

Attachment 1: Final Report from the CPM Focus Group on Global Phytosanitary Research to the Commission on Phytosanitary Measures

CONTENTS

1. Background and introduction	2
2. CPM Focus Group on Global Phytosanitary Research Coordination	2
2.1 Mandate	2
2.2 Membership	2
2.3 Approach to scoping study	3
2.4 Stocktake.....	3
2.5 Stocktake analysis.....	3
3. Outline of IPPC need for collaborative global phytosanitary research	6
3.1 Draft policy	6
3.2 NPPO survey	7
4. Proposed structure for international phytosanitary research coordination	7
4.1 Model 1: In-kind funded network.....	7
4.2 Model 2: Fully funded network	8
4.3 Model 3: Hybrid in-kind and funded network	8
4.4 Model 4: Umbrella-type organization network.....	9
5. Gaps the IPPC could consider filling	10
6. Conclusion.....	10
7. Recommendations	11
APPENDIX A: Focus group terms of reference	12
APPENDIX B: Research networks summary spreadsheet	14
APPENDIX C: Research network questionnaire.....	21
APPENDIX D: NPPO survey questionnaire	22
APPENDIX E: NPPO survey analysis.....	25

1. Background and introduction

The [Strategic Framework for the International Plant Protection Convention \(IPPC\) 2020–2030](#) has been developed to guide national plant protection organizations (NPPOs) and the Commission on Phytosanitary Measures (CPM) in navigating the evolving global landscape of plant health to deliver on the IPPC mission to protect global plant resources and facilitate safe trade.

The operating environment for plant health is changing and is being shaped by major global trends, including expanding and diversifying trade, evolving roles and structures of NPPOs, rapid scientific and technological advancements, and the growing impacts of climate change.

Scientific advancements through phytosanitary research offer significant potential to address the challenges of a changing operating environment while minimizing potentially negative impacts on global plant-health systems.

The IPPC currently facilitates information sharing on phytosanitary issues through hosting of webinars on key global challenges, side sessions at CPM meetings, and discussions at Strategic Planning Group meetings and annual IPPC Regional Workshops. However, these are generally not specifically targeted at phytosanitary research needs and priorities, nor at fostering collaborations for research purposes.

Stronger collaboration on research across nations, institutions and disciplines will enable higher quality science, efficiencies of resource use, better outcomes and wider adoption of results. These benefits will play a vital role in safeguarding plant health and supporting international trade, thereby achieving IPPC goals.

The enhancement of global coordination in phytosanitary research to support regulatory plant-health activities is one of the eight key development-agenda items identified in the IPPC Strategic Framework 2020–2030.

The IPPC goal for this key development area is to establish, by 2030, a voluntary mechanism for global phytosanitary research coordination, to accelerate development of science to support all regulatory phytosanitary activities.

A dedicated CPM focus group has been tasked to take this initiative forward.

2. CPM Focus Group on Global Phytosanitary Research Coordination

2.1 Mandate

The IPPC Strategic Framework recognizes that international research collaboration across nations, institutions and disciplines leads to higher quality science, efficiencies of resource use, better outcomes and wider adoption of results. However, these benefits of collaboration only occur when there is mutual vision in alignment of research goals and collaboration. The IPPC Strategic Framework also recognizes that the development of a balanced portfolio of research work, ranging from strategic to applied research, is essential in creating synergistic collaboration.

The primary objective of the CPM Focus Group on Global Phytosanitary Research Coordination (FG-GPRC) was therefore to formulate advice for consideration by the CPM on a research coordination policy and potential coordination mechanisms and structures the CPM may adopt. This advice is to be accompanied by a draft implementation and monitoring plan, which is intended to include clearly defined commencement dates, key milestones, a feasible timeline, a framework for monitoring and evaluation, and an adequate estimation of the necessary budget and staffing requirements, which may be used for resource mobilization purposes.

2.2 Membership

The FG-GPRC is composed of nine members with experience in phytosanitary research coordination, knowledge of the IPPC and its activities, or both. The FG-GPRC includes a CPM Bureau representative

within its membership. Membership covers all IPPC regions with the exception of Latin America and the Caribbean.

2.3 Approach to scoping study

The key task of the FG-GPRC in developing its advice to the CPM was to undertake a scoping study. This study was informed through two main activities: (1) a stocktake and analysis of existing international research-coordination structures and mechanisms; and (2) a survey of NPPOs and other national organizations to investigate needs and requirements.

2.4 Stocktake

To fulfil the objectives outlined in their terms of reference (Appendix A), the FG-GPRC examined the potential value of existing research networks, with a preference for those engaged in plant health, though not exclusively limited to this domain. A registry of relevant research networks was compiled; however, it should be noted that the geographical distribution of the networks identified may reflect a bias towards the regions and countries represented by the focus group members. Consequently, certain areas – such as Latin America and the Caribbean – are under-represented in the registry. The complete list of the 101 research networks reviewed is included in this report as Appendix B.

2.5 Stocktake analysis

The identified research networks were evaluated by the members of the FG-GPRC against four predefined criteria. Each network was assigned a score from 1 to 3 for each criterion, based on publicly available information, direct communication with network representatives, and the experience of the FG-GPRC members.

The criteria used were as follows:

- **Scope of the network:** The FG-GPRC prioritized networks with a broad range of interests within the domain of plant health, rather than those more narrowly focused on a specific disease, organism group, or commodity. A score of 1 was assigned to networks with a single field of expertise, a score of 2 indicated coverage of several related fields, and a score of 3 reflected a comprehensive range of expertise across multiple areas of plant health.
- **Geographical coverage:** The geographical extent of the network's activities was considered, with particular attention to its presence across different countries, which may correspond to varying climatic and ecological zones. Because of the difficulty in directly assessing climatic diversity, the number of countries in which a network operates was used as a proxy indicator. A score of 1 was assigned to networks operating solely at a (sub-)national level, a score of 2 to those active in up to five countries, and a score of 3 to networks with operations in more than five countries.
- **Phytosanitary relevance:** This criterion focused on the degree to which a network engages with plant health and related scientific areas. Networks with an emphasis on plant health were ranked higher. A score of 1 was assigned to networks with no specific focus on plants, a score of 2 to those focused on general plant sciences, and a score of 3 to networks dedicated specifically to plant health.
- **Policy relevance:** This criterion assessed the extent to which a network interacts with policymakers and contributes to policy development. Networks demonstrating little or no engagement with policymakers received a score of 1. A score of 2 indicated occasional or indirect engagement, while a score of 3 was awarded to networks where policymakers are actively involved, including in shaping the research agenda.

The overall score for each research network was determined by summing the individual scores assigned across the four evaluation criteria. Research networks that achieved a total score of 9 or higher were selected for further assessment. Representatives of the selected networks were subsequently invited to provide detailed information regarding their scope of activities, governance arrangements, and organizational and financial structures through a written questionnaire (Appendix C) and interview.

An overview of each of the five networks interviewed is provided below.

STAR-IDAZ

STAR-IDAZ is an acronym for Global **S**trategic **A**nalyses for the Coordination of **R**esearch on **M**ajor **I**nfectious **D**iseases of **A**nimals and **Z**oonoses. This research network was selected for interview as, during the 15 years since it was established, it has evolved into a large global player in its field, which is adjacent to plant health. It has a total of 36 partner organizations and activity in 55 associated countries. The total research budget of this network is estimated at USD 2.5 billion over a five-year period, which includes in-kind contributions by the members themselves.

The network is focused on advancing the scientific understanding of animal and zoonotic diseases. Each of its members has committed to a USD 10 million investment per five years, which is viewed as an in-kind contribution to the network. Most members are linked to a national or regional government, but membership is also open to private organizations and companies.

The governance structure of STAR-IDAZ consists of an Executive Committee, comprising representatives of all member countries, which oversees the strategic direction of the network and global priority setting. Regional priority setting is done in four regional networks (Africa, the Americas, Asia and Australasia, and Europe), while a Scientific Committee ensures the quality of the work produced.

New priorities are brought forward by the members themselves, and ties exist with global organizations such as the World Health Organization and the World Organisation for Animal Health.

In general, there is no centralized funding for new research activities; research is funded by individual members, or a joint reaction to a public call is made. The organization itself is mostly supported by in-kind contributions, although the approximately five-person secretariat is currently almost completely funded through the European Commission.

