NAPPO
North American Plant Protection Organization
Organización Norteamericana de Protección a las Plantas
MEXICO - USA - CANADA

NAPPO Regional Standards for Phytosanitary Measures (RSPM)

RSPM 7
Guidelines for Petition for First Release of Non-indigenous Phytophagous Biological Control Agents

The Secretariat of the North American Plant Protection Organization
1431 Merivale Road, 3rd Floor, Room 140
Ottawa, Ontario, Canada, K2B 0B9

Publication history:
This is not an official part of the standard.

Approved: October 14, 2001
Revised: April 18, 2007
Revised: October 20, 2008
Revision initiated: 05-11-2013 – updated editorial formatting (RLee)
Expert Group initiated revision: 30-01-2014
Expert Group revision: 19-08-2014
Country consultation: January 15-April 15, 2015

Contents

Review

NAPPO Standards for Phytosanitary Measures are subject to periodic review and amendment. The next review date for this Standard is 2019. This standard was last reviewed in 2015. A review of any NAPPO Standard may be initiated at any time upon the request of a NAPPO member country.

Approval

This Standard was approved on October 14, 2001, and updated on April 18, 2007 and October 20, 2008. The current revision was approved by the North American Plant Protection Organization (NAPPO) Executive Committee on xxx, 2015 and is effective immediately.

Approved by:

_____	_____
Greg Wolff Executive Committee Member Canada	Osama El-Lissy Executive Committee Member United States

_____
Javier Trujillo Arriaga
Executive Committee Member
Mexico

Implementation

No implementation plans are required for this standard.

Amendment Record

Amendments to this Standard will be dated and filed with the NAPPO Secretariat.

Distribution

This standard is distributed by the NAPPO Secretariat, to the Industry Advisory Group (IAG) and Sustaining Associate Members (SAM), the International Plant Protection Convention (IPPC) Secretariat, and to other Regional Plant Protection Organizations (RPPOs).

Introduction

Scope

These guidelines are intended to assist in drafting a petition for first release of non-indigenous phytophagous biological control agents of weeds. A standardized petition will also assist the reviewers and regulators in assessing the risk of non-indigenous introductions intended for biological control of weeds.

References

Balciunas, J.K. 1999. Code of best practices for classical biological control of weeds. P. 435, In: Spencer, N.R. ed. Proc. X Int. Symp. Biol. Control Weeds, 4-14 July. Montana State Univ., Bozeman, MT, USA.

DeClerck-Floate, R.A., P.G. Mason, D.J. Parker, D.R. Gillespie, A.B. Broadbent and G. Boivin. 2006. Guide for the Importation and Release of Arthropod Biological Control Agents in Canada. Agriculture and Agri-Food Canada Miscellaneous Publications, Ottawa, ON, Canada, 53 p.

Delfosse, E. S. 2005. Risk and ethics in biological control. Biological Control 35:319-329.

Forno, I.W. and M.F. Purcell. 1997. Exploration for agents. pp. 51-55, In: Julien M. and G. White, eds. Biological Control of Weeds: Theory and Practical Application. ACIAR Monograph No. 49.

Goolsby, J.A., R.D. van Klinken and W.A. Palmer. 2006. Maximising the contribution of native-range studies towards the identification and prioritisation of weed biocontrol agents. Australian Journal of Entomology 45: 276–286.

Harley, K. L. S. and I. W. Forno. 1992. Biological Control of Weeds: a Handbook for Practitioners and Students. Inkata. Melbourne, Australia. 74 p.

ISPM 3. 2005. *Guidelines for the export, shipment, import and release of biological control agents and other beneficial organisms.* Rome, IPPC, FAO.

ISPM 5. (Updated annually). *Glossary of phytosanitary terms*. Rome, IPPC, FAO.

McEvoy, P.B. and E.M. Coombs. 1999. Why things bite back: unintended consequence of biological control of weeds. pp. 167-195, In: Follett, P.A. and J.J. Duan. Non-target Effects of Biological Control. Kluwer Academic Publishers, Dordrecht, The Netherlands.

