Canola Disease Field Guide

MANITOBA CANOLA GROWERS | RESEARCH

Manitoba

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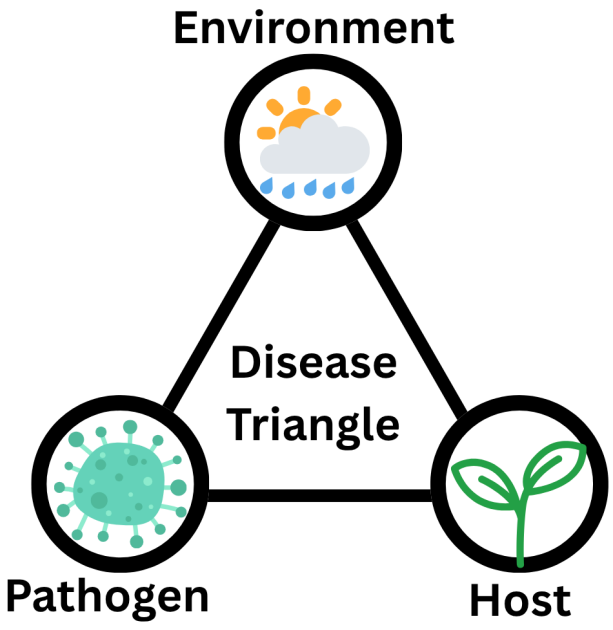
Disease Triangle

Three things must be present for a plant disease to develop in a field:

1. **Pathogen** - the pathogen must be present in the field. Pathogens can be stubble borne, coming from previous infected host crops, or can be soil borne. Soil pathogens spread with soil movement from erosion, equipment, or flooding.
2. **Host** - there must be a host crop that is susceptible to the pathogen. If the host is resistant to the pathogen (ie. clubroot resistant canola varieties), there is no host crop and the disease will not develop.
3. **Environment** - all plant diseases have environmental conditions that they thrive in. If the environment is not conducive to that disease, the disease will not develop.

All three of these factors must occur at the same time for disease to develop. If one factor is missing or controlled, disease will not occur.



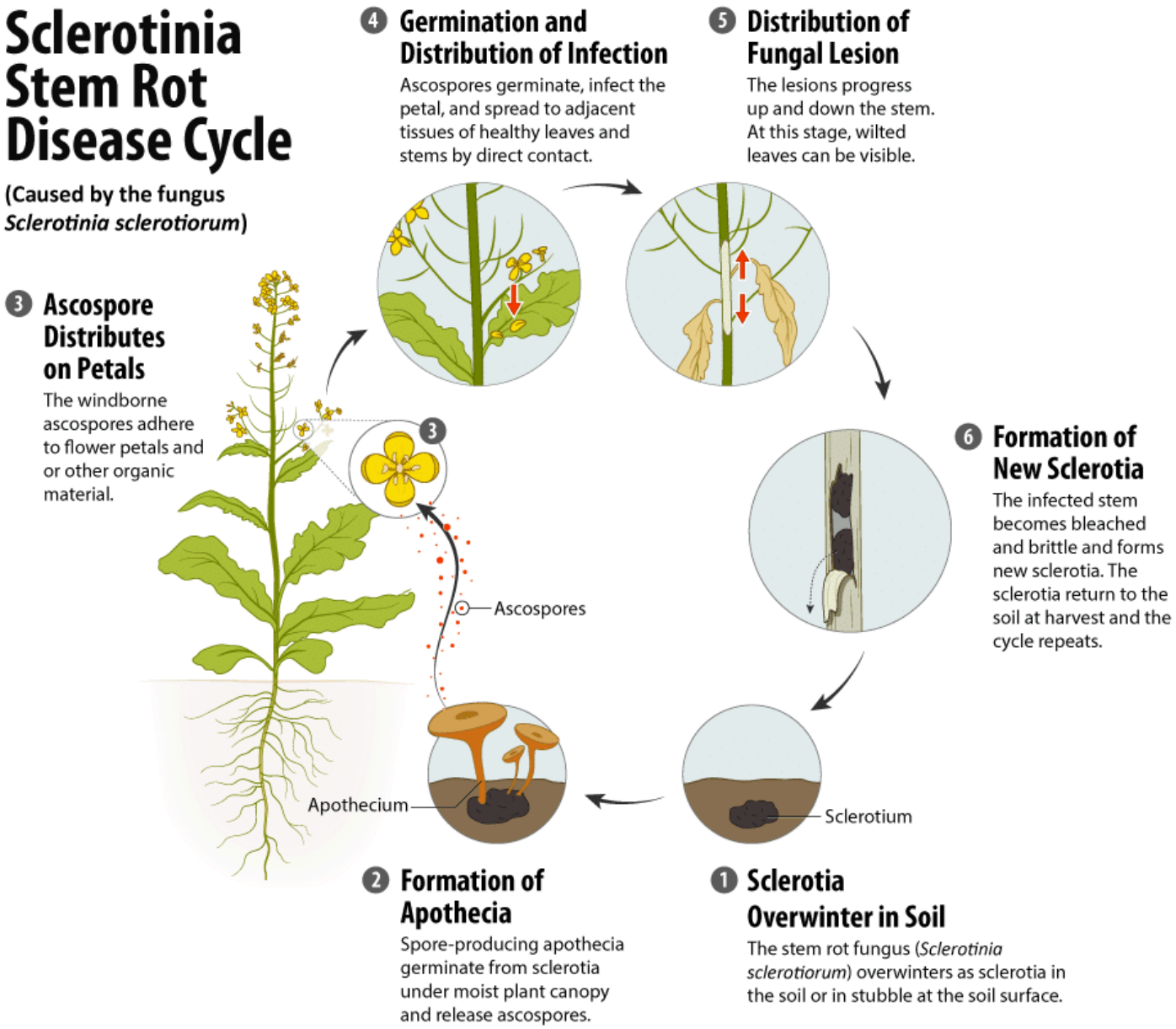
Sclerotinia

Sclerotinia stem rot, or white mold, is one of the most destructive canola diseases in Canada. It is found in all canola growing regions in Manitoba. The disease is caused by the fungus ***Sclerotinia sclerotium***, which **overwinters in soil as sclerotia** that come from previously infected crops. Conditions that favour high-yielding canola (dense canopy, high moisture and cool temperatures) also favour sclerotinia development. Sclerotinia infections can still occur in dry weather, as heavy morning dews and dense canopies are often enough to promote development. Other broadleaf crops grown in Manitoba, such as pulses, sunflowers and potatoes, are also hosts to sclerotinia.

