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Plant health in Europe and Central Asia – relevance, trends and developments

Executive summary

- This document is an introduction to plant health issues in Europe and Central Asia. It covers general aspects of plant health in the region, including the current environment for plant health operations, as well as ideas for possible main areas of development in the nearest future.
- Countries in Europe and Central Asia are highly diverse in climate, topography, ecology and agriculture and have highly heterogeneous phytosanitary systems. Across the region, plants in agriculture and the environment are very important for the economy, food security and livelihoods.
- Pests present significant threats to food security and the environment. As well as damaging impacts on crop production, forestry and food security, there are significant impacts on the international trade of plants and plant products.
- Climate change, international trade (including internet trade) and human mobility are among the key factors that increase the risks of pests' spread within and between countries and continents.
- The availability of information on pest presence is usually critical for timely reaction to emergencies. Advanced methodologies for pest surveillance and data collection are available but need harmonized implementation and enhanced capabilities to ensure that rapid responses can be made to emerging threats across the region.
- Integrated pest management is one of the cornerstones of sustainable crop production and protection and can serve to mitigate any future threats to human and animal health posed by antimicrobial resistance (AMR) in plant agriculture.

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- FAO plays a crucial role in promoting and supporting plant health-related activities in the region, given the disparities and divergences noted across Members within the European Union, outside the EU, and across Central Asia.

Guidance sought

The ECA is invited to:

- Endorse the recommendation for Members, as outlined in paragraph 32.
- Endorse the recommendations to FAO, as outlined in paragraph 33.

I. Introduction

1. In December 2018, the United Nations General Assembly declared 2020 the International Year of Plant Health (IYPH). The year is an opportunity to raise global awareness of how protecting plant health can help end hunger, reduce poverty, protect the environment and boost economic development. The Forty-first Session of the European Commission on Agriculture (ECA) is an opportunity to raise awareness, give attention and discuss solutions in this context for Europe and Central Asia.

2. The purpose of this document is an introduction to plant health issues in Europe and Central Asia. It covers general aspects of plant health in the region, including the current environment for plant health operations, as well as ideas for possible main areas of development in the nearest future.

3. The document has three sections. The first section outlines key issues related to plant health in Europe and Central Asia. The second section highlights the role of FAO in addressing plant health challenges. The paper concludes with recommendations for the Members and for FAO.

II. Plant health in Europe and Central Asia

4. Plant health is key for the sustainable intensification of agriculture in all regions of the world and underpins all aspects of animal, human and ecosystem health. Countries in Europe and Central Asia have diverse plant resources in the agricultural and forestry sectors. Plant production is mostly well developed in the countries of the region, while international trade of plants or plant products contributes to economic development.

5. Pests constantly threaten plant production across the region. Estimates of pest-related crop losses for globally important crop species range from 20 to 80 percent. Actual losses depend largely on the efficacy of pest control practices applied. Available data (Oerke, 2006) show that in different parts of Europe (Northwest, Northeast, South, Southeast, Commonwealth of Independent States) the estimated overall potential crop losses in 11 crops in 2001–2003

ranged from nearly 60 percent to more than 70 percent, with actual losses ranging from 27 percent to 45 percent. For Central Asian CIS countries, the estimates for losses were 67 percent, with actual losses reaching 37 percent. According to recent estimates, the value of crop losses due to the presence of plant pests and diseases amounts to EUR 450 billion a year globally (Rabbinge, 2016). In most cases, pests can also severely affect the quality of plant products, defined in terms of nutritional and post-harvest attributes, rendering them unsuitable for consumption or unmarketable and thus generating food waste. From the food security perspective, it is critical to minimize the pest-related losses and constraints to plant production that occur in the food supply chain and in forests or other natural resources.

6. Some historical and highly significant impacts of introduced plant pests on food security and socio-economic development have been well documented, with *Phytophthora infestans* on potatoes in Ireland in the first half of the nineteenth century and *Phylloxera vastatrix* in vineyards. Spread and damage caused in the second half of the twentieth century by Colorado beetle (*Leptinotarsa decemlineata*) on potatoes in Europe is widely known across the region. More recent impacts in Europe and Central Asia include yellow rust (*Puccinia striiformis*) on wheat, *Xylella fastidiosa* on olives, and brown marmorated stink bug (*Halyomorpha halys*) on hazelnuts.

