



CAREC Policy Dialogue on Regional Pest Surveillance Program¹ 25-27 March 2019

Draft Concept Note

(This draft concept note will be developed through regional policy dialogues and consultations with the CAREC National Working Groups for Sanitary and Phytosanitary Measures, relevant government agencies and development partners in the region.)

1. Why pest surveillance is needed

CAREC countries, negotiating trade in agricultural commodities that may provide pathways for moving pests into new areas, must be able to access information on the biology, distribution, host range and economic status of plant pests. While plant health has become a trade policy issue, knowledge of the health status of a country's agricultural and forestry industries has other important applications. These include the development of robust quarantine policies and the management of endemic pests. A country that cannot provide an adequate description of the plant health (pest) status of its agricultural industries is at a disadvantage when negotiating access to foreign markets. Prospective importers will assess risk based on their knowledge of the pests in the country seeking to export plants or plant products, the risk of introducing exotic pests of concern to the imported commodity and the feasibility of phytosanitary measures to be taken on importation to reduce risks to an acceptable level.

Extensive pest specimen-based records are the key for CAREC countries to negotiate with other countries on a fair-trading system as they provide the most reliable evidence of the plant health status of a country. These records are the foundation for developing robust policies for domestic and international quarantine and for developing pest-management strategies at the farm level. Pest lists and collections have taken on particular significance since the establishment of the World Trade Organization (WTO) in 1995, which was heralded as opening a new era in trade liberalisation. The WTO's Agreement on the Application of Sanitary and Phytosanitary (SPS) Measures recognises the need for WTO members to protect themselves from the risks posed by the entry, establishment and spread of plant pests and diseases, but also seeks to minimise any negative effects of SPS measures on trade. Countries wanting to expand exports of agricultural commodities under the rules of the SPS Agreement can accelerate the development of specimen-based pest lists through structured pest surveillance programs, focusing on the pests that might be carried on the commodity to be exported².

To support trade in agricultural commodities, WTO members need access to expertise in the detection and diagnosis of plant pests and diseases. Plant quarantine inspection officers, trained in sampling and detection techniques, are needed at import entry and export exit points. In addition to pest detection and interception activities at the borders, pest surveillance is also required for the major crops grown in the country for establishing and maintaining pest-free areas to convince trade partners that the commodities from those areas are free of certain

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² <https://ageconsearch.umn.edu/bitstream/114089/2/119.pdf>

regulated pests and should be exempted from quarantine measures. A regulated pest list may include pests of quarantine significance and may affect imports or assist with defining pest risk analysis (PRA) needs for justify regulating a particular pest and to require precautionary phytosanitary measures from trade partners.

National pest surveillance programs are mostly shaped by policy issues related to international trade (trade policy, market access, free trade agreements, International Plant Protection Convention [IPPC], WTO), followed by pest management objectives, and then for the purpose of protecting the country's agriculture through quarantine³. In most CAREC countries, resources for pest surveillance and pest diagnostics are under-developed and thus there is a great need to develop a regional pest surveillance program where CAREC countries can support one another in sharing resources and providing assistance where best practices are being done.

2. Challenges faced with implementing the International Standard for Phytosanitary Measures No. 6 (ISPM) 6 standard on Surveillance

The definition of pest surveillance is *“An official process which collects and records data on pest occurrence or absence by survey, monitoring or other procedures.”*⁴

ISPM 6 under the IPPC describes the components of survey and monitoring systems for the purpose of pest detection and the supply of information for use in pest risk analyses, the establishment of pest free areas and, where appropriate, the preparation of pest lists. Pest surveillance provides National Plant Protection Organizations (NPPOs) with a technical basis for many phytosanitary measures; for example, phytosanitary import requirements, pest free areas, pest reporting and eradication, and pest status in an area. National surveillance systems relate to both general surveillance and specific surveillance and surveillance protocols describe the methodology of surveillance.

Challenges for operating a national surveillance system include phytosanitary legislation and policies, survey funding, surveillance management, human and financial resources, communication and information management. The specific challenges faced by NPPOs in the CAREC region are covered in the Appendices 1 to 3 to this concept note.