Plants infected by sclerotinia will produce fewer pods per plant, fewer seeds per pod, or small seed. Plants can also lodge, which reduces harvestability and increases pod shatter.

For more information on sclerotinia, visit:
https://www.canolacouncil.org/canola-encyclopedia/diseases/sclerotinia-stem-rot/

Disease Cycle



Source: Canola Council of Canada

Sclerotina Identification

Sclerotinia is easier to identify just before harvest, but symptoms can appear after flowering. Check areas that are lodged, or areas with plants showing discolouration and premature ripening.

Early symptoms (near the end of flowering):

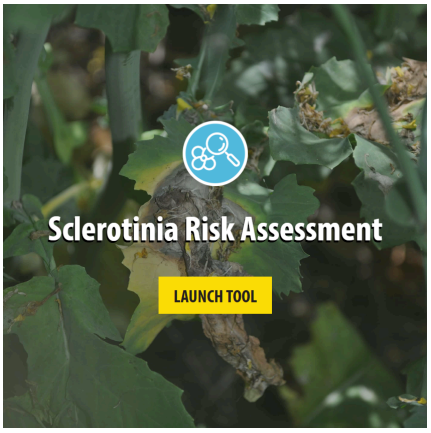
- First symptoms will appear where petals fall and accumulate on the lower plant, such as leaf axis
- Grey-white watery lesions on leaves and stems (**Photos 1 & 2**)
- White, moldy growth within the crop canopy (**Photo 3**)

Late symptoms (near swath timing):

- Bleached plants
- Hollowed out stems
- Sclerotia bodies can be found within hollowed out stems. Sclerotia bodies are small, black, hard and less than 1 inch long. (**Photo 4**)

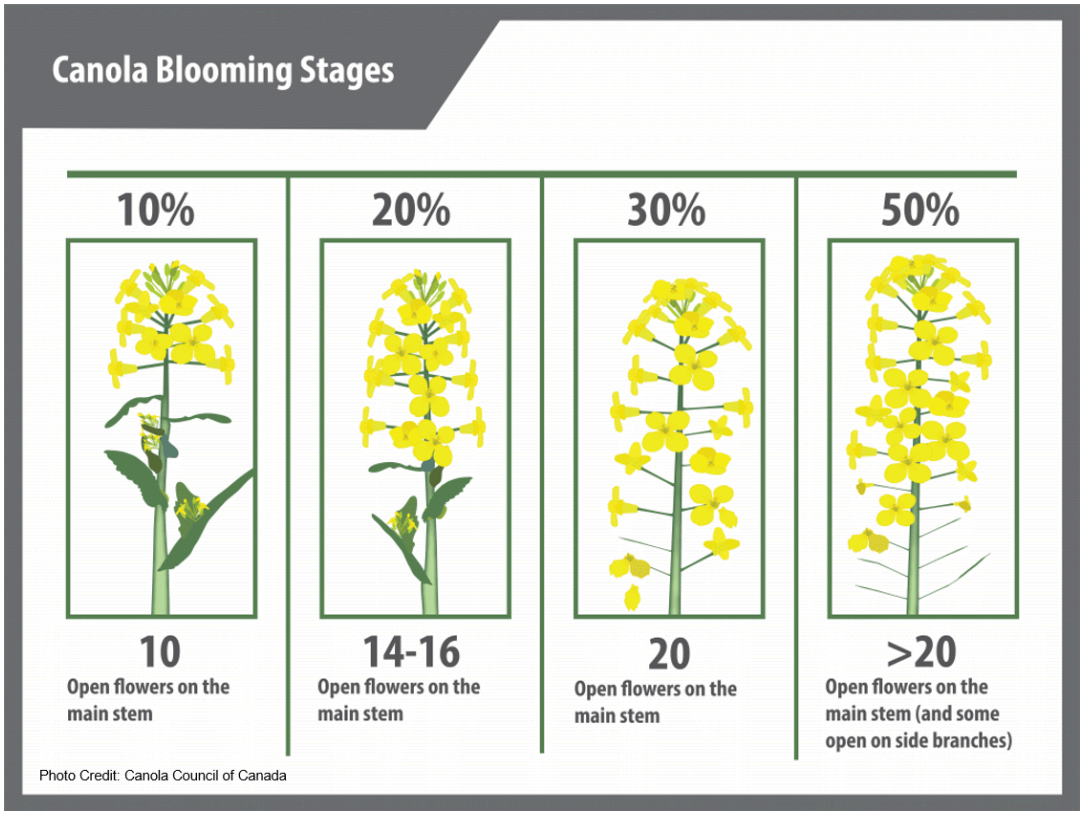
Sclerotina Management

Foliar fungicides are the best tool for sclerotinia stem rot management. Fungicides must be applied before infection occurs, making timing critical. Timing of application is determined by counting open flowers (and aborted flowers) on the **main stem** of the plant. Fungicide application timing is 20-50% bloom, with **30% bloom being the optimal time.**



The **Sclerotinia Risk Calculator** is a tool to help determine whether a fungicide spray is warranted. Find it at **https://www.canolacouncil.org/calculator**.

See **Appendix Table 1. Fungicide Products Registered for Use on Sclerotinia in Canola** for an up-to-date list of fungicides registered for sclerotinia in canola, and always refer to the product label and **Manitoba Guide to Crop Protection** for further details.



