



NAPPO Regional Standards for Phytosanitary Measures (RSPM)

RSPM No. 22

Guidelines for Construction and Operation of a Containment Facility for Insects and Mites used as Biological Control Agents

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Review

NAPPO Standards for Phytosanitary Measures are subject to periodic review and amendment. The next review for this NAPPO Standard is October 2009. 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 by the North American Plant Protection Organization (NAPPO) Executive Committee on October 17, 2004, and is effective immediately.

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Implementation

No Implementation Plans are required.

Amendment Record

Amendments to this Standard will be dated and filed with the NAPPO Secretariat. The most recent version will be posted on the NAPPO website at: www.nappo.org/stds_e.htm.

Distribution

This standard is distributed by the Secretariat of the NAPPO within NAPPO, including Sustaining Associate Members and Industry Advisory Groups, to the FAO IPPC Secretariat, to the ICGPP, and to the Administrative Heads of the Regional Plant Protection Organizations (RPPOs).

Introduction

Scope

These guidelines are intended to assist in the design, construction and operation of a facility for the containment of biological control agents (i.e. insects and mites) and associated organisms. These guidelines do not pertain to the containment of animal or plant pathogens.

References

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Definitions, Abbreviations and Acronyms

Biological control agent	A natural enemy, antagonist or competitor, and other self-replicating biotic entity used for pest control (FAO)
Biological control (Biocontrol)	Pest control strategy making use of living natural enemies, antagonists, or competitors and other self-replicating biotic entities (FAO)
Containment Facility	A building for the safe storage and/or propagation of a biological control agent (NAPPO)
Exotic	Not native to a particular country, ecosystem or ecoarea (applied to organisms intentionally or accidentally introduced as a result of human activities) (FAO)
Organism	Biotic entity capable of reproduction or replication, vertebrate or invertebrate animals, plants and micro-organisms (FAO)
Release (into the environment)	Intentional liberation of an organism into the environment (FAO)
Standard Operating Procedure (SOP)	Codified best laboratory practices for handling biological control agents in quarantine or containment (NAPPO)

Outline of Requirements

Information is presented on the design, construction and operation of a containment facility for the import, housing, culture and possible distribution of insects and mites for the biological control of insects, mites and weeds.

Requirements

1. Physical (Design and Construction) - Exterior

- 1.1 The facility should be located in areas that will present minimal risks to humans, agriculture and the environment.
- 1.2 Regulatory officials responsible for certifying the facility should be consulted before it is built.
- 1.3 Areas prone to natural disasters should be avoided when constructing new facilities.

- 1.4 Facilities should be surrounded by a buffer zone cleared of vegetation.
- 1.5 The facility should have only one primary entry and exit. The exterior doors of the facility should be lockable.

2. Physical (Structures and Equipment) - Interior

- 2.1 Surfaces of walls, ceilings, floors and furnishings (benches, cupboards, etc.) should have smooth surfaces which are easily cleaned and offer no hiding places or shadows (i.e. so insects on the surfaces can easily be distinguished).
- 2.2 Coloration - All surfaces and furnishings should be light in color so that insects will be easily seen. The surfaces should be washable. Floor construction and type is especially important. Since it is difficult to find commercial flooring which is not speckled or mottled by design, smooth concrete painted with washable white paint (epoxy) may be most appropriate. Monolithic flooring may also be an option, particularly if repeated cleaning and decontamination are necessary.
- 2.3 Seals - All seams, cracks or other openings around service outlets (electrical, plumbing, heating, ventilation), floor drains, furnishings (benches, cupboards), window and door frames, etc., must be caulked, taped or otherwise sealed and maintenance of these seals is essential throughout the life of the facility.
- 2.4 Windows - It is better if there are no windows. However, depending on the use of the facility and the level of pest risk associated with the organisms being handled, windows may be acceptable. All such windows should be permanently jammed so they cannot be opened, and all interior crevices around the windows should be caulked or otherwise sealed. In recognition that accidents can happen both inside and outside, each window should be made of a non-breakable material (e.g.) double-paned, wire-reinforced, Plexiglas. Glass blocks may also be an option for allowing light while reducing the risk of escapes.
- 2.5 Doors - A double-door system should be used, such that entry to the insect-confinement area is through a vestibule (or foyer), and each door should be self-closing and close quickly. If possible, the vestibule should have a system whereby one door cannot be opened at the same time as the other. It is also useful to have a system where the light in the vestibule automatically goes out when the laboratory door handle is opened (the theory being that most insects do not normally dart from lighted areas into darkness). Options to consider include commercially-available systems where forced air blows insects away from the doors. It is also important to have negative air pressure in the facility (See section 2.12). Above all, the doors must be tight-fitting and when closed all crevices must be sealed or covered, using magnetic seal strips, brush barriers or flexible flanges etc. It is recommended that the door does not reach the floor but has a raised sill that would improve security against insect escape. Emergency exits should be alarmed and not blocked with equipment. Note: Door security should not be only dependent upon electrical apparatus. Electrical service is subject to interruption for various reasons and such interruption could cause a breach in security.