7. Local, regional and global trade of plants and plant products is vital for many economies, especially in developing countries. It provides job security and stimulates economic growth in the exporting country's farm sector. As this trade has the inherent risk of moving pests with traded commodities, countries establish phytosanitary import requirements as part of their legal systems to counteract those risks. It should be noted, however, that trade can be significantly limited by technically unjustified plant health-related requirements. Working in the framework of the World Trade Organization Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) and the International Plant Protection Convention (IPPC), countries develop and adopt science-based international standards for phytosanitary measures (ISPMs) that help prevent pest spread between countries and avoid unjustified barriers in the trade of plants and plant products. At the same time, they help prevent severe impacts of pests on the socio-economic development of countries. The level of participation in these international efforts varies among the Members, and they may be invited to consider options for increasing their involvement in international cooperation at regional and global levels for mutual advantage.

8. The implementation of guidance on phytosanitary systems and measures agreed and adopted under the IPPC requires well-organized national phytosanitary systems, with national plant protection organizations (NPPOs) as the core. It is crucial that countries maintain sufficient capacities of their NPPOs in order to operate sound and effective phytosanitary systems so that challenges arising from the introduction and spread of plant pests can be identified and responded to early enough to enable the prevention or reduction of their negative impacts. Although the impacts of pests are often difficult to predict, preventing pests from spreading and establishing in new countries and regions is invariably more cost-effective than maintaining long-term control, containment or eradication.

9. Unfortunately, not always does plant health receive the recognition it deserves, which is demonstrated in insufficient resources dedicated to the operations of NPPOs. Despite declining resources for plant protection services, international, regional and national plant protection organizations continue in their efforts to protect plants from pests. A primary goal is

to prevent the introduction, spread and establishment of plant pests in new areas, where they could cause significant environmental and economic damage. These organizations aim to accomplish this critical goal in many ways, from developing regulations for the international trade of agricultural or forestry products to innovative, scientific methods for addressing pest threats through the promotion of responsible practices that reduce the risk of pest introduction and spread. By protecting plants against pests, these organizations help increase agricultural and forestry productivity, improve rural incomes, and reduce poverty. In so doing, they help increase food security, protect the environment and biodiversity, and boost economic development, especially where agriculture is a primary industry.

10. Recognizing the importance of plant health, the United Nations General Assembly has declared 2020 the International Year of Plant Health (IYPH); this is intended to raise awareness of the relevance of plant health in achieving the Sustainable Development Goals and the necessity of strengthening plant protection services. The IYPH is a key initiative to highlight the role of plant health in enhancing food security, protecting the environment and biodiversity, and boosting economic development. FAO, with the IPPC Secretariat as the lead agency, will spearhead the initiative at global, regional and national levels.¹

11. Activities of other UN agencies and relevant international organizations in providing policy advice and technical assistance to the countries with economies in transition were outlined in the contributions to the Secretary-General's 2008 report on the integration of the economies in transition into the world economy. In 2008, the Economic and Social Commission for Asia and the Pacific published an e-publication titled "Regional Approaches in Central Asia to Technical Barriers to Trade." The study identified key sanitary and phytosanitary technical barriers to trade in the Central Asia subregion and suggested options for regional approaches to address those issues. A report from the United Nations Economic Commission for Europe (UNECE, 2017) presents data on trade facilitation and paperless trade implementation in 36 countries. The World Bank has funded specific projects in the Europe and Central Asia region, such as the Agricultural Competitiveness Improvement Project in Azerbaijan (2013–2020), which supported sanitary and phytosanitary (SPS) services.²

12. The Asian Development Bank published a report on modernizing SPS measures to facilitate trade in agricultural and food products and the development of an SPS plan for the Central Asia Regional Economic Cooperation Program (CAREC) countries. As the first step in developing an action plan for the adoption and implementation of SPS measures, the existing measures and procedures were assessed in Kazakhstan, Kyrgyzstan, Mongolia and Uzbekistan in order to identify areas of nonconformity with the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement). A number of issues emerged, both during the study and during the workshops. A subsequent presentation was made by Black (2017) titled "CAREC Common Agenda for SPS Modernization" at the Expert-Level Regional Meetings in Dushanbe in August 2017. An Asian Development Bank Institute paper (Tan, 2017) on digital trade in Europe and Central Asia considers how the Internet can increase exports by reducing trade costs and discusses how e-commerce is transforming sales to both domestic and foreign consumers. Despite the potential benefits, use of the Internet is relatively limited across the broad range of developing and developed countries in the region.

