential collaborators and the best strategy for their incorporation into the network;
- prepare and update a calendar with seminars, workshops, etc., related to surveillance, scheduled at the region;
- propose improvements for the regional general plant pest surveillance system;
- prepare the requested plant pest surveillance reports.

Technical staff

- perform operational tasks within the framework of general surveillance;
- identify possible collaborators and provide elements within their reach to define the best strategy for their incorporation into the network;
- collaborate in the identification of seminars, workshops, etc., related to surveillance, scheduled at the region;
- take samples for consultation in the presence of unusual or new cases or the reception of communications;
- carry out the preliminary or definitive diagnosis of the samples taken in consultation or for the verification of general surveillance reports (regional laboratories, according to their capacity);
- propose improvements for the development of general plant pest surveillance activities in the region;
- participate in communication, training, geomatics and informatics actions if appropriate.



Section 6

6.2. ENTITIES OR PERSONS AUTHORIZED OR CONTRACTED BY THE NPPO

External entities or persons shall perform functions, as delegated or contracted by the NPPO:

- laboratories can perform the diagnosis of certain pests sent in consultation or for the verification of communications received through general surveillance;
- universities, research institutes and specialists can develop pest datasheets, protocols and procedure manuals, pest lists by crop or specific product, compilation of information on particular pests, maintenance of reference collections, etc.

6.3. ENTITIES OR PERSONS COLLABORATING WITH THE NPPO

The collaborators of the network intervene permanently in a voluntary way, providing the information that they generate in the field of their specialty and in the framework of their own activities. The members of the network are consulted periodically regarding the phytosanitary situation of certain crops (lists of pests per crop) or the status of specific pests at the national level. They can also provide agreed information of interest to the NPPO as they develop their surveys. Its active intervention allows the integration of dispersed existing data, thus constituting an important source of information that is available for the surveillance system to provide a technical and scientifically sustained response to national needs. Universities, research institutions and specialists can also collaborate in the training of NPPO staff and authorized entities and share information for the development of pest datasheets, protocols and procedures manuals, etc.

Under national law, certain interest groups (research organizations, nurseries, producers of particular crops, general public, etc.) may be required to report the detection of new pests, specific pests or symptoms or specimens similar to those of some mandatory reporting pest.

Section 6

The system also has the input of other actors related to agriculture (industrial sector, farmers and producers, nurseries, etc.) and the general public (consumers, markets, vendors, etc.) who provide current information or data collected over the time on the occurrence or incidence of pests in their establishments and alert the NPPO on the observation of unusual or new cases.

The press and other media have the function of disseminating information, educating, raising awareness and encouraging support for the programme and related activities. This intervention may sometimes have a cost to the NPPO.



Section 7

Implementation and methodology

The NPPO or the entities authorized by the NPPO can deliver different activities within the framework of general surveillance, in order to gather the information generated by the different sources. It is necessary that these activities are carried out in a coordinated manner and according to standardized procedures, adjusted according to the particularities of each country. The use of methodologies that are clear and known by all the actors involved, facilitates the effective flow of information.

The activities developed under the general surveillance system may include:

7.1. BIBLIOGRAPHY REVIEW

All bibliographic information available within the scope of the NPPO should be checked to compile both historical and current records. It is advisable to include both national and international databases.

From this review, bibliographic references for specific pests can be gathered and preliminary pest lists by host or commodity can be generated.

It is important that the data obtained are ordered and systematized appropriately, to facilitate their analysis. The support of a librarian can be very useful in this regard.

7.2. ATTENDANCE AT CONFERENCES, SEMINARS, WORKSHOPS, CONGRESSES, ETC.

The participation of NPPO staff in this type of activity is not only aimed at gathering all available phytosanitary information in this area, but also provides a valuable opportunity to get closer to the scientific sector, to know the lines of work in development, identify potential collaborators and create a link with them, strengthen links with researchers who are already part of the network and position the NPPO within the scientific field, by participating as exhibitors or panelists.

7.3. INCORPORATION OF INFORMATION GENERATED BY OTHER PROGRAMMES OR AREAS OF THE NPPO OR ITS FUNCTIONAL STRUCTURE

Other programs or sectors within the NPPO or its functional structure, such as phytosanitary certification, plant quarantine, border points control, certification and quarantine laboratory, generate valuable information, which should be routinely incorporated into the surveillance system, with the established periodicity, according to the available information management tools.

7.4. FORMATION OF A COLLABORATORS NETWORK

The formation of a network of collaborators within the framework of the general surveillance system should be thought of as a long-term and sustainable over time work.

While it may sometimes be necessary to identify collaborators on different topics with some urgency, whenever possible, it is advisable to organize the network in a structured way, to identify as many potential collaborators as possible, provide them with all the information they need, achieve necessary support and deal from the beginning with the difficulties that collaborators can express. Some of these difficulties may be related to:

- lack of information about the objectives of the official plant pest surveillance system and the differences with the objectives of surveillance systems developed in other areas (fear of overlapping actions);
- lack of knowledge about the operation of general surveillance and the implications of their participation;
- the assumption that their participation will require a long time of dedication;
- lack of support from their superiors or the institutions in which they perform functions;
- fear of loss of ownership of the information provided or of the impossibility of its publication.

