



Canadian Food
Inspection Agency

Agence canadienne
d'inspection des aliments

Plant Biosecurity

National Farm-Level Biosecurity Standard for Potato Growers



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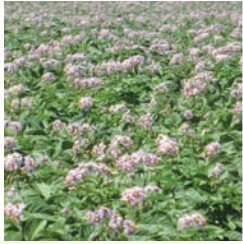
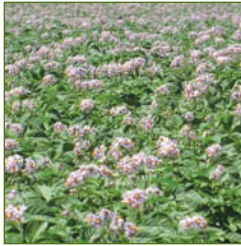


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Preface

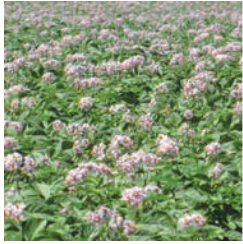
The Canadian Food Inspection Agency (CFIA), in collaboration with Agriculture and Agri-Food Canada (AAFC), the Canadian Potato Council (CPC) of the Canadian Horticultural Council (CHC), the Potato Industry Sector Organizations, and Provincial Departments of Agriculture, initiated the development of a voluntary *National Farm-Level Biosecurity Standard* and Producer Guidance document for potato growers. The objective of the standard is to provide potato producers with a nationally consistent proactive approach to preventing and managing the spread of diseases and pests through good biosecurity practices.

It is recognized that Canadian potato growers have a long-standing and successful practice of implementing proactive biosecurity measures on their farms. However, a more integrated systematic approach along the production continuum within the potato industry, as well as across the agri-commodity sectors, in both domestic and international movements of products, is desirable.

The *National Farm-Level Biosecurity Standard* represents a set of measures that focus on excluding, containing, and/or managing pests and diseases at the farm level. This approach provides protection from pests and diseases to Canada's potato industry at the farm level, regionally, nationally, and internationally.

The foundation of this biosecurity standard is guided by scientific information, producer-level consultation, and a detailed analysis of existing farm-level programs. The review of these key elements provided information on best-management practices and the current state of biosecurity implementation on potato-producing farms in Canada.

This *National Farm-Level Biosecurity Standard* provides a framework for the development of individual farm biosecurity plans or the enhancement of existing farm level programs, such as the following: CanadaGAP™, IPM Survey, Environmental Farm Plans, Safe Quality Food 2000, and other regional or provincial programs.



Introduction

The *National Farm-Level Biosecurity Standard for Potato Growers* (subsequently referred to as the “Standard”) identifies the key themes, considerations, and critical points of biosecurity intervention, based on pest introduction and transmission pathways.

The introduction of potato pests and diseases onto a farm occurs through a wide range of pathways. Knowing the pests of concern for your farm and identifying the pathways by which they are introduced and spread are key considerations of a biosecurity plan. The common pathways of introduction of pests are as follows:

Inputs

- planting materials (e.g. seed potato, seed of rotation crops, transplants, tubers)
- compost, manure, soil amendments
- irrigation water

Operational

- vehicles
- equipment
- family, staff, and visitors, including on-farm service providers
- waste material disposal (plant debris, waste water and soil)

Natural

- aerial dispersal (winds)
- water runoff

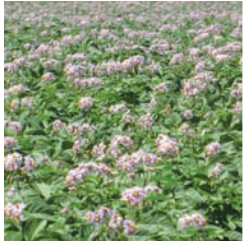
The biosecurity considerations identified in this Standard are not all-inclusive, but are accepted as best management practices for the production of potatoes. They are based on an understanding of risk pathways, supporting science, and time proven farm-level management practices.

Adopting these practices does not guarantee protection from all potential pests and diseases, but developing and implementing an effective plan will help protect your farm.

