

M-11

PREVENTION AND CONTROL OF CLUBROOT DISEASE OF CRUCIFERS

BYLAW

RURAL MUNICIPALITY of FOAM LAKE NO. 276 BYLAW NO. 07-2018

A BYLAW TO PREVENT AND CONTROL CLUBROOT

The Council of the Rural Municipality of Foam Lake No. 276 in the Province of Saskatchewan enacts as follows:

1. This Bylaw may be referenced as the "Clubroot Bylaw"
2. In this Bylaw:
 - a) "officer" means an officer within the meaning of The Pest Control Act;
 - b) "Municipality" means the Rural Municipality of Foam Lake No. 276;
3. Unless otherwise specified, the owner(s) and/or occupant(s) of land situated in the Municipality shall be responsible for carrying out the provisions of this Bylaw.
4. Every owner(s) and/or occupant(s) of any land in the Municipality shall notify the Municipality in which the land is located of the presence of clubroot, within 30 days of becoming aware of the same.
5. Notification of the presence of clubroot shall be in writing in Form "A", attached to and forming part of this Bylaw. Completed Form A should be returned to the office of the Rural Municipality of Foam Lake No. 276.
6. Where the officer believes that a person has contravened any provision of this Bylaw, a Bylaw Violation Notice may be served either personally or by mailing or leaving same at the last known address.
7. The Bylaw Violation Notice shall be in Schedule "1", attached to and forming part of this Bylaw.
8. The Bylaw Violation Notice shall be deemed to have been served:
 - a) on the expiration of twenty- four hours after it is posted, if the notice is mailed;
 - b) on the day of actual delivery, if the notice is served personally; or
 - c) on the business day following the transmission, if given by facsimile.
9. In lieu of prosecution, the person who has contravened the provisions of this Bylaw shall pay a fine in the amount of \$250.00 which shall be indicated on the Bylaw Violation Notice.

Kenny Kaban
Reeve

Shanna Loeppky
Administrator

Read a third time
and adopted this 19th day
of September, 2018

Shanna Loeppky
Administrator



Certified a true and correct copy of Bylaw 03-2018,
passed by resolution of the Council of the Rural
Municipality of Foam Lake No. 276, on the 19th day
of September, 2018.

Shanna Loeppky
Shanna Loeppky, Administrator

CLUBROOT SURVEY FORM – FORM A

_____ 1/4S _____ T _____ R _____ West of the _____ Meridian

and/or GPS Coordinates N _____ and W _____

as shown on the diagram attached,

-or- Number, Street: _____ Town/City: _____

Pest Control Officer: _____

Surveyor Name (if different than above): _____

Address: _____

Phone: _____ E-mail: _____

Landowner Name: _____

Farmer Name: _____

Date surveyed: _____

Is this survey part of an agreement with the landowner or an order? _____

Tillage Information (if applicable/known):

Fall 20__ : No tillage _____ Cultivation (# of times) _____ Discing (# of times) _____

Other: {(Please Specify) # of times} _____

Spring 20__ : No tillage _____ Cultivation (# of times) _____ Discing (# of times) _____

Other: {(Please Specify) and # of times} _____

Seeding information (if applicable/known):

Crop: _____ Variety: _____ Source: Certified _____ Common _____

Seeding date: (if available) _____ Seeding rate: (lbs./ac. or kg/ha) _____

Total rainfall (if available): June _____ July _____ Irrigated: Yes No _____

Rotation Information (if applicable/known):

(please list canola variety used in previous years if known): _____

20__ : Wheat _____ Barley _____ Canola _____ Field pea, lentil, dry bean _____

Oats _____ Rye _____ Potato Forage grasses Forage legumes _____ Other

(please specify) _____

20__ : Wheat _____ Barley _____ Canola _____ Field pea, lentil, dry bean _____

Oats _____ Rye _____ Potato Forage grasses Forage legumes _____ Other

(please specify) _____

History of crucifer vegetables or crucifer (brassica) crops other than canola grown on the field: _____

(could include indication of a previous home garden)

All survey information is considered **confidential** and is to be kept on file in the office of the municipality and released only to authorized municipal or provincial government personnel and the person owning, occupying or controlling the land surveyed. Disclosure is subject to the agreement reached or orders issued in the event of a positive clubroot finding, as outlined in the clubroot policy of the municipality.