¹ https://www.ippc.int/static/media/uploads/iyp/2018/07/27/IYPH_Links.pdf

² <http://projects.worldbank.org/>

13. Emerging pests and transboundary pests can present a significant threat to food security and the environment. Monitoring of their incidence and movement, accompanied by the development of operational support systems, is key to mitigating their potential impacts. Such enhanced monitoring must be accompanied by the strengthening of capacities to apply pest control measures effectively while protecting human health and the environment.

14. Many academic and research institutions in the region are active in research on plant protection and pest management problems, and numerous papers have been published on individual pests or approaches to pest management. Specifically for plant health and the risks posed by new introductions into the region, most research papers have dealt with specific pests, for example *Fusarium circinatum* (Vettriano *et al.*, 2018). Some scientific publications deal more generally with relevance, trends and developments in plant health issues in the region. For example, an assessment was made of the likelihood of establishment and potential sources of invasive species (Eschen *et al.*, 2014). Distribution data were assembled for 1 009 invertebrate pests and pathogens of woody hosts in 344 regions in the world, including those in Europe and Central Asia. Pests were split up into several groups based on their taxonomy, and clusters of countries or regions with similar pest assemblages were identified for each organism group. The likelihood of establishment of each pest species in a specific country was calculated as the frequency of its occurrence in other countries belonging to the same cluster. Species were ranked by risk to each EU country. The non-EU regions in Europe and Central Asia with the most similar pest assemblages to the EU are the Balkan countries, Kazakhstan, Turkey, Ukraine and Russian Federation.

15. Integrated pest management (IPM) is central to sustainable crop production. IPM research has often been concerned with single pest species or pest groupings (e.g. soil pests), or with such major crops as grapevine, pome fruit, wheat, or oilseed crops, and sometimes with minor vegetable and ornamental crops. In the European Union, as of 2014, all Member States have developed national action plans to ensure implementation of IPM principles (Lefebvre *et al.*, 2015). However, difficulties in adoption continue, requiring greater involvement by all actors in the food chain (Lamichhane *et al.*, 2016, 2018). What is lacking for the region is a comprehensive evaluation of IPM project outcomes and experiences over an extended period of time. Such an evaluation was done by Pretty and Bharucha (2015) using data from 85 IPM projects implemented over the past 20 years in 24 countries of Asia and Africa. The advantage of such an analysis for the region would allow the identification of potential benefits to be gained from the adoption of IPM. Analysis of observed impacts on productivity and reliance on pesticides has shown a mean yield increase across projects and crops of 40.9 percent, combined with a decline in pesticide use to 30.7 percent. Yield levels in countries of Europe and Central Asia are diverse, and in some they are relatively high compared to the global average, so the marginal increases resulting from IPM may not reach these levels. Thirty-five out of 115 crop combinations resulted in a transition to zero pesticide use.

16. Wheat is an important food security crop in Central Asia, but it frequently suffers severe damage and yield losses from insect pests, pathogens and weeds. With funding from the United States Agency for International Development, a team of scientists from three U.S. land-grant universities, in collaboration with the International Center for Agricultural Research in the Dry Areas and local institutions, implemented an IPM demonstration programme in three regions of Tajikistan from 2011 to 2014 (Landis *et al.*, 2016). An IPM package was developed and demonstrated in farmer fields using a combination of crop and pest management techniques.

The results indicated that the IPM package plots almost universally had lower pest abundance and damage and higher yields, and that they were more profitable than the farmer practice plots. Wheat stripe rust infestation ranged from 30 percent to over 80 percent in farmer practice plots, while generally remaining below 10 percent in the IPM package plots. An earlier project was developed for the Republic of Tajikistan (International Development Association, 2004) aiming at supporting the widespread application of IPM principles where a few large state or collective farms had been replaced by many small farms after land distribution.