The voluntary Standard is intended to encourage potato producers to implement the use of best management practices in order to safeguard the long-term health of their potato farm. Production operations differ significantly, and consequently, there is a need for each operation to develop its own unique plan. To prevent the introduction and spread of potato pests and diseases, each farm should incorporate these practices into appropriate daily routines. A Self-Evaluation Checklist (Appendix A) includes components for consideration in the development of your farm-specific biosecurity plan.

It is important that the design, effectiveness, and implementation of the biosecurity plan be assessed not only on a routine basis but also when changes in farm practices or biosecurity issues occur. Producers should review their production practices frequently to ensure that implemented practices are effective in relation to pest and disease prevention and control. An effective biosecurity plan is one that is practical, flexible, and adoptable to changing pest pressure and to new knowledge and technology.

A *Potato Producer Guide* has been developed as a supporting document to assist producers in acquiring a more comprehensive understanding of potato farm-level biosecurity measures and potential approaches in developing an on-farm biosecurity plan.



Glossary

Biosecurity: A series of management practices designed to prevent, minimize, and control:

- the introduction of pests and diseases into a production area or farm;
- the spread of pests and diseases within a production area or farm;
- the movement of pests and diseases off the production area or farm. (*Biosécurité*)

Biosecurity Plan: A written code of uniquely designed practices to prevent, minimize, control, and contain pest and disease movement onto, spread within, and off a potato farm. (*Plan de biosécurité*)

Biosecurity Standard for Potatoes: A voluntary, risk-mitigating program that conforms to the National Biosecurity Standards and is designed to minimize or control the introduction and spread of potato pests and diseases. (*Norme de biosécurité pour la pomme de terre*)

Controlled Access Zone (CAZ): A farm, area on the farm, or field area where access is restricted or otherwise controlled. (*Zone d'accès contrôlé*)

Crop: Plants, plant products, and other products that may be produced by a grower, producer, or operator for sale, including potatoes, fruits, other vegetables, grains, and horticultural plants, including trees. (*Culture*)

Disease: An impairment of the normal state of the potato plant or tuber caused by bacteria, fungi, virus, etc. (*Maladie*)

Disinfect: Sanitization of equipment, footwear, and surfaces of storage facilities with a chemical solution. (*Désinfecter*)

Farm: A tract(s) of land (commonly referred to as a farm unit) used for the purposes of potato, rotational, and other crop production. The farm includes residences and all farm storages, buildings, and structures, as well as fields (remotely located) used for the production of a crop. (*Exploitation agricole [ferme]*)

Farm Equipment: Tractors, farm machinery, and implements, excluding vehicles. (*Équipement agricole*)

Farm Vehicles: Farm vehicles, such as trucks, pickups, and all terrain vehicles, either used on the farm or to deliver potatoes to the market. (*Véhicules de ferme*)

Field: An area designated for the production of potatoes or other crops. (*Champ*)

Off-Farm Vehicles: Vehicles, such as trucks, not originating on the farm that come to the farm to pick up or deliver potatoes, fertilizer, chemicals, building supplies and other crops. This does not refer to farm vehicles. (*Véhicules extérieurs à la ferme*)

Pest: According to the Plant Protection Act, anything that is injurious or potentially injurious, whether directly or indirectly, to plants or to products or by-products of plants, and includes any plant prescribed as a pest. (*Organisme nuisible / Ravageur [parasite]*)

Post-Harvest Test: A test, either laboratory or field grow out (or both), of samples taken according to a protocol from a seed potato lot to determine the absence or the presence of disease that may be expected when the seed is used to produce a crop the following year. (*Test après récolte*)

Practice: Procedures that are followed by the operators, without necessarily being written or detailed to the extent of a protocol. (*Pratique*)

Prevention: The preclusion of the introduction or movement of potato diseases and pests. (*Prévention*)

Producer: One who owns or rents land for crop production. (*Producteur*)

Producer Guide: Document that contains examples of beneficial practices designed to facilitate the implementation of the National Farm-Level Biosecurity Standard. (*Guide du producteur*)

Production Area: A field designated for cultivation of potatoes and rotational crops. (*Zone de production*)

