

GUIDELINES FOR ASBs FOR CLUBROOT

1. Develop a policy for clubroot management within each municipality
 - a. See attached for examples of policies
 - i. **Attachments 8 and 9**
2. Public Relations Guidelines
 - a. Advertise policy in local media
 - i. i.e. newsletters, local paper, public meetings
 - ii. Try to do one month prior to inspections
 - iii. Set up a database of growers with land locations
 1. Ask them to call in with information to facilitate notifying for inspection purposes
 - iv. Have producer advisory committee
 1. Can help advise council and ASB on management plans
 2. Producer advisory committees are eligible for cost sharing under ASB grant
 - b. Subjects to cover in advertising
 - i. When field inspections will be occurring
 - ii. Right of entry of field inspectors under *Agricultural Pests Act (APA)*
 - iii. Potential impact of disease on canola and other cruciferous crops
 - iv. How disease is spread
 1. Movement with soil on equipment
 2. Wind movement of soil
 3. Water movement of soil
 4. Inoculum levels
 - v. Sanitation protocols staff will be following
 - vi. Urge producers to clean and disinfect equipment before moving fields
3. Inspection Guidelines
 - a. Don't drive vehicles into fields!
 - i. Park in a safe location on roadsides or along approach to field
 - b. Use disposable booties or have bleach available to disinfect boots
 - c. Follow Record Keeping and Sampling Guidelines below
4. Record Keeping Guidelines
 - a. Keep records on all fields sampled
 - b. Information to record on inspection forms
 - i. Field reference number
 - ii. Legal land location
 - iii. GPS location of field
 - iv. Surveyor
 - v. Date inspected/sampled
 - vi. Size of field
 - vii. GPS locations of sites sampled
 - viii. Pictures of field/aerial photos
 - ix. Date samples submitted
 - x. Lab numbers for samples submitted
 - xi. Results of samples
 - c. If landowner or other witness present, have them sign form
 1. See attached for a samples of field inspection forms

- d. Maintain a log of all samples submitted for testing
 - e. Record all contacts with landowner/occupant of land
 - 5. Sampling Guidelines
 - a. Sample more than one area of a field
 - i. If using a percent disease incidence to determine length of restriction (i.e. low, moderate or high), must follow attached guidelines from Dr. Strelkov
 - 1. Attachment 3**
 - ii. If using a presence of absence standard for enforcement, sample a minimum of 5 areas of field
 - 1. Number of samples taken per field should be outlined in local bylaws for each jurisdiction
 - 2. Highly recommend that a W or other zigzag pattern is used and multiple samples are taken
 - a. Don't just sample the entryways!!!
 - 3. Attachment 4**
 - b. If a positive visual sample is found on a field of a producer who has not previously had clubroot, lab samples **MUST** be taken for confirmation via a PCR test
 - i. Policy Guidelines for ASBs
 - 1. Attachment 5**
 - c. Use good sanitation when collecting samples to prevent cross contamination and prevent false negatives!
 - i. Sterilize sampling tools between each sample using a 1-2% v/v bleach solution or alcohol
 - ii. Use a new Ziploc bag for each sample
 - 1. If samples cannot be submitted immediately, paper bags may be used but steps have to be taken to prevent cross contamination of samples
 - d. Record field reference number on each sample as it is collected
 - e. Keep samples cool by placing into a cooler
 - f. Submit samples as soon as possible
 - i. If samples cannot be submitted immediately, air dry and send in for testing
6. Notice Guidelines
 - a. Upon receipt of a positive visual sample/PCR sample (especially for producers that have not had clubroot previously identified on their land), a notice should be issued **if cropping restrictions are going to be enforced**
 - i. Follow local policies and guidelines of municipality
 - ii. See **Attachment 5**
 - b. Issuing Notice
 - i. Form 2 (Section 6 (1)) Agricultural Pests Act is the notice that is to be issued for a clubroot infestation
 - 1. Attachment 6**
 - 2. Attachment 7 (example of clubroot notice)**

