How could we improve safety of biological control?

Josep A. Jaques

This is a slightly different and updated version of an invited presentation at the ‘Ecology of Entomophaga’ meeting that took place in Freising (Germany) in September 2016.
Outline

• Biological control (BC) methods and its associated risks

• Why assessment is necessary and harmonization highly desirable

• IOBC/WPRS engagement in the risk assessment of biological control agents: the “Commission on the Harmonized regulation of Invertebrate Biological Control Agents” (CHIBCA)

• The joint EPPO-IOBC/WPRS Panel on “Safe Use of Biological Control Agents”

• Conclusions
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• The joint EPPO-IOBC/WPRS Panel on “Safe Use of Biological Control Agents”

• Conclusions
Biological Control has been widely used since first massive success in 1888
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*Icerya purchasi* (Maskell, 1878)
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Rodolia cardinalis
(Mulsant, 1850)
Biological Control has been widely used since first massive success in 1888
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Since then, many additional exotic species have been imported, mass reared and released as invertebrate biological control agents (IBCAs).
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5,715 introductions of 2,384 species into 203 countries or islands over the past 130 years (Cock et al., 2016).

Most of these releases were made prior to the era of legislation, regulation and risk assessment of biological control agents (BCAs). Therefore, potential risks of these BCAs were not routinely studied with some exceptions.

However, there have been few reports of negative environmental effects.

Classical or inoculative BC: release of non-native natural enemies from the place of origin of the target alien pest with the aims of controlling the pest and permanent establishment in the system
Ranking of biological control methods according to the IPM hierarchy:

4. **Classical or inoculative BC**: release of non-native natural enemies from the place of origin of the target alien pest with the aims of controlling the pest and permanent establishment in the system.

3. **Seasonal inoculative BC**

2. **Inundative BC**

1. **Conservation BC**
Ranking of biological control methods according to the IPM hierarchy:

4. **Classical or inoculative BC:** release of **non-native natural enemies** from the place of origin of the target alien pest with the aims of controlling the pest and **permanent establishment** in the system.

3. **Seasonal inoculative BC:** release of **natural enemies, either indigenous or not**, which will control the pest while reproducing in the system for **less than one season**.

2. **Inundative BC**

1. **Conservation BC**
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3. **Seasonal inoculative BC**: release of natural enemies, either indigenous or not, which will control the pest while reproducing in the system for less than one season

* Aphidoletes aphidimyza (Rondani, 1847)  
* Aphidius colemani (Dalman, 1820)

https://www.koppert.es
Ranking of biological control methods according to the IPM hierarchy:

4. Classical or inoculative BC: release of non-native natural enemies from the place of origin of the target alien pest with the aims of controlling the pest and permanent establishment in the system

3. Seasonal inoculative BC: release of natural enemies, either indigenous or not, which will control the pest while reproducing in the system for less than one season

2. Inundative BC: massive release of natural enemies (usually pathogenic microorganisms), either indigenous or not, which will control the pest without self-perpetuation in the system

1. Conservation BC
Ranking of biological control methods according to the IPM hierarchy:

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![Lecanicillium longisporum](http://www.flickr.com/photos/koppert/2775537893/)
Ranking of biological control methods according to the IPM hierarchy:

1. **Conservation BC**: exploitation of resident natural enemies by providing additional resources (food, alternative prey, nesting places...), changing pesticide use frequencies and choosing selective products. This is the only preventative BC method.

2. **Inundative BC**: massive release of natural enemies (usually pathogenic microorganisms), either indigenous or not, which will control the pest without self-perpetuation in the system.

3. **Seasonal inoculative BC**: release of natural enemies, either indigenous or not, which will control the pest while reproducing in the system for less than one season.

4. **Classical or inoculative BC**: release of non-native natural enemies from the place of origin of the target alien pest with the aims of controlling the pest and permanent establishment in the system.