Property: The land on which the production areas are located, including the residence and all farm buildings or structures. (*Propriété*)

Protocol: Defined and written procedures, which detail the steps to be followed to achieve an objective, for example, disinfecting a piece of farm equipment. (*Protocole*)

Quarantine Pest: A pest of potential economic importance to the endangered area, though not yet present there, or the pest is present, but not widely distributed and is being officially controlled. (*Organisme de quarantaine*)

Regulated Non-Quarantine Pest: A pest (pathogen, weed, or insect) that is injurious or potentially injurious, whether directly or indirectly, to potato plants or tubers, and is regulated through provincial and/or federal regulations. (*Organisme réglementé non de quarantaine*)

Restricted Access Zone (RAZ): An area, generally located inside the controlled access zone, where access by people or equipment, is further restricted. (*Zone d'accès restreint*)

Rogue: Removal of diseased or unwanted plants and plant parts. (*Élagage*)

Seed Potatoes: Potatoes that are recognized as meeting the requirements defined in the *Seeds Act and Regulations*. (*Pommes de terre de semence*)

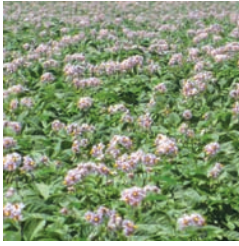
Service Vehicles: Vehicles used by various service providers who visit the farm to provide a specific service, namely, electricians, plumbers, heating specialists, crop specialists, inspectors. (*Véhicules de service*)

Staff: People who are hired or are volunteering to work on the farm. (*Personnel*)

Target Outcome: A goal that all potato producers, regardless of the size of their operation should try to implement to protect their farms and crops from the introduction and spread of diseases and pests. (*Résultat visé*)

Visitor: Any non-farm personnel who arrives at the farm (e.g. salespersons, inspectors, delivery people, contractors, friends or relatives of farm personnel). (*Visiteur*)

Volunteers: Potato plants resulting mainly from tubers or tuber parts and from true potato seed remaining in the soil from the previous year. (*Plants spontanés*)



National Farm-Level Biosecurity Standard for Potato Growers

This Standard is a framework to assist producers with developing their farm-specific biosecurity plan, despite the type of potato production (i.e. seed, fresh or processing). Developing a farm-specific potato biosecurity plan is guided by the unique circumstances of the farm that includes the various types and combinations of potato production. The biosecurity outcomes presented in this Standard are broad based, and thus should be considered during the development of an on-farm biosecurity plan.

A written on-farm plan, although voluntary, is highly recommended. A written plan allows for regular review and update, and forms a base for training.

Target Outcome:

To enable potato producers to develop and implement a farm-specific biosecurity plan that provides a systematic approach to minimizing the introduction and spread of pests and diseases, both at the farm level and across Canada.

The Standard is based on three primary themes:

- 1. Farm Property Management**
- 2. Farm Operational Management**
- 3. Plant Health Management**

Key biosecurity outcomes and considerations have been identified for each of the three themes and are presented in subsequent sections. These form a framework to assist producers in the development of a systematic biosecurity plan for their farm.



Farm Property Management

Target Outcome:

Detailed map(s) are used in the development of the farm biosecurity plan to identify potential access points for pests and diseases, pathways for pest and disease transmission, designated areas, and traffic flow. New construction and renovations are designed to enhance existing biosecurity measures.

Farm property management involves the use of detailed maps to identify potential risks for the introduction and spread of pests via the movement of people, inputs, vehicles, equipment, water, and wind. This consists of both existing and newly acquired or leased land.

1.1 Farm Facility Location and Layout

The identification of the physical attributes of the farm layout, buildings, roads and fences assists the producer in visualizing potential pest access points. Implementing biosecurity measures in these critical areas and pathways is important in mitigating the risks associated with the movement of people, inputs, equipment, and vehicles.

