

Guidelines on Surveillance and Phytosanitary Actions for the Potato Cyst Nematodes: *Globodera rostochiensis* and *Globodera pallida*.

1.0 Scope

The Canadian Food Inspection Agency (CFIA) and United States Department of Agriculture Animal Plant Health Inspection Service (USDA-APHIS), being the National Plant Protection Organizations (NPPOs) of their respective countries, have established these Guidelines to implement appropriate phytosanitary measures upon the detection of Golden nematode (*Globodera rostochiensis*) and/or Pale cyst nematode (*Globodera pallida*) collectively referred to as Potato Cyst Nematodes (PCN) in either country. These Guidelines outline the phytosanitary measures that will be used to ensure that mutually acceptable and appropriate phytosanitary actions are being pursued to contain and control, and to eradicate if feasible, an infestation in accordance with the International Plant Protection Convention (IPPC) and the World Trade Organization Agreement on the Application of Sanitary and Phytosanitary Measures (WTO-SPS).

Relevant terminologies used in these Guidelines are defined by the IPPC unless otherwise noted in (Appendix 1). These guidelines are intended to ensure predictable and equivalent science based phytosanitary actions in both countries. The establishment and implementation of each country's ongoing surveillance and risk-based controls of regulated articles is intended to mitigate effectively against the spread of PCN to pest-free areas.

Further expansion of the provisions in the October 15, 2006 version of the Guidelines was necessary to provide specific details on the Canada and United States incremental PCN detection survey and certification requirements for seed potatoes. Associated PCN phytosanitary certification requirements for the trade of potatoes and other regulated articles between Canada and the United States are explained within this version of the Guidelines. Furthermore, because PCN infestations now involve seed production areas, it is imperative to conduct PCN detection surveys on fields used to produce seed potatoes throughout both countries in a reciprocal manner. Beginning in 2008, all seed potato production in States or Provinces with a PCN infestation or PCN-regulated area (Alberta, British Columbia, Idaho, New York and Quebec) and fields used to produce seed potatoes traded between our respective countries will be surveyed to safeguard seed potato movement. The production of seed potatoes in fields surveyed for PCN should be part of the respective seed potato certification programs by 2010 to further safeguard the domestic movement of seed potatoes.

In addition to these regulatory Guidelines, it is recommended that good PCN management practices be followed by producers, including practicing crop rotation and maintaining appropriate sanitation. Both the CFIA and USDA-APHIS commit to communicating to their respective industries good management practices that will assist in restricting the spread of PCN and other soil-borne pests. APHIS and CFIA will jointly assemble an International Science Panel to address key issues such as soil survey requirements and other science-based questions as they arise.

2.0 Outline

These Guidelines specify the requirements for ongoing and renewed PCN detection surveys, delimitation surveys, defining the extent of infestations, and establishing appropriate PCN-regulated areas based upon defined risk criteria. This will allow the NPPOs of both countries to maintain the PCN-free status of the remaining areas of their countries and will minimize disruptions in the movement of regulated articles produced both within and outside of PCN-regulated areas. These Guidelines also describe categories of fields that present differing degrees of risk. Fields may be assigned to one of two broad risk categories: exposed (infested/suspect, primary exposed, adjacent, or other exposed) or non-exposed. These risk categories provide a mechanism to allow regulators to appropriately manage the risk associated with the fields. In addition, procedures for establishing and maintaining pest free production sites and pest free places of production within regulated areas are described.

3.0 Background

3.1 History of PCN in North America

PCN are known to occur, singly or together, in more than 65 countries world-wide. In North America *Globodera rostochiensis* was first detected in 1941 in New York and subsequently, in 1962 in Newfoundland and Labrador, and in 1965 in British Columbia. The populations of PCN in Newfoundland consist of both species. Until the spring of 2006, the known presence of PCN was limited to regulated areas within the State of New York, and the provinces of British Columbia, Newfoundland and Labrador. *Globodera pallida* has since been detected in the State of Idaho and *Globodera rostochiensis* in the Provinces of Quebec and Alberta. Strict movement restrictions are in place in these areas to prevent the spread of these pests to non-infested areas. A variety of approaches have been used in different North American jurisdictions to contain, control, suppress and potentially eradicate PCN from specific areas.

There are no human health risks associated with these pests but they can, if uncontrolled, cause significant reductions in potato yields as well as appreciable losses in tomatoes and eggplants.

3.2 Pest Biology

Both species of PCN are obligate parasites of certain members of the family Solanaceae. Potato (*Solanum tuberosum*) is the most important host plant followed by tomato (*Lycopersicon esculentum*) and eggplant (*S. melogena*). Altogether approximately 90 species of the genus *Solanum* are known to be susceptible to PCN.