Other Management Considerations:

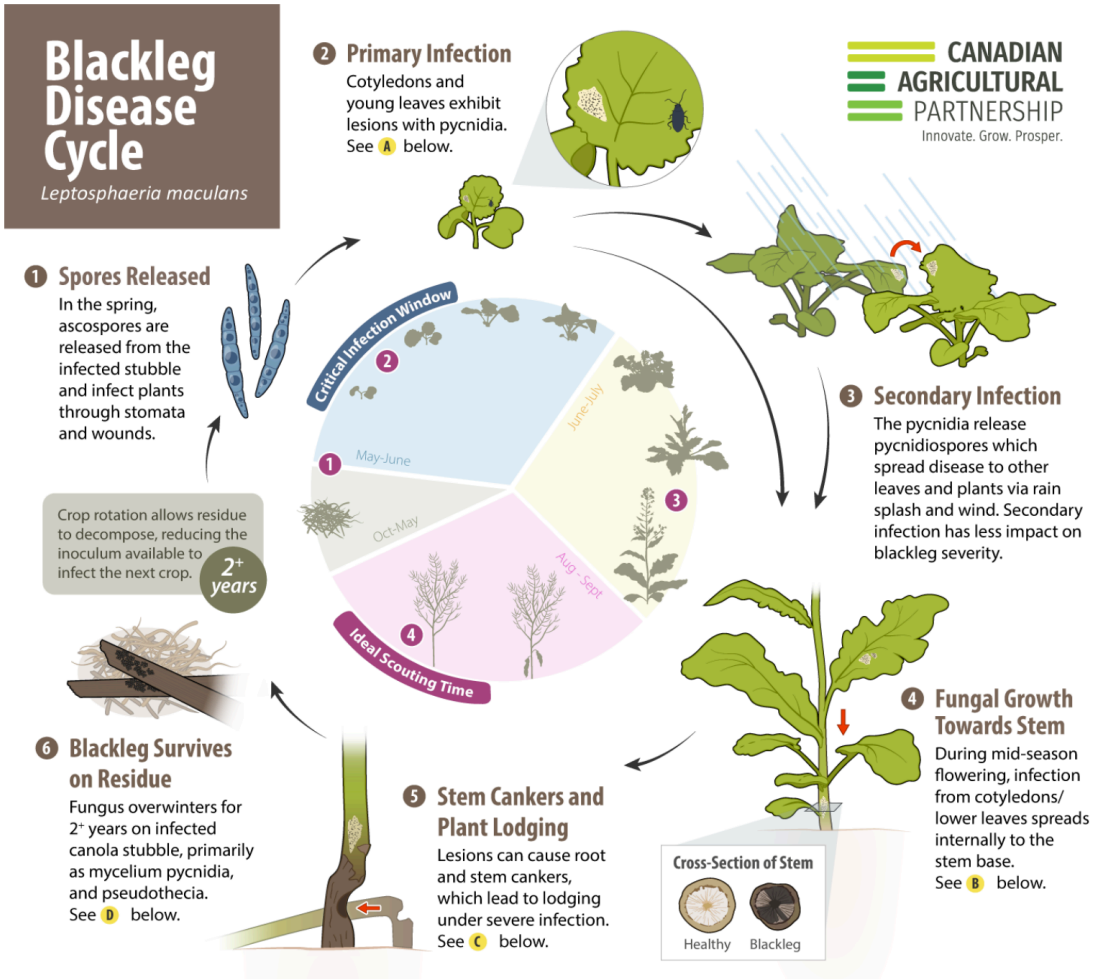
- Use the recommended seeding rate, aiming for a plant stand of 5-8 plants per square foot. Dense plant stands with limited airflow favour sclerotinia development.
- Certain canola varieties have higher tolerance to sclerotinia. However, currently there are no varieties with complete genetic resistance.
- Crop rotation alone generally provides limited control, because the pathogen has many host species and sclerotia bodies can survive for several years. Ascospores have also been found to travel into fields from neighbouring fields via wind.

Blackleg

Blackleg disease has been found in Canada for many years, and is an economically damaging disease in canola. It is a complex disease, caused by two stubble-borne pathogens: ***Leptosphaeria maculans*** and ***Leptosphaeria biglobosa***, with *L. maculans* being more virulent. The fungus is **stubble-borne** and can produce spores from infected residue for several years.

Warm and humid conditions favour blackleg disease incidence. Early in the season, frequent heavy rain showers can promote infection as rain splash spreads spores. Warm, dry conditions slow development, but the disease can still be present. As disease severity increases, yield decreases.

Disease Cycle



Source: Canola Council of Canada

Blackleg Identification

Blackleg is most easily identified at harvest, however symptoms may be present earlier in the season. The disease is often scattered throughout the field, but it may occur in distinct patches depending on the source of infection. At harvest, evaluate plants by pulling them and cutting the stem just above the soil line to examine stem cross-sections.

<u>Early symptoms (cotyledon to bolting):</u>

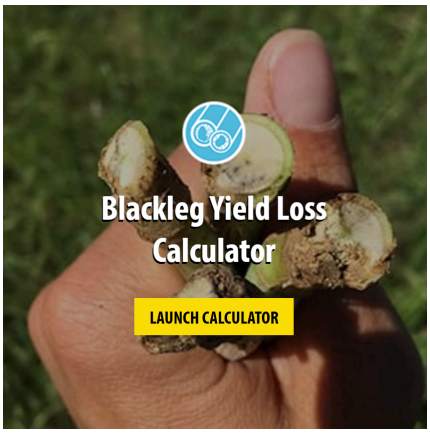
- Lesions on lower leaves that are grey-white, round to irregularly shaped, containing many small black pycnidia (**Photo 5**)