(INSERT MUNICIPALITY) CLUBROOT INSPECTION FORM

					(INSERT DATE)
LANDOWNER					INITIAL INSPECTION DATE
					FIELD DIAGRAM
QTR	SEC	TWP	RGE	MER	
LEGAL LAND DESCRIPTION					
MUNICIPAL ADDRESS (IF AVAILABLE)					
ESTIMATED SIZE OF FIELD					
INITIAL VISIT					
INSPECTION PERFORMED:				SAMPLE TAKEN: YES or NO	
REMARKS: i.e. Found suspicious plants near the entrance of field. Samples taken and sent into (Lab) for PCR test.				SAMPLE LOT:	
				LAB NO:	
				RESULT: POSITIVE or NEGATIVE	
GPS LOCATION:					
INSPECTOR NAME		INSPECTOR SIGNATURE		DATE	
NOTIFICATION OF INFESTATION					
NOTICE NO:					
DATE NOTICE ISSUED:					
DATE NOTICE RECEIVED:					
INITIAL CONTACT					
CONTACT NAME:					
REMARKS:					
INSPECTOR NAME		INSPECTOR SIGNATURE		DATE	

Attachment 2
 Example - Clubroot Inspection Follow Up Forms

FOLLOW UP – YEAR 1		
CROP:		
REMARKS:		
INSPECTOR NAME	INSPECTOR SIGNATURE	DATE

FOLLOW UP – YEAR 2		
CROP:		
REMARKS:		
INSPECTOR NAME	INSPECTOR SIGNATURE	DATE

FOLLOW UP – YEAR 3		
CROP:		
REMARKS:		
INSPECTOR NAME	INSPECTOR SIGNATURE	DATE

FOLLOW UP – YEAR 4		
CROP:		
REMARKS:		
INSPECTOR NAME	INSPECTOR SIGNATURE	DATE

FOLLOW UP – YEAR 5		
CROP:		
REMARKS:		
INSPECTOR NAME	INSPECTOR SIGNATURE	DATE

**CLUBROOT OF CRUCIFERS
SURVEYING PROTOCOL TO DETERMINE PERCENT DISEASE INCIDENCE**

Introduction: Clubroot is a serious soil-borne disease of crucifers (canola, mustard and vegetable crops such as cabbage, broccoli, cauliflower, turnip and radish) caused by the fungus-like organism *Plasmodiophora brassicae*. Disease development is favored by wet and acidic soil conditions. The pathogen is mainly spread by movement of soil and infected plant material, as well as by run-off water.

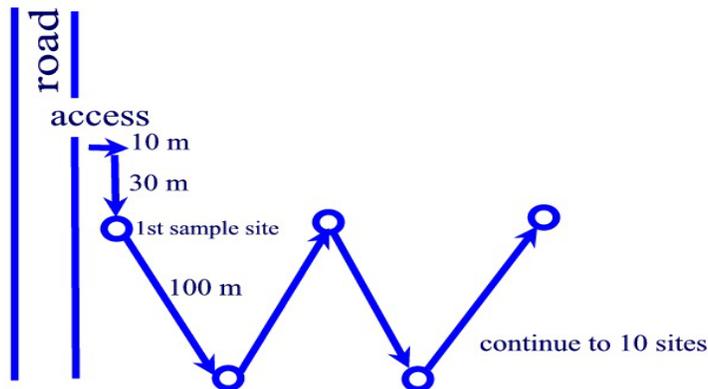
Symptoms: The pathogen infects the roots of susceptible hosts, causing the formation of club-shaped galls or swellings that restrict the uptake of water and nutrients by the plant. Above-ground symptoms include yellowing, stunting, premature ripening and wilting of plants under moisture stress. As symptoms may take 6-8 weeks to develop, they become most noticeable later in the summer (late July or August). See **Agdex 140/638-1, "Clubroot Disease of Canola and Mustard"** for more information on clubroot and pictures of galls.

Equipment and Materials Needed:

Clipboard	Pocket knife	plastic tray or pail
Record sheets	Paper bags	Disposable boot covers
Hand trowel	5% bleach solution	GPS Unit

Survey Procedure: Scout for clubroot by visually inspecting canola / mustard / cole crop roots for galls. **Survey the field shortly after swathing** – the physical effort needed to walk through the field will be minimal and galls will be maximum size. If the survey is conducted long after swathing, the galls will begin to deteriorate and more care is needed during root removal and diagnosis.