Section 7

The steps to take into account to establish a network of collaborators, include:

- identification of institutions of reference: the existence of institutions (other national bodies, local governments, research institutes, universities, scientific societies, museums, etc.) linked to plant protection or other areas of interest for plant pest surveillance should be examined;
- formal contact with the authorities of each agency: it is important to raise the awareness of the authorities, to obtain their support for the system, their contribution in identifying potential collaborators within the organization and the encouragement of their participation;
- establishment of formal links: it is desirable to establish collaboration and information exchange agreements as formal links between the NPPO and the agencies, which support and encourage participation;
- identification of experts within each body that can be part of the network;
- organization of dissemination and awareness-raising events: to transmit the importance of their collaboration and the possible modes of participation;
- invitation and data collection: of the collaborators interested in joining the network; in order to facilitate this task, it is useful to have a data collection form (Appendix 1 presents the possible contents of this form);
- incorporation of the information gathered in the database: it is important to create a database of collaborators, allowing easy access and selection of data, when it is necessary to identify specialists in specific issues;
- formal notification: the delivery of an official note formalizes the collaborator's incorporation into the network and serves as a record of this work history (see model note in appendix 2).

It should be remembered that it is a cooperative network of voluntary participation, so the relational capital obtained must be valued and taken care of. In order for the effort to identify, sensitize and incorporate collaborators to be productive, it must be accompanied by a permanent work to strengthen the links, so as to keep the network active. In this sense, it is advisable:

- take special care in the management of the bases (for example, requesting consent for the publication of the data of the collaborators);
- hold personal meetings routinely to strengthen links and communication;

- care for relationships (avoid asking for the same information twice or not properly formulating the questions);
- give feedback on the information provided by the collaborators (consolidated reports, processed data, maps, etc.);
- evaluate the implementation of awards or incentives;
- verify that responsible professionals have respectful treatment, capacity for interpersonal relationships and negotiation and training in phytosanitary issues;
- once any information provided by a collaborator has been made official, consider its communication in an agreed form;
- respect the rights of authorship and ownership always and especially if it is a first report or first date.

The incorporation of contact personnel in the management of the network can represent a significant improvement in the participation and quality of the information provided by the collaborators, so it should be considered whenever possible.

7.5. CONSULTATIONS ORIENTED TO THE COMPILATION OF CROP OR COMMODITY PEST LISTS OR TO THE DETERMINATION OF PEST STATUS IN AN AREA

Members of the network are periodically consulted on the phytosanitary status of particular crops or commodities (pest lists per crop or commodity) or on the situation of specific pests, in order to gather the information available at the national level.

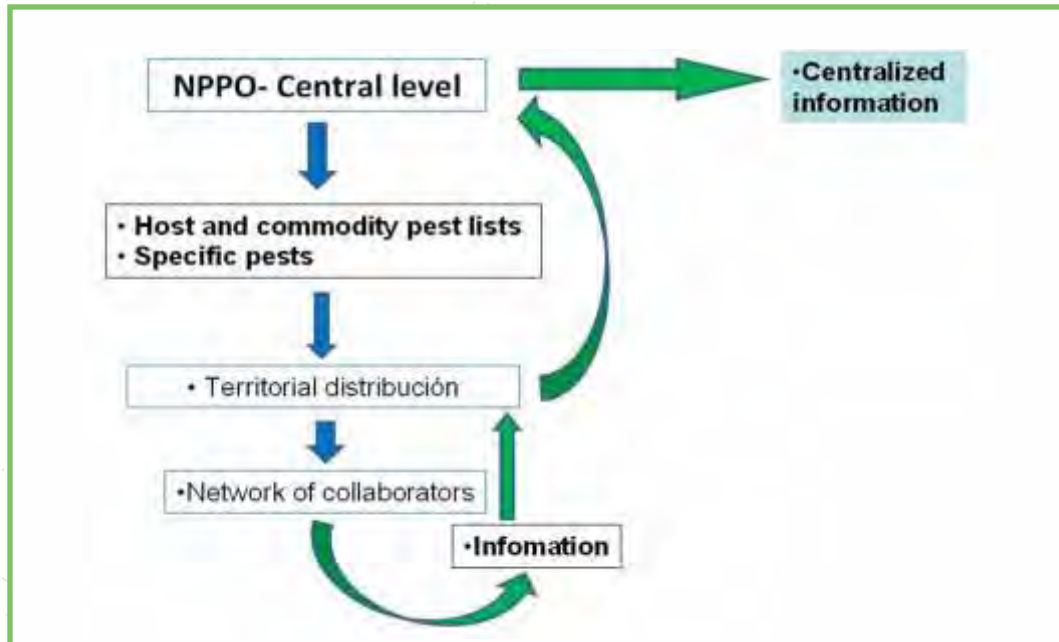
These consultations should be based on the information collected so far by any means, so that the collaborator consulted can validate and complete it, based on the experience developed in the framework of their own activities. The intention is not for the collaborators to carry out an exhaustive bibliographical search, since this task will have been previously developed by the NPPO, but to incorporate his own knowledge, in the field of his specialty and in the area covered by his work. It is of great relevance to transmit this concept, since the dimension of its participation, determines the time that the collaborator must dedicate to make its contributions and provide all the data of support. The consultation should, therefore, be accompanied by the lists of pests prepared by the NPPO from the information available up to that moment. Appendix 3 presents a possible structuring of these pest lists (considering the pest term as defined by FAO).