<u>Late season (after flowering up to harvest):</u>

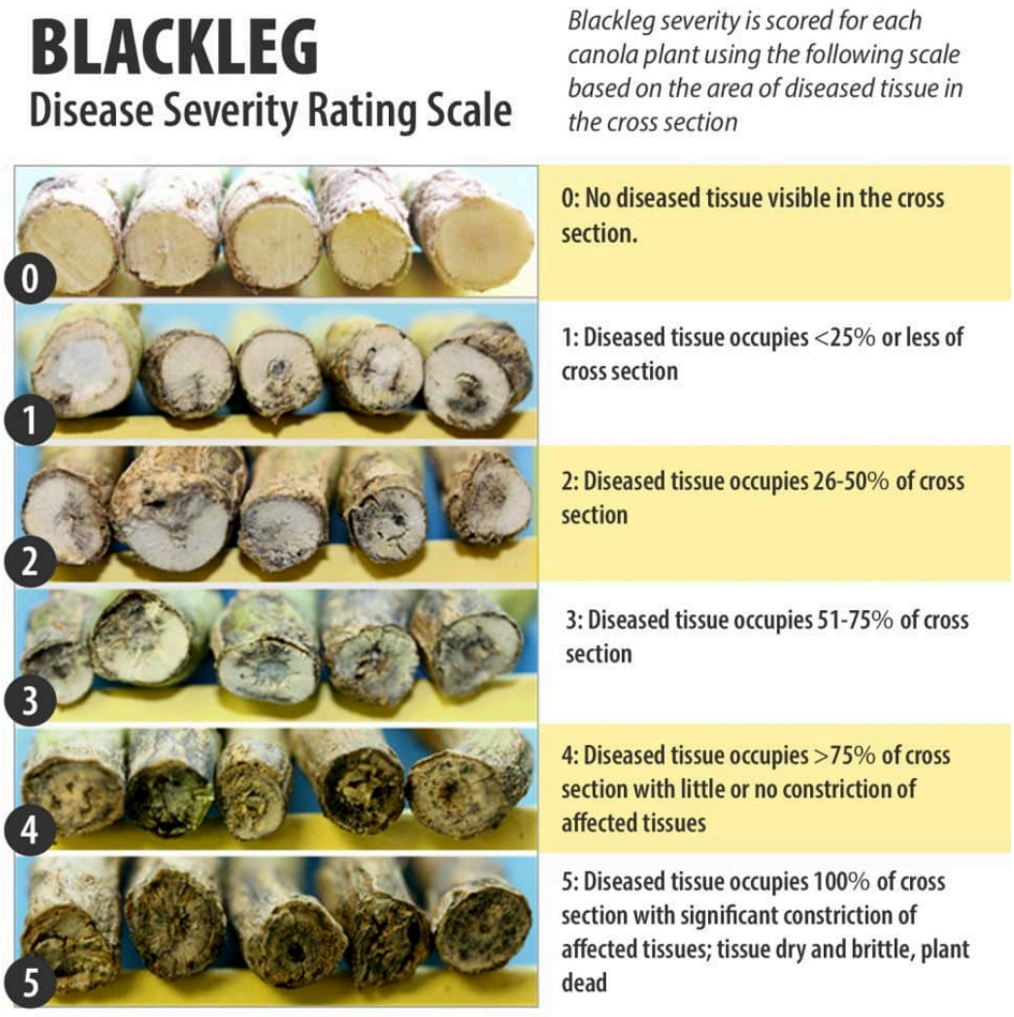
- Stem cankers at the base of the plant (**Photo 6**)
- Premature ripening and lodging
- Black necrotic discolouration within stem cross-sections (**Photo 7**)

Assessing Blackleg Severity

Before harvest (aiming for 60% seed colour change), blackleg severity can be assessed in crop by cutting plants at the cross section and using the rating scale below. Yield loss from blackleg can be estimated using the Blackleg Loss Calculator from the Canola Council of Canada (**https://www.canolacouncil.org/calculator/blackleg-loss**).



Determining yield loss from blackleg helps farmers understand disease pressure in specific fields, manage disease properly, manage crop rotation and select appropriate canola varieties in the future.



Source: Canola Council of Canada

Blackleg Management

Field resistance label

The R/MR/MS/S label on cultivars is based on the disease severity compared to the susceptible check cultivar, Westar.

Field resistance rating	% Disease severity of Westar
R (Resistant)	0-29.9
MR (Moderately Resistant)	30-49.9
MS (Moderately Susceptible)	50-69.9
S (Susceptible)	70-100

Source: Canola Council of Canada

Genetic resistance is currently the most common method of management for blackleg. All commercially available canola varieties carry some level of field resistance to blackleg which is evaluated at the time of registration in comparison to a susceptible check.

Canola varieties include a combination of minor and major gene resistance:

Minor gene resistance (quantitative) is effective across multiple races and helps protect longevity of major gene resistance. Due to the complexity of this type of resistance there is no simple way to measure it other than field performance, which is captured in a varieties field resistance label (above).

Major gene resistance (qualitative) works when pathogen specific resistance genes are matched against the corresponding blackleg pathogen in a field.Major genes are known within a variety and seed companies choose to voluntarily provide blackleg resistance group labels on their varieties.When paired with pathogen Race ID testing in the field this can ensure varieties are chosen that provide the best control.

A major gene resistance group label

The resistance group labels identify the resistance group (RG) based on the major genes in a canola cultivar. It appears after the field resistance label in the two-part label. While 15 major gene resistance groups have been identified, currently only 10 are relevant to Canadian canola producers **(see table below).**

Resistance Groups	A	B	C	D	E_1	E_2	F	G	X
Major Gene	Rlm1 or LepR3	Rlm2	Rlm3	LepR1	Rlm4	Rlm7	Rlm9	RlmS or LepR2	unknown

Source: Canola Council of Canada

MCGA members receive free testing to determine what blackleg races are present in their fields and help guide future variety decisions for major gene resistance.

Fungicide seed treatments further protect canola seedlings from blackleg. Seed treatments are available that protect from airborne and seedborne blackleg. See **Appendix Table 2. Seed Treatment Products Registered for Blackleg on Canola** for an up to date listing of available treatments. Seed treatments are activated as soon as the seed is in contact with soil moisture, so it is important to pair seed treatments with other management practices that ensure quick emergence and growth, like seeding at the right depth and soil temperature.

Foliar fungicides are available for blackleg. These fungicides typically only provide an economic return if they are applied in fields with high blackleg pressure and/or a variety that doesn't have a high level of resistance. Foliar fungicides for blackleg must be applied early in the season, before the 4-leaf stage. Please see **Appendix Table 3. Foliar Fungicides Registered for Use on Blackleg (*Leptosphaeria maculans*) in Canola** for an up-to-date list of fungicides registered for blackleg in canola, and always refer to the product label and the Manitoba Guide to Field Crop Protection for further details.

Crop rotation and tillage are another tool against blackleg. The pathogen can survive on infected stubble for several years, or until the stubble breaks down. Tillage accelerates the decomposition of the infected crop residue, reducing pathogen survival and lowering the risk of infection in future crops. It is recommended to have at least 3 years in between canola crops to allow for the pathogen to break down in the soil, but alternative host plants, such as stinkweed, volunteer canola, wild mustard and others, must also be controlled in those years so as not to create a "green bridge" of disease.