Persistence +
1. Conservation BC  
   (preventive)

2. Inundative BC  
   (curative)

3. Seasonal inoculative  
   (curative)

4. Classical  
   (curative)
1. Conservation BC (preventive)
   - Origin of NE: Indigenous or naturalized
   - Reproduction: Yes
   - Establishment: Already established
   - Attributes: From specialists to generalists
   - Host range: Public-funded institutions

2. Inundative BC (curative)

3. Seasonal inoculative (curative)

4. Classical (curative)
1. Conservation BC
   (preventive)

2. Inundative BC
   (curative)

3. Seasonal inoculative
   (curative)

4. Classical
   (curative)

Persistency

Negligible ecological risk

Attributes
- Establishment: Already established
- Host range: From specialists to generalists
- Reproduction: Yes

Origin of NE
- Indigenous or naturalized

Organization in charge: Public-funded institutions
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Possible transient side-effects on non-target species; dispersal could be a key risk factor when open field massive releases of flying insects (e.g., Trichogramma spp.)
1. **Conservation BC**  
    (preventive)  
    - Origin of NE: Indigenous or naturalized  
    - Reproduction: Yes  
    - Establishment: Already established  
    - Host range: From specialists to generalists  
    - Organization in charge: Public-funded institutions

2. **Inundative BC**  
    (curative)  
    - Origin of NE: Indigenous, naturalized or non-native  
    - Reproduction: No  
    - Establishment: No  
    - Host range: As specialized as possible  
    - Organization in charge: Private companies

3. **Seasonal inoculative**  
    (curative)  
    - Origin of NE: Indigenous, naturalized or non-native  
    - Reproduction: Yes  
    - Establishment: Seasonal only  
    - Host range: From specialists to generalists  
    - Organization in charge: Private companies

4. **Classical**  
    (curative)
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- Persistence

- +

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Possible permanent side-effects on non-target species
So, indigenous IBCAs are less risky if properly used, especially in Conservation BC but also in, Seasonal Inoculative and Inundative BC.

Interestingly, there is good examples of fortuitous BC where an indigenous natural enemy has resulted in satisfactory control of a non-native pest.
So, indigenous IBCAs are less risky if properly used, especially in Conservation BC but also in Augmentative BC. There is good examples of fortuitous BC where an indigenous natural enemy has resulted in satisfactory control of a non-native pest.

*Nesidiocoris tenuis* (Hem. Miridae) and *Tuta absoluta* (Lep. Gelechiidae) in tomatoes in Spain

*Eretmocerus mundus* (Hym. Aphelinidae) and *Bemisia tabaci* (Hem. Aleyrodidae) in protected crops in Spain

*Euseius stipulatus* (Acari, Phytoseiidae) and *Panonychus citri* (Acari, Tetranychidae) in citrus in Spain
So, indigenous IBCAs are less risky if properly used, especially in Conservation BC but also in Augmentative BC. There is good examples of fortuitous BC where an indigenous natural enemy has resulted in satisfactory control of a non-native pest.

Therefore, a logical way to reduce the risks of releasing non-native species would be to use native species.

How could we improve safety of biological control?

Use NATIVE IBCAs.
So, indigenous IBCAs are less risky if properly used, especially in Conservation BC but also in Augmentative BC. There is good examples of fortuitous BC where an indigenous natural enemy has resulted in satisfactory control of a non-native pest.

Therefore, a logical way to reduce the risks of releasing non-native species would be to use native species.

However, many non-native species have been released without even considering the use of indigenous species.

Interestingly, attempts at biological control often failed because they ignored existing food webs and the fact that the top-down control of populations is often the outcome of multiple species interacting at different trophic levels.
A good example is the case of citrus aphids in Spain, the non-native species *Aphis gossypii* and *A. spiraecola*, which are considered key pests of clementine mandarins.
The Braconidae *L. testaceipes* was introduced in the seventies in a classical BC program. However, *A. spiraecola* is not a suitable host for this parasitoid (Tremblay et al., 1983). Recent studies have demonstrated that the parasitoid guild of *A. spiraecola* is highly dominated by native hyperparasitoids (Gómez-Marcos et al., 2015). Therefore, the key to successful management of this aphid is the early arrival of native predators, which can be achieved via Conservation BC (Gómez-Marcos et al., 2016) using grassy cover crops and banker plants (seasonal inoculative BC).
In the case of non-native IBCAs, the likelihood of establishment, natural dispersal, host range extent (generalist vs specialist) and direct and indirect effects on non-target organisms are crucial attributes to take into account (Environmental Risk Assessment, ERA) before a release permit is eventually issued.
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On the one hand, establishment is a prerequisite in Classical BC but should be avoided in Augmentative BC.
Outline