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It is important that consultations are carried out using standardized formats (worksheets by crop- appendices 4, 5 and 6- or pest - appendix 7), which are known to the collaborator, thus facilitating their understanding and intervention. On the other hand, the worksheets limit the type of information provided, to that which is of interest to the NPPO.

The consultation can be done personally or using different channels: telephone, e-mail, using a computer system to support general surveillance, etc. It should be sought in each case, the channel that best fits the profile of the contributor. However, the use of computer systems has certain advantages since it helps to centralize, organize, analyze, availability and safeguard the collected information and also facilitates the work of preparing the consultation for the NPPO. When using any other means, it is convenient the intervention of local staff (contact personnel), who will generally have a closer link to the sources and will be able to identify new collaborators, if the network is not yet consolidated.

Figure 4- Collaborators consultation circuit.



It is important to set deadlines for the consultation, in accordance with the urgency of the need for information, and to do the necessary follow-up and accompaniment during the process.

The use of geomatics tools can help define the scope of these activities depending on the availability of sources in a given territory, analyse the information received, etc.

7.6. ORGANIZATION OF WORKSHOPS WITH COLLABORATORS

The organization of these group activities with experts to evaluate the status of specific pests, hosts or commodities, allows to deepen the analysis of the information collected so far, and provides the opportunity of having a direct contact with collaborators, to reaffirm their understanding of the official plant pest surveillance and verify the quality of the information provided by them.

During these activities, it is important for the NPPO to set out the information collected and analyzed up to that point, and to propose an orderly work on that basis.

This exchange can be useful to know in more detail the distribution of the different pests in the national territory, when the participants have influence in different productive zones.

If it is not possible to develop these type of activities in person, videoconferencing tools can be an option.

The use of standardized worksheets can facilitate the work and the presentation of the results and conclusions. In appendix 8, an example of a worksheet is shown.

7.7. ATTENTION TO COMMUNICATION OF SPECIFIC PESTS OR SUSPICIOUS SITUATIONS

Communications received may respond to the compliance of different legislative obligations or to the observation of unusual or new phytosanitary situations, whether they are reported by third parties or detected by NPPO staff or by authorized entities during their fieldwork.

In any case, it is important to have a standard format form for receiving reports (Appendix 9).

According to the relevance of the pest or situation communicated, direct contact with the person who reports to request greater precision in the data provided and the taking of samples for identification or verification in an official laboratory, may be required.

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It is important that personnel who extract samples are based on standardized sampling and collection procedures and that, if necessary, they have direct contact with the laboratory, to ensure the quality of the samples sent and their arriving at destination in suitable conditions for analysis.

It may also be required in the case of a first detection, that the individual who performs it, provides the official laboratory with a sample (examples, isolations) with its proper description and references, allowing its specialists to review the identity of the pest or develop appropriate keys.

The availability of a free mail service for sending samples for consultation by third parties, within the framework of general surveillance, and the development of applications that allow information to be sent quickly through commonly used equipment (smartphones or tablets), can encourage the participation and reporting of suspicious phytosanitary situations.

7.8. PARTICIPATION IN EDITING COMMITTEES

Beyond the dissemination of current legislation and the communication plans to raise awareness among the various sectors, whenever possible, it is recommended that NPPO staff be part of the evaluation or editor committees of congresses, scientific publications, etc., in order to verify the compliance of the legislative obligations of report regarding the occurrence of new or specific pests.

In the event of breaching of these obligations, it is important to notify both the person responsible and the authorities of the body in which he or she performs, if applicable, informing about the validity of the legislation violated.

7.9. INCORPORATION OF INFORMATION COORDINATED WITH COLLABORATORS

According to the link established with different collaborators or working groups, mainly from the scientific and academic field, the sending of certain information as they progress in the implementation of their own monitoring and research activities, to the NPPO, can be coordinated. Depending on the needs of the NPPO, it may be agreed to send information on specific pests or crops.

Section 8

Validation of information and determination of a pest status in an area

From the general surveillance, a great volume of data of different quality and precision is obtained. All sources should be taken into account as the system seeks to access all available information. However, it is essential that each record be analysed carefully and validated before its formalization.

ISPM 8- Determination of pest status in an area, identifies elements that allow to evaluate the reliability of sources and pest records, based on the characterization of the collector and the identifier, technical information (conservation and identification), origin (monitoring, casual observation, etc.), location and date of recording and publication.

In addition, in the case of collaborators belonging to the plant pest surveillance network, the evaluation of their participation over time and the identification of different profiles according to their background, experience and category of the institution to which they belong (if applicable) can help to define the reliability of their contributions.

When the record comes from a report and it is considered necessary and possible, the NPPO will verify this data, through the analysis of a sample in the laboratory.