1. Do not drive or park vehicle into fields.
 - a. Try to park on the side of the road in a safe location.
2. Put on new disposable boot covers.
3. Survey the field in a 'W' pattern, sampling 10 plants at each of 10 equally spaced sites along the arms of the W.
 - a. Begin 30 m to the right of the field access, 10m from field edge and allow 100 m between sampling points.
 - b. The last sampling point may be conducted at any spot in the field that is suspect due to topography (for example, low-lying area with more moisture) or due to suspicious symptoms during ripening (indicated by farmer or pre-scouting during ripening stages).
 - c. See diagram below for sampling pattern.



4. At each sample site, dig up roots from 10 plants and shake off excess soil. Visually examine roots for presence of galls. Record sample site GPS location and findings on form.
 - a. At sample sites where infection is observed or suspected, collect 5 root specimens with galls, by cutting off stems and placing roots in a paper bag labeled with field location.
 - i. **NOTE:** Disinfect sampling tools with a 10% v/v bleach solution or alcohol between samples.
 - b. Combine the root samples from suspect individual sites in the field. The composite sample should have 5 to 10 suspect root specimens.
 - c. Retain sample (air dry) for submission to lab for confirmation (needed for first occurrence for an individual grower). Dr. Strelkov at the University of Alberta may also request samples for pathotype identification.
5. Prior to leaving potentially infested field, discard disposable boot covers into garbage bag and incinerate later. If boot covers were not used, remove clumps of soil from boots, and then wash in plastic tray with 1-2% v/v bleach solution (in order to prevent disease spread). Disinfect sampling tools with bleach solution.
 - a. Recommended to keep boots/tools in solutions for 15 minutes.

Indicate roads and field access, sample points, and landmarks



CLUBROOT OF CRUCIFERS SURVEYING PROTOCOL TO DETECT PRESENCE OR ABSENCE

Introduction: Clubroot is a serious soil-borne disease of crucifer (canola, mustard, cabbage, broccoli, cauliflower, turnip and radish) crops caused by the fungus like organism *Plasmodiophora brassicae*. Disease development is favoured by wet and acidic soil conditions. The pathogen is mainly spread by movement of soil, infected plant material and run off water.

Symptoms: The pathogen infects the roots of susceptible hosts causing the formation of club-shaped galls or swellings that restrict the uptake of water and nutrients by the plant. Above ground symptoms include yellowing, stunting, premature ripening and wilting of plants under moisture stress.

Equipment and Materials Needed:

Clipboard	Pocket Knife	Plastic Tray or Pail	GPS Unit
Record Sheets	Paper Bags	Disposable Boot	
Hand Trowel	5% Bleach Solution	Covers	

Survey Procedure

Scout for clubroot by visually inspecting susceptible crops for galls (swellings on the roots). Symptoms may take 6 to 8 weeks to develop and are most detectable late in the summer. Recommended time to survey to detect presence or absence of clubroot galls is from **July to September**.

1. Do not drive or park vehicle into fields. Try to park on the side of the road in a safe location.
2. Visually assess field for suspect infection of clubroot. Look for symptoms such as premature ripening, yellowing or browning of plants, stunting and wilting of plants under moisture stress in crop.
3. Put on new disposable boot covers.
4. Survey the field in a 'W' pattern, concentrating on areas of potential contamination such as field entrances, sloughs, water runs and other areas identified as suspect.
5. Sample several sites within the travel pattern. At each site, record the GPS location and dig up the roots of 10 plants. Shake excess soil off the roots and visually inspect for the presence of galls. Record the number of infested plants (plants that have galls) at each sample site within the field.
 - b. At sites where infection is suspected or found, collect 5 samples of the roots by cutting off the stems and placing the roots in a paper bag labeled with field location.
 - i. **NOTE:** Disinfect sampling tools with a 10% v/v bleach solution or alcohol between samples.
 - c. Combine root samples from individual sample sites within the field to submit for analysis when clubroot is suspected or found. The combined sample must have 5-10 root specimens. If there is no prior history of clubroot for that grower, a sample from the field must be submitted for confirmation by a laboratory test (PCR test).

