

Risk assessment procedures in Argentina for the safe import, quarantine, and release of biological control agents against pests

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Summary

The decision to import and release biological control agents (BCAs) from outside of one's country is a national one which may involve various authorities but will be overseen by the national plant protection organisation with responsibilities described in the International Plant Protection Convention. This paper provides an overview of the decision processes and roles of these authorities in Argentina. Argentina has a long history of coordination with the other Southern Cone nations on plant protection and other technical sanitary and phytosanitary matters associated with trade. This article reports on 25 years of evaluation, import, and release of BCAs classified as exotic. Not a single of import with a permit has faced rejection on the basis of phytosanitary requirements. This highlights the commitment of the region to the use of integrated pest management approaches that rely on international shipments of live insects and other beneficial organisms.

Keywords

Biological control agents – Import – ISPM No. 3 – Release – Risk assessment.

Introduction

In Argentina, the National Directorate for Plant Protection (DNPV) is the government division of the National Service for Agri-Food Health and Quality of Argentina (SENASA) that is assigned the functions that the International Plant Protection Convention (IPPC) establishes for national plant protection organisations (NPPOs). Among its actions is to intervene in agro-environmental biosecurity, including biological control agents (BCAs) and other types of beneficial organisms, such as pollinators (herein after referred to jointly as BCA). (These terms are used based on the following definitions: biological control agent: natural enemy, antagonist or competitor or other organism, used for pest control; beneficial organism: any organism directly or indirectly favourable to plants or plant products, including biological control agents.)

The International Standard for Phytosanitary Measures (ISPM) No. 3 (1) provides guidelines for risk management related to the export, shipment, import and release of biological control agents and other beneficial organisms. Among other aspects, it describes the role and responsibilities of NPPOs, exporters and importers of these agents. Beyond this, the Southern Cone Plant Health Committee (referred to by its acronym in Spanish, COSAVE), which is the regional plant protection organisation (RPPO) to which Argentina belongs, has Regional Plant Protection Standards (ERPF, or RSPM in English) with guidelines that describe in more detail the procedures and requirements for the import, infrastructure, quarantine, registration, and release of BCAs within the region. These are ERPF No. 4.1, 4.1.1, 4.2 and 4.2.1 (2, 3, 4, 5).

In this context, in 1997 Argentina regulated, through the Ministry of Agriculture, Livestock, Fisheries and Food of the Nation, Resolution No. 758/97 (6), the entry, quarantine and release of BCAs for the

control of agricultural pests, or intended for private use, teaching, demonstration, research or trials. In this way, the international general guidance of ISPM No. 3 was translated into a regional framework, developed under COSAVE, which is implemented on the national level with Resolution No. 758/97; national regulations align with the international and regional guidance.

Risk assessment

The process of importing an exotic BCA begins with the importer's request. This action involves the presentation of a form to the NPPO of Argentina in which information about the BCA, the pest to be controlled, the importer and the exporter must be detailed. It is important to note in this regard that ISPM No. 3 establishes that it is the responsibility of the importing NPPO to 'evaluate the documentation on the target pest and on the biological control agent and beneficial organisms supplied by the importer in relation to the acceptable level of risk' (Section 3.1.2). This focuses on the potential risk arising from the end use of the imported organism, but also implies managing risks during transport.

Once the application to receive the BCA in Argentina has been submitted and approved, the corresponding risk analysis is carried out. This risk analysis consists of the assessment of risk to the environment when the exotic BCA is released. The risk analysis covers a range of issues regarding the possible impact on the agroecosystem in relation to: its geographical distribution; its biology and ecology; its presence or absence in the country of destination; the form of control against the target pest (predation, parasitism); its taxonomic and prey specificity; behaviour of its population as a natural enemy of any native fauna present; its capacity for post-release establishment; and options for monitoring the introduced BCA after release.

By virtue of the result of the risk analysis and consultations with specialists in each case, an application for the importation of a BCA is either authorised or refused. The BCA shipment must be accompanied by a certificate from the NPPO of the exporting country.

The list of BCAs that have been evaluated in Argentina are listed in Table I. Some of these have not been allowed, due to lack of information or other barriers to proper completion of a risk management plan.

[Place Table 1 here]

Shipments

Two conditions that must be specified before importation are the quantity (units) of BCA for each shipment and the purpose for which they will be imported. The general conditions include the need for transport to be carried out in biosafe packaging, sealed, and labelled, with the declaration of the country of origin. The point of entry into the country and the time of validity of the permit must also be declared with the prior consent of the NPPO of the country of origin.

Each permit also required the review by the Ministry of Environment and Sustainable Development at the national level, as well as the environmental enforcement authorities of the competent Province, according to the final destination of the release.

Import of biological control agents

A key requirement to be met prior to importation is the designation by the importer of a responsible specialist in charge of the work programme. It is the function of this person in charge to ensure the correct identification, compliance with the biosecurity conditions in the packaging of the material at the time of entry into the country, and the subsequent transfer of the BCA to the facilities of the official quarantine station.

Once the import has been authorised, subject to formal communication by the NPPO of the country of destination, the shipment is controlled under specified biosecurity conditions, during both the entry and transfer of the material to the quarantine site. The organisms must then be quarantined for a variable period, according to the BCA in question. This is intended to ensure the identity and health status of the exotic BCA and to avoid a potential risk to the country's plant production.