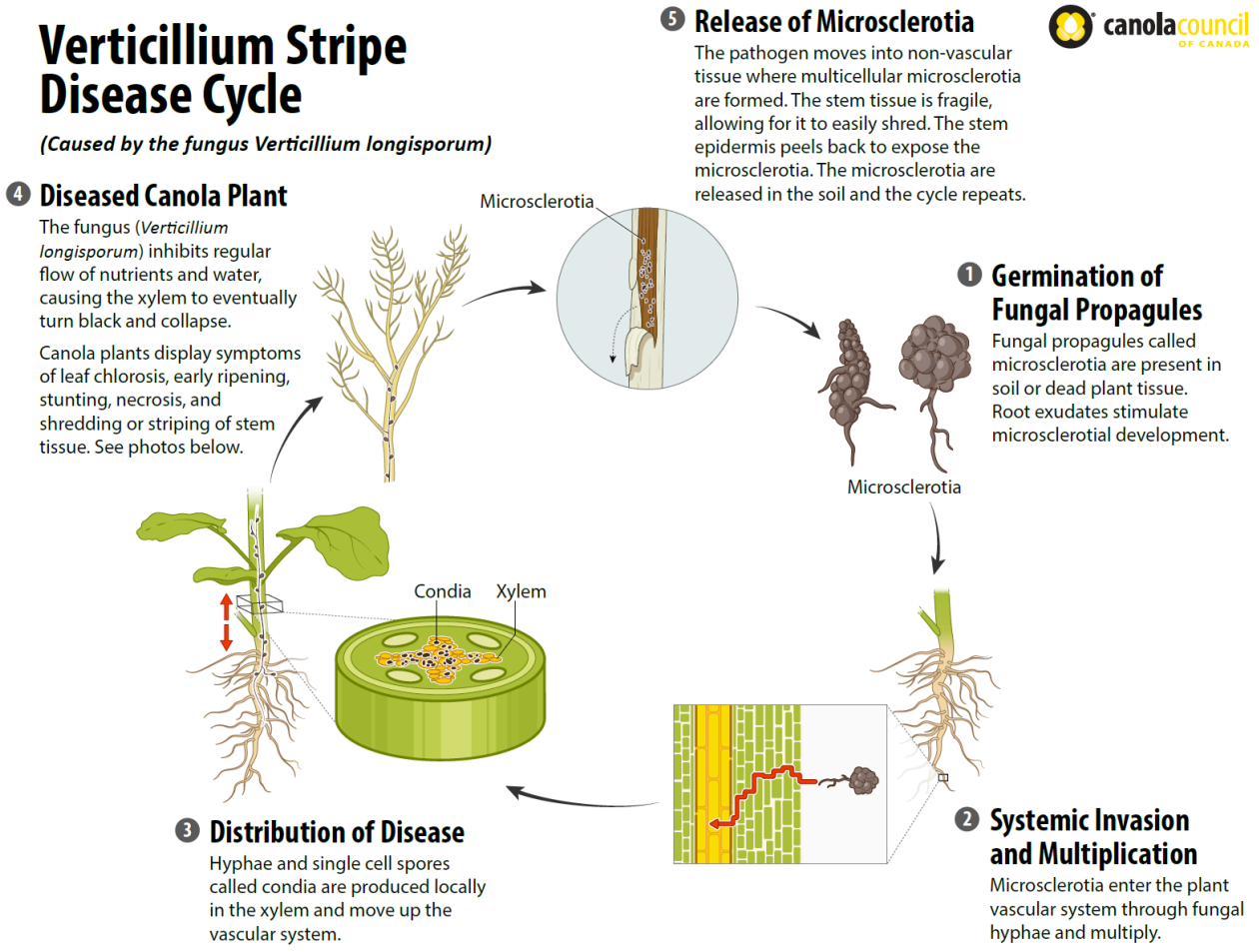
For more information on blackleg, visit **www.blackleg.ca .**

Verticillium Stripe

Verticillium stripe is a **soil-borne** disease caused by the fungal species ***Verticillium longisporum*** that was first found in Manitoba in 2014 and is now widespread (see map below). It infects the xylem tissue of the canola plant, restricting the movement of water and nutrients to the rest of the plant.

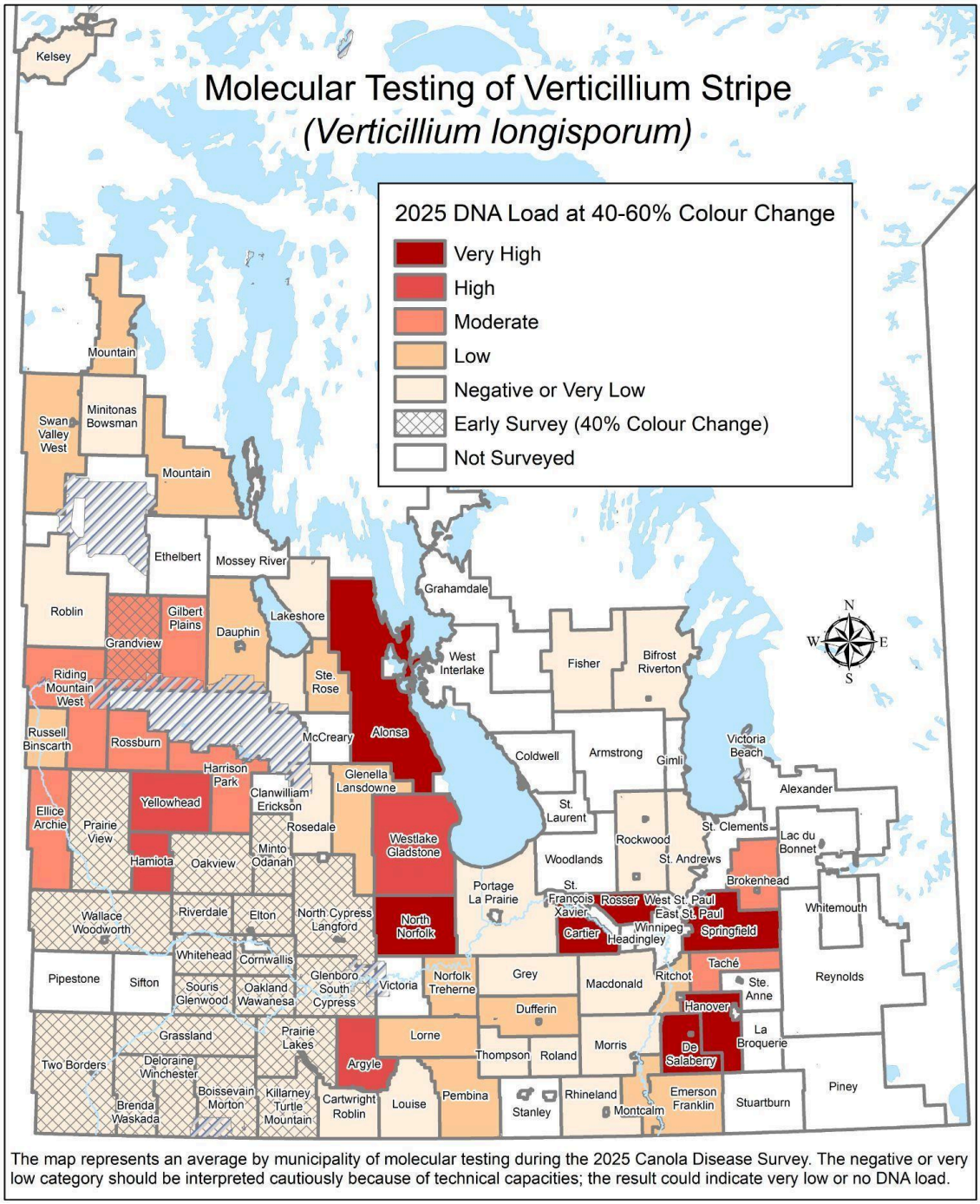
Verticillium can cause significant yield loss, which can also vary greatly depending on environment, variety and disease severity. Research is still ongoing to better understand how and when yield loss is most severe. Verticillium stripe favours hot and dry conditions.