On the other hand, the validity of the records must be verified. They may be considered invalid or no longer valid in the following officially declared cases; changes in taxonomy, misidentification, erroneous record or changes in national borders.

Pest status in an area can be described as present, absent or transient.

Determining pest status in an area requires integrating all available information, considering historical background, and incorporating expert judgment about the current distribution of the pest.

Special attention should be paid to consistency of information. In particular, careful judgment is required when contradictory information exists.

Interconsulting with specific stakeholders, scientific panels, etc., to compare data, can be very useful.

It is possible to conclude that a pest is absent even if there are valid and reliable pest records suggesting the contrary, when the pest was eradicated or when it was transient or established in the past, but general surveillance indicates that it is no longer present (the causes of its disappearance, may include climate or other natural limitation to pest perpetuation or changes in hosts cultivated, in cultivars used or in agricultural practices).

Section 9

Supervision

9.1. INTERNAL SUPERVISIONS

General surveillance activities delivered by the NPPO or authorized entities should be periodically reviewed on the basis of the indicators defined in the management plans, through internal supervision or auditing, following the established line of command.

The mechanisms used should be structured and designed to verify the conformity of the developed actions with the established procedures, their degree of compliance and the uniformity between regions or subregions, as appropriate. They can be carried out in person or as a data analysis at a distance, based on the information received in the framework of general surveillance, from the level to be audited.

It is important to consider that a good performance in the general surveillance activities of each region of the country is achieved through the permanent accompaniment of its personnel by the central level and the agreed programming of actions. The supervision instance should be done on the establishment of clear goals, with the aim of identifying the points of the system to improve, but does not imply an improvement by itself.

Some parameters to consider, can be:

Organizational aspect:

- existence of an internal work structure in the defined region, with a consolidated general surveillance team, with roles and deadlines established by activity and personnel committed to their work;
- consistency of the regional information management system, with the national system, with a clear flow chart and communication channels;
- organization of internal activities of permanent training and updating;
- training in general surveillance of NPPO personnel at different operational levels;
- degree of collaboration of other functional areas achieved;
- if appropriate for the region, inclusion of general surveillance activities in the budget;
- degree of sensitivity of the NPPO diagnostic unit.

Conformation and strengthening of the network of collaborators:

- existence of a survey of organisms of interest in the region covered;
- percentage of organisms of interest contacted;

- participation of the corresponding authorities, according to their hierarchy, in the formal contact of the organisms;;
- percentage of collaborators in the network, of the total number of collaborators identified;
- participation or organization of communication and training activities linked to general surveillance;
- monitoring by staff in the region, the performance of network collaborators, to identify profiles;
- evaluation by staff in the region, of critical points of the general surveillance system in its area of influence;
- efforts made to overcome the perceived difficulties in obtaining information from the collaborators.

Activities for gathering information:

- sending samples for diagnosis as a consult on the observation of new phytosanitary situations by field staff of any area of the NPPO or authorized entities in the evaluated zone.

When consultations with collaborators are carried out with the intervention of the personnel of the regions:

- consultations made, on the total number of consultations requested from the higher level;
- number of collaborators consulted, on the total available for each topic covered;
- percentage of responses obtained on the total number of consultations performed;
- appropriate local registration of the information and delivery to the higher level (within the same region or at the central level, as appropriate), within the established deadlines;

When the consultations are carried out in a centralized way, through a computer system as a support to general surveillance:

- follow-up of the progress of the replies received and accompaniment of the collaborators of the region to achieve their participation.

In addition to the supervision of the activities carried out by the various operational levels of the NPPO and authorized entities, it is essential that the surveillance responsible periodically reviews the compliance of the general surveillance system with the national strategic aims and the degree of deviation from general planning.

Section 9

9.2. EXTERNAL AUDITING

In order to verify the degree of internalization, acceptance, positioning and external image of the general surveillance system, and to identify possible improvements in procedures to increase the cooperation of collaborators and stakeholders at the national level, the NPPO can promote the formation of a review group that involves them, to carry out an objective assessment, in accordance with the functions of the NPPO.

On the other hand, international trading partners can carry out external audits to verify the operation of the system and evaluate its reliability.