3. How regional cooperation can overcome these challenges

3.1 National Legislation

A Plant Health regional legislation workshop would be a useful forum for developing a toolkit, and sharing lessons learned, for ensuring harmonization of each country' primary Plant Health legislation with the key requirements of the WTO and the IPPC. In addition, national secondary laws/regulations could be based on a common ISPM framework (e.g. ISPM 6 – Guidelines for surveillance), where individual countries can then further adapt secondary legislation according to their country's specific legal requirements.

³ <http://www.fao.org/docrep/015/i2731e/i2731e00.pdf>

⁴ http://www.standardsfacility.org/sites/default/files/Pg_350_Manual_Plant_pest_surveillance_0.pdf

3.2 Funding and Sustainability

The National Working Groups (NWGs) and the Regional Working Group (RWG) could provide a platform for sharing surveillance funding issues and regional case studies on how pest surveillance funding has been supported from government funds and industry funding, particularly for those agriculture sectors where there is large regional trade. Sustainability of regional pest surveillance activities could be enhanced with RWG coordination of loans, or grants, from international lending institutions, and the technical assistance programs provided by the FAO, the IPPC and the WTO's Standards and Trade Development Facility.

3.3 Management

Each country's proposed NPPO Surveillance Manager would be responsible for providing the NWG Plant Health representative with summary pest surveillance data and current capacity gaps. The RWG could delegate an entity to compile summarized pest surveillance data from each CAREC country and communicate this information to the national contact persons in each country.

3.4 Human Resources

The RWG could appoint a Plant Health coordinator/unit that could arrange for the compilation of regional training resources, for example a CAREC Manual on Pest Surveillance Methodology.

3.5 Information Management

Although general pest surveillance information sources can be obtained from international sources by each country, national pest records can be shared among CAREC countries and this would be very useful for each country's Pest Risk Analysis work. The RWG could promote the development of a regionally-compatible data system for collecting, storing and reporting pest surveillance information. Other information resources that can be regionally compiled are horizon scanning results and importing country's border pest interception data.

3.6 Communication

Best practices with NPPO internal and external communication could be shared among CAREC countries for strengthening their national pest surveillance programs. For national surveillance programs that have been conducted on similar pests in CAREC countries, the lessons learned need to be compiled for regional distribution. Important outputs would be the outcomes of national surveillance programs and how CAREC pest surveillance programs can be improved based on lessons learned.

3.7 Prioritization

Regional pest surveillance prioritization must identify the main reasons for initiating specific pest surveys, such as: gathering information about the importance and damage of a specific pest, maintaining trade opportunities, on-farm pest management, and new pest detections.

Coordination of a regional list of key plant crops is a key prioritization for the CAREC region, along with data on how many crops are officially surveyed for pests on a regional basis.

A common PRA management plan needs to be developed for the region so ensuring that there is consistency in pest information sources and the ISPM 11 PRA methodology.

National pest laboratory diagnostic capacity needs to be summarized so that diagnostic gaps can be identified, and resources identified for those diagnostic tests that certain countries are unable to perform.

Quarantine pest outbreak responses need to be regionally coordinated to ensure pest spread is reduced and correct control methodology implemented.

3.7 Planning a Surveillance Program

Cost-benefit analysis work for justifying the costs of a pest surveillance program ought to be shared among CAREC countries, especially pest surveys in those major crops that have a commonality for most countries. A cost-benefit template could be designed for individual NPPOs to fill in.

Regional sharing on the use of pest detection tools in the major crops would focus national surveillance resource requirements such as the use of target-specific traps and lures.

3.8 Supporting Operations

Pest Risk Analysis Management

Pests need to be prioritized based on likelihood of causing serious impacts to crops and this work needs to be done by a dedicated PRA team comprising of staff from various NPPO disciplines, including economics. A national PRA Management Team needs clearly defined roles, information sources, analysis tools, interactions with the diagnostic laboratory and their pest interception database and be able to implementation of commodity risk categorization. An outline of a suggested PRA management plan is included in Appendix 4.

There are three major challenges for PRA development in the CAREC region: (a) the data required to make accurate analyses of the risks throughout the region is often lacking, (b) border and field pest surveillance programs are underdeveloped and (c) the PRA procedures are considered too complex, discouraging take-up among some countries. Regional collaboration for supporting national PRA teams could involve data collection and information sharing, and a consensus on how pests should be prioritized.

