EPPO ACTIVITIES ON EMERGING PESTS AND DISEASES

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ABSTRACT

The European and Mediterranean Plant Protection Organization (EPPO) is an intergovernmental organization, which was created in 1951. It currently has 50 member countries and one of its missions is to prevent the entry and spread of pests presenting a risk to agriculture and forestry. Since the 1970s, EPPO has made recommendations to its members on which pests should be regulated (EPPO A1 and A2 Lists) and on phytosanitary measures which should be implemented to avoid their introduction and spread. However, these existing measures can be challenged by the emergence of new pests and diseases. Human activities and in particular the commercial trade of plants and plant products is perceived as playing a major role in the emergence of new pests. The introduction of pests into new areas can have serious economic and environmental impact, and this will be illustrated with several examples of recent introductions into Europe. In order to assess in a harmonized way the risks that are associated with emerging pests, EPPO has elaborated a Pest Risk Analysis (PRA) scheme which will be presented. When new pests are emerging, it is also quite important to provide early warning to Plant Protection Services so that they can put in place import inspections and surveillance programmes on their territory. Since 1998, EPPO has set up an Alert List on its website to provide data on these emerging pests. Some of them may later be submitted to a PRA and eventually be recommended for regulation as quarantine pests. When a quarantine status is felt appropriate for an emerging pest, EPPO Standards can also be developed to provide guidance on diagnostics, eradication and containment programmes.

Key words: emerging pests, plant quarantine, early warning, pest risk analysis, international organization

1 INTRODUCTION

During the last decades, many new plant pests and diseases have emerged in different parts of the world, and this phenomenon seems to be accelerating. Although there is no agreed definition of what is an emerging pest, it can correspond to an already known organism whose incidence or geographical distribution is increasing notably but it can also be a newly described species. The causes of pest emergence are multiple and quite complex, but it is generally accepted that human activities (e.g. trade of plants, accidental introduction of vectors for some pathogens, modifications of agricultural practices or land use) play an important role. The introduction of pests into new areas can have serious economic and environmental impact. For example, the costs of official control against fireblight (*Erwinia amylovora*) in Switzerland have been estimated to be 19 million euros from 1989 (first detection of the disease) to 2007 (Anon., 2007). In the United Kingdom, the costs of research and development added to the costs of containment and eradication programme against *Phytophthora ramorum* and *P. kernoviae* have been estimated to be 5.8 million euros per year

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(Williams *et al.*, 2010). Finally, the National Plant Protection Organization (NPPO) of Spain has estimated the costs of official control against *Rhynchophorus ferrugineus* to be 45.5 million euros from 2002 to 2009.

Over the years, the European and Mediterranean Plant Protection Organization (EPPO) has made recommendations to the NPPOs of its member countries on phytosanitary measures which should be implemented to avoid these pest introductions (plant quarantine). EPPO is an intergovernmental organization, which was created in 1951. It currently has 50 member countries, including the 27 Member States of the European Union, countries around the Mediterranean Basin and countries which were formerly part of USSR. Since the 1970s, EPPO has made recommendations to its members on which pests should be regulated (EPPO A1 and A2 Lists of pests recommended for regulation as quarantine pests) and on phytosanitary measures which should be implemented to avoid their introduction and spread. In the particular case of emerging pests, EPPO considered that it was necessary to provide early warning to NPPOs and that the risk associated with the emergence of a specific pest should be evaluated (Pest Risk Analysis) in order to decide whether phytosanitary measures could be appropriate to mitigate such a risk.

2 EARLY WARNING

When new pests are emerging, it is important for National Plant Protection Organizations (NPPOs) to be informed as early as possible, so that import inspections and surveillance programmes could be initiated. Since 1998, EPPO has set up an Alert List on its website (EPPO, 2011) to provide data on emerging pests (e.g. *Chalara fraxinea, Drosophila suzukii, Fusarium oxysporum* f.sp. *lactucae, Meloidogyne ethiopica, Phytophthora kernoviae, Pseudomonas syringae* pv. *actinidae,* viroids of solanaceous plants, new tomato viruses). The pests on the Alert List are selected by the EPPO Secretariat, mainly from the literature but also from suggestions of NPPOs of EPPO member countries. Their addition to the list is marked by an article in the EPPO Reporting Service which is a monthly newsletter on plant quarantine issues (freely available by e-mail). All pests on the Alert List are selected because they may present a phytosanitary risk for the EPPO region. The reasons for considering inclusion on the Alert List can be of various nature: pests which are new to science, new outbreaks, reports of spread, repeated interceptions in trade, etc. The Alert List is reviewed critically every year by the EPPO Panel on Phytosanitary Measures. It is not a quarantine list, and does not constitute a recommendation for phytosanitary action. The section 'possible risk' is a preliminary attempt by the EPPO Secretariat to identify the main elements of risk. Some of the pests may later be selected by relevant EPPO Panels and submitted to a full Pest Risk Analysis (PRA). As a result, they may be added to the EPPO A1 and A2 lists or, if the PRA shows the risk to be low, removed from the Alert List

3 PEST RISK ANALYSIS

The apparently 'simple' listing of pests raises many fundamental questions on how to select those to be included in the quarantine lists and which management options should be taken to prevent their introduction and spread. Previously, the assessment of risks presented by certain pests was based on expert judgment and decision was taken by consensus within EPPO, but this is now done on the basis of a PRA. The reasons for doing PRA include: interceptions of pests on imports, opening of new trade routes, and the emergence of potentially invasive pests in some parts of the world. From a regulatory point of view, existing phytosanitary measures may have to be modified to cope with new pests (e.g. *Agrilus planipennis, Anoplophora chinensis, A. glabripennis, Tuta absoluta, Rhynchophorus ferrugineus*).