17. Antimicrobial resistance (AMR) is a topic of major importance in agriculture, animal health and human health. Even though the use of antibiotics is limited, other chemicals are widely used against microbial pests (e.g. fungi) that may trigger questions about the relevance of AMR in plant health. One of the first reviews of this topic for plant health was provided by Vidavar (2001), at a time when the authorized use of antibiotics (streptomycin and oxytetracycline) to control bacterial diseases of food and feed, ornamental and non-food crops in the United States of America was both feasible and economic. A particular concern noted was the use of gentamicin, which once was an important antibiotic in human medicine. Resistance to streptomycin in plant pathogenic bacteria had begun to appear in the 1960s. It was also noted that although there was no correlation between the use of azoles as antifungal agents in plant agriculture and the development of resistance in humans, such concerns merited further research. Subsequently, in relation to triazole fungicides used to control fungal plant pathogens, there is increasing evidence of cross resistance to medical fungicides used against the clinically important *Aspergillus fumigatus*, a common saprophyte in crop litter (Snelders *et al.*, 2012; Bromley *et al.*, 2014), which may have wider implications in human health (Fisher *et al.*, 2018).

18. A recent overview of the emergence and spread of AMR in animals and plants was made by Thanner *et al.* (2016). It provides a comprehensive and holistic view of pathways for antimicrobial products and resistance throughout the food chain and emphasizes the importance of obtaining new data so that comprehensive risk assessments can be done. Resistance to the concerned products continues to be found, although there is a high variability across pathogens and regions of the world, with little or no systematic monitoring and testing of where antimicrobial products are used in plant protection. As with the use of pesticides more generally, IPM has been shown to have the potential to reduce reliance on antimicrobial products, especially in horticulture.

19. The region is also facing up to a set of internal and external conditions that may affect the approach to plant health arrangements in some countries. The EU is Central Asia's largest economic partner (Pomfret, 2014), and since 2000, China is the fastest growing. If this growth continues, the cross-regional East–West link between Central Asia and China and the EU will expand. The EU has published the EU–Central Asia trade picture for 2016–2018 and is developing a new strategy for trade with Central Asia.³ The increase in the trade of plants and plant products may result in plant health-related implications, such as increased risks of pest movement or challenges for national phytosanitary systems to manage the risks in countries of transit and destination.

³ http://ec.europa.eu/trade/policy/countries-and-regions/regions/central-asia/index_en.htm

III. The role and activities of FAO

20. FAO, with its headquarters and decentralized expertise, promotes different sustainable agriculture approaches, with a focus on activities to develop and strengthen national capacities to monitor and to respond effectively to transboundary and other important plant pests and diseases. A number of specific databases/information systems relevant for agricultural production or plant protection are maintained.⁴ The FAO Forestry Department, through its forest health and protection programme, assists, advises and supports countries and national institutes in safeguarding the health and vitality of forests, forest ecosystems and trees outside forests, with special reference to insect pests, diseases and other harmful biotic and abiotic agents. The FAO Forestry Department also provides advice on preventive measures and integrated pest management⁵ and on recommended actions to minimize the risks of transboundary transfer. FAO offers assistance to countries not only in response to pest outbreaks and emergencies but also in establishing long-term prevention and forest protection strategies.

21. The monitoring of emerging and transboundary pests, accompanied by the development of operational support systems, is key to mitigating potential impacts. For three locust pest species, the collection and analysis of standardized data is in place, with the Automated System for Data Collection and the Caucasus and Central Asia Locust Management (CCALM) geographic information system. Similar approaches and tools available for the monitoring of wheat rust diseases in Europe are being expanded to Central and West Asia. Furthermore, FAO's Emergency Prevention System (EMPRES)⁶ promotes international cooperation, preventive approaches, monitoring, early warning, rapid response and integrated management.

22. FAO's regional priorities defined by the Members in Europe and Central Asia⁷ are being addressed through three Regional Initiatives: (i) empowering smallholders and family farms for improved rural livelihoods and poverty reduction; (ii) improving trade in food and food products and market integration; and (iii) sustainable natural resources management under a changing climate. In each of these initiatives, food security and nutrition are addressed as a cross-cutting theme. Country Programming Frameworks (CPFs) are the tool for FAO to agree with each country on how to address the development of national plant health systems. Furthermore, national policies and programmes, as well as regional collaboration to enhance plant health, will contribute to achieving multiple Sustainable Development Goals and to meeting nationally determined contributions (NDCs) under the Paris Agreement on Climate Change.