Diagnostic Laboratories

The NPPO should provide appropriate diagnostic services to support general surveillance and specific survey activities. Regional cooperation can support plant health diagnostic laboratory capacity through:

- Sharing of scientific expertise in all disciplines relevant to pest identification, including access to specialists for pest verification.

- Identifying best practices for record keeping and for processing and storing voucher specimens.
- Harmonizing laboratory standard operating procedures.
- Strengthening formal arrangements with laboratories in the CAREC region, such as sharing of pest images to assist in pest diagnosis.
- Verification of diagnostic results with other laboratories.
- Preparation for diagnostic laboratory accreditation.
- Harmonizing training in pest diagnostics.

4. Framework for a Regional Pest Surveillance System

Regional Working Group (RWG) Appoint a Regional Plant Health Focal Point (country NPPO - rotated) <i>Duties include liaising with country focal points, and reporting plant health activity progress to the RWG</i>		
National Working Group (NWG) Appoint a National Plant Health Focal Point for Regional Coordination (person/team) <i>Duties include liaising with NPPO departments and reporting to the regional Plant Health Focal Point</i>		
Objective	Framework Principles	How to achieve goals
National Legislation Responsive legislation that enables and supports surveillance and diagnostic activities.	National legislation provides officers with appropriate powers to carry out actions as part of national surveillance programs.	Countries will work together to harmonise plant health legislation, regulations, policies and approaches where this is appropriate and practicable.
Funding and Sustainability Investment plans that target priority activities and reflect partnerships between NPPO, industry, landholders and the community.	Risk creators and beneficiaries contribute to national activities in proportion to the risks they create and / or the benefits that they gain. All investors in the national activities participate in the decision-making process.	Investment plans for surveillance and diagnosis of regionally significant pests and diseases will form part of national strategies for each agricultural sector. Investment in technology (e.g. citizen science, remote diagnostics) will create opportunities for stakeholder engagement and the consolidation of diagnostic capacity.
Management Management arrangements that provide accountability for the implementation and oversight of the national surveillance and diagnostic system and assure trading partners of the reliability of CAREC countries pest and disease status.	Governance/Management structures for surveillance and diagnostics in each sector include all stakeholders from industry including beneficiaries and risk creators.	Sectoral committees or government-industry partnerships will establish stakeholder consultative processes to ensure appropriate consultation with industry and other relevant groups where these processes do not currently exist.

<p>Human Resources Enough baseline capacity, including technical capacity and expertise, for surveillance and diagnostic activities.</p>	<p>Regional processes support the development and maintenance of baseline capacity for surveillance and diagnostics programs.</p>	<p>Have processes in place to engage with stakeholders to ensure adequate numbers of appropriately trained staff or access to those personnel in the event of an emergency.</p>
<p>Information Management Sharing of data and intelligence</p>	<p>Harmonized Information Systems support the collection, analysis and sharing of data and intelligence.</p>	<p>Intelligence gathered through tracing, sharing and consolidation of surveillance data, science and research findings is available to inform decision making at a regional level, in particular decisions regarding emergency responses to new or emerging surveillance risks.</p>
<p>Communication Communication and engagement activities that engage a range of stakeholders and increase the participation of public and private stakeholders in pest and disease investigation and reporting</p>	<p>Stakeholder engagement plans for operational surveillance and diagnostics promote the collection of reports of pest or disease occurrence.</p>	<p>Decision making structures for surveillance and diagnostics will include, relevant industry stakeholders (including beneficiaries and risk creators) and environmental and community groups as appropriate.</p> <p>Communication tools and products will be shared to minimise set-up and training costs.</p>
<p>Supporting Operations Efficient development and use of diagnostic capability and infrastructure</p>	<p>Diagnostic capability is targeted to regional priority pests and can be quickly expanded to respond to new and emerging pest issues</p>	<p>Identify existing laboratory capability including expertise such as reference collections and taxonomy skills that could be shared across the CAREC countries.</p>

5. Action Plan

The Plant Health representatives of the CAREC National Working Groups need to identify and agree on key regional priorities, and then develop an Action Plan for who is responsible for managing each priority task and when each task is planned to be completed. Examples of regional pest surveillance priorities could include:

Short Term (1-2 years):

- Sharing of technical resources such as supplier information (e.g. pest traps, data loggers), general identification guides (pest identification fact sheets, diagnostic protocols, taxonomic identification keys, Lucid Keys, etc).
- Regional pest survey manuals that can be commodity-based, taxon-based, or pathway-based.
- International phytosanitary standards should be used whenever possible (e.g. report pest status according to ISPM 8, use EPPO codes for pest/plant names, etc.). Agreement to use EPPO Codes and the EPPO Global Database for regional standardization. EPPO codes are computer codes developed for plants, pests (including pathogens) and constitute a harmonized coding system which aims to facilitate the management of plant and pest names in computerized databases, as well as data exchange between IT systems⁵.