The designation of specific areas for certain activities provides an opportunity for producers to manage risk and traffic flow.

Considerations:

- Locate visitor and farm personnel parking away from production areas, and separate from farm equipment and vehicles.
- Locate washing facilities for cleaning and disinfecting equipment, footwear, vehicles, etc., in an area that prevents pest introduction and spread. Consider the capacity for water supply and waste water collection and disposal.
- Appropriately locate designated receiving areas for inspection (cleaning and treatment, if necessary) of farm inputs and new off-farm acquisitions (e.g. used or borrowed equipment, seed, feed, livestock).

The identification of natural drainage patterns, watercourses, tile drainage, and topographical details will provide insight to managing the risk of introduction and spread of pests due to local environmental conditions (i.e. wind and water).

Considerations:

- Understand the potential of disease spread from natural drainage patterns.
- Where possible, remedy or mitigate these risks.

1.2 Construction

New construction or renovations of existing facilities provide potential opportunities to enhance or facilitate the implementation of effective biosecurity measures.

Considerations:

- Design new construction and renovations of existing facilities to minimize the risk of introducing or spreading of pests by people, products, input vehicles, and/or equipment.
- Assess the impact of changes to traffic flow (people and vehicles) and equipment.
- Use construction materials that are easily cleaned and disinfected.
- Consider incorporating temporary measures as part of your biosecurity plan during construction and renovation.



Farm Operational Management

Operational Management entails all the day-to-day farm operation activities. It focuses on producer and manager organization, as well as observational skills, sound judgement, and the need for knowledgeable and trained employees who understand why biosecurity guidelines exist and who accept the responsibility for implementation of the management procedures established in the guidelines. A clear knowledge of biosecurity principles, continual commitment to the implementation of the plan, and frequent assessment of effectiveness of the biosecurity plan will help ensure that it is successful in controlling the introduction, spread, and movement of potato diseases and pests.

2.1 Biosecurity Zones

Target Outcome:

Controlled Access Zones and Restricted Access Zones are established and identified with appropriate signage to prevent the entry or contain the spread of pests and diseases.

Biosecurity zones are areas where biosecurity measures are implemented to control access, exit, and movement of a pest or a disease. To be effective, these zones are visible and controlled, and their importance understood.

Considerations:

- Controlled Access Zone (CAZ) and Restricted Access Zone (RAZ) are identified, where needed, based on the degree of biosecurity measures required.
- Signage indicating the biosecurity zones and types (CAZ or RAZ) is visible.
- Movement between zones is controlled.
- Newly acquired or leased land is not incorporated into the biosecurity zones until a full assessment of the history and previous use of the land has been conducted and evaluated.

2.2 People, Communication, and Training

Target Outcome:

Farm personnel and visitors, including service providers, are trained and/or informed of and comply with the farm biosecurity protocols.

People moving between different farms or between different biosecurity zones within a farm can spread pests on footwear and plant debris. However, one can develop and implement measures to reduce these risks through protocols and controlled access to biosecurity zones.

Considerations:

- Ensure that visitors and service providers
 - contact the producer before entering the farm,
 - report to the farm office to document their visit, and
 - receive a briefing on the biosecurity measures in place.
- Maintain a visitor and service personnel log.
- Require cleaning and disinfection of equipment and hygiene measures for farm personnel and visitors, prior to entry to CAZs and RAZs. Provide clean and disinfected footwear, or footwear covers. Place cleaning facilities for visitors and their vehicles at designated access points.
- Use dedicated clothing and footwear for work within the zones.
- Establish the traffic flow patterns or routes of people from high security zones (e.g. the RAZ) to lower security zones (e.g. the CAZ), unless mitigative measures are in place.
- Document the movement of people.

2.3 Movements of Vehicles and Equipment

Target Outcome:

All vehicles and equipment, especially those of service providers, are assessed for biosecurity risks, cleaned and/or disinfected, when necessary, on entry and exit from the farm, and/or when moving between CAZs and RAZs.

