

**A. Flagstaff County Procedures**

1. All Flagstaff County equipment must be cleaned of soil and crop debris prior to entering and operating on and then prior to leaving fields, in order to prevent the introduction of Clubroot into clean fields.

Cleaning equipment involves knocking or scraping off soil lumps and sweeping off loose soil followed by a wash or rinse.

2. No soil shall be transferred from one field to another for the purposes of reclamation until the County, to the best of their ability has determined the soil to be free of Clubroot.
3. All Flagstaff County operators are encouraged to minimize the use of field approaches for turning around and/or parking where practical. Clubroot surveys in Alberta indicate that almost all new infestations begin near the access which indicates that contaminated equipment is the predominant spread mechanism.

**B. Inspection and Identification of Clubroot**

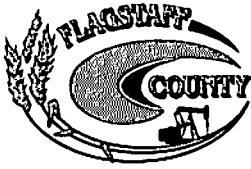
1. Clubroot Field inspections will be conducted by the Agricultural Fieldman or by any other inspectors appointed by Flagstaff County.
2. Clubroot survey methods, reporting form and calculation of disease incidence will follow standard protocols as recommended by the Alberta Clubroot Management Committee. (See Form A)
3. Positive identification of Clubroot shall be obtained by a laboratory test.
4. When land is verified positive for Clubroot the landowner will be notified in writing with a legal notice in accordance with the Province of Alberta Agricultural Pests Act.
5. Fields that have a low incidence of clubroot disease (1 positive site out of 10 sample sites in field), the occupant shall not plant canola or other susceptible crops in the three (3) following years. Proper cleaning of field equipment prior to transport from infested fields is required.
6. Fields that have a moderate to high incidence of clubroot disease (2 or more positive sites out of 10 sample sites in field), the occupant shall not plant canola or other susceptible crops for five (5) subsequent years. Proper cleaning is mandatory and of highest priority.
7. When one positive clubroot field for a grower is identified, a longer rotation (1 in 4) will be recommended for canola on all land farmed by that grower. There is a high probability that resting spores have already been or will be spread from the infested field to other fields farmed by that grower.
8. A person who has an interest in land as an owner or occupant and feels personally aggrieved by a notice issued by an inspector under Section 12 of the Agricultural Pests Act may appeal to the local authority of Flagstaff County within ten days after service of the notice.

9. If a host crop is sown on land that has Clubroot and a notice has been issued on this property restricting the growth of host crops, the host crop shall be destroyed.
10. Survey results and legal locations of infested fields must be made available to land renters, landowners, adjacent landowners and any other parties with a genuine commercial interest, under 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.

<b>CAO Approval:</b>	<b>Date:</b>
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## ASB CLUBROOT SURVEY FORM 2010

Surveyor name \_\_\_\_\_  
 Municipality \_\_\_\_\_  
 Email \_\_\_\_\_  
 Telephone \_\_\_\_\_

Field location (quarter, section, township, etc) \_\_\_\_\_  
 Name of producer farming that field \_\_\_\_\_  
 Date surveyed \_\_\_\_\_  
 Crop cultivar \_\_\_\_\_  
 Previous crops 2009 \_\_\_\_\_  
                   2008 \_\_\_\_\_  
                   2007 \_\_\_\_\_  
 Field soil pH from previous soil tests if available \_\_\_\_\_

Article I.            Survey results

Strictly according to protocol (sample 10 plants at each of 10 sites using W pattern)

Sample site	GPS coordinates	Number of infested plants
1 (nearest access)		
2		
3		
4		
5		
6		
7		
8		
9		
10		

# of positive sites / 10 \_\_\_\_\_  
 Lab test confirmation \_\_\_\_\_

Additional comments  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Optional – draw map of field and landmarks with sampling points (on back of page)

Surveyor signature \_\_\_\_\_ Date \_\_\_\_\_

### Clubroot of Crucifers – Surveying Protocol

**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.

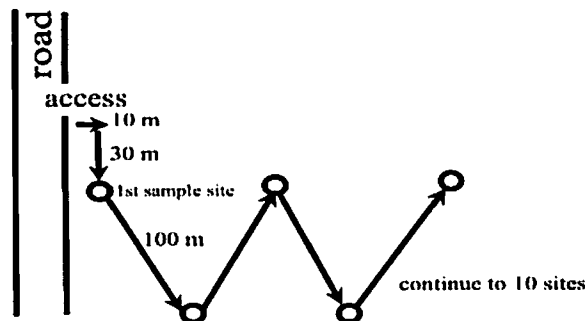
**Symptoms:** The pathogen infects the roots of susceptible hosts, causing the formation of club-shaped galls or swellings that restrict the uptake of water and nutrients by the plant. Above-ground symptoms include yellowing, stunting, premature ripening and wilting of plants under moisture stress.

**Equipment and Materials Needed:**

Clipboard	Pocket Knife	5% bleach solution	Disposable boot covers
Record sheets	Paper bags	Plastic tray or pail	GPS unit
Hand trowel			

**Survey Procedure:** Scout for clubroot by visually inspecting canola / mustard / cole crop roots for galls. As symptoms may take 6-8 weeks to develop, they are most detectable later in the summer (late July or August). Do not drive into field or access, but park on the road whenever possible.

1. Put on new disposable boot covers. Survey the field in a 'W' pattern, sampling 10 plants at each of 10 equally spaced sites along the arms of the W. Begin 30 m to the right of the field access, 10m from field edge and allow 100 m between sampling points.



2. At each sample site, dig up roots from 10 plants and shake off excess soil. Examine roots for presence of galls. Record sample site GPS location and findings on form. At fields where infection is found or suspected, collect 5-10 root specimens, by cutting off stems and placing roots in a paper bag labeled with field location. Retain sample for submission to lab for confirmation (if needed), or to Dr. Strelkov for pathotype identification (if requested).
3. 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). Disinfect sampling tools with bleach solution.