Host plant symptoms caused by *Globodera* infection are also associated with a wide variety of different pests or abiotic conditions and are not diagnostic. Patches of poor growth may occur generally in the crop, sometimes with yellowing, wilting or death of foliage due to resultant water or nutrient deficiencies. On the roots of heavily infested plants, cysts (white, yellow, golden or brown, depending on the developmental stage and the species present) of about 0.5 mm diameter are clearly visible.

The desiccated bodies of female nematodes take the form of mature brown cysts that enclose eggs containing juvenile nematodes. These durable cysts protect the eggs from physical damage, thereby making it possible for them to survive unfavorable conditions and thereby infect new plants. In the spring, eggs are stimulated to hatch by host root exudates. Once hatched, the juveniles will undergo three additional stages with the third and fourth stages occurring within the plant root. Once the juveniles have entered the host plant root, usually at or near the growing point, the juveniles become sedentary and sausage-shaped. The females eventually become "sac-like" with their posteriors protruding from the root and can be seen as tiny white, yellow or brown embedded objects along the host's roots. When the females die, their body walls gradually harden and darken to form the cyst. A new cyst may contain as many as 500 eggs. Cysts with viable eggs may persist in the soil for more than 20 years.

3.3 Rationale for Phytosanitary Actions

Golden Nematode (*Globodera rostochiensis*) and Pale Cyst Nematode (*Globodera pallida*) are internationally recognized as quarantine plant pests. PCN are considered quarantine pests because: 1) they are not widely distributed in all potato growing areas of the world; 2) they can, if uncontrolled, cause total failures of potato and other host crops; 3) they are long-lived; 4) they are soil-borne; 5) the cysts are difficult to detect at very low populations and 6) there is no quick, economical and effective treatment. Once present, control of PCN is difficult and requires integrated approaches that may utilize legislative control, pesticides (granular and fumigant nematicides), and cultural practices (rotation, use of resistant varieties (where available) and host avoidance). The financial implications of PCN detections are considerable due to the potential for direct crop losses which are compounded by market access issues, and the possible need to abandon, curtail or heavily manage potato cultivation in infested areas. In Europe and other jurisdictions the detection of PCN has led to the immediate decertification of seed potatoes and outright bans or severe limitations on the production of seed, tablestock and processing potatoes.

Plant health officials from Canada and the United States reacted in a similar fashion to detections of PCN in fields used for table and processing potato production in April 2006 in Idaho, in August 2006 in Quebec, and in fields used for seed potato production in November 2007 in Alberta. Temporary phytosanitary measures were implemented to prevent the movement of high risk material that might carry PCN cysts, while protecting market access. Upon review of these situations and the consequent phytosanitary actions, it is clear that consistent containment measures, investigation activities and phytosanitary actions were immediately taken by both countries.

Both Canada and the United States have adhered to recognized scientific principles and international standards applicable to PCN. Additionally, applicable sanitary and phytosanitary (SPS) measures for risk mitigation have been considered and they have contributed to the development of these Guidelines. These approaches are consistent with internationally recognized phytosanitary principles and practices.

4.0 Phytosanitary Measures

The CFIA and USDA-APHIS have reviewed the longstanding phytosanitary measures implemented over the years to control PCN in Saanich, BC, Newfoundland and Labrador, and in the State of New York. The regulatory controls adopted in those regulated areas have been effective in controlling the spread of PCN and are not subject to change as a result of the recent detections in Idaho, Quebec and Alberta. However, as they are reviewed and amended they should remain consistent with the requirements specified in these Guidelines.

Due to these recent detections, an in-depth review was undertaken of phytosanitary measures implemented after a detection of PCN occurred. In general, both countries' NPPOs have adopted the same science-based risk mitigating approaches to contain PCN and have applied very similar principles to investigate the potential source and distribution of PCN for each infested field. Therefore, representatives from both NPPOs accept, as equivalent, the necessary phytosanitary controls adopted by the respective NPPO to prevent the spread of PCN.

When PCN is detected, the respective NPPO will implement immediate regulatory measures according to the stepwise process outlined below.

4.1 Immediate Regulatory Measures

The NPPO of the country with a new or suspect PCN detection will initiate immediate control measures to contain PCN and prevent its spread to non-infested areas. This will include measures to restrict the immediate movement of regulated articles from suspect, infested, adjacent, and primary exposed fields. All those fields will represent the initial regulated area(s), upon which movement restrictions would be imposed. The NPPO of the other country will be informed without undue delay of any new or suspect detection, in accordance with mutually held IPPC pest reporting obligations.