Euphresco

The **Euphresco** network is an international consortium that funds and coordinates research in the phytosanitary field, with the goal of enhancing collaboration and maintaining a strong, sustainable network of research stakeholders. Established in 2006 as an initiative of the European Union-funded European Research Area Networks scheme, Euphresco's overarching goal is to enhance coordination and collaboration in plant-health research and to sustain a strong, long-term network of research stakeholders. Euphresco successfully unites national research programme owners and managers through strengthened cooperation, has developed tools for transnational collaboration, and has jointly funded 47 research projects with a combined budget of nearly EUR 9 million.

The network is hosted by the European and Mediterranean Plant Protection Organization (EPPO). Euphresco's governance board includes a secretariat, network management group and executive committee, and the operating model is described in a written document – the *Modus operandi* – which outlines the roles and responsibilities of members and structures within the network, as well as outlining the approach to coordination. Members include NPPOs but also some research institutes and non-regulatory bodies, including some in the industrial sector. This diversity in membership is considered vital to enhance expertise for collaboration in addressing complex plant-health issues.

Euphresco's flexible, member-driven governance promotes inclusivity and responsiveness, relying on in-kind contributions rather than centralized funding. Its core objectives are to coordinate transnational research programmes, support collaborative projects, provide scientific evidence to inform policy, optimize national research resources, and facilitate dissemination and uptake of results. Today, there are more than 70 member organizations from over 50 countries, although the majority of membership still resides in the EPPO region. Euphresco continues to expand its global reach and is currently exploring models to establish itself as a more formally recognized international network. The network's success lies in its lightweight structure, agility, and ability to bridge research, regulatory and policy communities to address emerging plant-health challenges and strengthen global phytosanitary capacity.

Forestry network (International Forestry Quarantine Research Group)

The International Forestry Quarantine Research Group (IFQRG) supports and addresses quarantine issues for the global community through scientific analysis, discussion and collaborative research on forestry quarantine issues. Membership includes experts from NPPOs, regional plant protection organizations (RPPOs), and the IPPC Secretariat, the majority of which are involved in policymaking and providing input into research needed to support policy setting.

The group's activities cover ISPM 15 (*Regulation of wood packaging material in international trade*) – the initial issue which led to the group's creation – as well as systems approaches for forestry products, alternative treatments to methyl bromide, guidance and research on dielectric heating, molecular tools used in forestry trade, heat treatment for forest products, and research and design of methods to determine lethal doses of specific treatments for pests, plants for planting and seed pathways.

IFQRG has a Science Steering Committee, terms of reference and rules of procedure. Whereas the Science Steering Committee meets about ten times a year to discuss the status of working groups (molecular tools, drywood pests), emerging forest quarantine issues and research solutions, annual agenda development, liaison with IPPC expert working groups and panels, and reporting to the CPM, the whole group meets annually for a five-day working meeting.

The group has a total of about 179 permanent members, originating from more than 20 countries.

IFQRG includes representation from scientific, industrial and phytosanitary organizations from both developed and developing nations from all FAO regions. There is no specific funding to support the group's activities nor the research projects of its members; all participations are provided in-kind.

Policymakers are active members of the Science Steering Committee. They also provide in-kind contribution to projects as well as bringing forward scientific needs and recommendations.

Consultative Group for International Agricultural Research

The Consultative Group for International Agricultural Research (CGIAR) phytosanitary network was established through the creation of its Germplasm Health Units (GHUs), which operate across 11 CGIAR centres. This network built upon the foundation of the CGIAR–FAO Task Force on Safe Germplasm Exchange from the 1980s and was formally realized after the adoption of the Germplasm Health Framework in 1993. The GHUs were initially intended to address crop-specific phytosanitary risks associated with CGIAR's mandate crops, such as rice, wheat and maize, particularly in regions with weak quarantine infrastructure. Regarding its governance, the network ensures compliance with various international treaties, including the IPPC, the International Treaty on Plant Genetic Resources for Food and Agriculture, the Convention on Biological Diversity, and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization. Furthermore, the GHUs collaborate closely with NPPOs and regional bodies, and their phytosanitary agenda is shaped through increasing involvement with policymakers and alignment with broader CGIAR policies co-designed with stakeholders.

The core role of the GHU network is to serve as one of the largest coordinated phytosanitary systems globally, facilitating germplasm movement to over 100 countries annually for agricultural development. To fulfil this function, GHUs integrate multidisciplinary expertise – including plant pathology, entomology, virology, molecular diagnostics and phytosanitary policy – to provide comprehensive risk management across the entire germplasm value chain, from acquisition to international distribution. While initially crop-focused, the network's scope has expanded to cover all major crops and their wild relatives, with objectives to harmonize and share best practices, develop new tools to overcome phytosanitary bottlenecks, and actively tackle major transboundary pest risk.

By embedding phytosanitary protocols in CGIAR's core operations, the network strengthens biosecurity, ensures compliance with quarantine regulations, and supports regional and global systems through knowledge sharing and capacity development.

Commonwealth Scientific and Industrial Research Organisation

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is not a research network but was selected for interview because of its recent experience in engaging, through IPPC bodies, on research into systems approaches. The challenges faced by CSIRO in trying to establish global multilateral collaboration on a critical phytosanitary research issue were seen as a useful insight that the FG-GPRC could consider when developing its advice.

CSIRO is Australia's national science agency and is an Australian Government entity which is established through Commonwealth Government of Australia legislation. It serves to assist Australian industry, community and government by conducting research and facilitating uptake of research outcomes. CSIRO is primarily funded by the Australian Government with additional funding for specific activities through fee-for-service arrangements. Its priorities are set by the CSIRO Board through business strategy and planning processes. Current research areas include: "Energy and minerals", "Food and fibre", "From wonder to discovery", "Nature", "One Health", and "Tech economy". Phytosanitary research is included under One Health.

CSIRO engages with policymakers in developing research projects and supporting their adoption. CSIRO is also an active research partner nationally and internationally and works with other research organizations bilaterally and multilaterally on issues of mutual interest. Most recently, CSIRO has been presenting internationally on systems approaches to foster collaboration in the development and application of this emerging area of risk science.

3. Outline of IPPC need for collaborative global phytosanitary research

Based on these analyses, a draft policy (this section) and proposed structures for international phytosanitary research coordination (section 4) have been developed.

3.1 Draft policy

In improving global phytosanitary research collaboration, the IPPC seeks to protect the world's plants, agricultural products and natural resources from plant pests by supporting a strong scientific evidence base for regulatory phytosanitary activities and improving the visibility and accessibility of phytosanitary research to IPPC contracting parties and other stakeholders.

The benefits of improving global phytosanitary research collaboration include:

- better coordinated and higher quality science that provides greater assurance that a particular phytosanitary measure will manage risk;
- efficiencies of resource use through better alignment of research initiatives across regions and internationally;
- better outcomes for plant health and plant protection, as phytosanitary risks will be better managed; and
- wider adoption of results, maximizing the value from research investment.

To realise these benefits, the IPPC seeks to:

- advance collaboration;
- identify shared priorities for research; and
- accelerate development of scientific evidence to support all regulatory phytosanitary activities.

This will be delivered by facilitating a mutual vision in alignment of research goals and identification of shared priorities, and collaboration across nations, institutions and disciplines.

The model for global research collaboration under the auspices of the IPPC Secretariat is underpinned by the following principles:

- Global and regional phytosanitary research collaboration will cover food security and some aspects of food safety, safe trade and environmental outcomes.

- Global phytosanitary research collaborations are to be inclusive of the phytosanitary needs of all regions.
- Structures and mechanisms used to support phytosanitary research collaboration will be able to be applied across regions and not duplicate existing mechanisms.
- Structures and mechanisms used to support phytosanitary research collaboration will respect intellectual property and commercial-in-confidence arrangements.
- Existing international and regional research fora that support specific technical or scientific disciplines or risk areas will be leveraged, and/or appropriate links established.
- Global research collaboration will cover a balanced portfolio of research work, ranging from strategic research to applied research and basic or fundamental research.
- All countries and regions will be given the opportunity to participate in collaborations.

3.2 NPPO survey

A survey on the coordination needs for global phytosanitary research was conducted among IPPC contracting parties, primarily targeting NPPOs (Appendix D). Launched in October 2025, the survey received 75 responses from various FAO regions. It provided valuable insights into the current landscape, existing challenges, and perceived opportunities for improving international collaboration in phytosanitary research. The results of this survey are summarized in Appendix E.