• Biological control (BC) methods and its associated risks

• Why assessment is necessary and harmonization highly desirable

• IOBC/WPRS engagement in the risk assessment of biological control agents: the “Commission on the Harmonized regulation of Invertebrate Biological Control Agents” (CHIBCA)

• The joint EPPO-IOBC/WPRS Panel on “Safe Use of Biological Control Agents”

• Conclusions
There are a lot of important questions that need discussion and agreement:

• How is the indigenism/exoticism of an IBCA defined?

• Should an IBCA naturally occurring in the Mediterranean Basin be considered native for Europe as a whole?

• What about different eco-types, strains... (i.e., diapausing strains)?

• Is likelihood of establishment the same throughout the assessment area (Europe)?

• IBCAs are not aware of political borders........should we consider eco-regions?
171 IBCAs commercialized for augmentative releases in Europe (De Clercq et al., 2011; EPPO, 2011; van Lenteren, 2012)

Fauna Europaea (2012) (http://www.faunaeur.org/)
Universal Chalcidoidea Database (2012) (http://www.nhm.ac.uk/research-curation/research/projects/chalcidoids/database/)

EPPO (2011) EPPO Standards on Safe use of Biological Control - PM 6/3 - Version 2011. List of biological control agents widely used in the EPPO region (http://archives.eppo.int/EPPOSTandards/biocontrol.htm; August 2016)
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Many non-native IBCAs have established in Europe, mostly in the Mediterranean Basin.

171 natural enemy species commercialized for augmentative releases in Europe (De Clercq et al., 2011; EPPO, 2011; van Lenteren, 2012)
Concerns about establishment of non-native IBCAs

Some of these species are no longer included in the EPPO positive list (EPPO, 2017):

- **Cales noacki** Howard, 1907 (Hymenoptera: Aphelinidae)

![Image of Cales noacki](https://www.nhm.ac.uk/research-curation/research/projects/chalcidoidea/database/)

![Map showing distribution of Cales noacki](https://www.faunaeur.org/)

_Cales noacki_. Female attacking _Aleurotrichus floccosus_.

Photo & © Mike Rose

Universal Chalcidoidea Database (2012)

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Concerns about establishment of non-native IBCAs

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- *Cales noacki* Howard, 1907 (Hymenoptera: Aphelinidae)
- *Lysiphlebus testaceipes* (Cresson, 1880) (Hymenoptera: Braconidae)

Lysiphlebus testaceipes attacking cotton aphids. J.K. Clark- University of California Statewide IPM Project
UC-IPM Online- Statewide IPM Program (2012)
(http://www.ipm.ucdavis.edu/)

Fauna Europaea (2014) (http://www.faunaeur.org/)
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These species have a wide host range and have shown non-target effects. In some areas they have spread into non-target habitats, where they have attacked non-target host species and outcompeted native natural enemies.
Concerns about establishment of non-native IBCAs

In a few cases, unintended introductions have even disrupted existing biological control

- *Encarsia pergandiella* (Hym. Encyrtidae), introduced in 1978 into Italy to control *Trialeurodes vaporariorum* (Hem. Aleyrodidae) spread to neighboring countries
Concerns about establishment of non-native IBCAs

In a few cases, unintended introductions have even disrupted existing biological control

- *Encarsia pergandiella* (Hym. Aphelinidae), introduced in 1978 into Italy to control *Trialeurodes vaporariorum* (Hem. Aleyrodidae) spread to neighboring countries

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• **171 natural enemy** species commercialized for **augmentative** releases in **Europe** (van Lenteren, 2012; EPPO, 2011)

How could we change this situation?
Concerns about establishment of exotics

- 171 natural enemy species commercialized for augmentative releases in Europe (van Lenteren, 2012; EPPO, 2011)

**By focusing on indigenous IBCA’s**
Concerns about establishment of exotics

- **171 natural enemy** species commercialized for **augmentative** releases in **Europe** (van Lenteren, 2012; EPPO, 2011)

![Pie chart showing 32.2% Indigenous and 67.8% Exotic]