Quarantine stations

Based on the guidelines of COSAVE's ERPF 4.1.1 on Infrastructure Requirements, Personnel, and Operational Procedures of BCA Quarantine Stations, the enclosure where quarantine takes place must meet certain requirements according to the level of biosecurity required and in order to be approved for its operation as an official Quarantine Station. These requirements cover the handling of the BCA, infrastructure conditions, training of the personnel involved, and the technical responsibilities of the Quarantine Officer during the process of entry, quarantine, and release of each shipment.

The Officer responsible for the quarantine must carry out the evaluation of the taxonomic identification and sanitary status of the imported biological material. If the presence of any contaminant is detected in the consignment that has arrived at the quarantine station, the consignment must be destroyed.

While most of the procedures described are carried out at the national level, Argentina also has experience of working with Chile through the framework of a binational programme for suppression of the *Sirex noctilio* pest. In this case, since both countries were interested in using BCA for the control of the pest, the official quarantine stations of Argentina and Chile coordinated the related evaluation and studies, with the aim of safely introducing CBA shipments from a third country into both countries.

Release of the biological control agent

If the results of the quarantine studies are satisfactory, the Director of the NPPO of the destination country (in this case, Argentina) provides a formal note approving release into the environment. Field releases are monitored, in line with the work plan presented by the applicant, with the aim of verifying the establishment or not of the BCA in the area of release, as well as the effectiveness in the control of the target pest. The duration of this monitoring period is determined on a case-by-case basis depending on the project proposed by the applicant.

Outcomes

Applicants request import to Argentina of live insects for research, biocontrol, or pollination. After the evaluation is completed and permits issued, there has not been a single rejection on phytosanitary grounds of a shipment of exotic BCAs for import and release since the legal framework for risk analysis was established in Argentina. There is now extensive experience of importing shipments, the monitoring of processes in quarantine enclosures, the subsequent release to the environment, and even the implementation of compliance protocols. The general conditions of shipments of live BCAs into Argentina have been found to be safe. This experience demonstrates the importance of having a regularly updated regulatory framework in force based on the general international guidelines, and regional and more detailed national requirements, as is the case in Argentina. This risk analysis system ensures shipments of BCAs have been free of contaminants and minimises possible negative impacts to the environment while facilitating pest control.

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Table 1 List of biological control agents evaluated in Argentina

Year of application	Biological control agent	Pest species to be controlled
1996	<i>Ageniaspis citricola</i> <i>Citrus ageniapsis</i>	<i>Phyllocnistis citrella</i>
1997	<i>Cystiphora</i> Schmidt <i>Bradyrrhoa gilveolella</i>	<i>Chondrilla juncea</i>
1998	<i>Diachasmimorpha longicaudata</i> and <i>D. tryoni</i> <i>Deladenus siricidicola</i>	<i>Anastrepha fraterculus</i> and <i>Ceratitis capitata</i> <i>Sirex noctilio</i>
1999	<i>Spalangia cameroni</i> and <i>S. gemina</i> <i>Megarhyssa nortoni</i> and <i>Rhyssa persuasoria</i>	<i>Haematobia irritans</i> <i>Sirex noctilio</i>
2000	<i>Carpovirus</i> <i>Cotesia flavipes</i>	<i>Cydia pomonella</i> <i>Diatraea saccharalis</i>
2003	<i>Ascogaster cudridentatus</i>	<i>Cydia pomonella</i>
2004	<i>Semiela cheresensis</i> <i>Megarhyssa nortoni</i>	<i>Phyllocnistis citrella</i> <i>Sirex noctilio</i>
2005	<i>Mastrus ridibundus</i> <i>Cotesia flavipes</i> <i>Eretmocerus mundus</i>	<i>Cydia pomonella</i> <i>Diatraea saccharalis</i> <i>Bemisia tabaci</i> and <i>Trialeurodes vaporariorum</i>
2007	<i>Orius insidiosus</i> <i>Neoseiulus californicus</i> <i>Steinernema carpocapsae</i>	<i>Western Franklioniella</i> and <i>Thrips tabaci</i> <i>Tetranychus urticae</i> <i>Cydia pomonella</i>
2008	<i>Macrocentrus ancyliovorus</i> <i>Megarhyssa nortoni</i>	<i>Annoying grapholite</i> <i>Sirex noctilio</i>
2009	<i>Orius insidiosus</i> <i>Iphiseius (=Amblyseius) degenerans</i>	<i>Western Franklioniella</i> and <i>Thrips tabaci</i> <i>Franklioniella occidentalis</i>
2011	<i>Orius insidiosus</i>	<i>Franklioniella occidentalis</i>
2012	<i>Beauveria bassiana</i> , <i>Metarhizium anisopliae</i> and <i>Isaria</i> (= <i>Paecilomyces fumosoroseus</i>)	<i>Diaphorina citri</i> Kuwayama
2014	<i>Paranosema locustae</i> <i>Cleruchoides noackae</i> <i>Selitrichodes neseri</i>	<i>Dichroplus maculipennis</i> ; <i>D. elongatus</i> and <i>Scotussa lemniscata</i> <i>Thaumastocoris peregrinus</i> <i>Leptocybe invasa</i>
2016	<i>Paranosema locustae</i>	<i>Dichroplus maculipennis</i> , <i>D. elongatus</i> and <i>Scotussa lemniscata</i>
2017	<i>Selitrichodes neseri</i>	<i>Leptocybe invasa</i>
2018	<i>Metarhizium acridum</i>	<i>Schistocerca cancellata</i>
2019	<i>Steinernema feltiae</i>	<i>Cydia pomonella</i>

Year	Species	Objective of the introduction
2006	<i>Bombus impatiens</i>	Pollinator
2009	<i>Megachile rotundata</i>	