23. Many FAO activities have dealt specifically with particular issues in different parts of Europe and Central Asia. It should be noted that there are major disparities in the ways plant health issues are addressed inside the EU, in the European countries outside the EU, in Eurasia and in Central Asia, resulting in problems for countries, especially in trade relations.

⁴ <http://www.fao.org/agriculture/crops/information-resources/en/#c68639>

⁵ http://www.fao.org/tempref/GI/Reserved/FTP_FaoSeur/New%20REU/ipm_en.htm

⁶ <http://www.fao.org/food-chain-crisis/how-we-work/plant-protection/en/>

⁷ <http://www.fao.org/about/meetings/erc31/en/>

24. A number of FAO development projects have aimed at strengthening phytosanitary services in many developing countries of the region by providing recommendations on modernizing phytosanitary legislation, enhancing pest surveillance systems and establishing effective collaboration among regulatory agencies and relevant institutions. The capacity and effectiveness of phytosanitary services were improved in all recipient countries. Regional and national workshops were organized to cover such topics as reporting obligations under the IPPC, pest surveys and diagnosis, and the use of modern laboratory equipment and inspection tools. Plant quarantine staff and phytosanitary inspectors were trained on the implementation of international standards, pest risk analyses and pest surveillance procedures. National legislation was assessed, and implementation frameworks to strengthen national phytosanitary services were prepared. For more than 20 years, the FAO Regional Office for Europe and Central Asia has implemented a number of programmes and projects for farmer education and capacity-building to promote and support integrated pest management (IPM) among governments and smallholder farmers, as reported in Véték *et al.* (2017). Other recent FAO activities and events in the region include options for electronic phytosanitary certificates, IPM training programmes⁸ and pest monitoring and surveillance.⁹

25. Within the FAO system, IPPC plays a key role in plant health globally, especially in relation to international trade. The exchange of information related to plant health is essential, especially in the context of international trade, and guidance on sharing such information is available on the International Phytosanitary Portal (IPP).¹⁰ The IPPC ePhyto Solution system, recently developed by the IPPC Secretariat, supports countries in the issuance and exchange of phytosanitary certificates in electronic form.¹¹

26. Countries have developed the draft IPPC Strategic Framework for 2020–2030,¹² which outlines a set of key developments over the years 2020 to 2030, all of relevance for the Europe and Central Asia region. These include:

- harmonization of electronic data exchange;
- commodity and pathway-specific international standards on phytosanitary measures;
- management of e-commerce and courier mail pathways;
- enabling the use of third-party entities;
- strengthening pest outbreak alert and response systems;
- assessment and management of climate change impacts on plant health;
- coordination of global phytosanitary research; and
- establishment of a diagnostic laboratory network.

27. In this context, the draft IPPC Strategic Framework sets the basis for the work of the global plant health community for the next decade. Members may consider relevant activities

⁸ <http://www.fao.org/europe/events/detail-events/en/c/275991/>

⁹ <http://www.fao.org/europe/events/detail-events/zh/c/902485/>

¹⁰ <https://www.ippc.int/en/core-activities/information-exchange/nro/>

¹¹ <https://www.ippc.int/en/ephyto/>

¹² <https://www.ippc.int/en/core-activities/governance/ippc-strategic-framework/>

aiming at its implementation at regional and country levels, while recognizing the heterogeneity of ecological and phytosanitary systems in Europe and Central Asia.

28. Specific recent IPPC activities in the Europe and Central Asia region over the past two years include IPPC–FAO Regional Workshops in 2017 and 2018 on draft international standards for phytosanitary measures and the IPPC National Reporting Obligations, held in Tbilisi, Georgia (2017) and in Bykovo, Russian Federation (2018), and a Regional Workshop on Pest Risk Analysis, held in 2018 in Moscow. An IPPC high-level symposium on cooperation of phytosanitary measures among the countries taking part in China’s Belt and Road Initiative was held in 2019 in Xi’an, China.