These measures will also include the seed potato fields that were used as seed sources for the infested field(s) in the last 3 years, unless full field survey data (minimum of method B) are available for such fields. If not available, immediate measures will be taken, until full field survey data (minimum of Method B) are available from such fields. Additional information is available in Table 1 and Appendix 2 on the different survey methodologies that are required.

The movement of seed potatoes traded between both countries will be regulated as follows:

- 4.1.1. For States and Provinces without PCN soil sampling and testing of all land used annually for seed potato production.

- o No new PCN detection

Seed potatoes produced in fields sampled using Method B and tested negative for PCN from the respective States and Provinces can be exported to the U.S. or Canada without any additional PCN-related restrictions.

- New PCN detection
 - The movement of seed potatoes traded between both countries is immediately prohibited from the State or Province where the PCN detection was made while the investigation and the immediate regulatory measures are established.
 - An investigation will be initiated immediately to identify all adjacent and primary exposed fields.
 - Immediate regulatory measures are implemented on infested, adjacent and primary exposed fields as listed in Section 4.1.
 - Once the immediately regulatory measures are in place, seed potatoes from non-regulated fields can be traded between United States and Canada from the respective State or Province, provided that the fields used to produce the seed potatoes were soil sampled and tested using at least method B.

4.1.2. States and Provinces with PCN soil sampling and testing, as specified in Section 5.1, of all fields used annually for seed potato production.

- No new PCN detections
 - Provinces or States without a PCN-regulated area and without a PCN detection during the annual PCN detection survey can continue to trade seed potatoes between Canada and the United States.

Note: All fields used to produce seed potatoes in a Province or a State with a PCN-regulated area must be soil sampled and tested using at least method B.

- New PCN detection
 - Since these States and Provinces would have access to abundant survey data, the movement of seed potatoes not associated with the new find and traded between both countries may continue without additional measures.
 - An investigation will be initiated immediately to identify all adjacent and primary exposed fields.
 - Immediate regulatory measures are implemented on infested, adjacent and primary exposed fields as listed in Section 4.1.

During the delimitation survey, the PCN detection survey requirements for seed potatoes traded between the two countries as outlined in Table 2 will provide the necessary safeguards to facilitate their continued trade from fields outside of the immediate regulated area within that State or Province. Until a long-term regulated area is established, trade of regulated articles, other

than seed potatoes, within the immediate regulated area must comply with the requirements described in Section 6 of these Guidelines.

Canada will issue Individual Notices of Restrictions and/or a Ministerial Order and the United States will use a combination of Emergency Action Notices, Federal Rules, Federal Order, State Rules, Interim Rule, and Final Rule to create a regulated area and to regulate fields infested or presenting a significant probability of being infested with PCN.

4.2 Trace Back and Trace Forward Investigations

The NPPO of the country with a new PCN detection will conduct trace-forward and trace-back investigations (collectively referred to as “investigations”) to identify all potentially exposed fields to be included as part of the delimitation process. Delimitation surveys will be conducted, on a priority basis (described in Table 1), in these fields and immediate controls will be put into place if other PCN detections occur. Trace-back information should be obtained from as far back as possible, up to 10 years. Information from investigations related to the trade of regulated articles between the two countries will be shared with the NPPO of the other country.

4.3 Delimiting Surveys

The NPPO will conduct delimiting surveys to establish the boundaries of an area considered to be infested by or free from PCN. The selection of fields for survey should be based on crop history and the survey priorities outlined in Table 1. In addition, fields planted to potatoes and/or tomatoes consecutively for the longest period of time should be sampled on a priority basis.

Delimiting surveys will:

- include all exposed fields;
- include all non-exposed fields within 0.5 mile from an infested field used for host crop production during the last 10 years;
- be conducted as summarized in Table 1, section 4.3.1.

During and upon completion of the delimiting survey, the NPPO of the respective country will review and assess regularly the need to make any adjustments to the regulatory measures placed immediately after the PCN detection and during the investigation. The review will focus on the effectiveness and timeliness of measures implemented and determines if adjustments are required to existing measures and legislative tools to control the infestation on a longer term basis.

4.3.1 Delimiting Survey Requirements

The CFIA and USDA-APHIS officials have decided upon harmonized soil sampling and laboratory analysis procedures in keeping with internationally recognized practices. Survey intensity and priority will vary depending on field status as described below in Table 1. All exposed fields are to be surveyed once using method A during the delimitation survey.

Table 1: Survey requirements for delimiting a PCN infestation.

Land Category	Exposed Fields				Non-Exposed Fields within 0.5 mile of an infested field with a previous history of host crops
	Suspect/ Infested	Adjacent	Primary	Other	
Soil Sampling Method*	A (minimum)	A (minimum)	A (minimum)	A (minimum)	B (minimum)
Survey Priority	1	1	1	2	2

*Appendix 2 contains information on sampling methodology. When applicable, the NPPO will provide specific details on the implementation of their PCN delimiting and detection surveys to their cooperators. All soil samples are to be submitted to NPPO-recognized laboratories.