By exploiting **FORTUITOUS BIOLOGICAL CONTROL**
Fortuitous biological control

Regulation of an exotic pest population by a native IBCA without deliberate introduction
Fortuitous biological control

Some examples in Europe:

*Neoseiulus cucumeris* against *Frankliniella occidentalis* (1985)
*Orius laevigatus* against *F. occidentalis* (1993)
*Macrolophus spp.* against *Trialeurodes vaporariorum* (1994)
*Anagyrus pseudococci* against mealybugs (1995)
*Eretmocerus mundus* against *Bemisia tabaci* (2001)
*Nesidiocoris tenuis* against *Tuta absoluta* (2003)
*Amblyseius swirskii* against *Bemisia tabaci* (2005)

*Euseius stipulatus* against *Panonychus citri*
*Euseius scutalis* against *Oligonychus perseae*
Fortuitous biological control

*Diglyphus isaea* against *Liriomyza spp.* (1984)

*Neoseiulus cucumeris* against *Frankliniella occidentalis* (1985)

*Orius laevigatus* against *F. occidentalis* (1993)

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Exploiting cases of fortuitous biological control could be a possible solution for Europe:

- Select IBCAs from the Mediterranean Basin:
Exploiting cases of fortuitous biological control could be a possible solution for Europe:

• Select IBCAs from the Mediterranean Basin:
  • Unlikely establishment at lower latitudes/ higher altitudes
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Exploiting cases of fortuitous biological control could be a possible solution for Europe:

- Select IBCAs from the Mediterranean Basin:
  - **Unlikely establishment at lower latitudes/ higher altitudes**

  *Permanent establishment* would be *improbable* due to *cold winters* and/or *short days*. If they were to establish, they would have done it already (same biogeographical region). However, climate change should be taken into account.
Exploiting cases of fortuitous biological control could be a possible solution for Europe:

- **Select IBCAs from the Mediterranean Basin:**
  - Unlikely establishment in lower latitudes/ higher altitudes
  - Highly effective when correctly identified and managed
SUCCESS OF BC IN SWEET PEPPERS IN SOUTHEAST SPAIN
(9,300 ha)

The acreage under biological control exponentially increased in recent years

Releases of the predatory mite *Amblyseius swirskii* and pirate bug *Orius laevigatus* provide effective control of the two key pests in sweet pepper: *Bemisia tabaci* and *Frankliniella occidentalis*.

Nowadays ALL sweet pepper production in both areas is produced using these indigenous IBCA’s as the main pest control method.
SUCCESS OF BC IN TOMATOES IN ALMERÍA, SOUTHEAST SPAIN (8,000 ha)

- Until recently, chemical control was the most common pest management strategy in greenhouse tomatoes in Spain.
- The appearance of *T. absoluta* in 2005 dramatically changed this situation.
SUCCESS OF BC IN TOMATOES IN ALMERÍA, SOUTHEAST SPAIN (8,000 ha)

- The inoculation of the predatory mirid bug *Nesidiocoris tenuis* in the nursery resulted very effective in controlling tomato key pests: *Bemisia tabaci* and *Tuta absoluta*.

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However, non-native IBCAs are still necessary when indigenous IBCAs do not effectively attack the target pest.

What should we do in those cases?
Outline

• Biological control (BC) methods and its associated risks

• Why assessment is necessary and harmonization highly desirable

• IOBC/WPRS engagement in the risk assessment of biological control agents: the “Commission on the Harmonized regulation of Invertebrate Biological Control Agents” (CHIBCA)

• The joint EPPO-IOBC/WPRS Panel on “Safe Use of Biological Control Agents”

• Conclusions
To help to answer that question, IOBC-WPRS established the **Commission on the Harmonization of Invertebrate Biological Control Agents (CHIBCA)** in 2003.
Commission on the Harmonization of Invertebrate Biological Control Agents (CHIBCA)

CHIBCA was established in 2003 with Franz Bigler as Convenor. The Commission had 7 members originally but also invited other scientists to attend meetings. In January 2006, Jeff Bale was elected by the Council of WPRS as Convenor of the Commission. He was replaced by Josep Jaques in October 2013. Members of CHBCA take part in the Joint EPPO/IOBC Panel on Safe Use of Biological Control Agents.
So far, different international organizations have produced guidance on the risk assessment for IBCAs, including:

- the European Plant Protection Organization (EPPO: PM 6 - Safe use of biological control),

http://archives.eppo.int/EPPOSta ndards/biocontrol.htm
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However, at present, the use of IBCAs in Europe is not regulated by any EU directive such as EU Council Directive 1107/2009/EC that regulates the use of microorganisms, botanical substances and semiochemicals as plant protection products.
At EU level relevant regulations include those aimed at plant pests, invasive species, marketing of pesticides and protection of habitats. The first three have been recently amended (the New Plant Health Regime was approved in December 2016). Further amendments to accommodate biological control agents are unlikely in the near future.
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As a result, there is a ‘patchwork of regulation’ of IBCAs across Europe, in which some countries have strict controls on the import of non-native species enshrined in national legislation, and other countries, sometimes directly neighboring countries, have no restrictions on the import and release of non-native species.

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The absence of regulation has been cited as one of the main **reasons for the success of IBCA-based biological control in Europe** (mostly seasonal inoculative BC), and it is the case that there have been relatively few reports of any negative environmental effects arising from such unregulated releases.
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The fact that countries with regulation have different ‘information requirements’ within their permit application forms means that companies have to produce separate dossiers for each country to which an application is made (seasonal inoculative BC). These differences can result in contradictory decisions in countries with similar eco-climatic conditions, even for classical BC (e.g., *Torymus sinensis* (Hym. Torymidae) against *Drycosmus kuriphilus* (Hym. Cynipidae)) and therefore, situations as those with *H. axyridis* could happen again.
Aims of the Commission on the Harmonization of Invertebrate Biological Control Agents (CHIBCA) (2003)

- To collect information on the status of regulation requirements for IBCAs in countries of the WPRS and to compile an overview.
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✓ To collect information on the status of regulation requirements for IBCAs in countries of the WPRS and to compile an overview

✓ To (co-)organize workshops with countries that participated in the data compilation together with stakeholders, including scientists, the biocontrol industry and regulators
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  ✓ Rotterdam 2011
  ✓ Budapest 2015
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- To up-date and improve EPPO’s list of safe and widely used organisms (origin of the Joint EPPO-IOBC Joint Panel on Safe Use of Biological Control)
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- To propose a consultation procedure that will allow exchange and use of information and data on IBCAs between WPRS countries
- To propose a permanent expert group (= FREG) to give advice on the regulation of IBCAs
Commission on the Harmonization of Invertebrate Biological Control Agents (CHIBCA)

In 2003, Franz Bigler was contacted by the EU-DG Research and a meeting was held in early 2004 to discuss the idea of launching a policy support activity on the harmonized regulation of invertebrate biocontrol agents. A first meeting of the Commission was convened at a workshop in Zurich in July 2004. 20 biocontrol scientists, regulators and representatives of commercial companies were invited to attend the meeting.
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At this meeting a decision was made to submit a project (REBECA) to the EU with Ralf-Udo Ehlers as coordinator.
Commission on the Harmonization of Invertebrate Biological Control Agents (CHIBCA)

REBECA was approved and until 2007, CHIBCA remained inactive as different members participated in the EU-funded project.
Commission on the Harmonization of Invertebrate Biological Control Agents (CHIBCA)

REBECA was an EU policy support action to:

(1) **review** possible **risks of biological control agents**, 

(2) **compare regulation** in the **EU** and the **USA** and

(3) to **propose alternative**, less bureaucratic and **more efficient regulation procedures** maintaining the same level of safety for human health and the environment but accelerating market access and lowering registration costs
Flowchart summarizing a hierarchical environmental risk assessment (ERA) scheme for arthropod biological control agents (van Lenteren et al. 2006)

- Safe IBCAs are identified early in the evaluation and this saves resources.
- Only doubtful species go through the whole process
- Useful for both quick scan and comprehensive evaluation

Flowchart summarizing a hierarchical environmental risk assessment scheme for arthropod biological control agents (van Lenteren et al. 2006)

Native IBCAs which are usually safe

Flowchart summarizing a hierarchical environmental risk assessment scheme for arthropod biological control agents (van Lenteren et al. 2006)