29. At the regional level, the exchange of expertise and information, as well as work on the development of effective plant health solutions, is supported by regional plant protection organizations (RPPOs).¹³ The European and Mediterranean Plant Protection Organization (EPPO) is the RPPO for the region and has been involved in many initiatives, especially in Eastern Europe and neighbouring countries. As part of a broader programme of analysis of the risk of forest pests in the former USSR to other parts of EPPO region, at the turn of the millennium the EPPO Secretariat made an inventory of pests of forest trees in the former USSR.¹⁴ A joint workshop with the Eurasian Economic Commission (EEC) on regulated pests, titled Pest Risk Analysis and Listing, was held in Moscow 6–8 June 2018.¹⁵ EPPO also supports Euphresco – a network of organizations funding research projects and coordinating national research in the phytosanitary area, which is an example of a platform supporting scientific cooperation in plant health in Europe and Central Asia.¹⁶ In a joint EEC–EPPO workshop on Euphresco in Moscow in July 2016, collaborations were reported between FAO and NPPOs of Central Asian countries, including Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkey, Turkmenistan and Uzbekistan.

30. The SPS Agreement and the IPPC provide platforms for cooperation among countries on plant health issues. Countries may make relevant plant health-related information available on the International Phytosanitary Portal. The World Trade Organization Aid for Trade work programme for 2016–17¹⁷ focused on helping developing countries connect to export markets, following up on the key message of the Fifth Global Review that high trade costs create substantial obstacles to trade. Technical cooperation and training activities included a regional workshop on trade policy modelling for Central and Eastern Europe, Central Asia and the Caucasus. A regional SPS Workshop for Central and Eastern Europe, Central Asia and the Caucasus will be held in the week of 16 September 2019 in Vienna.

IV. Conclusions and Recommendations

31. Taking into account the importance of agricultural plant production and plants in natural environments in Europe and Central Asia, as well as the actual and potential threats posed by plant pests, a set of recommendations may be formulated that might contribute to the

¹³ <https://www.ippc.int/en/external-cooperation/regional-plant-protection-organizations/>

¹⁴ https://www.eppo.int/media/uploaded_images/RESOURCES/special_projects/forestry_pests/EPPOforestry_project.pdf

¹⁵ https://www.eppo.int/MEETINGS/2018_meetings/wk_rnqp

¹⁶ <https://www.euphresco.net/>

¹⁷ <https://www.tralac.org/images/docs/9074/wto-committee-on-trade-and-development-aid-for-trade-work-programme-2016-2017.pdf>

enhancement of national plant health-related policies and improvements in national plant protection systems. FAO's role would be to provide support and assistance to Members in developing relevant programmes and policies aiming at the implementation of those recommendations.

Recommendations for Members

32. The ECA may wish to invite Members to consider the following activities:
- 1) **Analyse** the IPPC Strategic Framework for 2020–2030 as the basis for work in the coming decade, as well as consider options for increased international cooperation on plant health issues at global and regional levels.
 - 2) **Support** the activities under the International Year of Plant Health in 2020, aiming at raising awareness on the importance of plant health for societies and national economies.
 - 3) **Audit** and Report at the national level the progress made in relation to the Sustainable Development Goals relevant for plant health.
 - 4) **Review** the national phytosanitary systems, especially against the implementation of international agreements and standards, and develop strategies to address possible gaps.
 - 5) **Ensure** that the capacities of national plant protection organizations are sufficient to address existing and emerging plant health challenges.
 - 6) **Promote** adaptation and implementation of environmentally sound practices as the core elements of integrated pest management.
 - 7) **Support** the implementation of new and existing technologies in addressing old and new threats in plant health by targeting efforts of governments and other actors to maximize benefits and minimize possible safety and societal risks.
 - 8) **Raise awareness** that regional collaboration and ecologically based approaches are essential in minimizing the impacts of plant pests, both those already present and those which may invade.

Recommendations for FAO

33. The ECA is invited to recommend that FAO:
- 1) **Support** the strengthening of national phytosanitary systems and plant health regulatory regimes by regional workshops, trainings, and promotion by different agencies, and reduce the high level of heterogeneity currently found across the region.
 - 2) **Raise** awareness of the impact of plant pests and diseases on food security, nutrition and economic development across the region.
 - 3) **Raise awareness** on the need to pay particular attention to pathways for the movement of plant pests between countries in different parts of the region, between regions, and between continents, including transboundary pests as well as new trade routes.

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