4.4 Establishment of Regulated Areas

Based on the results of investigation and delimitating surveys, field categories can be determined and a long-term regulated area will be established. Regulated areas will consist of infested, adjacent, primary exposed fields and, where appropriate as determined by the respective NPPO, other exposed and non-exposed fields, e.g., when creating a contiguous regulated area. These regulated areas may be contiguous or non-contiguous, based on the nature of the PCN infestation, the exposure of surrounding fields, and other survey data.

Boundaries of regulated areas must be carefully considered. These may consist of physical boundaries such as rivers, forest, roadways and/or geopolitical characteristics of exposed areas. Based on delimitating survey results and the nature of the PCN infestation, a smaller regulated area may be considered regardless of physical boundaries.

The size and extent of a regulated area is dependent on a number of risk criteria including but not limited to:

- Fields operated by a farmer who has farmed infested fields;
- Fields farmed with equipment used in a field with a history of infestation;
- Fields bordering a field with a history of infestation;
- Fields that receive direct drainage from a field with a history of infestation;
- Fields exposed as a result of a regulatory violation;
- Fields that received potentially PCN infested piler or tare dirt including grader station debris;
- Fields where propagative host material produced in an infested field was used for planting. In the case where land was previously tested using at least method B, only

the land which has subsequently been planted with propagative material may be included in the regulated area;

- Fields where equipment moved directly after use in an infested field;
- Fields adjacent to or bordering an infested field and not separated by any major highway or any major water course or forested area or non-agricultural area of more than 15 yard wide which act as a physical barrier for the spread of PCN into other agricultural fields;
- Fields planted with PCN infested seed potatoes.

Fields within the regulated area may be categorized as infested, exposed, or non-exposed. The restrictions placed on individual fields are linked to the category assigned to the field.

Accordingly, different phytosanitary measures are applied to these field categories. These phytosanitary measures may be adjusted over time (Section 8 contains details).

Since PCN is primarily transported with soil associated with equipment, potato tubers, root crops, nursery stock or other articles that move soil, it is important that these articles be regulated in order to mitigate the risk of PCN spread. Equipment and regulated commodities can only move from PCN-regulated areas after they meet the risk mitigation requirements outlined in Section 6 or under compliance as authorized by the respective NPPO. The NPPO, in collaboration with their respective partners, is responsible for the implementation of all necessary regulatory controls within a regulated area, monitoring of the effectiveness of controls and ensuring compliance to minimize the possibility of PCN spread.

In the long term, it is vital that strategies adopted eliminate or effectively suppress PCN populations within regulated areas. Therefore, the production of seed potatoes in PCN-regulated areas should be integrated into an NPPO approved PCN management plan and such seed should not move out of the respective PCN regulated area. Similarly, the commercial production of potato, tomato and eggplant should be integrated in an overall NPPO-approved PCN management plan and as provided in Section 8 below.

5.0 PCN Detection Survey and Certification for Seed Potatoes

5.1 PCN Detection Survey and Seed Potato Certification principles

A multi-year Canada/United States PCN detection survey of potato production areas was initiated in 2006, with the understanding that further expansion was desirable for the 2007 potato crop and beyond. However, such long term initiative required the consultation with, and engagement of, various stakeholders from the potato sector. In 2008 and beyond, both countries must, as part of the PCN detection survey program commitments (described below in Table 2), survey all seed potato fields in States or Provinces with a PCN infestation or PCN-regulated area (Alberta, British Columbia, Idaho, New York and Quebec). In addition all land used to produce seed potatoes traded between the two countries must have been surveyed using at a minimum of method B. Soil samples from land used to produce seed potatoes can be gathered within one year prior to or after planting and must be tested and found negative for PCN prior to phytosanitary certification. All seed potato growers from any and all States and Provinces are encouraged to have all their fields tested annually for the presence of PCN, as described in section 4.1. Only the seed potato production from those fields with negative PCN detection survey results would be eligible to be shipped between the two countries and to another State and Province in the event of a positive detection of PCN in their respective State or Province.

Table 2: Integrated approach to PCN detection surveys conducted in Canada and the United States.

Crop Year	Certified Seed Potatoes (field)			Non-Seed Potato Production
	All seed production in a State/Province with a PCN-regulated area	Traded between countries	Total certified seed potato production	
2008 and 2009	Method B at a minimum		Voluntary at Method B at a minimum	10% voluntary at Method C at a minimum
2010 onward	Method B at a minimum			

Note: All certified seed potatoes produced within a Province or State with a PCN-regulated area or a new PCN detection should be surveyed for at least three successive PCN host crops to cover the vast majority of the fields used for seed potato production.