Overall results reveal widespread concerns regarding the adequacy of funding for phytosanitary research and significant gaps in formal national strategies. While collaborations with national research institutions are generally strong, international coordination among NPPOs and RPPOs presents areas for improvement. Respondents overwhelmingly support a more proactive role for the IPPC in establishing central data repositories, facilitating priority-setting workshops, and fostering collaborative projects. The primary obstacles to translating research into practical regulatory action include insufficient funding, limited technical capacity, and a disconnect between academic research and regulatory needs.

4. Proposed structure for international phytosanitary research coordination

Four types of model structures to support phytosanitary research coordination were explored: (1) in-kind funded network, (2) funded network, (3) hybrid in-kind and funded network, and (4) umbrella-type organisation network.

4.1 Model 1: In-kind funded network

One option to enhance global research collaboration is to establish a new network managed and supported in-kind from interested parties. This has the advantage of not requiring additional resourcing and instead relying on participating organizations to contribute resources, expertise or services to achieve the intent of the network.

Meetings of the network could be organised virtually, thereby minimizing the need for additional costs. The convener could be nominated from the membership and rotations could be considered depending on capacity.

With no additional costs, a secretariat or administrative support function would need to be covered by members or member organizations as needed. This may make it challenging to deliver the objectives of the network in proactively sharing research information and fostering collaborations outside of the meetings.

Meetings could be used by participants to share their research activities and needs, discuss emerging issues and risks, and work together to develop a combined set of priorities.

As there is no additional funding, the network would rely on members promoting research priorities and activities through existing communication mechanisms with their research organizations to try and influence funding.

Success would be dependent on the benefit the organizations would receive from participating in the network. This would require monitoring activities and influence against the network priorities to demonstrate value, which would need to be conducted by the membership. This option is dependent on the capacity of members to contribute and actively drive collaboration.

Example: Forestry network

4.2 Model 2: Fully funded network

In contrast to the fully in-kind model, another option to enhance global research collaboration is to establish a new network managed and supported financially by interested parties in a non-in-kind manner. This would provide a centralized financial resource that would cover all costs related to support for coordination, identification of priorities, project review and approval, as well as administration. Governance would most likely be representative and could be delivered through an elected board of directors or executive committee. Research topics and priorities would also be determined by the membership itself. Such a model could provide long-term stability, equitable participation, and greater capacity to deliver large-scale, strategically aligned research. This contrasts with in-kind or self-funded models, which rely on member contributions and voluntary project participation.

While fully funded networks can achieve stronger coherence and faster implementation, they may also be less flexible and more administratively complex, with greater dependence on a single funding source and stricter reporting requirements. Additionally, during periods of economic uncertainty or periods of financial restraint, securing funding from all participating organizations at levels required to maintain such a network will be significantly challenging. Depending on the funding source, there is also a risk that the research priority areas may not be aligned to the needs of regulatory bodies and NPPOs. In-kind models, by comparison, tend to foster agility, innovation and member ownership but can face challenges related to uneven participation, limited resources and difficulty sustaining long-term commitments. Ultimately, the choice between models depends on the desired balance between stability and flexibility, as well as the scale and scope of the network's objectives.

Example: CGIAR

4.3 Model 3: Hybrid in-kind and funded network

A variation on the models described above is a research network that is partially funded. Such a network typically operates with a hybrid structure where the administrative and operational functions are supported by paid staff, while the actual research itself is carried out independently and without direct financial support from the funder. In this structure, funding is provided to cover operational costs like salaries for the secretariat and administrative overhead, but does not contribute directly to the research activities, which are largely conducted on an in-kind basis by the network members.

Strategic decision-making and research priority setting is still carried out by a central board of member organizations, but the secretariat within such a network plays a central role in ensuring the smooth operation and management of the network, even though the secretariat does not directly engage in research. The primary tasks of the secretariat could include:

- administrative support (coordinating communication between network members; organizing meetings, workshops and events; managing documentation of the network's activities);
- project management (assisting with the administrative set-up and monitoring of collaborative research projects; coordinating project timelines, milestones and deliverables);
- dissemination (developing materials to disclose research output); and
- reporting (reporting to the body hosting the secretariat (a public body) or other relevant entities on the network's progress, impact and financial status).

The annual costs of establishing and maintaining such a hybrid network can vary depending on its size, the complexity of the tasks, and the location. In similar organizations, one or a few people staff the secretariat and are dependent on direct funding. It should be noted that the secretariat does not necessarily have to be housed within the public body. While housing the secretariat within the public

body may be preferred for logistical reasons, such as proximity to funding management or shared resources, a decentralized secretariat model may be considered to provide more flexibility and potentially reduce costs. If a secretariat is located at a research institution or university, it allows the network to engage with specialized administrative expertise.

In comparison with a research network that is fully operated in-kind, this hybrid research network has several advantages, such as the following:

- Sustainability: A network with a paid secretariat is less reliant on the goodwill of a small group of enthusiastic individuals, and thus continuity of the network can be maintained when researchers are leaving their field of work because of, for example, retirement.
- Scalability: As the professional support infrastructure is in place, a network can grow or scale its activities more effectively. It also means that when new members join or new projects are initiated, there's an established team to handle onboarding and project management.
- Clearer accountability: A paid secretariat provides a clear point of accountability for the network's activities.
- Operational efficiency: A fully in-kind network may rely on volunteers, which can lead to inefficiencies or inconsistencies in how tasks are managed. A paid secretariat ensures that the administrative, financial and project-management tasks are handled by professionals. This reduces the burden on researchers, allowing them to focus solely on their research without having to manage logistical or operational tasks.

In summary, a partially funded research network can operate effectively with a dedicated, paid secretariat handling the operational and administrative tasks. The secretariat ensures efficiency, professionalism and accountability, allowing researchers to focus on their work. While the funder does not contribute directly to the research itself, the operational costs are typically covered. A flexible approach to the location of the secretariat also offers advantages, allowing the network to maintain its independence while benefiting from external expertise.

Examples: Euphresco, STAR-IDAZ

4.4 Model 4: Umbrella-type organization network

Regardless of the funding system envisaged, optimizing research coordination and better identifying research gaps to be filled could also be considered through a systemic and inclusive approach that would go beyond the actors identified in the three types of networks mentioned above (i.e. NPPOs, RPPOs, policymakers and research institutions).

Indeed, the institutions responsible for risk assessment are another potentially important source of research questions, which can be listed thanks to the sources of uncertainty in the conclusions of their opinions. It might therefore be relevant to check the adequacy between research projects carried out by, or involving, plant-health research stakeholders and the knowledge gaps identified through risk assessment.

In addition, scientific societies represent communities that are also potential sources of important data: they may involve actors in applied, finalized or regulatory research that is likely to be compatible with the expectations of policymakers. They are breeding grounds for highly committed and passionate scientists who are very aware of, or seeking meaning in, their research, including in the field of public policy dedicated to plant health. They organize regular conferences that can address topics of interest to the plant-health community.

Finally, technical institutes, because of their focus on the field, are also potentially important in identifying the most critical research questions at the public policy level.

Furthermore, an approach could be followed based more on the emergence of an IPPC forum rather than on the establishment of a meta-network. This would bring together around the same table the various networks identified as most relevant at this stage: the top three as presented above, or the four networks with a plant-health-related focus interviewed during the FG-GPRC's mandate (note that the

fifth network interviewed, STAR-IDAZ, has an animal-health focus). The objectives of such a framework would simply be to share the research priorities identified by each of the networks and then discuss their relevance on a global scale. Following this sharing, a comparison with the expectations of NPPOs and RPPOs would make it possible to verify that there were no significant gaps in the research effort.

The simultaneous implementation of these two approaches – opening up to more stakeholders (risk assessors, learned societies, technical institutes) or their outputs and the formal organization of a discussion forum under the auspices of the IPPC Secretariat, involving the networks identified as the most relevant ones – could therefore facilitate the establishment of an “umbrella”-type organization for phytosanitary research, which in principle should not require specific funding other than for the necessary corresponding logistics.

