POTATO WART IN PRINCE EDWARD ISLAND: DOMESTIC LONG TERM MANAGEMENT PLAN

The Potato Wart (PW) Domestic Long Term Management Plan outlines the restrictions and surveillance activities for PW in Prince Edward Island (PEI) to reduce the risk of spread of PW and protect potatoes, potato production, trade and the economy.

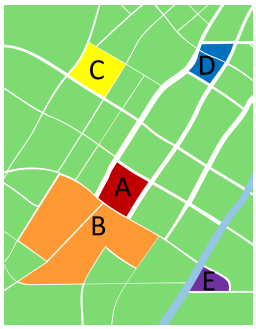
Potato wart (PW) is a soil-borne fungus (*Synchytrium endobioticum*) that can remain dormant in a field for more than 40 years. Although PW poses no threat to human health, animal health or food safety, it reduces yield and makes potatoes unmarketable. In Canada and many other countries, PW is a quarantine pest. The fungus produces spores which can spread through many pathways, including the movement of potatoes and soil.

Potato wart is regulated under the *Plant Protection Act*, which means that its detection may trigger land-use restrictions, movement controls, requirements for cleaning and disinfection of equipment, soil sampling and testing. **The fungus is extremely persistent and the only efficient way to control the disease is to prevent the spread into new locations.**

DEFINITIONS

Bioassay involves growing a potato variety that is susceptible to PW (usually in a greenhouse) in soil collected from a field to see if symptoms of PW develop

Conducive conditions where PW grows best are cool, wet growing seasons.



Fields under restrictions are any parcels of land under restrictions to reduce the risk of spread of PW, and may be **Category A, B, C or D**. In addition, **Category E** is land that is entering seed potato production for the first time and requires post-harvest field inspection to confirm the absence of PW.

PW host crops are crops in the family Solanaceae that are susceptible to PW.

Resistant varieties are varieties of potato that are resistant to PW.

Soil microscopy involves using a microscope to examine soil collected from a field to look for PW spores.

Soil sampling grids determine the spacing between sub-samples.

Tare soil is the soil found on potatoes after harvesting. It falls off during handling and storage.

TYPES OF POTATOES

Table stock are potatoes to be prepared fresh, cooked and eaten.

Processing end use means potatoes that are turned into other products (for example, French fries, potato starch), and not consumed fresh.

Seed potatoes are eligible to be planted to grow other potatoes under the Canadian National Seed Potato Certification Program.

SOIL SAMPLING AND TESTING

Why: Soil samples are collected and tested as part of the PW management plan:

- as part of investigations related to findings of PW
- from some fields under restrictions every five years

Soil samples may be used for microscopy testing and for bioassays.

How many: The number of samples is higher in years where PW investigations are triggered or additional monitoring is required. During an investigation, the number of samples collected can vary greatly depending on the size of the field and the number of fields involved.

To collect a sub-sample, a soil probe is inserted to the field and removes a sub-sample to a depth of 20 cm. When the sub-samples combine for a total of approximately 5 lbs, 2.27 kg or 2000 cc of soil, they are placed in a sample bag. A sample is typically made of about 35 sub-samples.

When: To minimize impact on growing crops, samples are collected during the spring or fall. Most samples are collected in the fall after crops have been harvested, before the ground freezes.

Example: For a 1 ha field measuring 100 m x 100 m, a 4 m x 4 m sampling grid would result in 625 sub-samples, around 18 samples and approximately 41 kg of soil submitted for testing.

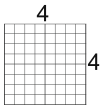
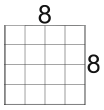
VISUAL INSPECTION

Post-harvest field inspection takes place during or shortly after harvest. An inspector walks the whole field to visually inspect potato tubers and plant material left behind.

Tuber inspection is a visual inspection of potatoes as they enter or leave storage, or at any time an inspector wishes to view tubers.

LEGEND

Many different surveillance measures are used to detect and monitor for the presence of PW in fields under restrictions.