Disease Cycle



Source: Canola Council of Canada

Molecular Testing of Verticillium Stripe in Manitoba (map)



The map represents an average by municipality of molecular testing during the 2025 Canola Disease Survey. The negative or very low category should be interpreted cautiously because of technical capacities; the result could indicate very low or no DNA load.

Author: Manitoba Agriculture
Source: MB Ag, MLI
Date: May 11, 2026

Manitoba

1:2,300,000

0 25 50 100 Kilometres

Verticillium Identification

Verticillium stripe is commonly misidentified as other canola diseases. The best time to scout for symptoms is when plants are close to swath timing (60% seed colour change and beyond). Infected plants will typically be scattered throughout the field, but in severe cases entire areas of the field can be affected.

Symptoms include:

- Premature ripening, often resulting in lodging
- Yellow or brown vertical striping on stems, with the striping becoming more obvious as the plant dries down (**Photo 8**)
- Stem shredding on ripe plants, revealing tiny black microsclerotia underneath the epidermis (**Photo 9**)
- A grey “starburst” pattern within stem cross-sections (**Photo 10**)

MCGA members can submit samples to Manitoba Canola Growers Canola Diagnostics Program for Verticillium testing.

Verticillium Management

As we are still learning about verticillium stripe, there are currently **no foliar or seed treatment fungicides registered** for the control of the disease in Canada.

There are currently **no commercial varieties resistant to verticillium stripe**, however differences in observed tolerance have been noted between varieties.

Increasing crop rotation may help with the prevention of verticillium, but it has not been the best solution, as the pathogen survives in the soil for long periods of time and appears to move easily across fields.

Verticillium can easily be misidentified as blackleg or sclerotinia, therefore **identification** is the first line of defence at this time. The disease must be properly identified to make long term management decisions.

For more information on verticillium stripe, visit https://www.canolacouncil.org/canola-encyclopedia/diseases/verticillium-stripe/

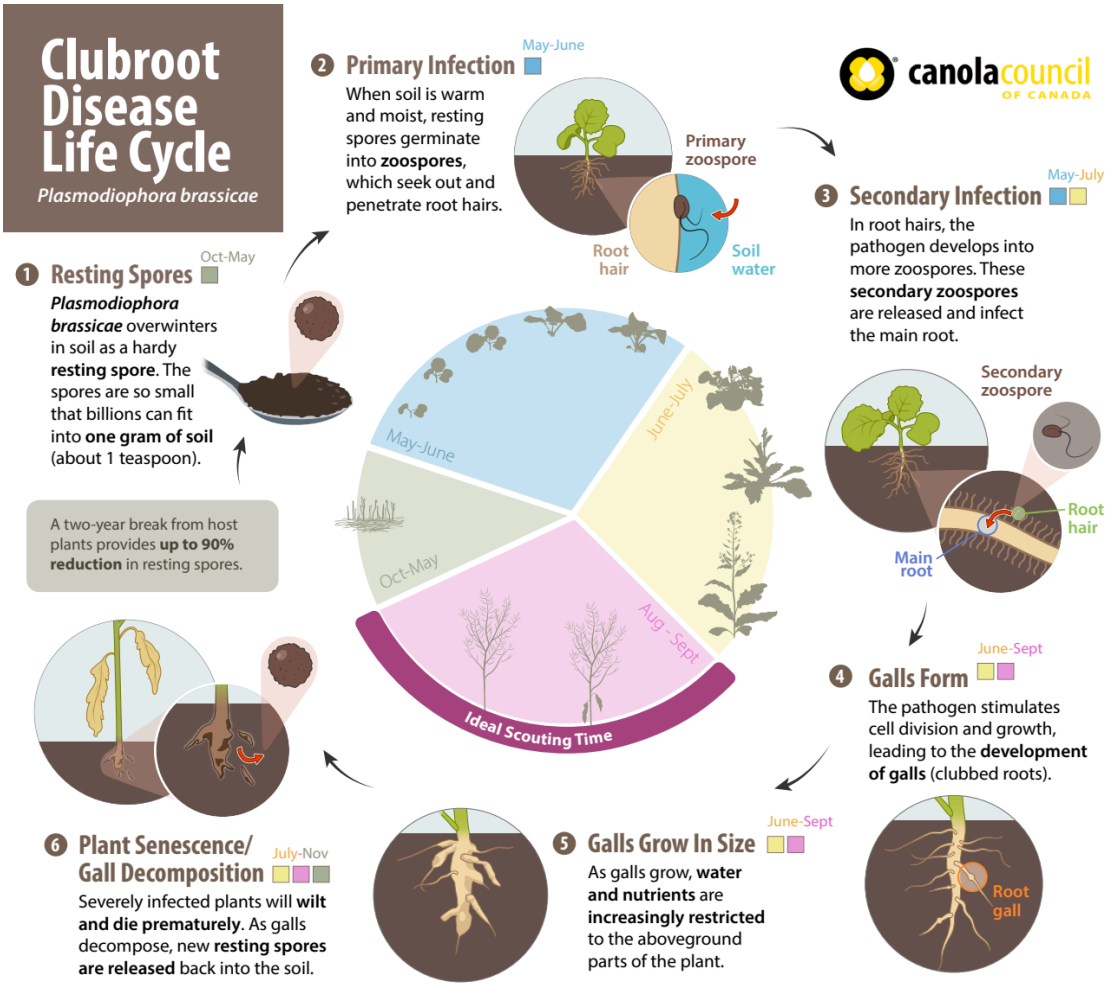
Testing for identification of verticillium stripe is available to members of the Manitoba Canola Growers Association.