Medium Term (1-3 years):

- A structured, transparent assessment process to identify regional pest threats, including forecasting pest distributions, emergence and invasion patterns.
- Multi-pest surveys that concentrate on multiple, high priority pests for efficiency and economy of survey

Long Term (1-5 years):

- Training materials resources such as regional guidelines for plant pest surveillance, and advocacy materials (posters, brochures and leaflets of quarantine pests).
- Regional data sharing platforms, such as a website, email list, social media account, or applications for mobile devices, should be further explored.
- Open databases (regional pest portal) on climate, crops and pest distributions (e.g. crop and yield forecasting systems) are useful for regional plant pest modelling and PRA modelling.

⁵ EPPO Codes. https://www.eppo.int/RESOURCES/eppo_databases/eppo_codes

Appendix 1. Organizational Arrangements

1.1 National Legislation

Appropriate national phytosanitary legislation is a basic requirement for supporting activities of a pest surveillance program among other necessary provisions for compliance with the IPPC. National legislation should have clear provisions related to powers, authority and responsibilities regarding pest surveillance.

Legislation should ensure that it provides authority and responsibility to the NPPO and authorized entities for all pest surveillance activities (e.g. the right to enter premises, inspect, take samples) in support of the IPPC Article IV.2(b), which requires NPPOs to be responsible for the surveillance of plants to report the occurrence, outbreak and spread of pests. In addition, staff involved in pest surveillance programs need to be legally protected in performing their duties (e.g. against accidents, trespass charges, physical attacks, etc.)⁶.

1.2 Funding and Sustainability

The cost of running an effective national plant pest surveillance programs can be very high and funding from government budgets alone may not be sufficient. Collaboration between the government and stakeholders may be needed to ensure that adequate funding is available. Stakeholders such as the food industry and producers through, for example producer associations or commodity boards, can contribute to crop pest surveillance efforts where the benefits to them can be clearly demonstrated.

Potential sources of funding could be:

- Government-funded national plant pest surveillance program.
- Industry funding - strong and well-established industries (e.g. wheat, cotton) may fund plant pest surveillance operations completely if they stand to benefit from such investments through market access or improved food quality.
- Joint funding between government and industry - contributions may be financial or in-kind (e.g. the production and dissemination of guidance materials to industry).
- Technical cooperation to facilitate trade - an importing country, or potential importing country, that has a strong interest in importing a commodity from a country where it is evident that risks cannot be adequately managed without additional measures may choose to fund the cost of specific surveys in order to help mitigate risks associated with the imported commodity.
- Loans or grants - a government may obtain a loan or grant from a donor country, or from national or international lending institutions in cases where very clear surveillance targets can be met and can be seen to result in significant benefits to the country.
- Technical assistance programs - the FAO, the IPPC and the Standards and Trade Development Facility of the World Trade Organization (WTO), for example, have mechanisms to provide technical assistance in support of the enhancement of phytosanitary capacity that may include national plant pest surveillance.

⁶ A Plant Health legislative toolkit can be developed for providing a detailed analysis of existing primary legislation. Such a toolkit would provide a Table of Concordance between provisions in national phytosanitary legislation, the World Trade Organisation's (WTO) SPS Agreement and the IPPC with additional indications of the relevant International Standards for Phytosanitary Measures (ISPMs).