5. Gaps the IPPC could consider filling

The analysis conducted by the FG-GPRC highlights the following gaps in existing research structures and coordination mechanisms:

- limited coordination among existing networks in phytosanitary research;
- inconsistent responses to global phytosanitary needs by existing research networks;
- lack of standardized procedures and effective communication mechanisms to address research needs identified by policymakers;
- no global catalogue of current research needs required to enable attainment of IPPC strategic priorities;
- some countries do not participate or have only limited participation in research networks;
- limited information sharing on ongoing phytosanitary research; and
- insufficient funding to sustain comprehensive global phytosanitary research.

Solution: To address these gaps the following could be considered:

- Compile and maintain a list of research needs defined in pest risk analysis studies.
- Explore mechanisms to better communicate research needs and outcomes in a proactive manner (e.g. social media, communication via RPPOs and NPPOs, annual reports, scientific journals).
- Develop a centralized global dashboard tool to enable compilation of existing phytosanitary research needs.
- Establish processes to engage with existing research networks and scientific societies in priority-setting activities to focus more directly or explicitly on research that would address global phytosanitary needs.
- Support RPPOs and NPPOs not connected to existing networks to have access.
- Ensure coverage of existing networks across commodities, regions and pests.
- Identify the availability of in-kind support to address global phytosanitary priorities.

6. Conclusion

Several research networks have been identified that are involved in phytosanitary research. However, these often do not collaborate. This is partly because most of them focus on only a small portion of the plant-health domain, cover a broad range of topics on a specific commodity, are focused on a field of research adjacent to plant health, or cover a limited geographical area.

The priorities of most of these networks are also not directly targeted at addressing IPPC challenges noremerging phytosanitary risks.

The analysis conducted by the FG-GCPR highlights that there are gaps in existing research structures and coordination mechanisms with respect to supporting the needs of the IPPC community and in delivering the 2020–2030 Strategic Framework development agenda item.

The FG-GPRC proposes that these research networks are brought together with NPPOs and RPPOs under a global framework to facilitate a mutual vision in alignment of research goals and identification of shared priorities, and collaboration across nations, institutions and disciplines. Such a framework for research networks could be shaped under the guidance of the IPPC for global research coordination, or by the RPPOs for a more regionally driven approach, and would require identification criteria for inclusion. This could be part of the mandate for a future focus group or focus groups that may be convened by the CPM.

This approach would contribute to and support the needs of the IPPC community by ensuring a broader global understanding of current phytosanitary research and research needs.

7. Recommendations

- (1) **Consider** the establishment of an IPPC-led framework of research networks to enhance communication between existing research networks and NPPOs and RPPOs, to collaboratively address shared priorities.
- (2) **Consider** amending the FG-GPRC terms of reference to task the FG with:
 - finalizing a policy and research framework;
 - developing an implementation plan that gives effect to this proposed policy and research framework.
- (3) **Consider** addressing the following items in the implementation plan:
 - how the funding model options described in this report could be appropriately integrated into the IPPC-led framework of research networks;
 - opportunities for other IPPC groups (e.g. Implementation and Capacity Development Committee, RPPOs) to support and participate in an IPPC-led research framework as part of their ongoing work programmes;
 - development of a communication and engagement plan to actively facilitate engagement, promote phytosanitary research and foster collaboration;
 - development of criteria to evaluate inclusion of candidate networks in an IPPC-led framework of research networks;
 - identification of resources required to support implementation; and
 - further analysis of how to progress the potential solutions identified by the FG-GPRC as part of the IPPC-led research framework.

The designations employed and the presentation of material in this document do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

APPENDIX A: Focus group terms of reference

TERMS OF REFERENCE CPM FOCUS GROUP ON GLOBAL PHYTOSANITARY RESEARCH COORDINATION

Purpose:

International research collaboration across nations, institutions and disciplines leads to higher quality science, efficiencies of resource use, better outcomes, and wider adoption of results. However, these benefits of collaboration only occur when there is mutual vision in alignment of research goals and collaboration.

The need to develop a balanced portfolio of research work, ranging from strategic to applied research, is essential in creating synergistic collaboration.

The CPM decided to form a Focus Group on Global Phytosanitary Research Coordination ahead of the recommended start of this development agenda item at the earliest in 2025. During the Scope and Plan phase, a study is to be conducted to build an understanding of the coordination mechanisms that already exist, what gaps the IPPC could fill (or whether existing mechanisms are sufficient), and how the mechanism could contribute to and support the needs of the IPPC. The need for developing an implementation plan and the continuation of the DAI would depend on the outcome of the Scope study and be subject to a CPM decision based on this work.

Process:

The IPPC Secretariat will release a call for experts on the IPPC website to allow contracting parties and regional plant protection organizations to nominate their representatives to be part of the focus group. Each region, the RPPOs, and the CPM Bureau, will submit one nomination and all nominations will be presented to the CPM Bureau for their selection and endorsement.

Meetings of the focus group will be convened virtually but may have one in-person meeting, if necessary. Attendance of meetings by focus group members is mandatory. The meetings will be held in English.

Membership:

The CPM Bureau will decide the membership of the focus group. The membership should have collective experience and expertise in a broader, global perspective of global phytosanitary research, as well as multilateral research cooperative and coordination arrangements and policies, as well as knowledge of the IPPC and its activities.

The focus group will be composed of up to eleven members with knowledge of the IPPC's mandate and activities, taking account of geographical representation and gender balance as follows:

1. Up to seven members representing national plant protection organizations in each of the seven FAO regions;
2. Up to three members representing regional plant protection organizations (RPPOs);
3. One representative of the CPM Bureau;
4. Up to three experts representing existing phytosanitary research coordination structures are to be invited.

Functions:

The focus group may propose to add tasks or amend the tasks listed below according to the information they gather during the active period, for approval of the CPM Bureau.

The key tasks of the focus group will be:

1. undertake a scoping study to build an understanding of the needs of the IPPC and existing research coordination structures and mechanisms, to determine what is necessary for the IPPC to advance collaboration and accelerate development of scientific evidence to support all regulatory phytosanitary activities;
2. as part of the scoping study, consult with and explore existing international research coordination structures and mechanisms and map the options for enhancing regional and global coordination;
3. as part of the scoping study, assess the benefits of developing an IPPC policy and structure for international phytosanitary research coordination, especially with regard to determining the role of RPPOs in such coordination;
4. following the scoping study, assess whether existing international research coordination mechanisms are sufficient and identify what gaps still exist to meet the needs of the IPPC;
5. following the scoping study, seek approval from CPM to develop options for CPM consideration on the possible mechanisms for implementing global phytosanitary research coordination;
6. subject to CPM decision, develop a draft implementation and monitoring plan including proposed milestones;
7. provide any further observations or recommendations to the CPM as deemed appropriate.

Expected start date and Duration

The focus group will be established by the Bureau by June 2024 and report to CPM in 2026 for decision on whether to proceed with further work. If CPM decides to proceed with the work, the focus group will remain effective until the CPM approves the implementation plan.

Expected Outputs

1. For CPM, a report of the scoping study to be conducted by the focus group to explore the needs of the IPPC and current international and regional phytosanitary research structures to identify gaps to be filled and structure coordination mechanisms.
2. Upon approval of CPM, a proposal and structure of a coordination mechanism to be established.

Reports to: CPM Bureau and CPM

Funding

The organization that employs an IPPC meeting participant is responsible for funding the travel and daily subsistence allowance for that person to attend. If the employer is unable to allocate sufficient funds, participants are first encouraged to seek assistance from sources other than the IPPC Secretariat. Where such demonstrated efforts to secure assistance have been unsuccessful, requests for assistance (i.e., travel and subsistence costs) from the IPPC Secretariat may be made. However, any support is subject to available funds. The IPPC Secretariat will consider funding assistance for participants following IPPC criteria for funding. Full details on these criteria can be found on the IPP (<https://www.ippc.int/publications/criteria-used-prioritizing-participants-receive-travel-assistance-attend-meetings>).