Vehicles and equipment entering and moving within your farm pose a serious biosecurity threat; they can carry soil and plant debris, including plant diseases and pests. The risk is increased with shared, contracted, and second-hand vehicles and equipment, due to their use on other farms with unknown plant health status and biosecurity practices. Care must also be taken with non-agricultural

vehicles and equipment that travel within your farm (e.g. earth-moving equipment, gas exploration equipment, utility service vehicles). A good biosecurity plan considers incorporating protocols and controls to mitigate the risk associated with moving soil and plant debris.

Considerations:

- Establish designated parking areas for visitors and farm personnel. Provide transportation for on-farm movement, as appropriate.
- Ensure that the vehicles of service providers and other off-farm vehicles and equipment are cleaned and disinfected upon entering and exiting the farm, as appropriate.
- Ensure that farm personnel follow all biosecurity procedures pertaining to the movement of vehicles, especially when moving from zone to zone.
- Assess the biosecurity risks associated with the movement of equipment and vehicles transitioning between various biosecurity zones. Remove soil and crop debris, and disinfect, if required, based on the risk assessment.
- Maintain a record of cleaning and disinfection.
- Minimize the movement of equipment over wet soil to avoid excessive movement of soil.

2.4 Waste (water, plant, and soil)

Target Outcome:

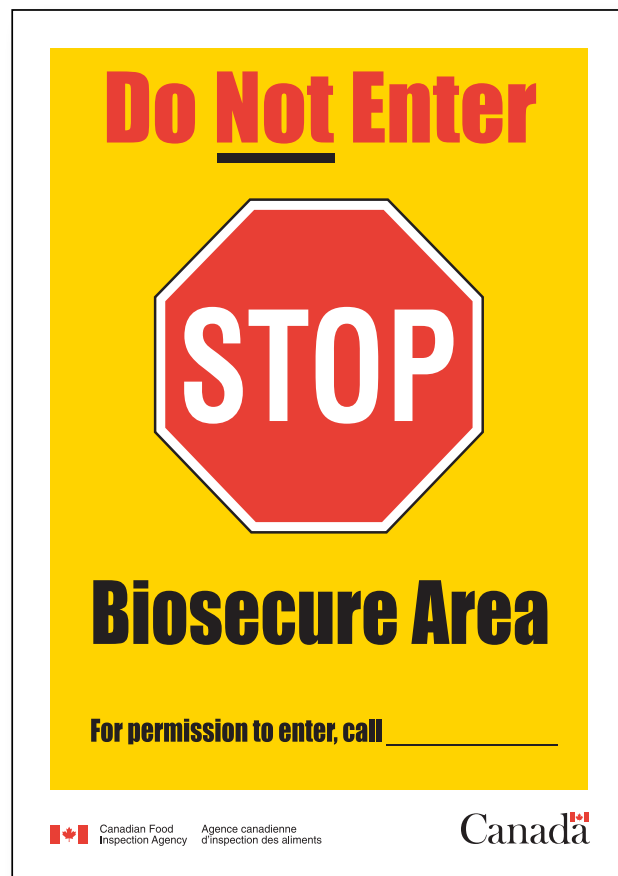
A farm waste management program for all potato, soil, and waste water is established and implemented to contain any potential plant pests and diseases.

Potato culls, waste material, rogue plants, soil, and water used for the washing of potatoes pose biosecurity risk pathways that must be addressed. The pests and pathogens that these materials may contain can easily spread to growing potato crops on your farm and to other farms in your area. Proper disposal is a critical component to mitigate risks associated with waste material and packing material. Disposal of all forms of waste should be done in accordance with existing federal, provincial, and municipal legislation.

Considerations:

- Ensure that cull potatoes (tubers, or parts thereof, that are unsuitable for planting, or potatoes discarded during other stages of production [i.e. harvest, washing, or grading]) are discarded, appropriately buried, or disposed of in a manner (e.g. used as animal feed) to contain any disease and pest.