Medal, J., H. Norambuena, and D. Gandolfo, eds. 2005. Memorias del Segundo Curso Latinoamericano de Control Biológico de Malezas. June 7-10. Montelimar, Nicaragua. University of Florida-IFAS. Gainesville, Florida. 116 p.

National Research Council (U.S.). 1996. Ecologically Based Pest Management. Board Agriculture. National Research Council. National Academy Press. Washington, D.C. 144 p.

Olckers, T. and M.P. Hill. 1999. Biological control of weeds in South Africa (1990-1998). In: Olckers, T. and M.P. Hill, eds. African Entomology Memoir No. 1. Entomological Society of Southern Africa, Hatfield, South Africa. 182 p.

RSPM 5. (Updated annually). *NAPPO glossary of phytosanitary terms*. Ottawa, NAPPO.

RSPM 12. 2008. *Guidelines for petition for first release of non-indigenous entomophagous biological control agents*. Ottawa, NAPPO.

RSPM 40. 2014. *Principles of pest risk management for the import of commodities*. Ottawa, NAPPO.

Sheppard, A.W. 2003. Prioritising agents based on predicted efficacy: beyond the lottery approach. pp. 11-22 In: Improving the Selection, Testing and Evaluation of Weed Biological Control Agents. CRC for Australian Weed Management Technical Series 7.

Strong. D.R. and R.W. Pemberton. 2001. Food webs, risks of alien enemies and reform of biological control, pp. 57-74,. In: Wajnberg, E., J.K. Scott, and P.C. Quimby, eds. Evaluating Indirect Ecological Effects of Biological Control. CAB International, Wallingford, UK.

U.S. Congress, Office of Technology Assessment. 1993. Harmful Non-Indigenous Species in the United States. OTA-F-565. U.S. Government Printing Office, Washington, D.C. 391 p.

U.S. Congress, Office of Technology Assessment 1995. Biologically Based Technologies for Pest Control. OTA-ENV-636. U.S. Government Printing Office. Washington, D.C. 204 p.

USDA. 2003. Reviewer's manual for the Technical Advisory Group for biological control agents of weeds: guidelines for evaluating the safety of candidate biological control agents. United States Department of Agriculture Plant Protection and Quarantine 02/2003 02. (revised 2013).

Van Driesche, R., B.Blossey, M.Hoddle, S.Lyon, and R.Reardon, eds. 2002. Biological control of invasive plants in the eastern United States. US Forest Service Forest Health Technology Enterprise Team-2002-04, Morgantown, West Virginia. 413 p.

Wapshere, A.J., E.S. Delfosse, and J.M. Cullen. 1989. Recent developments in biological control of weeds. Crop Protection 8: 227-50.

Winston, R.L., M. Schwarzländer, H.L. Hinz, M.D. Day, M.J.W. Cock and M.H. Julien. Biological Control of Weeds: A World Catalogue of Agents and their Target Weeds. 5th ed., USDA Forest Service, Forest Health Enterprise Technology Team, Morgantown, West Virginia. FHTET-2014-XX. XXX pp. In Press.

Withers, T.M., L. Barton Browne, and J. Stanley. 1999. Host specificity testing in

Australasia: towards improved assays for biological control. Department of Natural Resources. Cooparoo, Queensland, Australia. 98 p.

Definitions, Abbreviations and Acronyms

Definitions of phytosanitary terms used in the present standard can be found in NAPPO RSPM 5 and in ISPM 5.

Outline of Requirements

Information is requested on the proposed action including: aspects of the biology, regulatory status, distribution and impact (positive and negative) of the target weed; biology, source, known host range, related species in the proposed area of introduction, quarantine procedures for the biological control agent; host-specificity; expected impacts (positive and negative) after release; and plans for post-release monitoring and impact assessment.