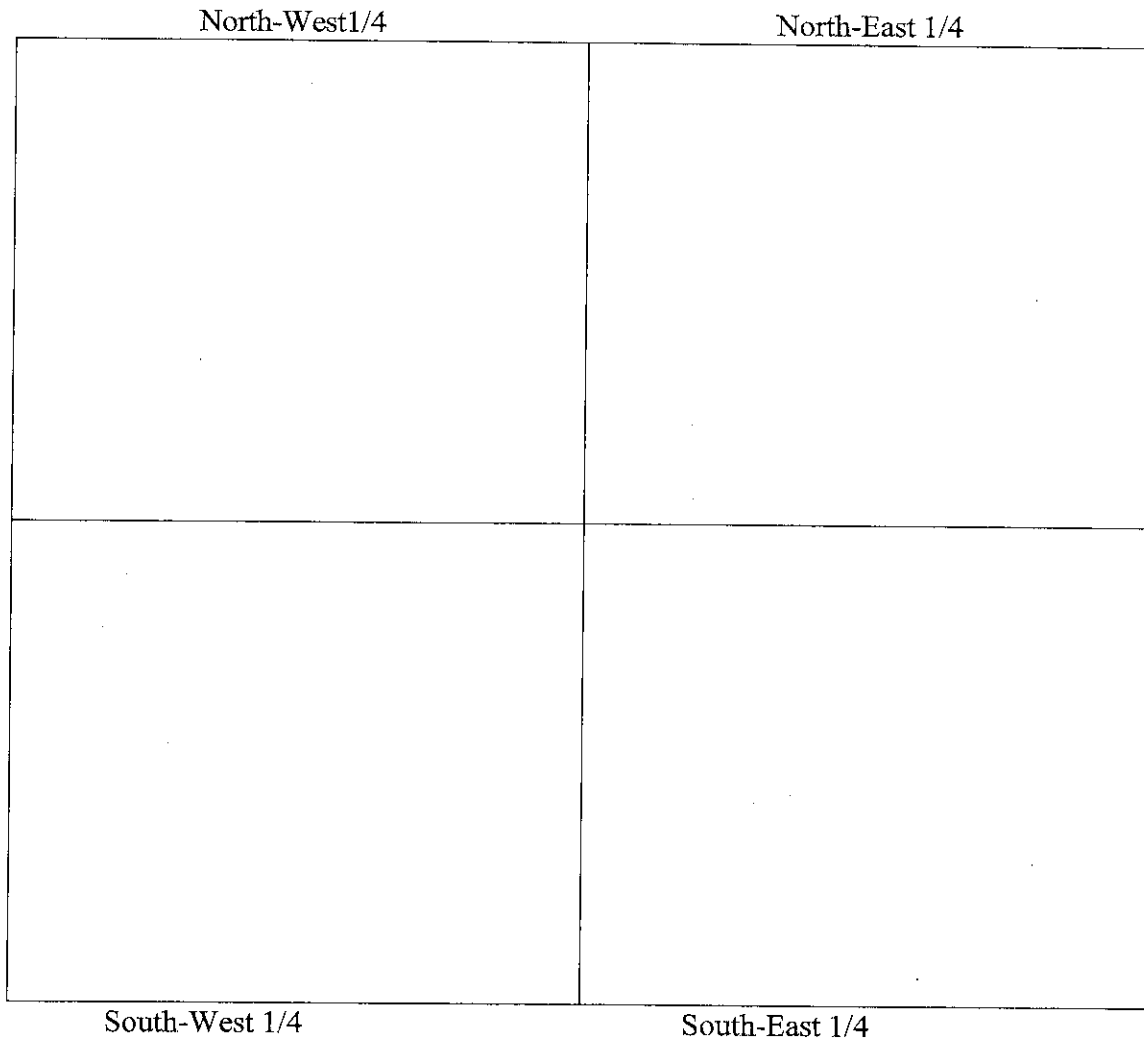
Field Traffic: Is there occasional traffic on to the field, i.e. oil pumping rigs, power installations, research plots, recreational vehicles (ATVs), etc.? _____

Comments *(please attach additional sheets if required):* _____

TYPE OF SAMPLE(S) COLLECTED (circle one or both):

SOIL		PLANTS	
Number of samples:		Number of samples:	

DIAGRAM SHOWING LOCATION OF FIELD ENTRANCE and/or SAMPLES:
 (may be supplemented with map printed from GIS software) North-West



CLUBROOT SURVEY PROTOCOL- SCHEDULE 1

Introduction: Clubroot is a soil-borne disease caused by a microbe, *Plasmodiophora brassicae*. Clubroot affects the roots of cruciferous field crops such as canola, mustard, camelina, oilseed radish and taramira. It also affects cruciferous vegetables such as arugula, broccoli, Brussels sprouts, cabbage, cauliflower, Chinese cabbage, kale, kohlrabi, radish, rutabaga and turnip, as well as cruciferous weeds (e.g. stinkweed, shepherd's purse, wild mustard, volunteer canola).