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- Control on-farm and off-farm movement of potato tubers designated for use as animal feed.
 - Remove rogued material from the field and dispose of the rogued plants to contain any disease or pest.
 - When returning cull potatoes to the field, they should only be spread in the field of origin and allowed to freeze thoroughly prior to any tillage.
 - Carry out handling, storage, and disposal of used packaging material in a way that reduces the risk of introduction and/or spread of pests.
 - Keep areas around water sources free of potato crop waste and other potential sources of infestation.
 - Ensure that cleaning and disinfection waste water is contained and disposed of in a manner that does not pose a risk of introducing or spreading pests.
 - Avoid using, or returning to fields, waste water and sediment, resulting from washing and/or fluming, unless treated.





Plant Health Management

Plant health management decision making directly pertains to potato production and cultivation practices, as well as to the biology of potato diseases and pests that pose biosecurity threats. Plant Health Management forms one of the pillars of a sound biosecurity plan. Careful observation and background knowledge are critical.

Target Outcome:

A plant health management plan is established and implemented.

3.1 Preventative Management Practices

Target Outcome:

Seed potatoes and other crop inputs (fertilizer, manure etc.) are sourced and managed to minimize the introduction and spread of pests and diseases.

The development, implementation, and maintenance of good crop management practices allow for the farm-specific biosecurity plan to operate effectively and assist in the production and maintenance of healthy potato crops.

Considerations:

- Implement a biosecurity plan for your farm that includes enhanced sanitation and the maintenance of detailed production and storage records.
- Implement an integrated pest management plan, which includes pesticide resistance management and appropriate pest-prevention strategies.
- Know the crop history and health status of any new land that you purchase or lease. Ensure that your biosecurity protocol is implemented and respected when leasing land to another producer.
- Ensure that staff is trained and knowledgeable about potato diseases, pests, and crop-production practices. The training consists of awareness of federal and provincial regulations, as well as any municipal by-laws pertaining to potato production.

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- Plant certified or higher-class seed that has been post-harvest tested and procured from a known and reliable source.¹ Plant seed potatoes on fields where volunteers will not be an issue.
 - Use pest and disease-resistant varieties, where possible.
 - Establish weed and volunteer plant-control strategies. Plant cover crops to control weeds and to reduce soil movement by erosion.
 - Ensure proper crop rotation. Make sure that seed used to establish rotational crops is either certified or cleaned and carefully inspected to verify freedom from weeds and soil.
 - Avoid moving soil between fields and biosecurity zones.
 - Have in place on-farm compost and manure management programs, and comply with existing regulations and guidelines. Manure, compost, or other soil amendments are sourced and managed to minimize the introduction and spread of crop pests.

3.2 Surveillance

Target Outcome:

A surveillance program is developed and implemented for early detection, identification, and control of pests and diseases.

To minimize the impact and to successfully contain and/or eradicate pests and diseases, early detection is vital.

Considerations:

- Maintain accurate and routine scouting reports, noting the presence or absence of weeds, pests, and diseases, or other crop health issues.
- Keep farm personnel up to date on the latest information concerning pest and disease alerts in their area.
- Consult professional agrologists or other professionals, as required.
- Investigate suspected problems to identify pests, and implement appropriate management practices. Report any unusual finding to the appropriate authorities.

¹ Ensure that third parties (e.g. brokers) are sourcing from suppliers that implement a proactive biosecurity program that can be validated.

3.3 Pest Response Plan

Target Outcome:

A response plan is developed and ready for implementation to effectively contain and control pest and disease outbreaks.

The ability to react quickly and effectively to a pest outbreak is vital in minimizing the effects on an operation and preventing its spread. Ensuring that the producer's biosecurity plan anticipates new biosecurity threats and has procedures in place to trigger the steps required to contain any outbreak is critical. This approach ensures that the situation is quickly brought under control and managed.