EXAMPLES OF SURVEILLANCE ACTIVITIES			EXAMPLES OF RESTRICTIONS		
 4 m x 4 m grid soil sampling	 8 m x 8 m grid soil sampling	 Bioassay tests for PW	 Containment and safe disposal of soil	 Cleaning and disinfecting of equipment	 Only processing end use within the province is permitted
 Post-harvest field inspection	 Soil microscopy for PW	 Tuber inspection	 Restriction of soil movement	 Only non-host crops can be planted	 Planting of any material intended for propagation is prohibited

Under the current management plan, when PW is detected, the initial restrictions and surveillance activities include:

- Containment and safe disposal of soil and crops
- If there is a potato crop in the field, only processing end use within the province is permitted with risk mitigation measures in place
- Restriction of soil movement
- Cleaning and disinfecting of equipment
- For future crops, only non-host crops can be planted, no potatoes permitted for at least 5 years
- Planting of any material intended for propagation is prohibited
- 4 m x 4 m grid soil sampling
  - o Soil microscopy for PW
- Post-harvest field inspection and tuber inspection for PW

5 years after a detection and when spore counts in the soil are < 5 spores/g of soil and PW is not detected in bioassays, the production of resistant potato varieties may be permitted, with full cleaning and disinfection. Processing end use remains within the province with risk mitigation measures in place. Post-harvest field inspection and tuber inspection for potato wart are required.

5 years after the initial detection, and at every 5 years, surveillance activities include:

- 4 m x 4 m grid soil sampling
  - o Soil microscopy for PW
  - o Bioassay tests for PW

15 years after the planting of resistant varieties, when regular soil samples indicate < 5 spores/g of soil in EACH sample and PW is not detected in all bioassays:

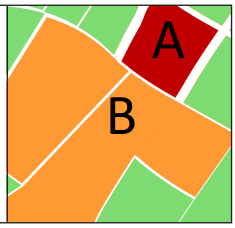
- Production of PW-susceptible potato varieties may be permitted
- Cleaning and disinfection and soil movement restrictions may be lifted, except that tare soil must be returned to the Index field
- Processing end use of potatoes within the province remains a requirement
- Post-harvest field inspection and tuber inspection for PW for at least three crops of a PW-susceptible potato variety in conducive conditions

For a field to be released from all restrictions, PW must not be detected for three further crops of PW-susceptible potato varieties grown under conducive conditions.

B

ADJACENT FIELDS USED FOR POTATO PRODUCTION

Fields next to an index field not separated by a physical barrier of more than 15 m width



For all Adjacent fields used for potato production, the initial restrictions and surveillance activities include:

- Containment and safe disposal of soil and crops
- Only processing end use within the province is permitted with risk mitigation measures in place
- Restriction of soil movement
- Cleaning and disinfecting of equipment
- Only non-host crops can be planted
- Planting of any material intended for propagation is prohibited
- 8 m x 8 m grid soil sampling
  - o Soil microscopy for PW
- Post-harvest field inspection and tuber inspection for PW

Once the results of soil testing and post-harvest field inspection for PW-susceptible potato varieties indicate that PW is not detected:

- Cleaning and disinfection and soil movement restrictions may be lifted, except that tare soil must continue to be controlled.
- Processing and table stock end-use of potatoes is permitted (excluding export to the US), but they must receive a phytosanitary inspection

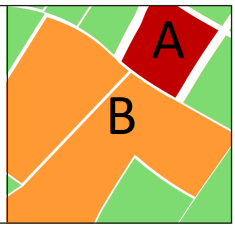
Once there is acceptable surveillance on three additional crops of a PW-susceptible potato variety, end use will be limited to processing and table stock only. Seed production is not permitted.

Once all soil restrictions are lifted AND surveillance activities are acceptable for two additional crops of a PW-susceptible potato variety in conducive conditions, the field may have all restrictions lifted. However, seed production is ONLY permitted after all restrictions are lifted for the Index field.

B

ADJACENT FIELDS NOT USED FOR POTATO PRODUCTION

Risk is reduced when the field has not been used for potato production in >20 years and is not intended for future use in potato production.



For all Adjacent fields NOT used for potato production, the initial restrictions and surveillance activities include:

- Containment and safe disposal of soil
- Restriction of soil movement
- Cleaning and disinfecting of equipment
- Only non-host crops can be planted
- 8 m x 8 m grid soil sampling
  - o Soil microscopy for PW

On the 15 m portion of the field immediately adjacent to the Index field:

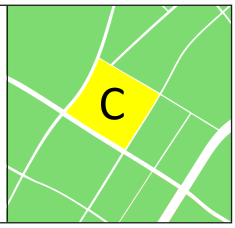
- 4 m x 4 m grid soil sampling
  - o Soil microscopy for PW
  - o Bioassay tests for PW

Once the results of surveillance activities above indicate that PW is not detected, cleaning and disinfection and soil movement restrictions may be lifted.