Section 10

Bibliography and additional resources

Bibliography

- Banco Interamericano de Desarrollo (BID)- Sector de Integración y Comercio (INT) BID. 2015. Medidas Sanitarias y Fitosanitarias en la Organización Mundial del Comercio. (Fase I) Edición 2.
- Comité de Sanidad Vegetal del Cono Sur. 2010. Estándar regional en protección fitosanitaria sección I - Organización y funcionamiento 1.5 Organización y funcionamiento de los grupos técnicos y funciones de los puntos de contacto.
- Committee on Sanitary and Phytosanitary Measures. 2000. Technical Assistance Typology. Note by the Secretariat. G/SPS/GEN/206.
- Department for Environment, Food and Rural Affairs. 2005. Plant Health Strategy for England. www.defra.gov.uk. © Crown copyright 2005.
- Hammond et al., 2016. Can general surveillance detect high priority pests in the Western Australian grains industry? *Crop Prot.*, 79 (2016), pp. 8–14. Available at: https://www.researchgate.net/publication/283018506_Can_general_surveillance_detect_high_priority_pests_in_the_Western_Australian_Grains_Industry (last accessed on 14 December 2016).
- IPPC. 2015. Establishing a National Plant Protection Organization- A guide to understand the principal requirements for establishing an organization to protect national plant resources from pests.
- IPPC. 2015. Plant pest surveillance- A guide to understand the principal requirements of surveillance programmes for national plant protection organizations.
- Kalaris, T., Fieselmann, D., Magarey, R., Colunga-Garcia, M., Roda, A., Hardie, D, Cogger, N, Hammond, N, Martin, P.A.T. & Whittle, P. 2014. The role of surveillance methods and technologies in plant biosecurity. In G. Gordh and S. McKirdy, eds. *The handbook of plant biosecurity*. Springer, pp. 309–337. Available at <http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1173&context=zoonoticspub> (last accessed on 13 December 2016).
- McMaugh, T. 2005. Guidelines for surveillance for plant pests in Asia and the Pacific. ACIAR Monograph No. 119. Bruce, ACT. 192 pp. Available at <http://aciarc.gov.au/files/node/2311/MN119%20Part%201.pdf> (last accessed 13 December 2016).

Section 10

- Servicio Nacional de Sanidad Agraria (SENASA) - Peru, 2006. Manual de Procedimientos para la verificación de Notificaciones de Ocurrencia de Plagas. Available at: http://www.senasa.gob.pe/senasa/wp-content/uploads/2014/12/Manual_Procedimiento_Verificacion_Notificaciones_Ocurrencia_Plagas.pdf. (last accessed 2 November 2016).
- Servicio Nacional de Sanidad Agraria (SENASA), Perú – Sistema de Notificación de Ocurrencia de Plagas. Available at: <http://www.senasa.gob.pe/senasa/notificacion-de-plagas/> (last accessed 2 November 2016)
- STDF. 2015. Funding Opportunities with the Standards and Trade Development Facility (STDF) Guidance Note for Applicants.
- USDA. 2007. Pest prioritization.
- Wrighta C., et. al. 2016. Can grain growers and agronomists identify common leaf diseases and biosecurity threats in grain crops? An Australian example. Crop Protection. Volume 89, November 2016, Pages 78–88. Available at: <http://www.sciencedirect.com/science/article/pii/S0261219416301612> (last accessed 14 December 2016).

Internet resources

- CIPF: www.ippc.int
- COSAVE: www.cosave.org
- ONPF Argentina: <http://www.senasa.gov.ar/>
- ONPF Bolivia: <http://www.senasag.gov.bo/>
- ONPF Brasil: <http://www.agricultura.gov.br/>
- ONPF Chile: <http://www.sag.cl/>
- ONPF Paraguay: <http://www.senave.gov.py/>
- ONPF Perú: <http://www.senasa.gob.pe/>
- ONPF Uruguay: <http://www.chasque.apc.org/dgsa/>
- STDF: <http://www.standardsfacility.org/es>

Other links of interest

<http://biointel.org/>

<http://www.catalogueoflife.org>

<http://www.catalogueoflife.org/col/info/databases>

<http://www.pestalert.org/espanol/main.cfm>

<https://pestlens.info/>

<https://www.bgci.org/resources/article/0562/>

https://www.eppo.int/PUBLICATIONS/reporting/reporting_service.htm

ISPMs related to Plant Pest Surveillance

- ISPM 1. 2006. Phytosanitary principles for the protection of plants and the application of phytosanitary measures in international trade. Rome, IPPC, FAO.
- ISPM 2. 2007. Framework for pest risk analysis. Rome, IPPC, FAO.
- ISPM 3. 1995. Code of conduct for the import and release of exotic biological control agents. Rome, IPPC, FAO.
- ISPM 5. 2015. Glossary of phytosanitary terms. Rome, IPPC, FAO.
- ISPM 6. 1997. Guidelines for surveillance. Rome, IPPC, FAO.
- ISPM 7. 2011. Phytosanitary certification system. Rome, IPPC, FAO.
- ISPM 8. 1998. Determination of pest status in an area. Rome, IPPC, FAO.
- ISPM 10. 1999. Requirements for the establishment of pest free places of production and pest free production sites. Rome, IPPC, FAO.
- ISPM 11. 2013. Pest risk analysis for quarantine pests. Rome, IPPC, FAO.
- ISPM 17. 2002. Pest reporting. Rome, IPPC, FAO.
- ISPM 19. 2003. Guidelines on lists of regulated pests. Rome, IPPC, FAO.
- ISPM 21. 2004. Pest risk analysis for regulated non-quarantine pests. Rome, IPPC, FAO.
- ISPM 22. 2005. Requirements for the establishment of areas of low pest prevalence. Rome, IPPC, FAO.
- ISPM 26. 2015. Establishment of pest free areas for fruit flies (Tephritidae). Rome, IPPC, FAO.
- ISPM 29. 2007. Recognition of pest free areas and areas of low pest prevalence. Rome, IPPC, FAO.
- ISPM 31. 2009. Methodologies for sampling of consignments. Rome, IPPC, FAO.
- ISPM 32. 2009. Categorization of commodities according to their pest risk. Rome, IPPC, FAO.