APPENDIX B: Research networks summary spreadsheet

In the table below, a list is compiled of 107 research networks that were considered for further interviews and investigation. The research networks were assessed for five criteria:

- Scope** of the network – prioritizing networks with a wide range of interests within plant health, rather than those focused on a single disease or commodity. Scores: 0 - Unknown; 1 - Single field of expertise (e.g. single organism group or disease); 2 - Several fields of expertise; 3 -Broad range of expertise.
- Geographical coverage** – considering networks that operate across a significant geographical area, potentially encompassing diverse climatic and ecological conditions. Scores: 0 - Unknown; 1 - National level only; 2 - five countries or fewer involved; 3 - More than five countries involved.
- Phytosanitary relevance** – selecting networks with a strong focus on phytosanitary issues and research. Scores: 0 - Unknown; 1 - No focus on plants; 2 - Plant sciences; 3 - Plant health
- Policy outreach** – prioritizing networks that actively engage with and influence relevant policy decisions. Scores: 0 - Unknown; 1 - No policymakers involved; 2 - Policymakers somewhat involved; 3 - Policymakers contribute actively.

The scores for the four criteria above were summed together to help select the most relevant research networks for this scoping study.

- Funding structure** – indicating the sources of funding for the network's activities. 0 – Unknown; 1 - Grants based; 2 - Pooled funding; 3 - In kind contribution; 4 - Other.

Name	Research topic	Scope ^{a)}	Geographical coverage ^{b)}	Phytosanitary relevance ^{c)}	Policy outreach ^{d)}	Total Score	Funding Structure ^{e)}
ACIAR (Australian Center for International of Agricultural Research)	Broadly focused on agricultural research	3	3	3	2	11	1
Agralife Programme Agency	Sustainable agriculture and food, forests, and associated natural resources	3	1	1	1	6	3
Animal and Plant Quarantine Agency (Gov't – Republic of Korea)	Broad range – phytosanitary, quarantine, pest/disease surveillance, biosecurity, diagnostics, international collaboration	3	3	3	3	12	1,3
ASEANET The ASEAN Network on Taxonomy	Taxonomy	3	3	3	3	12	1
Asia-Pacific Association of Agricultural Research Institutions (APAARI)	Agri-food research and innovation systems towards more sustainable development	3	3	2	3	11	4
Biological Control Working Group (Government - Agriculture and AgriFood Canada also includes members from Canadian Forest Service NRCAN and CABI international)	Biological control projects and common challenges	2	1	2	2	7	3?

Name	Research topic	Scope ^{a)}	Geographical coverage ^{b)}	Phytosanitary relevance ^{c)}	Policy outreach ^{d)}	Total Score	Funding Structure ^{e)}
Biosafety Level 4 Zoonotic Laboratory Network (BSL4Znet)	Zoonotic Disease Surveillance.	3	3	1	2	9	3?
BIOTECH UPLB	Engineering, chemistry and applied microbiology to conduct research, training and extension in biotechnology	3	3	2	0	8	0
Box Tree Moth Technical Advisory Committee	Box tree moth; policy and regulatory approaches; survey design and implementation; outreach, education, and marketing strategies and products to increase awareness	1	1	3	2	7	3
Bugwood	Invasive species, forest health, and natural and agricultural management	2	2	2	1	7	1,4
Bureau of Plant Industry - National Plant Quarantine Services Division (BPI-NPQSD)	Phytosanitary, plant health	3	1	3	2	9	1
CABI	Agriculture	3	3	2	3	11	1
Canadian Animal Health Surveillance Network (CAHSN)	Animal health	3	1	1	2	7	3
Canadian Corn Pest Coalition	Corn pest management stewardship, particularly Bt corn and resistance	1	1	2	1	5	0
Canadian Food Safety Information Network (CFSIN)	Food safety	3	1	3	2	9	3
Canadian Forestry Phytosanitary Working Group	Phytosanitary trade issues related to Canadian wood products	2	1	3	2	8	0
Canadian Grapevine Certification Network	Phytosanitary: Research and surveillance of viruses that infect grapevines	2	1	3	2	8	2
Canadian Plant Health Information System Network (CPHIS)	Plant health: Information sharing for enhanced biosecurity, surveillance and response	3	1	3	2	9	3
Canadian Plant Health Council	Broad scope – all phytosanitary topics	3	1	3	2	9	3
CBSD Programme Agency	Climate, biodiversity, sustainable societies	3	1	1	1	6	3
Central Post Entry Quarantine (CPEQS)	Phytosanitary-related (quarantine and regulated non quarantine pests)	2	1	3	3	9	0
Centre ACER	Innovation, quality and profitability in the Quebec maple syrup industry, all within a modern perspective of sustainable development	1	1	3	1	6	2
CGIAR Plant Health Research Initiative	Plant Health Research Initiative to protect key crops and reduce pests & diseases	3	3	3	2	11	2
Chaire de recherche en phytoprotection serricole MAPAQ – Premier Tech	Greenhouse crop diseases; greenhouse crop pests; integrated pest management and artificial intelligence	3	1	3	1	8	2
Collaborative research with private companies	Phytosanitary-related	2	2	1	1	6	2
Commission de lutte contre le Criquet pèlerin dans la région occidentale (CLCPRO)	Desert locust control.	1	3	3	2	9	1
Community for Emerging Zoonotic Diseases (CEZD)	Zoonotic disease surveillance.	2	1	1	2	6	3

Name	Research topic	Scope ^{a)}	Geographical coverage ^{b)}	Phytosanitary relevance ^{c)}	Policy outreach ^{d)}	Total Score	Funding Structure ^{e)}
Consortium de recherche sur la pomme de terre du Québec (CRPTQ)	Reduce and optimize pesticide use; develop and test effective alternatives to pesticide use; develop strategies to control soilborne diseases in order to improve product quality; develop and apply genetic improvement methods; develop cultivars resistant or tolerant to diseases.	3	1	2	1	7	2
Corn Disease Workers	Corn disease monitoring, management and collaborative research/extension	1	2	3	1	7	0
Corn Rootworm Trap Monitoring Network	Collaborative monitoring for corn rootworm in corn and soybeans	1	2	3	1	7	0
Crop Pest and Management Division (Government)	Fall armyworm and onion armyworm	1	1	3	0	5	1
Crop Pest and Management Division (Government)	Climate-smart pest management (CSPM) in rice	1	1	3	0	5	1
Crop Pest and Management Division (Government)	Participatory technology development (PTD) on the management of fall armyworm with emphasis on the utilization of different biological control agents (BCAs)	1	2	3	0	4	1
Crop Protection Network	Crop protection and pests network of university, extension, ag professionals	3	2	3	1	9	2
Da-Young Lee, POSTECH / Purdue University (Academic – Republic of Korea / United States of America)	Several fields – disease phenotyping, plant epidemiology, functional genomics, disease resistance, sensor technology	2	3	3	3	11	1
EFSA - European Food Safety Authority Panel on Plant Health	Deliver independent and transparent scientific advice to policymakers, through cooperation with our partners, and in an open dialogue with society. Contribute to protecting human life and health, taking account of animal health and welfare, plant health and the environment.	3	3	3	3	12	3
Enabling Agricultural Research and Innovation (EARI) Program	Disease identification and management; scouting using deep learning technologies; Pesticide application using drones; disease forecasting	3	2	2	1	8	1
EUP AH&W	Animal health	3	3	1	3	10	3
EUPHRESCO	Phytosanitary: Research to improve plant health and food security worldwide	3	3	3	3	12	3
European Plant Science Organisation (EPSO)	Plant sciences; provide authoritative source of independent information on plant science funding and advice to policy	3	3	2	3	11	3
Federal-Provincial-Territorial Plant Health Committee	Broad scope – all phytosanitary topics. This is a national government information-sharing committee where phytosanitary research is frequently showcased.	3	1	3	2	9	3
Fresh and Secure Trade Alliance (Australia)	Phytosanitary research	2	1	3	2	8	2
Global African Swine Fever Research Alliance (GARA)	Animal Health: research, control and eradicate African swine fever	1	2	1	2	6	?
Global Foot and Mouth Disease Alliance (GFRA)	Animal health: An international network of organizations working to research, control and eradicate foot-and-mouth disease	1	3	1	2	7	2