Clubroot

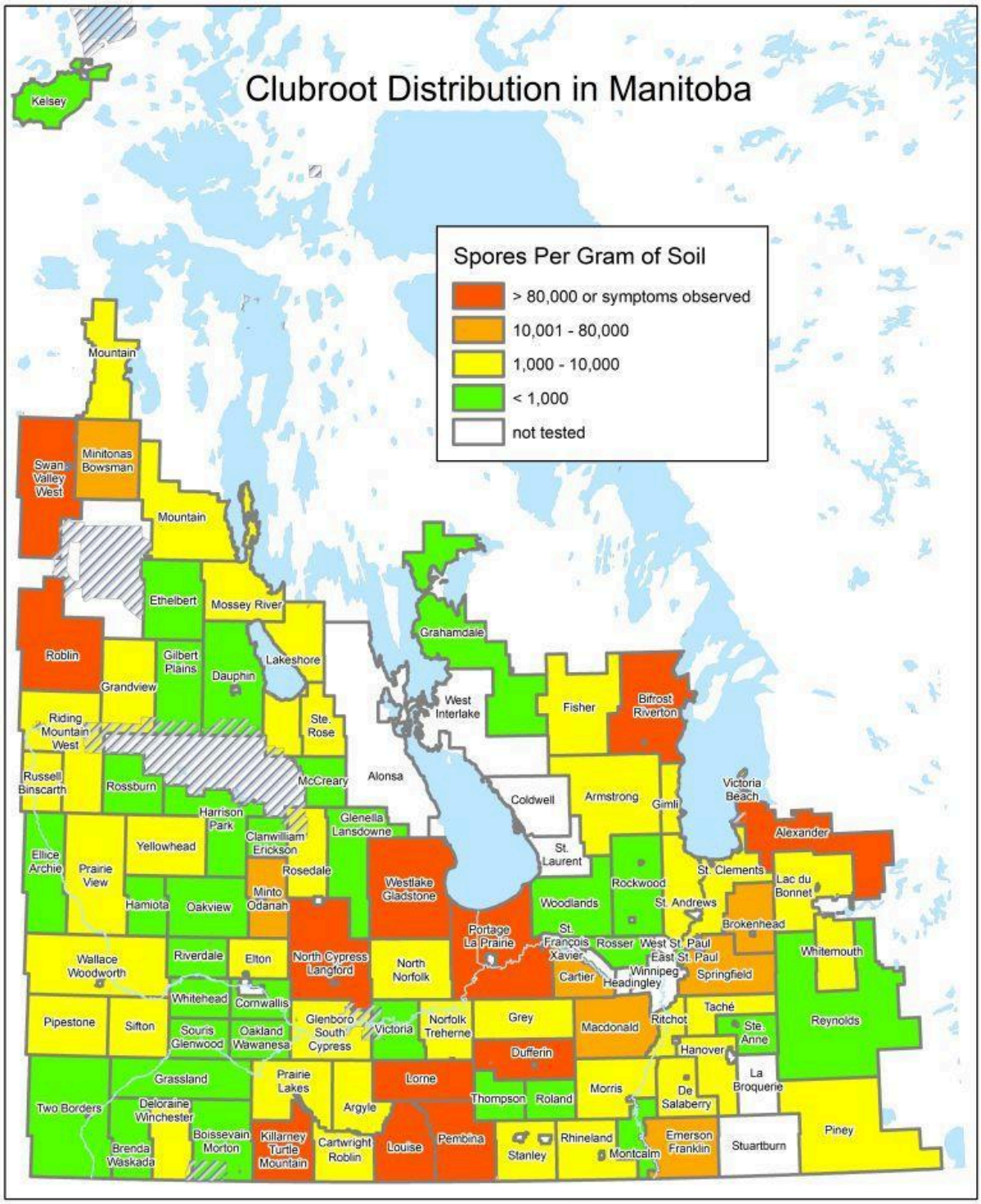
Clubroot is a serious **soil-borne** disease in canola, caused by ***Plasmodiophora brassicae***. Clubroot was first reported in commercial canola in Alberta in 2003 and has spread to most canola growing areas across Western Canada and Manitoba (see map below).

Once this pathogen is in a field it cannot be removed, but its spores can decrease over time with proper management. It is spread by soil movement, particularly on equipment and tools. Areas of the field with high traffic, such as field entrances, typically have the first and most severe infestations. Clubroot favours warm, high moisture conditions and acidic soils. Root galls formed on infected plants restrict the movement of water and nutrients within the plant. Clubroot infections can be severe and can cause complete yield loss if all the conditions are favourable for infection.

Disease Cycle



Manitoba Clubroot Map



Clubroot Identification

Clubroot will typically occur in patches throughout the field commonly in low spots, water runs and field entrances. The best time to scout is after flowering, during pod formation onward. Patches will have **premature ripening and may lodge**. Pulling up the plants in these areas will reveal **galls on the roots** (see **Photo 11 & 12**).

Clubroot Management

Prevent clubroot spread by **minimizing soil movement from infected areas or fields**. Cleaning and sanitizing equipment and footwear with a bleach solution has been shown to reduce spread. Grassing the field entrance/exit can also help with soil movement.

Genetic resistance is an extremely valuable tool that is common in commercial canola varieties. Varieties have various sources of resistance and the clubroot pathogen in Manitoba is diverse, therefore not every cultivar will work on every field. Resistant varieties are categorized as one of the following:

- **First Generation**: should work well for most fields and includes resistance to the most common pathotypes 2F, 3H, 5I, 6M and 8N.
- **Second Generation**: contains resistance to a varying set of pathotypes in addition to the original five first-generation pathotypes,

If symptoms are observed while using a resistant variety seek out a new source of resistance. Some companies choose to label their resistance sources while some do not. There is currently no commercial testing available to determine the pathotype of clubroot present in a particular field. **Rotation of genetic resistance sources is always encouraged to minimize the risk of resistance breakdown.**

Growers in clubroot areas are also encouraged to **lengthen their crop rotation** and give at least a two-year break in between canola crops to lower the spore load. Crop rotation is only effective if all clubroot weed hosts are also controlled. Clubroot can infect all members of the Brassicae family, including weeds such as stink weed and wild mustard.