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Appendices

- Appendix 1 - Form to gather collaborators data
- Appendix 2 - Model of official note for incorporation of collaborators to the network
- Appendix 3 - List of pests (pests / diseases / weeds) by crop
- Appendix 4 - Consultation worksheet- entomology
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- Appendix 6 - Consultation worksheet- malherbology
- Appendix 7 - Consultation worksheet- specific pests
- Appendix 8 - Worksheet for workshops with collaborators
- Appendix 9 - Pest reports form

Appendix 1 - Form to gather collaborators data

At least the following data of each collaborator to be incorporated should be released:

Name:	
Degree:	
Specialty:	
Diagnostic methodologies collaborator can use:	
Reference organization:	
Area of influence of the collaborator:	
Pest type/s:	
Crop Groups:	
Crops:	
Notes:	
CONTACT INFORMATION:	
Email:	
Phone:	
Address:	

Appendix 2 - Model of official note for incorporation of collaborators to the network

NOTE No.	PLACE AND DATE, / YEAR
DEGREE, NAME AND LAST NAME ORGANIZATION / INSTITUTION TO WHICH COLLABORATOR BELONGS POSTAL ADDRESS	

Dear Sir/Madam:

I am pleased to address you in order to inform you that you have been formally incorporated into the Network of collaborators of the National Plant Pest Surveillance System.

This system, carried out by the (ORGANIZATIONAL LEVEL - eg: Surveillance Department) of the (NPPO), has as its general objective to provide updated and reliable information on the phytosanitary situation of the main crops, both agricultural and forestry, in the national territory. This information is crucial for effective and timely decision-making with regard to phytosanitary measures.

In order to achieve this objective, activities aimed at surveillance of those pests and biological controllers that are strategic for our country, due to their incidence in trade or production (OR ANY OTHER SITUATION RELEVANT TO THE COUNTRY) are implemented. Not only monitoring programmes are established, but at the same time, the collection of existing information in the field of national plant health is organized through the organization of a cooperative information exchange network.

This network, a fundamental part of the Surveillance System, has been growing steadily, both in number and in efficiency. Today it brings together about (NUMBER) collaborators, both from the public and private sectors, who constantly generate essential information about the phytosanitary condition of our main crops.

We thank you for your collaboration in this network, because of the work you normally perform in (ORGANIZATION / INSTITUTION TO WHICH COLLABORATOR BELONGS) in crops (CROPS OR CROP GROUPS ON WHICH COLLABORATOR CAN PROVIDE INFORMATION). We believe that your contribution as a reference will be very important for us and, along with that of other distinguished colleagues, will continue to produce a very valuable synergy in terms of knowledge of the phytosanitary condition of our country.

While remaining at your disposal to clarify any concerns that may arise regarding your participation, I send my kind regards.

[Redacted signature]

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Appendix 3 - List of pests (pests / diseases / weeds) by crop

List of pests cited for

COMMON NAME OF THE CROP (Scientific name of the crop) in COUNTRY

Last revision: Month and year

- 1) 1) Preliminary evaluation of the bibliography, according to its origin, date, source. (Eg Pest with recent national scientific background)

<p>a. Taxonomic group</p> <p>Taxonomic subgroup a1</p>	<p>4. Pest</p> <p>Bibliography 1. Bibliography 2. Bibliography 3. ... Bibliography n.</p> <p>b. Taxonomic group</p> <p>Taxonomic subgroup b1</p>	<p>Taxonomic subgroup b2</p>
<p>1. Pest</p> <p>Bibliography 1. Bibliography 2. Bibliography 3. ... Bibliography n.</p>	<p>5. Pest</p> <p>Bibliography 1. Bibliography 2. Bibliography 3. ... Bibliography n.</p>	<p>7. Pest</p> <p>Bibliography 1. Bibliography 2. Bibliography 3. ... Bibliography n.</p>
<p>2. Pest</p> <p>Bibliography 1. Bibliography 2. Bibliography 3. ... Bibliography n.</p>	<p>6. Pest</p> <p>Bibliography 1. Bibliography 2. Bibliography 3. ... Bibliography n.</p>	<p>8. Pest</p> <p>Bibliography 1. Bibliography 2. Bibliography 3. ... Bibliography n.</p>
<p>Taxonomic subgroup a2</p> <p>3. Pest</p> <p>Bibliography 1. Bibliography 2. Bibliography 3. ... Bibliography n.</p>		<p>9. Pest</p> <p>Bibliography 1. Bibliography 2. Bibliography 3. ... Bibliography n.</p>

- 2) 2) Preliminary evaluation of the bibliography, according to its origin, date, source. (Eg, pests with not recent national scientific background).