- i. The PCR test is to confirm the presence of clubroot within the field. GPS data and visual survey results may be used to identify individual sites within the field.
- d. Retain samples for submission to lab or to Dr. Strelkov for pathotypes identification (if requested).
- e. Prior to leaving potentially infested field, discard disposable boot covers into garbage bag and incinerate later. If boot covers were not used, remove clumps of soil from boots, and then wash in plastic tray with 5% bleach solution (in order to prevent disease spread).
- f. Disinfect sampling tools with bleach solution.
 - i. Recommended to leave boots and tools in bleach solution for 15 minutes for proper disinfection.

Attachment 5

CLUBROOT POLICY GUIDELINES FOR MUNICIPALITIES

Adoption of uniform enforcement policies by Alberta municipalities is recommended for reducing the spread and severity of clubroot disease in canola and cole crops. It will be easier for all land users (farmers, oil and gas companies, etc) who operate in several municipalities to know and follow clubroot policies if they are uniform. There are clubroot best management practices (BMP) that should be communicated to all stakeholders. The following policy recommendations and BMP's were developed by the Alberta Clubroot Management Committee.

Recommended Clubroot Policies:

A. Field Surveys

1. Clubroot field surveys should be conducted in municipalities where canola, mustard and cole crops are grown.
2. Clubroot survey method, reporting form and calculation of disease incidence must exactly follow standard protocols provided by the Alberta Clubroot Management Committee.
3. The first positive survey result for an individual grower must be confirmed by laboratory test (PCR).
4. Survey results and legal locations of infested fields must be made available to land renters, landowners and other parties with a genuine commercial interest, under the provisions of the *Alberta Agricultural Pests Act and the Pest and Nuisance Control Regulation (section 10)*. The method of information release shall be at the discretion of the municipal officer, and may be in the form of a map at the municipal office, verbal communication or other formats.

B. Disease Spread Reduction

1. For fields with a low incidence of clubroot disease (1 positive site out of 10 sample sites using the clubroot survey method), the occupant shall not plant canola or other susceptible crops in the **three** following years. Proper cleaning of field equipment prior to transport from infested fields is required, using procedures outlined in the factsheet "Clubroot Disease of Canola and Mustard" (Agdex 140/638-1, May 2007).
2. For fields with a moderate to high incidence of clubroot disease (2 or more positive sites out of 10 sample sites using the clubroot survey method), proper cleaning of field equipment is mandatory and of highest priority, and the occupant shall not plant canola or other susceptible crops for **five** subsequent years.
3. Municipalities may also put policies in place allowing the Pest Inspector to issue notices based on the presence or absence of clubroot disease within a field. In these instances, if clubroot is present within the field, proper cleaning of field equipment is mandatory and of highest priority, and the occupant shall not plant canola or other susceptible crops for **(insert number of years)**.
 - i. **NOTE:** Discretion is left to local municipalities to determine the number of years to take canola and other susceptible crops out of

rotation for this situation. When local ASBs and councils are making Clubroot Policies, it is recommended that a minimum of three years is used (see point 1 above).

Best Management Practices:

1. Canola growers in high-risk situations (confirmed clubroot in the area) should follow traditional canola rotation recommendations (1 in 4). Although this will not prevent the inadvertent introduction of clubroot to clean fields, long rotations will keep any such introductions at very low levels with a minimal economic impact.
2. Equipment should be cleaned before transport from all fields. Basic equipment cleaning should be practiced even after fields not known to be infested by clubroot, to reduce the spread of other pests (weeds and other diseases).
3. The area next to the exit in infested fields should be grassed to facilitate equipment washing. Where light infestations are only present near the current field access, a field exit should be established at another distant location if possible.
4. Grain (canola, cereals, pulses, etc) or propagative materials (potato tubers) from infested fields should not be kept for seed purposes. Straw should not be baled and removed from infested fields.
5. Volunteer canola and crucifer weeds must be controlled on infested fields before three weeks of growth has occurred to prevent the production of new resting spores.
6. Equipment traffic from infested fields should be minimized. Minimum tillage systems are recommended partly due to less machinery traffic from the field than with conventional tillage. Minimum tillage systems also reduce soil erosion and thus decrease the risk of local spread.
7. Scout fields regularly and identify causes of poor crop growth.

FOIP Questions and Answers

Can information about infested fields be released?

Results from soil or clubroot tests can be released as long as they don't identify a person by name. Test results are not considered personal information – it is considered information about the land and not information about a person, therefore, it can be disclosed that a pest exists on a piece of land but NOT who owns or farms the land.