General Requirements

Each petition should be preceded by a title page, a table of contents, and a summary or abstract (see Appendix 1 for template). A petition to request the first release of non-indigenous phytophagous biological control agents of weeds in NAPPO member countries should include the following information, as known or available using reasonable efforts or means:

1. Information on the Proposed Action

1.1 Purpose of the release (reflects the title of the petition and provides more detail of what is expected).
1.2 Need for the release (explains why the agent is being introduced).
1.3 Reasons for choice of the phytophagous biological control agent.
1.4 Specific location of rearing/containment facility and name(s) of qualified personnel operating the facility.
1.5 Timing of the release (approximate month(s) of release), as well as factors that may affect timing of release (e.g. life stage of target pest or of biological agent to be used, season, agricultural practices, weather).
1.6 Location of initial release (including geographic coordinates).
1.7 Methods to be used after agent importation (e.g., rearing, multiplication, release).
1.8 Methods to be used for disposing of any host material, pathogens, parasites, and parasitoids accompanying the imported shipment.
1.9 Agencies and/or individuals that will be involved in the release and monitoring.

2. Target Weed Information

2.1 Taxonomy: scientific name, full classification, higher level phylogeny, synonymy, common names (if any), and sufficient characterization (including specific molecular characterization where needed) to allow unambiguous identification.
2.2 Biology and reproductive potential of the target weed.
2.3 Economic, environmental and health impacts, and benefits of the target weed.
2.4 Global distribution of the target weed.
2.5 Economically and ecologically important species in North America (introduced and native) phylogenetically related or habitat associated to the target weed.
2.6 Regulatory or pest status of the target weed in state, provincial or federal law.
2.7 Knowledge of status of other biological control agents (indigenous and introduced) that attack the target weed.
2.8 Life stage(s) and plant part(s) of target weed that are vulnerable to the biological control agent.

3. Biological Control Agent Information

3.1 Taxonomy: scientific name, synonymy, common names and name of the taxonomic authority making the identification of the biological control agent.
3.2 Methods used to identify the biological control agent (e.g., morphological, molecular).
3.3 Location of reference specimens (national collection).
3.4 Natural geographic range, other areas where introduced, and expected attainable range in North America (also habitat preference and climatic requirements of the organism).
3.5 Source of the biological control agent (laboratory/rearing facility/containment facility, original collection locality, name of collector, and name of identifier).
3.6 Biology and reproductive potential (including dispersal capability and damage inflicted on host plant).
3.7 Known host range based on published scientific literature, host data from museum specimens, and unpublished records.
3.8 History of past use of the biological control agent.
3.9 Pathogens/parasites of agent and how to eliminate them from a culture of the agent.
3.10 Standard operating procedures stating how the agent will be handled in containment.
3.11 Other closely related genera, sibling species or similar species of the biological control agent in North America.

4. Host-Specificity Testing

4.1 Selection of test plants: subspecies, species, subgenera, genera and other closely-related plants and plants recorded as hosts in the literature, museum labels or other unpublished collection records, agriculture pest reports, etc.; hosts of close relatives (i.e. in the same genus) of the candidate agent; unrelated plants having physical and chemical similarities to the weed, habitat associates, rare and endangered species (or their surrogates), and economic plants.
4.2 Laboratory tests (replicated no-choice and choice feeding tests, oviposition tests, development tests).

4.3 Information from the area of origin based on field surveys or experimental field manipulation.

5. Environmental and Economic Impacts of the Proposed Release

5.1 Known impact of the biological control agent on humans and other vertebrates.
5.2 Benefits of releasing this biological control agent (e.g., pesticide use, physical controls, no weed control, benefit-cost (see RSPM 40: 2014 for guidelines on cost-benefit analysis of management measures).
5.3 Direct impact of the biological control agent, including pre-release efficacy studies, intended effects on target plants, and direct effects on non-target plants.
5.4 Indirect impact of the biological control agent (e.g., potential effects on organisms that depend on the target pest and non-target species, including potential competition with resident biological control agents and other natural enemies).
5.5 Possible direct or indirect impact of the biological control agent on threatened and endangered species in North America.
5.6 Impact of the biological control agent on physical environment (e.g. water, soil and air resources).
5.7 Proposed contingency plan to mitigate undesired environmental impacts.