Since the 1990s, EPPO has been working on a Pest Risk Analysis (PRA) decision-support scheme to better answer the particular needs of European and Mediterranean countries and provide a transparent and harmonized framework. An EPPO Panel on PRA development meets every year to further develop and improve this PRA decision-support scheme. It should be stressed that the overall lay-out of the EPPO PRA decision scheme follows the general framework given by the International Standard on Phytosanitary Measures no. 11 (FAO, 2007) by containing a similar sequence of three stages (initiation, risk assessment and risk management). The first initiation stage allows the analysts to reflect on the identity of the pest or pathways to be studied, as well as on the area concerned (one or several countries). The aim of the Risk Assessment stage is to determine the probability of the different events that will lead to the establishment of a pest (likelihood of entry, potential for establishment, capacity of dispersal, etc.) and then to evaluate the economic, environmental and social impacts of its introduction. To assess the likelihood of pest establishment, climate matching studies using computerized models (e.g. CLIMEX) can be used to visualize on maps which areas would be suitable to the pest development across the EPPO region. The last stage on Risk Management aims to define possible phytosanitary measures for all pathways which are likely to introduce (or disseminate) the pest. In most cases, to mitigate the risk, a series of measures (e.g. place of production freedom, treatments during crop production, inspections and tests) will be recommended to reduce the risk to an acceptable level. The EPPO decision-support scheme is available on the EPPO website and revised by the Panel on PRA development on an annual basis (EPPO, 2009). In addition, a computerized version of the scheme will be available shortly to facilitate the work of risk analysts.

4 DEVELOPMENT OF PEST-SPECIFIC STANDARDS

When a quarantine status is considered appropriate for an emerging pest, EPPO Standards can also be developed in order to provide guidance to the NPPOs, in particular on diagnostic methods, as well as on eradication and containment programmes.

The early detection and identification of an emerging pest is crucial, especially when eradication or containment action is envisaged. In most cases, eradication or containment measures have to be implemented as soon as possible to be successful. EPPO has initiated a programme for the development of diagnostic protocols for regulated pests. So far, nearly a hundred pest-specific protocols have been prepared by EPPO Panels and more are in preparation. Some of these protocols concern emerging pests (e.g. *Bursaphelenchus xylophilus, Rhynchophorus ferrugineus*), and propose harmonized detection and identification techniques which can be used by diagnostic laboratories.

EPPO Panels have also developed standards on eradication and containment programmes (National regulatory control systems) against specific pests. In these standards, guidance is given on delimiting surveys, sampling and trapping methods, and measures which can be taken in infested areas. At present, ten standards have been prepared and some of them concern emerging pests (e.g. *Bursaphelenchus xylophilus, Bactrocera zonata*). In addition, EPPO has developed a general standard on contingency planning in order to ensure a rapid and effective response of NPPOs to pest outbreaks. It is important for NPPOs to define what might be the most efficient response which will have to be given before an outbreak takes place. In practice, eradication/containment campaigns involve a large number of different actors (policy-makers, inspectors, laboratories, extension services, growers, media etc.) and good coordination is essential to achieve success. At present, general guidance is provided in the EPPO standard but contingency plans for specific pests still remain to be drafted. All Standards can be freely accessed from the EPPO website (www.eppo.org).

5 EXCHANGE OF INFORMATION

In its own Convention, EPPO has clearly been assigned a mission of information exchange, and it is obvious that for emerging pests a rapid and efficient information exchange is highly needed. Each member country has to report on the existence, outbreak or spread of pests to EPPO which in turn has to convey this information to all its members. Since its creation, EPPO has provided a Reporting Service to its member countries. In its present form, the EPPO Reporting Service is a monthly newsletter which reports on events of phytosanitary concern and focuses on new geographical records, new host plants, emerging species (pests, diseases, and invasive alien plants). This newsletter contains official reports made by NPPO as well as information which is collected by the EPPO Secretariat from the scientific literature or other sources. The EPPO Reporting Service can be obtained freely by e-mail by any interested person. The collected information (geographical distributions, lists of host plants) is then stored in a database (PQR). This database is currently under reconstruction but it will be soon available from the EPPO website.

6 CONCLUSIONS

In the context of increasing trade and climate change, the issue of emerging pests is of particular concern on all continents. There is a growing concern that these emerging species are not only causing direct crop losses to agriculture or forestry but may also threaten ecosystems and be responsible for biodiversity losses. Emerging pests are clearly challenges for all plant health stakeholders (citizens, researchers, growers, plant protection services, international bodies, etc.). Further research is needed to better understand the biology and epidemiology of emerging pests, and to better understand the mechanisms of pest emergences. There is also a need to develop and further improve tools to predict patterns of spread and establishment potential of pests. In addition, the timely detection and availability of suitable diagnostic tools is a key element in the management of emerging pests. Because these species can threaten both cultivated and non-cultivated environments, efforts should continue to be made to facilitate information exchange and cooperation between the different regions of the world, and regional plant protection organizations such as EPPO have a fundamental role to play in this field.

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