Symptoms: Invasion of host roots leads to the formation of clubroot galls. These deformed roots have a reduced ability to absorb water and nutrients leading to stunting, wilting, yellowing, premature ripening and shrivelling of seeds. The cause of these above-ground symptoms can be confirmed by digging up suspect plants to check roots for gall formation. Clubroot affects canola yield and quality to a similar degree as other diseases affecting water and nutrient uptake, and its impact depends on soil conditions and the growth stage of the crop when infection occurs and the level of the pathogen in the soil. Early infection of seedlings can result in significant yield losses. Spore germination of *Plasmodiophora*, infection and disease development are favoured by warm soils, high soil moisture and low soil pH.

Equipment and Materials Needed:

Clubroot survey sheets (Form A)	Hand trowel	Disposable booties and gloves
Clipboard and pen	Pocket knife	Garbage bags
GPS unit or maps	Pail of two per cent bleach for soaking/cleaning tools	two per cent bleach solution in misting bottle
Paper bags or boxes		

Plant Sample Survey Procedure:

1. As clubroot may take six to eight weeks to develop, symptoms are most detectable later in the growing season (late July or August).
2. Records must be kept for all fields visited using *Form A* clubroot survey sheets.
3. Do not drive into field or access, but park on the road whenever possible. Surveyors can walk into infested fields but must follow human sanitation procedures.
4. If survey personnel enter a field in any potentially infested regions, whether it is known to have clubroot or not, they are to follow these procedures:
 - Wear disposable footwear that can be removed immediately after leaving the field. Another option is to use rubber boots or other footwear that can be sterilized (misted) with a disinfectant solution (two per cent bleach) upon leaving the field.
 - Dispose of the disposable footwear in a sterile fashion. Sealing in a garbage bag and incinerating is preferred. Do not reuse disposable footwear.
 - Clean and disinfect any tools that may have been in contact with soil in the field.
5. Observe 20 plants at the field entrance and at each of five additional sites in the field, for a total of 100 plants. Keep each of these five sites at least 20 metres from each other and at least 20 metres from the field edge.
6. If patches of premature ripening are observed, particularly in field entrance or corners of field, dig or pull up plants, shake off excess soil and inspect roots for the presence of galls. If clubroot is suspected, cut off stems and collect root samples.
7. Air-dry root samples in paper envelopes/boxes/bags and send them to the Ministry of Agriculture's Crop Protection Laboratory at 346 McDonald Street, Regina SK, S4N 6P6, telephone (306) 787-8130. You may mail, courier or drop off samples in person. There is a \$20 fee for visual inspection.
8. If the visual diagnosis is positive, root samples will be forwarded to a laboratory on behalf of the municipality for DNA testing. Cost of the DNA testing will depend on the current fee set by the credited laboratory (approximately \$100).

Soil Sample Survey Procedure:

1. Soil samples can be collected at any time but soil should be dried after collection.
2. Records must be kept for all fields visited using *Form A* clubroot survey sheets.
3. Do not drive into field or access, but park on the road whenever possible. Surveyors can walk into infested fields but must follow human sanitation procedures.
4. If survey personnel enter a field in any potentially infested regions, whether it is known to have clubroot or not, they are to follow these procedures:
 - Wear disposable footwear that can be removed immediately after leaving the field. Another option is to use rubber boots or other footwear that can be sterilized (misted) with a disinfectant solution (two per cent bleach) upon leaving the field.
 - Dispose of the disposable footwear in a sterile fashion. Sealing in a garbage bag and incinerating is preferred. Do not reuse disposable footwear.
 - Clean and disinfect any tools that may have been in contact with soil in the field.
5. Soil samples should be comprised of a mixture of small scoops (approximately one cup each) of soil taken at each of 5 sites visited in one field. Because clubroot is most likely to arrive on soil attached to vehicles and field equipment, IF the entrance to the field is evident, these 5 sites should be located in the vicinity of this approach. Clear away residue from the soil surface, and scoop approximately 1 cup of the top 5-10 cm of soil at each site (total 1 litre from all 5 sites combined). Keep each of these five sites at least 20 metres from each other and at least 20 metres from the field edge.
6. Air-dry soil samples in paper boxes and send them to a laboratory for DNA testing. Cost of the DNA testing will depend on the current fee set by the credited laboratory (approximately \$100).
 - For a list of laboratories providing clubroot testing, please visit: www.clubroot.ca (click on Identify Clubroot) or contact the Crop Protection Laboratory in Regina.