USDA-APHIS and CFIA officials have taken into consideration the high risk pathways, soil sampling and testing capacities, required regulatory amendments, and associated implications as

they move forward with the PCN detection survey plan and transition it to a respective seed potato certification programs for PCN. The PCN detection survey requirements outlined in Table 2 address seed potato certification requirements for the trade of seed potatoes between Canada and the United States from the 2008 seed potato crop onwards. Once fully implemented, seed potato certification for PCN will address the highest risk pathway for the long distance dispersal of PCN, i.e., movement of seed potato tubers, and it will address domestic and other PCN-related trade requirements.

It is expected that the PCN detection survey requirements, as specified in Table 2, will be fully implemented in 2008, and by 2010 at the latest, become integrated into the seed potato certification standards. Certified seed potatoes must then be produced on fields sampled and tested for PCN. Fields surveyed in accordance with Method B for three consecutive PCN host crops, i.e., the first three potato crops within the regular field rotations, will not require PCN surveillance for the two subsequent PCN host crops. The apparent PCN freedom of the field has been demonstrated through 3 negative PCN detection survey sampling cycles and therefore exempts the field from PCN survey for an additional two host crop cycles, provided the land in question is not associated with a PCN find.

The State National Harmonization Program for Seed Potatoes Memorandum of Understanding (SNHP MOU) is recognized as the program that will be utilized to implement the PCN detection survey in the United States. The Plant Protection Act and the National Seed Potato Certification Program are recognized as the vehicles that will be utilized to implement the PCN detection surveys in Canada.

The Canada-United States PCN detection survey approach is described in Table 2. This approach is based on a number of specific principles as follows:

- Surveys are conducted on a per field basis or the area used to produce the crop of certified seed potatoes.
- Soil sampling is based on collecting samples using a minimum of Method B as described in Appendix 2.
- Soil samples from a given field can be gathered within one year prior to or after planting for the production of recognized certified seed potatoes. However, except for small tuber samples (section 5.2), all testing of soil samples from the respective field must be accomplished prior to phytosanitary certification.
- 100% annual soil sampling and testing of all fields for seed potato production from 2010 will be required. However, once a field has been soil-surveyed and tested negative for PCN for a minimum of three consecutive host crops, survey intensity will be reduced to a surveillance mode (i.e., testing will be on a cycle of one out of every three host crops.)
- 10% of commercial potato acreage is targeted on a voluntary basis using a minimum of method C (see Appendix 2).
- In all cases, the entire amount of soil collected is to be tested prior to certification of commercial shipments as seed potatoes.

5.2 PCN-related Certification of seed potatoes

All commercial shipments of seed potatoes traded between Canada and the United States must have been surveyed as specified in section 5.1 and not be part of the immediate regulatory controls specified in section 4.1. Soil samples, representing the field(s) used to produce the seed potatoes in a shipment, must have been collected as specified using Method B in Appendix 2, tested in their entirety and found not to contain PCN before the shipment can receive phytosanitary certification. The following additional declaration will appear on phytosanitary certificates associated with commercial shipments of seed potatoes traded between Canada and The United States:

"Field(s) used to produce the seed potato lot(s) in this shipment were surveyed and tested according to the agreed-upon protocol and the Potato Cyst Nematodes (*Globodera rostochiensis* and *Globodera pallida*) were not detected."

All land used for seed potato production, including land owned by Universities, Government or other research organizations, will be surveyed in the same manner as land used for commercial seed potato production. Strict standards must be enforced to ensure the seed potato supply including that for various research trials, variety evaluation and post harvest evaluation is free from PCN.

Shipments of seed potato samples consisting of 500 tubers or less for trials or research purposes may be exempt, at the time of shipment, from the PCN surveillance and certification requirements. This is primarily due to the infeasibility of having all the soil samples associated with the lot(s) tested prior to the shipment of some samples for evaluation. Soil samples must have at least been collected from the fields on a full field basis using a minimum of Method B prior to seed potato sample shipment and the soil samples from that field must be tested in full. The following additional declaration will appear on phytosanitary certificates associated with shipments of seed potato samples for trials or research purposes traded between Canada and the United States:

"The field(s) associated with the seed potato sample(s) in this shipment were surveyed and soil sample(s) will be tested according to the agreed-upon protocol to ensure that Potato Cyst Nematodes (*Globodera rostochiensis* and *Globodera pallida*) are not detected."

The following additional declaration will appear on phytosanitary certificates associated with shipments of regulated articles produced in a protected environment traded between Canada and the United States (see Section 7.0):

"The articles in this shipment were grown in a PCN-free place of production and in a manner to prevent infestation by Potato Cyst Nematodes (*Globodera rostochiensis* and *Globodera pallida*)."