1.3 Management

An appropriate management structure, with appropriately trained and qualified staff, needs to be established for a pest surveillance program:

- NPPO Surveillance Manager – responsibilities include: ensuring that field staff use the same operating procedures, management systems are in place for the efficient and effective storage, retrieval and distribution of information, performance review of use of surveillance data in international trade and phytosanitary improvement is critical, monitoring and evaluation.
- National Surveillance Committee (includes key stakeholders but is managed by the NPPO) - responsibilities include: defining the program, selecting and approving partners, public awareness, training, preparation of training materials and protocols, implementation, information management and communication.
- Administrative and logistic support
- Technical support (diagnostic scientists, field staff/inspectors)
- Industry and third-party providers (industry groups, universities, research institutions)

1.4 Human and financial resources

- Training - personnel management, data collection, information on pest biology and ecology, and surveillance methodology.
- Safety at work provisions - protective equipment, first aid equipment, etc.
- Transport for field work with adequate budget for fuel and vehicle maintenance

1.5 Information Management

General surveillance approach and application may include: NPPOs, other national and local government agencies, research institutions, universities, scientific societies (including amateur specialists), producers, consultants, museums, the general public, scientific and trade journals, unpublished data and contemporary observations. In addition, the NPPO may obtain information from international sources, such as FAO, the IPPC, Regional Plant Protection Organizations (RPPOs), etc.

ISPM 6 (Guidelines for surveillance) details a set of minimum records that need to be kept. A form, whether paper or computer based, needs to be designed for collecting raw pest data from the field and a consistent layout is important.

1.6 Communication

- NPPO internal communication - field officers, NPPO technical managers and supporting administrative staff.
- NPPO external communication - NPPOs should be prepared to communicate with: surveillance committees, industry groups, general public, universities, research institutions, farmers and producers, plant nurseries, press and media.
- Reporting - information gathered through general surveillance will be used most often for reporting to concerned trading partners, RPPOs and the IPPC (Article IV).

Appendix 2. Planning and Prioritization

Planning and implementation of a pest surveillance program must occur through the establishment of priorities. The cost of surveillance will be prohibitive if planning has not been carried out.

2.1 Prioritization

Failure to properly assign NPPO resources to the highest risk plant pests may result in: delays in new market access, unnecessary or unjustifiable import requirements, significant and devastating agricultural crop loss. PRA can be an important component of the decision process for target pest or commodity- focused surveillance programs.

- Early Detection - early detection and rapid pest eradication are often the goals of a regulatory surveillance program. Available field tools, such as species-specific pheromone-baited traps, can significantly improve field detection efficiency. However, visual scouting remains a relatively low-cost and frequently used method in many cases.

Responses to pest outbreaks or incursions - a strong network of trained individuals who are prepared to respond is an essential component of an emergency response program.

2.2 Planning a Surveillance Program

- Cost–benefit analysis – studies need to be done on the importance of the agricultural commodity at risk to the local economy, potential export economic importance of an agricultural commodity, risk of pest introduction, estimated economic damage and impact of a pest to an agricultural commodity, available field, diagnostic and administrative human resources to implement a surveillance program, available target-specific traps, lures and other tools for pest detection.
- Stakeholder relations and support - the surveillance program needs to clearly identify its purpose (current or future benefit) and its beneficiaries. Pest-specific surveys with clear protocols and commercially available traps will be easier to deploy uniformly and monitor regularly.
- Surveillance implementation - if surveillance programs on a particular pest have been conducted in other regions, what was the outcome? How can an improved surveillance program be implemented, based on lessons learned from other surveillance programs focused on this pest?
- Gathering of information - horizon scanning, data mining, formal requests to NPPOs of other countries.
- Survey design – identifying whether a detection survey, monitoring survey, or a delimiting survey is needed.
- Pest-specific surveillance - description of survey methodology and quality management based on an understanding of the biology of the pest, purpose of the survey and including an explanation of: sampling procedures (e.g. attractant trapping, whole plant sampling, visual inspection, sample collection and laboratory analysis), diagnostic procedures, and reporting procedures.
- Commodity-specific surveillance - specific pest lists of commodities can be useful for providing general data in the absence of general surveillance. Commodity-specific surveillance may also be useful to provide information to requesting countries to facilitate their PRAs.