Exotic IBCA for glasshouse use (augmentation):

If establishment unlikely, usually safe

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Exotic IBCA for glasshouse use (augmentation):

If establishment unlikely, usually safe
If establishment possible, further evaluation
If establishment is certain, these IBCAs are detected very early in the evaluation process and can be excluded from release without further studies

Flowchart summarizing a hierarchical environmental risk assessment scheme for arthropod biological control agents (van Lenteren et al. 2006)

Exotic IBCAs attacking related and unrelated non-targets (generalists) and/or valued targets (i.e., protected species) are excluded without studying dispersal and non-target effects
Flowchart summarizing a hierarchical environmental risk assessment scheme for arthropod biological control agents (van Lenteren et al. 2006)

Exotic IBCAs released in Northern Europe (where establishment is unlikely) versus the Mediterranean (where establishment is most likely)

Other important **deliverables from REBECA:**

- **Application form** for the Import and Release of Macrobial (Invertebrate) Biological Control Agents
- **Guidance document**
Commission on the Harmonization of Invertebrate Biological Control Agents (CHIBCA)

In 2007, CHIBCA was ‘reactivated’. Jeff Bale and the Presidents of IOBC-WPRS (F Bigler) and IOBC Global (J van Lenteren) met several times with the Director General (DG) of EPPO to discuss possible collaboration between EPPO and IOBC based on a recommendation from REBECA. EPPO and IOBC agreed to establish a joint panel which met for the first time in March 2008 in Wageningen.
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The primary business was to consider recommendations for the addition or deletion of species from the EPPO Positive List created in 2001 and reviewed in 2002, only.

As REBECA had proposed updated criteria for placing species on the Positive List, the DG of EPPO (Chair of the Joint Panel) agreed to discuss with the EPPO Council in June 2008 the adoption of the new criteria.
Achievements of the Commission on the Harmonization of Invertebrate Biological Control Agents (CHIBCA)

 ✓ The Positive List of Safe Biological Control Agents, EPPO standard PM 6(3), has been updated annually and criteria for inclusion were reviewed in the Moscow meeting (October 2017)

This List is an EPPO recommendation to member countries to use a simplified procedure for introduction and releases of the BCAs listed.
Achievements of the Commission on the Harmonization of Invertebrate Biological Control Agents (CHIBCA)

European and Mediterranean Plant Protection Organization
Organisation Européenne et Méditerranéenne pour la Protection des Plantes

EPPO Standards on Safe use of Biological Control - PM 6/3 - Version of November 2015

List of biological control agents widely used in the EPPO region

Specific scope
This standard gives a list of biological agents widely used in the EPPO region, to facilitate decisions on the import and release of biological control agents within EPPO countries.

Specific approval and amendment
First approved in September 2001. Revisions of the list are not subject to approval by EPPO Council, but are decided by the Panel on Safe Use of Biological Control.

- Introduction and explanatory text
- Appendix I - Commercially used biological agents
- Appendix II - Successfully introduced classical biological control agents
- Appendix III - List of biological control agents formerly recommended by EPPO

Download appendix I, II & III
Achievements of the Commission on the Harmonization of Invertebrate Biological Control Agents (CHIBCA)

Commercially used BCAs: 99 spp.

- 14 Coleoptera, 4 Diptera, 8 Hemiptera (Heteroptera), 48 Hymenoptera, 1 Neuroptera,
- 3 Thysanoptera, 14 Acari, 7 Nematoda

Successfully introduced classical BCAs: 42 spp.

- 8 Coleoptera, 1 Diptera, 33 Hymenoptera

List of BCAs formally recommended by EPPO: 3 spp. (with supporting evidence for this decision)

- 1 Coleoptera (H. axyridis), 2 Hymenoptera (C. noacki, L. testaceipes)
Achievements of the Commission on the Harmonization of Invertebrate Biological Control Agents (CHIBCA)

REBECA made a further important recommendation that the EPPO-IOBC joint panel should provide on request, non-binding advice to EPPO countries (including EU member states) on the safety of ‘first releases’ of non-native species in Europe/EPPO region (FREG).
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REBECA made a further important recommendation that the EPPO-IOBC joint panel should provide on request, non-binding advice to EPPO countries (including EU member states) on the safety of ‘first releases’ of non-native species in Europe/EPPO region (FREG).