6.0 Regulated Articles

Regulated articles include soil, PCN host crops, and any other article that may result in the movement of soil or otherwise of PCN. Examples of regulated articles include, but are not limited to, the commodities described below. Initial requirements for the movement of regulated articles outside of regulated areas, farm units, or fields under restriction are described below. Section 8.0 "Releasing Land from Regulatory Requirements" describes the circumstances under which land may be released from some of the requirements described below.

Nursery stock, Bulbs, Corms, Rhizomes, Tubers of Ornamental plants, Grass Sod - field grown in soil

From a PCN-regulated area	<ul style="list-style-type: none"> • The movement of soil and related matter is prohibited (exceptions described in Section 7.2) • The movement of grass sod is prohibited (exceptions described in Section 7.2) • Must be washed free of soil and originate from a field found free of PCN based on a survey (Method A) conducted within the last 36 months. • Plants for planting and propagation may be produced in soil-less growing media in an enclosed facility, or in containers in a PCN pest free place of production as described in Section 7.1. • Field grown plants for planting and propagation may be produced in a PCN pest free place of production as described in Section 7.2. • Plants with soil must originate from outside the regulated areas and have been handled and grown in a manner to prevent PCN infestation (Section 7.0). • Other requirements may still apply.
From outside of a PCN-regulated area	<ul style="list-style-type: none"> • No specific requirements for PCN. • Other requirements may still apply.

Potatoes - Potatoes not for planting (including processing and tablestock)

From a PCN-regulated area	<ul style="list-style-type: none"> • Potatoes should be grown under an ongoing NPPO approved PCN management plan. • Processing potatoes (i.e., chipping, dehydration, French fry, etc.) must be processed under regulatory control (compliance agreements) at an NPPO approved processing facility. • Potatoes destined for fresh consumption (i.e., tablestock) must be washed, sprout inhibited and commercially packed under regulatory control (compliance agreements) at an NPPO approved facility • Government issued movement certificates are required to move both tablestock and processing potatoes outside of the regulated area.
From outside of a PCN-regulated area	<ul style="list-style-type: none"> • No specific requirements for PCN. • Other requirements may still apply.

Potatoes - Seed for Planting and Re-Certification

From a PCN-regulated area	Seed potatoes produced in the regulated area should be grown under an ongoing NPPO approved PCN management plan and they should not be planted outside of that regulated area.
From outside a PCN-regulated area	<p>For the 2008 crop year and beyond, all fields from States or Provinces with a PCN infestation or PCN-regulated area used for the production of certified seed potatoes must be surveyed using a minimum of Method B and found free of PCN as per Section 5.1.</p> <p>Other seed potato certification standards apply</p>

Note: Seed potato lot of 500 tubers or less destined for trials or research purposes can be shipped prior to completion of soil testing.

Soybeans, Peas, Beans, Cereals, Hay, Straw and Plant Litter

From a PCN-regulated area	Regulated articles must not be contaminated with soil.
From outside of a PCN-regulated area	No specific requirements for PCN. Other requirements may still apply.

Root Crops (other than potatoes)

From a PCN-regulated area	<ul style="list-style-type: none"> • Root crops should only be grown under an ongoing NPPO approved PCN management plan. • Root crops must be processed under regulatory control (compliance agreements) at an NPPO approved processing facility. • Root crops destined for the fresh consumption must be washed and commercially packed under regulatory control (compliance agreements) at an NPPO approved facility. • Government issued movement certificates are required to move root crops outside of the regulated area.
From outside of a PCN-regulated area	No specific requirements for PCN, however other requirements may still apply.

Farm Equipment, Farm Tools and Used Containers

From a PCN-regulated area	Must be free of soil or cleaned and disinfested as required by NPPO and accompanied by a movement certificate prior to leaving the regulated area.
From outside of a PCN-regulated area	No specific requirements for PCN. Other requirements may still apply.

7.0 Requirements for the Establishment of Pest Free Places of Production or Pest Free Production Sites Within Regulated Areas.

Pest Free Places of Production (PFPP) and Pest Free Production Sites (PFPS), as described in ISPM No. 10, *Requirements for the establishment of pest free places of production and pest free production sites*, are allowed within regulated areas, provided that they comply with the applicable official NPPO program.