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Appendix 4 - Consultation worksheet- entomology

List of diseases cited for COMMON NAME OF THE CROP (Scientific name of the crop) in COUNTRY
Last revision: Month and year

Collaborator consulted:
Contact e-mail:
Informed period (*):

ORDER No.	PEST	STATUS (1)	Territorial division (eg Provinces) (2)	Territorial subdivision (eg Departments) (3)	ABUNDANCE (4)	LEVEL OF DAMAGE (5)	Possibility of presence in the fruit/ seedling / seed, etc. (6)	OBSERVATIONS (7)	SUPPORT BIBLIOGRAPHY (8)
1	Disease 1								
2	Disease 2								
3	Disease 3								
n	Disease n								

(*): Indicate to which crop season/s the information you are providing refers

REFERENCES:

(1) P: PRESENT- A: ABSENT(2) Indicate the provinces / regions / departments, etc., in which you have detected the presence of the pest, according to the following code: NOTE: ESTABLISH A CODE ACCORDING TO THE TERRITORIAL DIVISION.

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- (3) Indicate the SUBDIVISION, eg Departments within the provinces, in which, according to your knowledge, the pest has been found.
- (4) H: HIGH, M: MEDIUM, L: LOW
- (5) H: HIGH, M: MEDIUM, L: LOW
- (6) Indicate whether the pest may accompany the designated organ, during transport in trade.
- (7) Add any relevant data referring to the pest.
- (8) Add bibliographic references other than those already mentioned in the attached word, if any. Develop each of the references in the "Bibliography" box, assign each one an order number and indicate it in the corresponding row/s in the "Support bibliography" column.

NOTES:

1- For pests with unknown species, indicate in "observations" if you know any species, other than those indicated above in this form, that is present in the country in this crop. 2- For the pests mentioned under common name, indicate in "observations" if you know any species that corresponds to that category, other than those indicated above in this form, that is present in the country in this crop. 3- In the empty cells at the end of the table, please add other pests not included in this list, which, to your knowledge, affect this crop in the country.

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Appendix 5 - Consultation worksheet- phytopathology

List of diseases cited for COMMON NAME OF THE CROP (Scientific name of the crop) in COUNTRY

Last revision: Month and year

Collaborator consulted:

Contact e-mail:

Informed period (*):

ORDER No.	DISEASE	STATUS (1)	Territorial division (eg Provinces) (2)	Territorial subdivision (eg Departments) (3)	PREVALENCE (4)	INCIDENCE (5)	SEVERITY (6)	Possibility of presence in the fruit/ seedling / seed, etc. (7)	OBSERVATIONS (8)	SUPPORT BIBLIOGRAPHY (9)
1	Disease 1									
2	Disease 2									
3	Disease 3									
n	Disease n									

(*): Indicate to which crop season/s the information you are providing refers.

REFERENCES:

(1) P: PRESENT- A: ABSENT

(2) Indicate the provinces / regions / departments, etc., in which you have detected the presence of the disease, according to the following code: NOTE: ESTABLISH A CODE ACCORDING TO THE TERRITORIAL DIVISION.

(3) Indicate the SUBDIVISION, eg Departments within the province s, in which, according to your knowledge, the disease has been found.

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- (4) H: HIGH, M: MEDIUM, L: LOW
- (5) H: HIGH, M: MEDIUM, L: LOW
- (6) H: HIGH, M: MEDIUM, L: LOW

(7) Indicate whether the pest may accompany the designated organ, during transport in trade.

(8) Add any relevant data referring to the disease.

(9) Add bibliographic references other than those already mentioned in the attached word, if any. Develop each of the references in the "Bibliography" box, assign each one an order number and indicate it in the corresponding row/s in the "Support bibliography" column.

NOTES:

1- For diseases with unknown species, indicate in "observations" if you know any species, other than those indicated above in this form, that is present in the country in this crop. 2- For the diseases mentioned under common name, indicate in "observations" if you know any species that corresponds to that category, other than those indicated above in this form, that is present in the country in this crop.3- In the empty cells at the end of the table, please add other diseases not included in this list, which, to your knowledge, affect this crop in the country.

BIBLIOGRAPHY	

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Appendix 6 - Consultation worksheet - malherbology

List of weeds cited for COMMON NAME OF THE CROP (Scientific name of the crop) in COUNTRY

Last revision: Month and year

Collaborator consulted:
Contact e-mail:
Informed period (*):

ORDER No.	WEED	STATUS (1)	Territorial division (eg Provinces) (2)	Territorial subdivision (eg Departments) (3)	ABUNDANCE (4)	LEVEL OF DAMAGE (5)	OBSERVATIONS (6)	SUPPORT BIBLIOGRAPHY (7)
1	Weed 1							
2	Weed 2							
3	Weed 3							
n	Weed n							

(*) : Indicate to which crop season/s the information you are providing refers..