Considerations:

- Investigate immediately any suspected problems to identify the potential pests, and implement the appropriate management practices to identify, control, contain, and/or resolve the outbreak.
- Maintain emergency contact information in order to inform the appropriate authorities if a biosecurity risk or event were to occur.
- Develop a procedure for reporting pests and other biosecurity risks to the appropriate plant health authority and specialist.
- Develop and be prepared to implement an effective disposal system for weeds and potentially infested plant material.



APPENDIX

A

Self-Evaluation Checklist

Components to consider in developing the farm-specific biosecurity plan

	Self-Audit	
	Yes	No
Section 1: Farm Property Management		
1.1 Farm Facility location and layout		
Detailed maps are available that identify farm facilities and geographical considerations; for example, buildings, production areas, designated receiving areas, inspection and cleaning area, storage facilities, roads, borders, fences, designated parking for visitors and farm personnel, natural drainage patterns, water courses, drain tile, and topographical details.		
Maps of newly acquired or leased land are available.		
1.2 Construction		
New facilities are designed with consideration to minimizing the potential for introduction and spread of pests. Facilities are built with materials that can easily be cleaned and disinfected.		
Section 2: Farm Operational Management		
2.1 Establishing Biosecurity Zones		
Restricted access and controlled access zones are established and managed, based on assessed risk and production type (seed, table, processing) or a combination of production types.		
Clearly visible signage identifies access points for restricted and control areas. Signage should provide contact numbers of farm personnel.		
The history and previous uses of newly acquired or leased land are assessed prior to bringing the land into production.		

Self-Audit

2.2 People, communication, and training

	Yes	No
The plan includes considerations for visitors, service providers, and farm personnel.		
i) A logbook is maintained for visitors and service providers.		
ii) Service providers are made aware of farm-specific biosecurity protocols and are asked to comply with the protocols prior to providing service on the farm.		
iii) Trained farm personnel escort visitors to ensure they comply with the biosecurity protocols when in biosecure areas.		
iv) There is a farm personnel biosecurity training program (written, implemented, and regularly updated).		

2.3 Movement of Vehicles and Equipment

The risk associated with the movement of vehicles and equipment is assessed, including consideration of previous use, previous location of use, location of use within the farm and destinations upon leaving the farm.		
Based on the risk determined by the assessment, vehicles and equipment are cleaned to remove soil, organic matter, crop waste, and weeds prior to entry to the farm and/or leaving the farm.		

2.4 Waste (water, plant, and soil)

Waste water and sediment, resulting from washing and/or fluming, is not re-used on agricultural land, unless treated.		
The biosecurity plan includes handling, transportation, storage, treatment, and disposal of plant and soil waste (culls, cuttings, rogued plants, and tare soil).		

Self-Audit

Yes	No
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Section 3: Plant Health Management

3.1 Prevention Management Practices

Designated farm personnel or crop scouts are trained to recognize and report weeds, insects, and diseases, including emerging pests.		
Only certified seed potatoes are planted on the farm, post-harvest test results are considered, and provincial potato planting regulations respected.		
Seed for rotation crops are certified and/or cleaned for weed seeds and soil.		
A crop rotation plan that considers disease, insect, and alternate host lifecycles is in place and followed.		
Crop and pest management records are maintained for each field.		
Manure, compost, or other soil amendments are sourced and managed to minimize the introduction of pests.		

3.2 Surveillance

Surveillance activities are described, implemented, and recorded.		
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3.3 Pest Response Plan

A Plan has been established to respond to suspected and/or confirmed detection of any quarantine pest.		
A Plan has been established to respond to the presence of a regulated non-quarantine or economically important pest or disease.		

Biosecurity Plan

A systematic biosecurity plan (based on the criteria identified above), has been developed, documented, implemented, and its effectiveness is assessed on a routine basis to improve the plan.		
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