As soon as it was clear that the EU had no desire to introduce any specific legislation for IBCAs, it was evident that any harmonization would have to be on a voluntary basis. Moreover, this also meant that the creation of an EU panel of experts to evaluate new applications, the FREG, was not going to happen.
Achievements of the Commission on the Harmonization of Invertebrate Biological Control Agents (CHIBCA)

However, expertise in biological control in some EU member states (and EPPO countries in general) is limited and this might prevent an appropriate scientific analysis of dossiers containing ERA data, especially for species that had never been previously released in a European country.
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However, expertise in biological control in some EU member states (and EPPO countries in general) is limited and this might prevent an appropriate scientific analysis of dossiers containing ERA data, especially for species that had never been previously released in a European country.

Therefore, EPPO undertook to discuss the creation of this FREG, which could be the existing Joint EPPO/IOBC Panel, at EPPO Council in 2008 and again in 2013....

...but it was rejected by the Working Party on Phytosanitary Regulations as it is not within the remit of EPPO to provide advice to individual countries and other legal issues.

Resource and legal implications prevented IOBC-WPRS from taking on this responsibility alone.
Achievements of the Commission on the Harmonization of Invertebrate Biological Control Agents (CHIBCA)

Interestingly, though, EFSA Plant Health Panel, which is an existing EU “expert group” on these matters, evaluated in 2014, upon request from Portugal, about the risks to plant health of the intentional release of a weed biological control agent.
Achievements of the Commission on the Harmonization of Invertebrate Biological Control Agents (CHIBCA)

Interestingly, though, EFSA Plant Health Panel, which is an existing EU “expert group” on these matters, evaluated in 2014, upon request from Portugal, about the risks to plant health of the intentional release of a weed biological control agent. Although it is not under the remit of EFSA to evaluate IBCAs, such an expert group already in place in Europe could in theory consider requests from member states for the evaluation of a dossier (as with Portugal and *T. acaciaelongifoliate*), or provide guidance on how this could be delivered via a new panel.
Achievements of the Commission on the Harmonization of Invertebrate Biological Control Agents (CHIBCA)

The application form, together with guidance document, developed during REBECA were presented and discussed at the meetings of the joint EPPO-IOBC panel. The Standard was finalized and submitted for adoption at the meeting in 2010 and later published in the EPPO/OEPP Bulletin 40, 2010 as PM6/2(2). The revision of the Standard (now PM6/2 (3)) was discussed during the meeting of the Panel in 2013 and finalized in April 2014.
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At this moment (October 2017), two new documents are under discussion within the panel:

- Documentation to Support the Addition of an organism to the Positive List
- Basic part of the draft EPPO Standard PM 6/XX ‘Decision-support scheme (DSS) for import and/or release of invertebrate biological control agents (IBCA) of plant pests (excluding pathogens)’
Achievements of the Commission on the Harmonization of Invertebrate Biological Control Agents (CHIBCA)

Twice, in 2011 (Rotterdam) and 2015 (Budapest), workshops where all interested stakeholders (scientists, regulators, industry) met were organized in connection with the meeting of the EPPO/IOBC joint panel. In both cases, there was ample support to proposals for better harmonization of applications and decision making processes.
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...things do not look as if they are going to change within EU unless an unforeseen environmentally damaging release (e.g., another “H. axyridis”-like IBCA) makes the inclusion of IBCAs in broader ‘environmental protection’ legislation’, which could result in a halt in the introduction of non-native species in Europe.

Therefore, it would be wise for all EU member states to voluntarily adopt a code of risk assessment (e.g., EPPO standards) as soon as possible, or run the risk of having a more expensive, bureaucratic and compulsory system introduced, which could seriously undermine the contribution of biological control to pest management as well as the viability of the industry in Europe.
Conclusions

Whatever it happens in the future, CHIBCA and IOBC-WPRS will do their best to help taking the most sound decisions and maintain biological control as one of the key methods in modern sustainable crop protection.

Thank you for your attention and join IOBC-WPRS now!

www.iobc-wprs.org → „membership“