Name	Research topic	Scope ^{a)}	Geographical coverage ^{b)}	Phytosanitary relevance ^{c)}	Policy outreach ^{d)}	Total Score	Funding Structure ^{e)}
Great Lakes and Maritimes Pest Monitoring Network	Shared crop pest monitoring and research collaboration	3	2	3	1	9	3
Great Lakes Fruit Workers	Information sharing related to pest management on fruit crops	3	2	1	1	7	?
Great Lakes Vegetable Working Group	Information dissemination	3	2	1	1	7	4
Green ERA-Hub	Agri-food and biotechnology, network of coordination of national research programmes on agri-food and biotechnology	3	3	1	3	10	1
Greenhouse Technology Network	Controlled environment agriculture	1	1	2	1	5	4
ICRAD	Animal health, international coordination of research on infectious animal diseases	3	3	1	3	10	2
Insect Surveillance Community of Practice within the Canadian Plant Health Council	Surveillance/ monitoring efforts for shared pests of importance across Canada	1	1	3	2	7	3
Institute of Plant Breeding	Agriculture and related-fields	3	3	2	0	8	0
International Forestry Quarantine Research Group (IFQRG)	Forest phytosanitary issues	2	3	3	2	10	3
International Organization of Biological Control in Europe	Promote environmentally safe methods of pest and disease control in plant protection	1	3	2	2	8	2
International Pest Risk Research Working Group	Improving pest risk modelling and mapping methods through the application and sharing of research	1	2	3	2	8	2
International Potato Wart Research Community	Phytosanitary: Identify priority research areas for potato wart and encourage collaboration on research, data sharing, strain characterization and diagnostics standardization	1	2	3	2	8	3
International Rice False Smut Consortium (IRFSC)	Rice false smut	1	3	3	2	9	1
Japan cabinet office "BRIDGE (Program for Bridging the gap between R&D and the ideal society (society 5.0) and generating economic and social value)"	Phytosanitary-related	3	1	1	3	8	2
Japan Society for the Promotion of Science "Grants-in-Aid for Scientific Research (Kakenhi)"	Phytosanitary-related	3	1	1	1	6	1
Japan Society for the Promotion of Science "International Bilateral Collaboration Research (IBCR)"	Phytosanitary-related	2	2	1	2	7	1
Le Réseau québécois de recherche en agriculture durable (RQRAD)	1. Alternatives to synthetic pesticides; 2. Conservation and restoration of agricultural soil health; 3. Digital tools, precision agriculture and big data; 4. Socio-economic aspects: adoption, innovation system and public policy	2	1	2	2	7	1

Name	Research topic	Scope ^{a)}	Geographical coverage ^{b)}	Phytosanitary relevance ^{c)}	Policy outreach ^{d)}	Total Score	Funding Structure ^{e)}
Ministry for Business, Innovation and Employment Endeavour Fund project: Protecting Aotearoa from Wind-dispersed Pests	Research aimed at detecting wind-dispersed pests earlier to assist eradication and optimizing surveillance networks	2	1	3	0	6	0
Minor Use Program	The minor use program brings pest control products to minor (smaller acreage) crop and specialty crop growers in Canada	1	2	2	2	7	0
NARO "Research and implementation promotion program through open innovation"	Others	2	1	1	2	6	1
NARO "Research and implementation promotion program through open innovation"	Phytosanitary-related	2	1	1	2	6	1
National Crop Protection Center (Academic)	Demonstration and extension of geo-zone based IPM package (fall armyworm)	1	3	3	0	7	1
National Invasive Species and Climate Change Network (NGO, Gov't, Academia collaboration)	Effects of climate change and invasive species	2	2	2	2	8	0
National Predictive Modeling Tool Initiative (NPMTI)	Develop tools that will help forecast incidences of diseases and mycotoxins	1	2	2	1	6	4
NC246 Ecology and Management of Arthropods in Corn	Corn entomology/pest research committee	1	2	3	1	7	1
NCERA (North Central Extension and Research Activity)	Cluster of various networks amongst which are "Current and emerging diseases of small grains" and "Monitoring development of Soybean diseases"	1	2	3	1	7	1
Network of INIAs (National Institutes for Agricultural Research and Food Technology) of Latin America + Spain	Agri-food and forestry science and technology	3	3	1	2	9	3
North American Plant Protection Organization – Forestry water bath heat treatment ring test	Water bath heat treatment experiments on wood product pests of concern to the NAPPO region	1	2	3	2	8	0
North American Plant Protection Organization – Wood packaging material risk evaluation and improving ISPM 15 compliance project	Harmonization of wood packaging material category terminology, data collection on ISPM 15 non-compliance, and evaluating risk associated with different types of wood packaging material to identify opportunities to improve ISPM 15 compliance	2	2	3	3	10	0
North American Plant Protection Organization Forest Quarantine Research Group	Identify forestry pest and trade issues	2	2	3	3	10	0
North American Thrips Parvispinus Task Force	Phytosanitary and plant health related research	1	2	3	0	6	0
NPQSD Central Laboratory	Phytosanitary-related (quarantine and regulated non quarantine pests)	2	1	3	3	9	0
OIE Foot and Mouth Disease Laboratory Network	Animal health: Network of reference laboratories for foot and mouth disease	1	3	1	2	7	3
OMAF, University of Guelph and TurnKey Genomics	Testing of weed populations for herbicide resistance. Weed species identification.	1	1	2	0	4	0
Ontario Pest Management Conference	Pest management	2	1	3	2	8	4

Name	Research topic	Scope ^{a)}	Geographical coverage ^{b)}	Phytosanitary relevance ^{c)}	Policy outreach ^{d)}	Total Score	Funding Structure ^{e)}
Ouranos	Adaptation to climate change; assessment of current and future impacts of climate change on several sectors, including agriculture; provision of climate scenarios and services	2	1	1	1	5	0
Philippine Nuclear Research Institute	Nuclear energy in food and agriculture, health, environment and industries	3	1	3	0	7	0
Plant Biosecurity Research Initiative (PBRI)	Collaboration for efficient coordination of plant biosecurity research	3	1	3	3	10	2
Plant Quarantine Technology Center, Animal and Plant Quarantine Agency, Republic of Korea	Phytosanitary	3	1	3	2	9	1
PMRA vertical farming working group	Pest management	2	1	3	3	9	0
Prairie Biovigilance Network	Pathology, entomology, weed science, surveillance / monitoring, forecasting	3	1	3	3	10	3
PréRAD-OI	Agricultural sciences	3	3	2	2	10	3
Prion Collaborative Framework	Animal health: A framework for designated OIE reference labs for chronic wasting disease	1	2	1	2	6	3
PROCINORTE – Plant Health Taskforce (Governments)	Phytosanitary	3	2	3	3	11	3
PulseNet	Foodborne illness: Monitoring foodborne illness outbreaks caused by <i>E. coli</i> , <i>Vibrio</i> , <i>Shigella</i> , <i>Salmonella</i> and <i>Listeria monocytogenes</i>	1	1	1	3	6	3
Quads+ Lures, Protocols and Surveillance Working Group	To provide insights, challenges, and opportunities as to how AI could be applied to surveillance. Information sharing.	2	3	3	0	8	0
Quads+ Methyl Bromide Alternatives Working Group	Identify research projects, treatments, needs and gaps associated with alternatives to MB. Providing data to support treatment development for alternatives to MB for forest products.	1	3	3	3	10	2,3
Safe Trade project	Phytosanitary and trade	2	1	2	2	7	2
Science and Technology Masterplan under the National Parks Board (NParks) Singapore	Broadly focused organization, for all kinds of agricultural issues	2	1	2	1	6	3
Soybean Cyst Nematode Coalition	Nematodes of soybeans	1	2	3	1	7	0
Soybean entomology/pest research committee	Improving soybean arthropod pest management in the United States of America	1	2	3	1	7	1
STAR-IDAZ	Animal health, veterinary sciences	3	3	1	3	10	3
The Belmont Forum	Climate change	3	3	1	3	10	3
The Entomological Society of Japan	Entomology (including phytosanitary)	1	1	1	1	4	2
The Japanese Nematological Society	Nematology (including phytosanitary)	1	2	1	1	5	2

Name	Research topic	Scope ^{a)}	Geographical coverage ^{b)}	Phytosanitary relevance ^{c)}	Policy outreach ^{d)}	Total Score	Funding Structure ^{e)}
The Japanese Society of Applied Entomology and Zoology	Applied entomology and applied zoology including acarology and nematology, as well as pesticides, their application machinery and phytosanitary	1	1	1	1	4	2
The Phytopathological Society of Japan	Phytopathology, incl. phytosanitary issues	3	1	1	1	6	2
UPLB College of Agriculture and Food Science	Agriculture and food science	3	3	2	0	8	0
Vertical Farmers of Ontario	Vertical farming and controlled environment agriculture	2	1	1	0	4	0
Water Framework Directive	Phytosanitary-related	3	3	1	2	9	2
Western Forum on Pest Management (Government, non-government, academia)	Phytosanitary, pest management	2	1	2	1	6	3?
Yield Enhancement Network	Grain yield	1	2	2	1	6	0

APPENDIX C: Research network questionnaire

COMMISSION ON PHYTOSANITARY MEASURES FOCUS GROUP ON GLOBAL PHYTOSANITARY RESEARCH COORDINATION

Network Formation and Establishment

- What are the features of the network which were key for its establishment and the launch of its activities?
- Was the network initiated on the basis of a particular need (e.g. a specific group of pest, a specific crop, a specific region) and then enlarged to a broader approach?
- Did you involve policy makers in the construction of the network, the definition of its objectives, the programming of its agenda/activities?