- 2.6 Furnishings - Benches, cupboards, chairs, and other apparatus should be kept to a minimum in order to reduce clutter and the associated risk of offering hiding places for insects. All furnishings should be of simple construction with all crevices caulked or sealed, and if possible the colour should be white (or at least very light). Laboratory space should not be used for storage with the exception of materials when not in use.
- 2.7 Light Traps - During the hours when the laboratory is dark, there should be some provision for regular periodical operation of blacklight or regular light traps in the vestibule and outside the security areas. These traps not only serve as a form of security but as a continual monitoring tool to highlight problems so remedial measures can be taken. If the security system is working properly, no pest insects should be observed on the light traps.
- 2.8 Cages - All cages used to house insects should be of sturdy, simple construction, capable of being disinfected for re-use. They should also provide full security (sleeve cages) against insect escape when the entry ports are closed.
- 2.9 Change Rooms - Ideally, the laboratory should be equipped with change rooms for everyone entering the facility. Such rooms should open off the vestibule so that the white lab coats and coveralls used in the insect-handling areas can be left in the secure area when not in use. There should be mirrors located in the vestibule for self-examination to prevent hitchhiker organisms from getting out. Generally, excess clothing should not be taken inside the containment facility.
- 2.10 Emergency Electricity - The facility has containment features (negative air pressure or flow, light traps, waste treatment etc.) that are dependent on electricity. Provision will be necessary for emergency electricity generation in case of interruptions or loss of service.
- 2.11 Storage Room - Provision should be made for adequate storage of sterilized cages and all other materials. The storage room need not be within the security area but it is essential that there be enough storage area so that there will be no cluttering up the insect-handling areas with equipment that is not in use.
- 2.12 Heating, Air-conditioning and Ventilation (HVAC Systems)- Negative air pressure is recommended for the facility. When the door is opened, air rushes in to prevent the escape of small insects. There should be 80 mesh (per inch or equivalent) metallic screen on all vents (heating, air conditioning and ventilation), drains and cages. Hepa filters are recommended for facilities dealing with mites or very small insects.
- 2.13 The facility should be outfitted with a telephone or intercom system. There should also be a computer or fax machine to allow for communication and data transfer to and from the containment facility, lessening the hazard of removing organisms with paper, laptops and briefcases.

3. Operation

- 3.1 All persons in the facility should wear laboratory coats. This clothing shall remain in the facility. Unnecessary articles should not be brought into the containment facility.

- 3.2 No living invertebrates or associated organisms should be removed from the facility without the approval of the supervisor and the appropriate regulatory authority.
- 3.3 Disposal/Sterilization - All packaging materials associated with the importation of exotic organisms, all rearing materials, all floor sweepings etc. from the insect handling areas should be destroyed or sterilized by autoclaving or incineration. To this end, it will be necessary to have an incinerator/autoclave/fumigation chamber located near the quarantine handling rooms and laboratories.
- 3.4 Collection/Destruction - The laboratory should be equipped with an efficient system for collection and destruction of unwanted pests. It is recommended to use a variable vacuum system, so that insects can be aspirated gently (for transfer into containers without injury to the insects) or for aspiration with force sufficient to kill the insects (when separating host insects from their parasites). Vacuum collection apparatus is also useful to reduce problems associated with handling insects that have allergenic scales or hairs.
- 3.5. Plumbing - Waste water must be treated adequately (sterilized) to prevent release of organisms into the environment.
- 3.6 There should be routine cleaning and decontamination of quarantine areas and equipment. There should be detailed Standard Operating Procedures for these duties. Rooms should be kept clean and free of debris. Only authorized staff should be allowed to clean the interior of the containment area.
- 3.7 The operator is required to keep records of shipments, confirmation of species identities, dates of import, associated organisms, destruction/sterilization of packaging, entrance of visitors, records of transfer to other quarantine and containment facilities.
- 3.8 There should be prompt clearance of shipments from the international airport. The consignment should be transferred to the containment facility with minimal delay and placed in sleeved cages for opening and subsequent sorting and study. All plant materials that accompanied the shipment must be destroyed or sterilized along with the packaging. Hyperparasites have to be killed and sent for identification. The imported organisms should be kept under strict quarantine until authorized for release. The organisms should complete at least one generation in quarantine to be sure the insects are not carrying any pests or diseases.
- 3.9 Each facility should have a single designated quarantine director. This individual is responsible for all organisms that enter, are held in or leave the facility. The director is responsible for complying with the regulatory requirements associated with the facility, maintaining the procedures manual and determining individuals who are authorized to work in the facility.

4 Security

- 4.1 Each facility should have an emergency action plan to be implemented in the event of an unintentional release of any contained organism. In the event of an escape, appropriate action should be taken including clean-up, measures to prevent future escapes and immediate notification of the responsible authorities.
- 4.2 A sign should be displayed at the entrance to the containment area indicating that the premises are a containment facility, that unauthorized entry is prohibited and giving contact information for the facility director/officer. A sign may also be desirable on the inner door of the vestibule/foyer (inside of containment and visible to personnel as they prepare to leave containment) indicating that unauthorized removal of organisms is prohibited.
- 4.3 Procedures should be implemented to prevent unauthorized access to the facility. There should be a log book to keep record of comings and goings at the facility. The name, organization, purpose of visit, date, time in and time out should be recorded in the log book for each visitor.
- 4.4 The entrances to the facility should be kept locked. Access should be limited to those people essential to the operation of the facility. Visitors should adhere to security procedures and be accompanied by authorized personnel. Procedures for access should be available at the entrance.