7.1 Plants for Planting and Propagation Produced in an Enclosed Facility, or in Containers

Pest free production sites in enclosed facilities may be established on any exposed field(s) provided that the criteria below are met:

- Negative PCN detection survey and testing at least once (using Method A) if soil is present in the facility;
- Production practices must prevent entry of soil from the surrounding fields into the facility;
- Soil-less growing media must be used;
- The water used must be filtered, treated, or from a cased and capped well;
- Shipping/receiving, parking and other areas must be constructed and maintained in a manner that prevents contact with soil;
- A five yard perimeter around the site is maintained free of PCN hosts;
- Facility floors must be constructed to provide separation from the underlying soil;
- Equipment must be rendered free of soil prior to entry into the facility and when moved outside of the regulated area.

7.2 Field Grown Plants for Planting and Propagation

Pest free places of production may be established on any non-exposed fields within a regulated area provided the criteria below are met:

- No history of host crop production within the last 10 years;
- Negative PCN detection survey (using Method A);
- Ongoing PCN detection survey every 36 months (using Method A);
- Minimum five yard buffer around the site maintained free of PCN hosts.

8.0 Releasing Land from Regulatory Requirements (Under Development)

This section will describe a process designed to remove land from regulatory control, including suspect, infested, adjacent, primary exposed, and other exposed fields. APHIS and CFIA agree to immediately develop this section and incorporated into the next iteration of the Guidelines, which is to be completed before January 1, 2009.

9.0 Review and Amendment

The CFIA and APHIS agree to immediately defer technical questions such as soil survey requirements and other science-based issues to an International Science Panel. APHIS and CFIA will review the science panel's recommendations and revise the Guidelines accordingly and prior to January 1, 2009. In addition, CFIA and APHIS also agree to immediately develop the regulatory conditions required for releasing land from regulatory control and incorporate such conditions into the next iteration of the Guidelines, which is to be completed before January 1, 2009

A review of these Guidelines should be undertaken at the request of either NPPO or at regular intervals as approved by the NPPOs. Such requests for review will be handled without undue delay.

While the NPPOs may discuss proposed amendments to the Guidelines, any such amendments will not be applicable until they have been mutually consented to in writing and signed by the authorized representatives of the NPPOs.

10.0 Duration

These Guidelines will be implemented and will apply immediately after the date of signature by authorized representatives of both NPPOs.

These Guidelines will remain applicable in containing, controlling and delimiting any outbreaks of PCN unless the Guidelines are terminated, as provided for below.

Either NPPO has the right to terminate these Guidelines at its sole discretion at any time after giving 60 days written notice to the other NPPO. The Guidelines may also be terminated by mutual consent as of a date approved in writing by both NPPOs and as confirmed by the signatures of their authorized representatives.

11.0 Non-compliance and Dispute Resolution

In the event of a non-compliance with a requirement specified in the Guidelines, the CFIA and the USDA-APHIS agree to discuss the matter bilaterally so that it can be mutually and quickly resolved. In the event that a dispute cannot be mutually and quickly resolved, either NPPO may at its sole discretion terminate the Guidelines immediately or at any other time upon providing written notice as described above. Any dispute regarding the interpretation or implementation of

the Guidelines will be resolved only by consultation between the CFIA and USDA-APHIS or through a mutually agreed upon dispute resolution process (e.g. NAPPO's Resolution Process).

12.0 Acknowledgments & Endorsement

The CFIA and APHIS hereby acknowledge that the present version of these Guidelines is acceptable to the respective NPPOs.

The CFIA and APHIS also hereby acknowledge and accept that the present version of the Guidelines revokes and replaces the previously signed version of the Guidelines, referred to as version 7 and dated October 15, 2006.

The CFIA and APHIS also agree to immediately defer technical questions to an International Science Panel to address key issues such as soil survey requirements and other science-based questions as they arise. APHIS and CFIA will review said recommendations and revise the Guidelines in accordance with the Science Panel's recommendation prior to January 1, 2009.

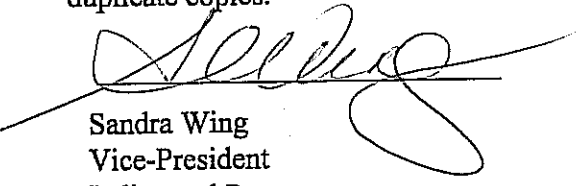
The CFIA and APHIS accept that in 2008 they will implement PCN detection surveys for seed fields in their respective States or Provinces having a PCN-regulated area and for all fields used to produce seed potatoes traded between their respective countries.