Network Structure and Dynamics

- Have the instances/committees of the network stable and/or evolving structures over time?
- What is the management structure of the research network? Who is “in charge”?
- How is the coordination of the research network organized?

Participation and Membership

- Does the network involve public, semi-public, private institutions? To what extent do the roles or mandates of these institutions differ?
- Are policymakers active members in terms of active or in-kind contribution to projects, or do they ‘only’ analyse the scientific needs and participate in the validation of projects?
- Does the network allow the participation in its projects to non-members? If yes, would it be a preliminary step to membership?

Research Focus and Activities (if your network has a plant focus)

- Does the network consider both Plant Health (focusing on quarantine/emerging pests, their diagnostic/detection and their management) and Plant protection (conventional control, bio-inspired control, genetic control)?
- Does the network involve partners and research activities with skills broader than plant health?
- How is the outreach to the aimed public organized?
- Does the network also play a role in dissemination of knowledge? How? And if so, does this only concern knowledge generated by the network or also output from related projects?

Funding and Sustainability

- How is the research network funded?
- What are the features which should and/or could evolve in order to ensure its durability?

Representation and Policy Engagement

- What is the network’s history of contributing to global, regional or national policy?
- Is the network globally representative? If not what are the dark spots and how is the research network aiming on covering these areas?
- Can the research network support sustained engagement with IPPC, or are there any potential conflicts of interest?

Best Practices:

- What challenges were faced in the development of the network?
- How does the group set the work agenda and/or priority topics for focus?
- How is momentum maintained?
- Are there other experiences or lessons learned that could be shared?

APPENDIX D: NPPO survey questionnaire

Respondent Information:

- Country/Contracting Party:
- Role/Title of Respondent:
- National Plant Protection Organization (NPPO) or other represented body:
- How familiar are you with your NPPO's current phytosanitary research activities and international collaborations? (Scale: 1-Not at all familiar, to 5-Extremely familiar)

Part A: Assessment of Existing National and Regional Research Coordination

This section aims to map the research coordination structures currently in place.

Question	Response Options
A1.1. Does your country have a formal national strategy or roadmap specifically for phytosanitary (plant health) research?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In Development
A1.2. Which entities primarily funds or approves your country's phytosanitary research (e.g., NPPO, Ministry of Agriculture, National Research Council, etc.)?	<input type="checkbox"/> NPPO <input type="checkbox"/> Other Government Ministry/Agency <input type="checkbox"/> (National) Research Council <input type="checkbox"/> University/Academic <input type="checkbox"/> Private Sector <input type="checkbox"/> International Donor <input type="checkbox"/> Other (Please specify: _____)
A1.3. How would you rate the adequacy of funding for priority phytosanitary research in your country?	<input type="checkbox"/> Very Inadequate <input type="checkbox"/> Inadequate <input type="checkbox"/> Adequate <input type="checkbox"/> More than Adequate

A2. Collaboration Mechanisms (scale: 1=Never, 5=Very Frequently)

Question	Response Options/Scale
A2.1. How frequently does your NPPO formally collaborate with national research institutes/universities on phytosanitary research (e.g., Pest Risk Analysis, diagnostics)?	1 / 2 / 3 / 4 / 5
A2.2. How frequently does your NPPO collaborate with other NPPOs on coordinating research efforts?	1 / 2 / 3 / 4 / 5
A2.3. How frequently does your NPPO collaborate with Regional Plant Protection Organizations (RPPOs) on coordinating research efforts?	1 / 2 / 3 / 4 / 5

A2.4. Has your country formally participated in any international or regional consortia (e.g., Euphresco, CABI, specific regional pest projects) for coordinating phytosanitary research in the last 5 years?	<input type="checkbox"/> Yes (Please name: _____) <input type="checkbox"/> No <input type="checkbox"/> Unsure
A2.5. Does your NPPO have a mechanism for prioritizing phytosanitary research topics based on trade needs or emerging pest threats?	<input type="checkbox"/> Yes, formal process <input type="checkbox"/> Yes, informal process <input type="checkbox"/> No <input type="checkbox"/> Unsure
A2.6. Are there any other mechanisms at regional level to initiate and coordinate research efforts (e.g. RPPO coordinated Expert Working Groups or Panels; Expert meetings initiated by the RPPO or another regional body)	<input type="checkbox"/> Yes, (Please describe _____) <input type="checkbox"/> No <input type="checkbox"/> Unsure

Part B: Identified Research Needs and Gaps in IPPC Support

This section seeks to identify specific IPPC-related research needs and where support is lacking.

B1. Research Needs for IPPC Work (Scale: 1=Low Priority, 5=High Priority)

Question	Scale
B1.1. Please rate the importance of coordinated international phytosanitary research in the following areas:	
a) Pest Risk Analysis (PRA) methodologies and data.	1 / 2 / 3 / 4 / 5
b) Pest Diagnostics (e.g., development/validation of new diagnostic protocols).	1 / 2 / 3 / 4 / 5
c) Phytosanitary Treatments (e.g., cold/heat treatment efficacy data).	1 / 2 / 3 / 4 / 5
d) Impact of Climate Change on pest distribution/behavior.	1 / 2 / 3 / 4 / 5
e) Managing phytosanitary risks from e-commerce and mail.	1 / 2 / 3 / 4 / 5
f) Uptake and adoption of tools, technologies, methods etc by regulators and/or growers.	1 / 2 / 3 / 4 / 5
g) Surveillance	1 / 2 / 3 / 4 / 5
h) Implementation of plant health in the One Health framework	1 / 2 / 3 / 4 / 5
i) Trade systems and processes (e.g. sea containers, commodity specific trade movements, etc.)	1 / 2 / 3 / 4 / 5
j) Social Science research (e.g. travelers behaviour, farmer management decision making, etc.)	1 / 2 / 3 / 4 / 5
k) Implementation of Artificial Intelligence in phytosanitary field (e.g. determining inspections, horizon scanning, development of diagnostic tools, etc.)	1 / 2 / 3 / 4 / 5
l) Are there any other phytosanitary research areas for which international coordination may be required?	open text field

B2. Gaps in Current Coordination (scale 1=No Gap, 5=Significant Gap)

Question	Scale
B2.1. How would you rate the current gap in accessing reliable scientific data and literature needed for your NPPO's regulatory decisions (e.g., PRA)?	1 / 2 / 3 / 4 / 5
B2.2. How would you rate the current gap in sharing research results and best practices among IPPC Contracting Parties?	1 / 2 / 3 / 4 / 5
B2.3. How would you rate the difficulty for your NPPO to influence the global phytosanitary research agenda (i.e., ensure global research addresses your country's priority pests/needs)?	1 / 2 / 3 / 4 / 5
B2.4. Is there a significant gap in the alignment between research conducted by your national institutes and the specific needs of your NPPO to implement ISPMs?	1 / 2 / 3 / 4 / 5
B2.5. Space for additional comments on questions B2.1 - B2.4.	open text field

Part C: Role of the IPPC (FG-GPRC) and Recommendations

This section explores how the IPPC could best act to fill the identified gaps.