C

PRIMARY CONTACT FIELDS USED FOR POTATO PRODUCTION

These fields may have had soil or potatoes transferred to them from an Index field, or had common equipment moved to them directly after use in an Index field.



For all Primary contact fields used for potato production, the initial restrictions and surveillance activities include:

- Containment and safe disposal of soil and crops
- Restriction of soil movement
- Cleaning and disinfecting of equipment
- Only processing end use within the province is permitted with risk mitigation measures in place
- 8 m x 8 m grid soil sampling
  - o Soil microscopy for PW
- Post-harvest field inspection and tuber inspection for PW

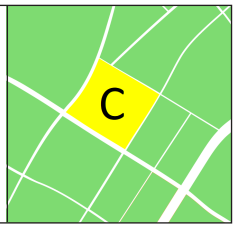
Once the soil test and one post-harvest field inspection for a PW-susceptible potato variety indicate that PW is not detected, cleaning and disinfection restrictions may be lifted. Potato production will be limited to processing and/or table stock end use with a phytosanitary inspection on table stock.

Once surveillance activities are acceptable for three additional crops of a PW-susceptible potato variety in conducive conditions, all remaining restrictions may be lifted and shipments to the US are permitted.

Once all restrictions are lifted, mandatory surveillance of two further crops of PW-susceptible potato varieties in conducive conditions is required.

C

PRIMARY CONTACT FIELDS NOT USED FOR POTATO PRODUCTION



For all Primary contact fields NOT used for potato production for >20 years, the initial restrictions and surveillance activities include:

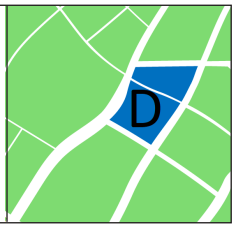
- Restriction of soil movement
- Cleaning and disinfecting of equipment
- Only non-host crops can be planted
- 4 m x 4 m grid soil sampling
  - o Soil microscopy for PW
  - o Bioassay tests

Once the results of surveillance activities above indicate that PW is not detected, soil movement restrictions may be lifted.

D

OTHER CONTACT FIELDS

Fields where common equipment has been shared with an Index field, after use in a primary contact field.



For other contact fields, the following is required:

- 8 m x 8 m grid soil sampling
  - o Soil microscopy for PW
- Any fields used for potato production are subject to post-harvest field inspection and a tuber inspection for PW

Once surveillance activities for the FIRST crop of a PW-susceptible potato variety are acceptable, all restrictions on potato end use domestically are lifted, table stock and processing potatoes are permitted. However, shipment to the US is not permitted due to requirements associated with the US Federal Order (DA-2015-01) that were put in place after the current version (2009) of the PW Domestic Long Term Management Plan was drafted.

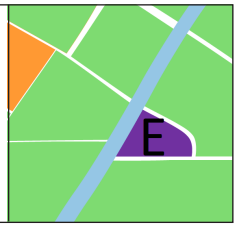
Once surveillance activities for the SECOND crop of a PW-susceptible potato variety are acceptable, the field will be considered PW free and the export to the US and Puerto Rico is permitted.

Mandatory surveillance of three further crops of a PW-susceptible potato variety in conducive conditions is required.

E

NEW FIELDS ENTERING SEED POTATO PRODUCTION

Fields not previously used for potato production. These fields are likely to have minimal risk for PW.



If there is any degree of risk of PW being detected, the following is required:

- Post-harvest field inspection

If surveillance activities are acceptable, the field will be considered PW free.

SUMMARY			EXAMPLES OF SURVEILLANCE ACTIVITIES						EXAMPLES OF RESTRICTIONS					
CATEGORY														
A	INDEX FIELD		●		●	●	●	●	●	●	●	●	●	●
B	ADJACENT FIELD	Used for potato crops		●		●	●	●	●	●	●	●	●	●
		NOT used for potato crops (15 m portion directly adjacent to Index field)	●		●		●		●	●		●	●	
		NOT used for potato crops (rest of field)		●			●		●	●		●	●	
C	PRIMARY CONTACT FIELD	Used for potato crops		●		●	●	●	●	●	●	●		
		NOT used for potato crops	●		●		●			●		●	●	
D	OTHER CONTACT FIELD			●		●	●	●						
E	FIELD ENTERING SEED POTATO PRODUCTION					●								