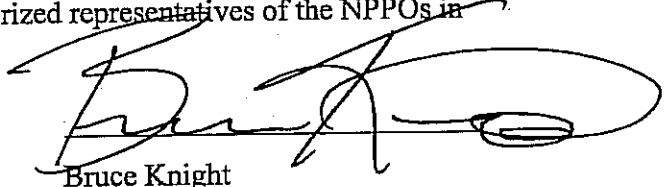
The CFIA and APHIS accept, subject to review of these Guidelines, that by 2010 they will implement PCN detection surveys, and that these surveys will become a component of each National or State seed potato PCN testing program, thereby further increasing confidence that seed potatoes are not contributing significantly to PCN spread within Canada and the United States. The NPPOs will require PCN testing for seed potatoes through the following actions:

- In the United States, a "State National Harmonization Program for Seed Potatoes Memorandum of Understanding" (SNHP MOU) will be concluded with all States having producers who undertake interstate shipment of seed potatoes under the MOU requirements.
- In Canada, through amendments to the Canadian National Seed Potato Certification Program.

The CFIA and APHIS will share information and update each other regularly, through their respective authorized representatives, on any existing problems and the status of new PCN detections in their respective countries.

These Guidelines have been executed by the authorized representatives of the NPPOs in duplicate copies.


Sandra Wing
Vice-President
Policy and Programs
Canadian Food Inspection Agency


Bruce Knight
Under Secretary
United States Department of Agriculture
Marketing and Regulatory Programs

Date: 5/5/08

Date: May 5/08

Appendix 1

Definitions:

Unless otherwise noted, definitions from the IPPC Glossary of Phytosanitary Terms (ISPM No. 5) apply.

Adjacent field:	Field or tract of land bordering an infested field and not separated by any major highway or any major water course or forested area or non-agricultural area of more than 15 yards wide which act as a physical barrier for the spread of PCN into other agricultural fields.
Certificate:	An official document issued or authorized to be issued by an inspector to allow the movement of regulated articles.
Certified Seed Potatoes:	Potato tubers officially accepted and classified as propagative material through a Seed Potato Certification program recognized by the Potato Association of America.
Delimiting Survey:	Survey conducted to establish the boundaries of an area considered to be infested by or free from a pest (IPPC, 2007).
Detection Survey:	Survey conducted in an area to determine if pests are present (IPPC, 2007).
Exposed field:	A parcel of land determined, in relation to an infested field, to be an adjacent field, a primary exposed field, or other exposed field.
Field:	A plot of land with defined boundaries within a place of production on which a commodity is grown (IPPC, 2007).
Infested field:	A field in which <i>Globodera rostochiensis</i> or <i>Globodera pallida</i> has been detected.
Non-Exposed field:	A field determined not to be associated with a PCN-infested field.
Other exposed field:	Parcels of land, excluding infested and primary exposed fields and adjacent fields exposed to other risk factors for the spread of PCN, as determined by the NPPO, and that may lead to regulatory restrictions being imposed by that NPPO.

Primary exposed field: Parcel of land where equipment moved directly after use in an infested field, where soil from an infested field was transported directly, or received propagative host material from an infested field.

Regulated Area An area into which, within which and/or from which plants, plant products and other regulated articles are subjected to phytosanitary regulations or procedures in order to prevent the introduction and/or spread of quarantine pests or to limit the economic impact of regulated non-quarantine pests (IPPC, 2007).

Suspect field A field in which one or more cysts, potentially of *Globodera rostochiensis* or *Globodera pallida*, have been detected but where definitive identification and/or confirmation have not yet been made.

Appendix 2

Potato Cyst Nematode Field Soil Sampling Requirements

Method A:

- Sample the entire field in a fixed grid pattern;
- Minimum of three, 5 lb. (2000 cc) soil samples/acre (0.4 ha);
- Minimum of 500 sampling points/hectare (200 points/acre);
- Maximum grid cell size of approximately 18m²;
- For hand sampling, the length of a grid cell should not be greater than 4 times the width;
- For rectangular shaped grid cells the longest dimension should be parallel to the direction of cultivation.

Method B:

- Sample the entire field in a fixed grid pattern;
- Minimum of 1.1 lb. soil/acre or 1235 cc/ha (combined in individual 2000 cc samples);
- Minimum of 100 sampling points/hectare (40 points/acre);
- Maximum grid cell size of approximately 100m²;
- For hand sampling, the length of a grid cell should not be greater than 4 times the width;
- For rectangular shaped grid cells the longest dimension should be parallel to the direction of cultivation.

Method C:

- Minimum of three, 5 lb. (2000 cc) soil samples/acre (0.4 ha) collected from a minimum of 10% of the total field acreage in the field perimeter;
- Each 2000 cc soil sample should be comprised of a minimum of 112 sampling points.

Notes:

- 1) Methods A and B require sampling of the entire field in a fixed grid pattern within the parameters above.
- 2) The field *perimeter* is the outside edge of the cultivated portion of a field, including the headlands and turnarounds. For the purpose of this survey, the degree to which the perimeter will extend into the field will depend on the size of the field and the subsequent number of samples that need to be taken.