Do the *Agricultural Pests Act (APA)* and FOIP work together?

The *APA* allows for the release of personal information. Section 10 under the *APA* Regulations states: *An inspector who finds on any premises evidence of an infestation in any crop may notify persons engaged in the growing, transporting or processing of any crop that may be affected by the infestation, or any organizations representing them, of the infestation, including the location of those premises and the name of their occupants, if the inspector considers such notification necessary or advisable with a view to preventing the spread of or controlling the infestation.*

FOIP allows for release of personal information when there is a provision under another Act.

FOIP Act Section 40(1)(f)

40(1) A public body may disclose personal information only

(f) for any purpose in accordance with an enactment of Alberta or Canada that authorizes or requires the disclosure,

Release of information remains is at the discretion of the municipality under both FOIP and the APA as they are most aware of current conditions within their jurisdictions and the potential affects the release of information may have within the community.

What if someone has a county map and looks up the name of the person who owns a parcel of land that is listed as being infected with clubroot? Would this be considered a release of personal information?

It would not be considered a release of personal information because the initiative to find out that information came from an individual and the information was found on documents that are publicly available. There is a provision under FOIP that allows for release of information as long as it is ethical and in good conscious.

FOIP Act Section 4(1)(l)

4(1) This Act applies to all records in the custody or under the control of a public body, including court administration records, but does not apply to the following:

(l) a record made from information

(i) in the Personal Property Registry,

(ii) in the office of the Registrar of Motor Vehicle Services,

(iii) in the office of the Registrar of Corporations,

(iv) in the office of the Registrar of Companies,

(v) in a Land Titles Office,

(vi) in an office of the Director, or of a district registrar, as defined in the *Vital Statistics Act*, or

(vii) in a registry operated by a public body if that registry is

authorized or recognized by an enactment and public access to the registry is normally permitted;

Why won't private agribusinesses share information with the municipalities?

Agribusinesses are subject to PIPA and not FOIP. They may disclose the land location of an infested field but there is no requirement under the current law that states that they must share information

What is an official FOIP request?

An official FOIP request is a formal request to release information. There is a cost of \$25 and a form to fill out to make an official FOIP request. If an official FOIP request is made then the municipality is required to release information. The municipality cannot release personal information but is required to release information such as test results and the legal land location for a field that is infected with clubroot, for example. The name of the landowner or occupant would not be released for an official FOIP request.

Information that is considered non-personal (i.e. legal land description, test results) **MUST** be released when an official FOIP request is received. It is up to the discretion of the municipality to release information in all other circumstances.

Attachment 6
Form 2 – Section 6(1) – *Agricultural Pests Act*

Notice to Control Pests
Agricultural Pests Act
(Section 6(1))
Pest and Nuisance Control Regulation (Form 2)

To (owner or occupant of land or property or owner or person in control of livestock)
_____ of (address) _____

You are hereby notified that (description of land or livestock or other property) located on the
_____ quarter of section _____ township _____ range _____ west of the _____ meridian,
Alberta, as indicated on the diagram below, contains or is likely to contain or should be
protected against (name of pest) _____, which has been declared a pest
by the Pest and Nuisance Control Regulation made under the *Agricultural Pests Act*, and you are
directed to take the following measures:

*(include description of measures to be taken, including the material, if any, to be used against
the pest)*



All of the above measures must be completed within _____ days from the date of issue of this
notice, failing which action may be taken in accordance with the legislation referred to above.
This notice is issued under section 12(1) of the *Agricultural Pests Act*. An appeal against this
notice may be served on the municipal secretary, accompanied by a deposit of \$100, before the
expiry of the time limit stated above or the period of 10 days from service of the notice,
whichever expiry date occurs first, and otherwise made in accordance with the *Agricultural
Pests Act*.