REFERENCES:

(1) P: PRESENT- A: ABSENT(2) Indicate the provinces / regions / departments, etc., in which you have detected the presence of the weed, according to the following code: NOTE: ESTABLISH A CODE ACCORDING TO THE TERRITORIAL DIVISION.(3) Indicate the SUBDIVISION, eg Departments within the provinces, in which, according to your knowledge, the weed has been found.(4) H: HIGH, M: MEDIUM, L: LOW(5) H: HIGH, M: MEDIUM, L: LOW

Appendix 7 - Consultation worksheet- specific pests

NATIONAL PLANT PEST SURVEILLANCE SYSTEM INFORMATION UPDATE SURVEY

Species: NAME OF THE PEST ON WHICH UNDER CONSULTATION (Order: Family)
(Datasheet is attached)

1. Collaborator's data:

NAME AND LAST NAME: _____

REFERENCE ORGANIZATION: _____

PHONE/ EMAIL: _____

AREA OF EXPERTISE:

- Research
 - o taxonomic identification
 - o other fields of entomology/phytopathology, etc.
 - o other fields of agronomy
- Extension
- Agricultural production
- Professional and technical advice service
 - o in plant protection
 - o in other areas of agronomy
- Other

1. Have you recently worked on plant health issues related to any of the host crops of NAME OF THE PEST? (If yes, please complete the box below)

Crop	Area	Approximate period

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3. Have you detected the presence of **NAME OF THE PEST** in our country?
YES - NO (Cross out what does not apply)

In an affirmative case:

- in what zone / s did you detect it?
- GPS Point (Latitude and Longitude where it was detected):
- can you mention the host specie/s?
- in which year/s?
- at any particular time of the year? Which one?
- who identified the species? By what procedure?

4. Are you aware of the existence of **PEST NAME** in your area or in others by reference of other people?

YES - NO (Cross out what does not apply)

In an affirmative case:

- can you indicate who is the referent?
- do you know who identified the pest?
- in what zone / s was it detected?
- can you mention the host specie/s?
- in which year/s?
- at any particular time of the year? Which one?

5. If you know the existence of a bibliography mentioning the presence of **NAME OF THE PEST** in any area of **NAME OF THE COUNTRY**, please cite it below:

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6. In the case the NAME OF THE NPPO organizes a survey of the presence of this pest, could you provide cooperation? If so, please indicate in which of the following items:

- Taxonomic identification
- Various laboratory tasks
- Identification of monitoring sites
- Installation of traps
- Extraction and shipment of samples
- Bibliographic cosemination
- Information dissemination
- Training
- Other items (please, indicate which ones):

7. Do you suggest us consulting someone else? Please, indicate the complete name of the person and, if possible, some other useful contact data que.

Thank you very much for replying to this survey. If in the future you have any information or indication of the existence of NAME OF THE PEST in any area of our country, please contact us by one of the different means available:

NPPO CONTACT INFORMATION

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Attached pest datasheet may include the following items (as appropriate):

Preferred scientific name

Other scientific names

Common names

Taxonomy

Plant hosts

Parts and stages of the plant affected

Life cycle

Morphology

Damage

Symptoms and signs

Predisposing conditions

Global geographic distribution

Pest records in the country

Photos

Bibliography



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Appendix 8 - Worksheet for workshops with collaborators

List of pests and biological controllers associated to COMMON NAME OF THE HOST/COMMODITY (SCIENTIFIC NAME OF THE HOST/COMMODITY) in COUNTRY

PEST	TAXONOMIC POSITION	CLASSIFICATION ACCORDING TO BIBLIOGRAPHIC REVIEW (eg Pest with recent / not recent national / international bibliographic references)	CONCLUSIONS AREA 1	CONCLUSIONS AREA 2	CONCLUSIONS AREA n	NATIONAL CONCLUSIONS	Observations
PESTS							
Pest 1							
Pest 2							
Pest 3							
Pest n							
DISEASES							
Disease 1							
Disease 2							
Disease 3							
Disease n							
WEEDS							
Weed 1							
Weed 2							
Weed 3							
Weed n							
BIOLOGICAL CONTROLLERS							
Biological controller 1							
Biological controller 2							
Biological controller 3							
Biological controller n							

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Appendix 9 - Pest reports form

Items to be included in the pest reporting form (the range of pests to be reported will depend on the regulations in force in each country):

- Data of who communicates:
 - name;
 - professional activity (researcher, technician, adviser, etc.);
 - institution/organization/agency;
 - mailing address;
 - e-mail;
 - phone.

- Data on the reported pest:
 - scientific name, including, if applicable, subspecific terms (strain, biotype, etc.);
 - taxonomic group;
 - description of the pest.

- Detection information:
 - origin of the sample (eg unknown, sample deposited in collection, sample received in laboratory, sample collected personally, etc.);
 - scientific name of the host;
 - detection location (including geographical coordinates if available);
 - date of onset of the phytosanitary problem;
 - description of the problem in the host;
 - level of incidence and presence of the pest;
 - sample collection date;
 - observations (eg crop condition - field or protected);
 - technological level.

- Information about the diagnosis:
 - date of diagnosis;
 - diagnostic protocol/method;
 - bibliographic information (taxonomic keys, descriptions, protocols used, etc.).

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- Possible date and medium of publication.
- Graphic record (photos of the pests and the structures used for their identification, as well as damages, symptoms, etc.).
- Sample of specimens / isolates: the person who communicates may be requested to provide a sample to the official laboratory or to indicate the place of deposit of the simple.

GUIDE FOR THE IMPLEMENTATION OF GENERAL PLANT PEST SURVEILLANCE SYSTEM