6. Post-Release Monitoring

A post-release monitoring plan should be included in the submission. Comparing predicted and observed behaviour and performance of biological control agents is necessary to validate and improve regulatory systems. Post-release monitoring of released agents can inform the development and screening of other biological control agents that are being considered for release. For example, additional screening or releases of new agents may be suspended or modified if a released agent proves to be ineffective, when control/suppression is achieved, or if unintended impacts are observed. Therefore, to assist in assessing program impacts, information is requested on plans for post-release monitoring.

In designing monitoring plans, the fact that pre-release baseline measurements of targets and non-target species provide for better monitoring data and documentation of impact should be taken into account. Also, some impacts may take years or decades to manifest while others may not be long lasting.

The key elements to monitor are:

6.1 Biological control agent establishment and spread.
6.2 Biological control agent and target weed densities and distribution over time.
6.3 Impact on the target weed and selected non-target species for which potential impacts are identified (e.g., threatened or endangered species, and taxonomically related or beneficial species). Data collected should include biological control agent host preference and development, and changes in the growth, survival, and reproduction of the target weed and selected non-target plants.

Researchers and practitioners should notify the National Plant Protection Organization (NPPO) and publish details on the economic and environmental impacts of programs, as

soon as practical after release of the biological control agent.

7. Pre-Release Compliance

7.1 Reference specimens (10 or more) must be deposited in the National Collection of the permitting country in advance of approval for release. The specimens should be of good condition for DNA extraction and with clear labels, indicating collection locality, latitude and longitude, date of collection, name of collector and any other pertinent information.

A letter explaining that the specimens are biological control agents and are being donated to the National Collection as part of the conditions under which release will be granted should accompany the specimens when they are submitted. A copy of the letter should be included in the submission to the permitting NPPO.

7.2 Information on the planned location and timing of the first release(s) should be included in the submission. Note: a letter confirming the release date and location should be provided to the NPPO within 3 months after release.

This appendix was adopted by the NAPPO Executive Committee on [Month day 201-].
The appendix is for reference purposes only and is not a prescriptive part of the standard.

Appendix 1

Title (e.g., 'Petition to introduce as a Biological Control Agent for, in.' or 'Host Plant Test List for')

Date:

Applicant: Name(s)
Applicant's Organization
Address

TABLE OF CONTENTS

Page

control agent

3. Biological Control Agent Information

3.1 Taxonomy
3.2 Methods used to identify the agent
3.3 Location of reference specimens
3.4 Natural geographic range, other areas where introduced and expected attainable range in North America
3.5 Source of the agent
3.6 Biology and reproductive potential
3.7 Known host range
3.8 History of past use of the agent
3.9 Pathogens, parasites, and hyperparasites and how to eliminate them from a culture of the agent
3.10 Standard operating procedures for handling the agent in containment
3.11 Closely related genera, sibling species or closely similar North American species

4. Host-Specificity Testing

4.1 Selection of test plants
4.2 Laboratory tests
4.3 Information from the area of origin based on field surveys or experimental field manipulation

5. Environmental and Economic Impacts of the Proposed Release

5.1 Known impacts on humans and other vertebrates
5.2 Benefits of releasing the biological control agent
5.3 Direct impact of the agent
5.4 Indirect impact of the agent
5.5 Possible direct or indirect impact on threatened and endangered species
5.6 Impact of the agent on physical environment
5.7 Proposed contingency plan to mitigate undesired environmental impacts

6. Post-Release Monitoring

6.1 Agent establishment and spread
6.2 Agent and target weed densities and distribution over time
6.3 Impact on the target weed and selected non-target species for which potential impacts are identified

7. Pre-Release Compliance

7.1 Reference specimens
7.2 Release information

8. **Acknowledgements**