Appendix 3. Surveillance Operations

Pest surveillance impacts on three phytosanitary areas, namely early pest detection for preventing pest spread, Pest Free Area declarations and Pest Risk Analysis studies for phytosanitary trade facilitation support. Early exotic pest detection results in emergency action for pest eradication or containment measures. Pest surveillance for detecting, and/or monitoring pest occurrence is important for establishing and maintaining a Pest Free Area. Pest surveillance also provides data for pest listing and pest categorisation required for the Pest Risk Analysis to provide scientific justification for phytosanitary measures. Thus, two plant health activities that are linked to pest surveillance are operating a Pest Risk Analysis program for identifying regulated quarantine pests and having a diagnostic laboratory capable of identifying the pests collected in a survey. Other pest surveillance operations include:

- Methodologies - surveillance methods may be based on recognized guidelines and international protocols or negotiated equivalents. These include standard operating procedures, sampling, trapping, sample screening, data collection and reporting, quality assurance.
- General surveillance - general surveillance also serves the purpose of potentially proving the absence of a pest for trade purposes. Participatory engagement of industry, citizens, growers and academia is a critical component of general surveillance. General surveillance systems must comply with ISPM 8 (Determination of pest status in an area) validation process.
- Specific surveys – specific surveys provide the means for NPPOs to actively gather pest distribution information through structured programs (detection, delimiting, and monitoring surveys).
- Field Communication and Feedback - pre-survey briefing, survey (in-field) communications, post-survey briefing, and methods of communication.
- Submission to diagnostic laboratory – sample packaging and sample preparation.
- Data Collection and Submission - NPPOs should develop and implement minimum data standards for use across all surveillance programs. NPPOs should also recognize the importance of capturing and recording negative data in their data collection systems. Negative data are used by NPPOs to support a country's pest status, Pest Free Areas and to support trade and market access.

Appendix 4. Pest Risk Analysis Management Plan

Crucial steps needed to be taken for Pest Risk Analysis work are:

- Recognition of the PRA trigger
- Establishing a Project Team
- Planning Sessions
- Gathering Information
- Conducting the PRA
- Developing a Pest Management Plan

1. Recognition of the PRA trigger

Two approaches are commonly adopted in conducting PRAs: a) species PRA, which focuses on a particular pest species as a risk agent taking into account all possible routes, independent of any particular route of entry, and b) pathway PRA, which is based on a specific route of entry. A quick evaluation is needed to determine whether the perceived threat could be of significance to the country or not.

2. Establishing a PRA Team

The role of the project team is to: draft objectives for the PRA; identify stakeholders, subject matter experts, information sources, and information exchange formats (e.g., knowledge synthesis workshops); set plan timeframes; establish roles and responsibilities, if necessary; and discuss the need for a risk communication plan or strategy. The task is, essentially, to develop an action plan that can be achieved through a planning session, the first stage of a PRA.

3. Planning Sessions

Conduct planning sessions and formulate an action plan that includes draft objectives, type of communications required, format of information and knowledge-gathering phases, and timelines.

4. Gathering Information

Identifying and collecting all the information and information sources relevant to the objectives of the PRA sets the stage for the actual analysis. These sources include previous PRAs, historical pest data, peer-reviewed articles, in-house reports, pest fact sheets, etc.

5. Conducting the PRA

Risk Assessment

Step 1. Scope out hazard - identify the area of concern.

Step 2. Define the risk tolerance threshold by determining the threshold based on whether the risk is imminent and unacceptable, and whether control actions might be required before a full PRA were completed.

Step 3. Conduct a preassessment by making a quick estimate of the pest's likelihood of occurrence and of the consequences of its occurrence, to determine whether a full PRA is warranted.

Step 4. Conduct a comprehensive pest risk assessment (probability of entry, establishment potential, spread potential, socioeconomic impacts, environmental impacts).

Step 5. Summarize the risk assessment and next steps - determine the overall risk and acceptability.

Risk Response and Conclusion

Step 1. Identify risk response options, both traditional and emerging response options.

Step 2. Evaluate risk response options by considering cost effectiveness, efficacy, feasibility and practicality, adverse consequences to other factors including human health, and expected costs.

Step 3. Select risk response options. No response is also an option if cost prohibitive or not efficacious. Identify and promote research needs accordingly.

Step 4. Provide conclusions and recommendations. Summarize the overall risk by considering both risk assessment and risk response and make recommendations which will guide policy and development of a pest management plan and research plan.

6. *Developing a Pest Management Plan*

For pests that are considered high-risk quarantine pests, the PRA team needs to determine what phytosanitary measures are needed for reducing entry risks and controlling potential outbreaks. These would include phytosanitary treatments (e.g. appropriate fumigation) and correct pesticide management options.