Date of Issue: _____

Inspector: _____

Telephone Number: _____

Attachment 7
Example of Form 2 Letter

NOTICE TO CONTROL PESTS
Form 2 (Section 6 (1))
Agricultural Pests Act
PEST AND NUISANCE CONTROL REGULATION

Attn:

You are hereby notified that cropland located on the (INSERT LEGAL LAND LOCATION) that was planted to canola in the (INSERT YEAR) growing season contains CLUBROOT, which has been declared a pest by the *Pest and Nuisance Control Regulation* made under the *Agricultural Pests Act*, and you are directed to take the following measures:

- No seeding of canola or other cruciferous crops (mustard, cabbage, cauliflower, broccoli, brussel sprouts, turnips, radish) for the next (INSERT NO. OF YEARS)
 - Therefore canola cannot be seeded on this land until the year (INSERT YEAR)
- Control all volunteer canola
- Clean dirt off tillage equipment when leaving this land location

Property owners who rent this land to other producers must share this information with them.

Failure to comply with the terms of the above measure may result in action taken in accordance with the legislation referred to as the *Agricultural Pests Act*. This notice is issued under section 12 (1) of the *Agricultural Pests Act*.

An appeal against this notice may be served on the municipal secretary, accompanied by a deposit of \$100, within a period of 10 days from service of the notice and otherwise made in accordance with the Agricultural Pests Act.

Agricultural Services – Pest Control

Control of Clubroot Disease in Canola

A control measure to prevent the growth and spread of clubroot in canola crops.

- a) All canola crops within (MUNICIPALITY) will be inspected for the presence of clubroot each growing season. This will take place in the months of August and September.
- b) Inspections will be conducted by the Agricultural Fieldman or by an Inspector appointed by the (MUNICIPALITY) Agricultural Service Board.
- c) Inspectors will follow procedures set out by Agricultural Services administration on proper sampling techniques and protocol for entering upon land.
- d) When land is verified positive for clubroot the landowner will be notified in writing with a legal notice under the Province of Alberta Agricultural Pests Act.
- e) The notice will prohibit the growth of canola and mustard crops for the period of five years. Under no circumstances will these crops be permitted to be grown.
- f) Any land then sown to such a crop within the five year crop restriction will be destroyed.
- g) The owner or occupants of the land who are disturbing the soil will have the responsibility to follow best management guidelines set out by Alberta Agriculture and Rural Development to reduce the spread of disease with the movement of soil and equipment.
- h) Agricultural Services administration staff will provide information and education to landowners regarding the spread of disease. Further, information may be obtained by contacting the Agricultural Services Board at (PHONE NUMBER).

This policy shall be reviewed on an annual basis by the Agricultural Service Board.

Example 9
Municipal Policy for Clubroot Inspection Procedure

(MUNICIPAL) CLUBROOT INSPECTION PROCEDURE

Equipment Requirements

- **(MUNICIPAL)** employee identification card
- Province of Alberta Agricultural Pests Act
- **(MUNICIPAL)** map
- Clubroot Inspection Reports
- Copies of **(MUNICIPAL)** Policy (**Policy No.**) Control of Clubroot Disease in Canola and copies of Management of Clubroot Agdex 140/638-2
- Sample bags or containers for collection of specimens
- Protective disposable slippers for footwear
- Garbage bags
- Small shovel
- Small pruning shears
- Phone log
- Mileage log

Procedure for Field Inspections

Preliminary

- The Inspector, along with the **(AGRICULTURAL FIELDMAN)**, will establish and follow a plan of action for the season. They shall also meet each week to discuss issues.
- The Inspector will check all prohibited parcels of land from the previous year's Notifications to ensure that canola is not grown.
- The Inspector will inspect all canola fields within **(MUNICIPALITY)** starting in July, concluding at the end of September.

Inspection

1. Upon finding a canola field, park vehicle in an approach or off to the side of the road in a safe location. Do not drive or park vehicle in fields.
2. Locate and verify field on **(MUNICIPAL)** map. Record location on map and in Inspection Report.
3. Visually assess field for suspect infection of clubroot (premature ripening, yellowing or browning of plants) in crop.
4. Before entering field, the Inspector will wear a protective disposable slippers over their footwear to stop the transfer of soil from one site to the next.
5. The crop shall be walked in a pre-determined travel pattern (such as a W configuration). Areas of potential contamination such as field entrances, sloughs, water runs should be closely examined. A minimum of **six (# IS UP TO INDIVIDUAL MUNICIPALITIES!)** plants should be pulled in this travel pattern so as to give the best representation of the crop.
6. When the presence of clubroot is found upon a plant, the Inspector shall take a tissue sample of the plant. This sample is to be bagged, recorded, and marked with the field reference.