C1. Proposed IPPC Actions (Scale: 1=Not Useful, 5=Essential)

Question	Scale
C1.1. How useful would it be for the IPPC to establish a central, searchable database of ongoing or completed global phytosanitary research projects?	1 / 2 / 3 / 4 / 5
C1.2. How useful would it be for the IPPC to develop or support a mechanism to pool in kind and in cash funding for globally critical phytosanitary research projects?	1 / 2 / 3 / 4 / 5
C1.3. How useful would it be for the IPPC to facilitate annual global research priority-setting workshops where NPPOs define the most urgent needs?	1 / 2 / 3 / 4 / 5
C1.4. How useful would it be for the IPPC to facilitate annual global research priority-setting workshops where NPPOs and researchers together define the most urgent needs?	1 / 2 / 3 / 4 / 5
C1.5. How useful would it be for the IPPC to actively promote collaborative research projects between developed and developing country NPPOs/institutions (e.g., twinning projects)?	1 / 2 / 3 / 4 / 5

C2. Open-Ended Feedback

C2.1. In your opinion, what is the single greatest obstacle your country faces in effectively translating phytosanitary research into practical regulatory action? *(Please specify in a few sentences)*

C2.2. Please suggest any additional specific mechanism or initiative the IPPC could create to improve global phytosanitary research coordination. *(Maximum 150 words)*

APPENDIX E: NPPO survey analysis

The survey collected responses from various FAO regions, each presenting unique contexts and shared challenges regarding phytosanitary research coordination. The organizational representation predominantly featured NPPOs, underscoring their central role in the phytosanitary landscape.

Responses by region

Africa

- Organizational representation: Predominantly NPPOs, with significant input also from National Agricultural Research, University/Academic, and International Donors.
- National strategy and funding: A majority of countries either lacked a formal national strategy or had one in development. Funding was overwhelmingly perceived as "Very inadequate" or "Inadequate", highlighting a critical financial bottleneck.
- Collaboration: While national collaboration with research institutes was strong (average 5.07), coordination with other NPPOs (average 2.93) and RPPOs (average 2.71) was moderate.
- Key obstacles: Major impediments included lack of funding, limited technical capacity and human resources, fragmentation of responsibilities, and a gap between academic research and practical application.
- FG-GPRC suggestions: Development of global research platforms, targeted funding mechanisms, capacity building, harmonized protocols, and stronger linkages between research and NPPOs.

Asia and the Pacific

- Organizational representation: NPPOs were the primary respondents, alongside contributions from Other Government Ministry/Agency and International Donors.
- National strategy and funding: A substantial number of countries were developing national strategies or lacked them entirely. Funding was largely considered "Very inadequate" or "Inadequate".
- Collaboration: National research institute collaboration was very frequent (average 5.57), while collaboration with other NPPOs (average 3.64) and RPPOs (average 3.57) was moderately frequent.
- Key obstacles: Limited technical expertise and capacity, budgetary constraints, disparity in integrating research into policy, and complex regulatory processes were frequently cited.
- FG-GPRC suggestions: Establishing a digital knowledge exchange hub, research grants, integrating with global pest surveillance systems, and creating regional coordination hubs.

Europe and Central Asia

- Organizational representation: NPPOs were key, complemented by strong input from Other Government Ministry/Agency, (National) Research Councils, and University/Academic sectors.
- National strategy and funding: A majority reported having a formal national strategy. While funding was perceived as "Inadequate" by some respondents and "Adequate" by others, this indicates a mixed but still challenging picture.
- Collaboration: Collaboration with national research institutes was notably very frequent (average 6.00). International collaboration with other NPPOs (average 3.41) and RPPOs (average 3.47) was moderately frequent. Participation in international consortia was very high.
- Key obstacles: Short-term, project-based funding models conflicting with long-term regulatory needs, insufficient evidence for policy advice, and difficulties in accessing samples from other NPPOs.
- FG-GPRC suggestions: Implementing an International Phytosanitary Research Fund, developing an IPPC Research Clearing House for validated data, supporting discussions on priority setting, and leveraging existing models like Euphresco.

Latin America and the Caribbean

- Organizational representation: All respondents were from NPPOs, with additional representation from Other Government Ministry/Agency, University/Academic, and International Donors.
- National strategy and funding: Most countries either had no formal strategy or one in development. Funding was widely considered "Inadequate" or "Very inadequate".
- Collaboration: National research institute collaboration was very frequent (average 7.00). Collaboration with other NPPOs (average 3.80) and RPPOs (average 4.00) was frequent.
- Key obstacles: Shortage of specialized professionals, outdated legislation, historical perception of NPPOs lacking research competence, and poor interinstitutional coordination.
- FG-GPRC suggestions: Strengthening official research institutions, creating free online repositories for scientific publications, and providing specific guides for NPPOs on research prioritization.

North America

- Organizational representation: NPPO and Other Government Ministry/Agency.
- National strategy and funding: No formal strategy was reported, and funding was deemed "Inadequate."
- Collaboration: Collaboration with national research institutes was very frequent (average 7.00), and with other NPPOs (average 4.00) and RPPOs (average 4.00) was frequent.
- Key obstacles: Short-term funding cycles clashing with the long-term nature of phytosanitary threats.
- FG-GPRC suggestions: Establishing an International Phytosanitary Research Fund and an IPPC Research Clearing House.

Cross-regional themes and conclusions

The analysis of survey responses across all FAO regions reveals several consistent themes that underscore the challenges and opportunities for global phytosanitary research coordination.

Cross-regional themes:

- Across all regions, NPPOs are the most frequently represented organizations in the survey, confirming their critical role at the forefront of phytosanitary research and its application. This highlights the importance of any coordination initiative being directly relevant and accessible to NPPOs.
- A lack of adequate funding is the most significant and consistent challenge reported globally. The majority of respondents across Africa, Asia and the Pacific, and Latin America, and even a significant portion in Europe, rated funding as "Inadequate" or "Very inadequate". This chronic underfunding limits infrastructure development, human capacity building, and the ability to conduct sustained, long-term research necessary for complex phytosanitary issues.
- Collaboration with national research institutes and universities is generally robust across regions, indicating existing local capacities and relationships. However, international collaboration among NPPOs and with RPPOs is often moderate, suggesting a need for more structured and facilitated cross-border research initiatives. While participation in international consortia is common, the depth and impact of these engagements could be further explored.
- Strong support for IPPC mechanisms: There is an overwhelming and consistent desire across all regions for the IPPC to play a more active and central role in facilitating global phytosanitary research. Specific proposals for IPPC action include:
 - centralized databases – establishing a searchable database of ongoing and completed research projects;
 - resource mobilization – developing mechanisms to pool in-kind and cash funding for critical research;

- priority-setting platforms – facilitating annual workshops where NPPOs can define urgent research needs; and
- collaborative project promotion – actively promoting joint research projects, particularly between developed and developing countries.
- Obstacles to research translation: Beyond funding, key impediments to translating research into practical regulatory action include:
 - capacity gaps – shortages of specialized professionals, limited access to advanced diagnostic tools, and insufficient practical training;
 - policy–science disconnect – challenges in integrating research findings into policy-making because of differing institutional priorities, regulatory complexities, or a lack of communication between researchers and regulators; and
 - informal prioritization – while many NPPOs prioritize research topics, these processes are often informal, potentially leading to less strategic alignment and missed opportunities for resource allocation.

The survey results paint a clear picture: there is a critical need and strong appetite for enhanced global phytosanitary research coordination. The FG-GPRC has a unique opportunity to address these identified challenges by focusing its strategies on the following:

- (1) **Championing funding advocacy:** Actively advocate for increased and sustained funding for phytosanitary research at national, regional and international levels, potentially through the establishment of dedicated funding mechanisms or a global research fund.
- (2) **Developing a centralized information hub:** Prioritize the creation of an IPPC-led, accessible, and user-friendly digital platform for sharing research data, diagnostic protocols, best practices, and emerging threat intelligence. This will bridge information gaps and facilitate evidence-based decision-making.
- (3) **Strengthening international collaboration frameworks:** Foster and facilitate more structured collaboration among NPPOs and RPPOs, perhaps through regional research networks, twinning projects, or thematic working groups that address shared pest threats and research priorities.
- (4) **Enhancing capacity building:** Develop programmes that address the identified capacity gaps, focusing on specialized training for researchers and regulators, access to modern diagnostic technologies, and support for developing national research strategies.
- (5) **Bridging the policy–science divide:** Promote mechanisms that ensure research directly informs regulatory action, such as facilitating dialogues between scientists and policymakers, developing guidelines for research-to-policy translation, and supporting robust risk analysis.
- (6) **Leveraging existing models:** Explore successful regional coordination models for potential adaptation and scalability in other regions, ensuring that any new initiatives complement rather than duplicate existing efforts.