The photo on the **left** shows an example of a rough cleaning kit to be kept in a vehicle and used to clean and sanitize tools and equipment when moving between fields.

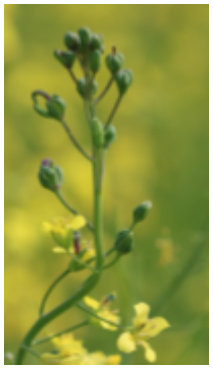
For more information on clubroot, visit www.clubroot.ca

Minor Diseases

These minor diseases can be seen often in fields, but rarely cause economic yield loss.

Alternaria Black Spot

Alternaria black spot is caused by the fungal pathogens *Alternaria brassicae, A. alternata* and *A. raphani*. Alternaria is often common and can be found on any canola variety, however it is rarely severe enough to cause damage. The disease can infect the plant at any stage. Symptoms are small, brown lesions that turn black due to the appearance of spore masses (see photo ***right***). Lesions can be found on stems, leaves and pods. In severe cases, lesions on pods can cause seeds to stay green and increase pod shatter.



Aster Yellows

Aster yellows is a plant disease that is transmitted by aster leafhoppers, which are carried north from southerly winds. The disease causes the plant to have abnormal growth during pod formation, causing bladder-like pods that are filled with leaf-like tissue, green pigmentation of floral parts and green flower petals (see photo ***left***).

Seedling Disease Complex/Root Rot

There are several pathogens that contribute to seedling disease complex, such as *Rhizoctonia solani*, *Fusarium* species, *Pythium* species, and *Globisporangium* species. These diseases infect the plant as a seedling and are more severe during prolonged cool, wet conditions. Symptoms include pinched stems, wilted and discoloured plants and failure to germinate (see photo ***right***). Seedling disease is controlled with fungicide seed treatments. Management considerations also include planting into warm, dry soils and not too deeply to ensure fast germination and emergence.

Powdery Mildew

Powdery mildew is caused by the fungus *Erysiphe cruciferarum*. It causes powdery, white fungal growth on canola leaves, stems and pods and is present at harvest time (see photo ***left***). It

favours dense crop canopies and excessive moisture. The fungus is not a serious problem and does not harm yield.

At a Glance: Disease ID

	Sclerotinia	Blackleg	Verticillium
Scouting Timing	Start scouting after flowering, but easier to see during seed fill	Early infection symptoms can be found on cotyledons up to flowering, late symptoms found from 60% seed colour change	Symptoms begin to show from 60% seed colour change
Early Symptoms	Grey or white watery lesions on leaves and where petals accumulate on leaf axis White, moldy growth within the crop canopy	Grey-white lesions on the leaves, irregular in shape with black pycnidia	Yellow or brown vertical striping up stems
Late Symptoms	Premature ripening and lodging Bleached plants Hollowed out stems with sclerotia bodies within stems	Premature ripening and lodging Bleached plants Black necrotic discolouration within stem cross-section Stem cankers at base of stem	Premature ripening and lodging Bleached plants Grey “starburst” discolouration within stem cross-section Stem shredding with tiny black microsclerotia underneath epidermis
Management Options	Foliar fungicides	Variety selection Foliar fungicide	

Canola Diagnostics

Your Field. Your Results.

Free Testing for Manitoba Canola Grower Members:

- Clubroot
- Blackleg
- Verticillium Stripe

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Appendix Table 1. Fungicide Products Registered for Use on Sclerotinia in Canola (2026)

Product	Company	Group	Active Ingredient	Rate (per acre)
Azoshy 250 SC	Sharda Crop Chem Canada	11	250 g/L azoxystrobin	280 to 400 mL
Emissarius	UAP Canada	11	250 g/L azoxystrobin	280 to 400 mL
Quadris	Syngenta Canada	11	250 g/L azoxystrobin	280 to 400 mL
Quasi	AgraCity Crop & Nutrition Ltd.	11	250 g/L azoxystrobin	280 to 400 mL
Razor	Albaugh	11	250 g/L azoxystrobin	280 to 400 mL
LALSTOP Contans WG	Lallemand Plant Care	Biofungicide	5.00% Coniothyrium minitans strain, minimum 1x10^9 CFU/g	400 to 1600 g **see label for details*
Serenade OPTI	Bayer	44	1.31 x 10^10 CFU/g Bacillus subtilis (QST 713 strain)	0.1 to 0.4 kg/ac
Serenade SOIL (not in CPG)	Bayer	44	1 x 10^9 CFU/g Bacillus subtilis (QST 713 strain)	0.4 to 1.6 L
Lance WDG	BASF Canada	7	70% boscalid	140 g
Maxunitech Boscalid 70% WG	Maxunitech North America	7	70% boscalid	140 g
SHAFT Fungicide	Sharda Crop Chem Canada	7	70% Boscalid (wettable granule)	140 g
Terra Guard	Tide International Canada, Inc.	7	70% boscalid	140 g
Evito 480 SC	UPL AgroSolutions Canada Inc.	11	480 g/L fluoxastrobin	59 to 118 mL
Quash SC	Valent Canada	3	480 g/L metconazole	59 to 118 mL
Acapela	Corteva Agriscience	11	250 g/L picoxystrobin	325 to 485 mL
Advantage Prothioconazole 480 SC	Advantage Crop Protection Inc	3	480 g/L prothioconazole	127 to 150 mL
Holdfast	WinField United	3	480 g/L prothioconazole	127 to 150 mL
Joust	NuFarm Agriculture	3	250 g/L prothioconazole	240 to 280 ml

Maxunitech Prothioconazole 480 SC	Maxunitech North America	3	480g/L prothioconazole	127 to 150 mL
Pavise 480SC	Albaugh	3	480 g/L prothioconazole	127 to 150 mL
Proline 480 SC	Bayer	3	480 g/L prothioconazole	127 to 150 mL
Rambler	NewAgco Inc by AgraCity	3	480 g/L prothioconazole	127 to 150 mL
Soratel	ADAMA Canada	3	250 g/L prothioconazole	240 to 280 mL
Taj	Sharda Crop Chem	3	480 g/L prothioconazole	240 to 280 mL
Miravis Bold	Syngenta Canada Inc.	7	200 g/L pydiflumetofen	304 to 405 mL
Cotegra	BASF Canada	3, 7	250 g/L boscalid, 150 g/L prothioconazole	240 to 280 mL
Dyax	BASF Canada	7, 11	250 g/L fluxapyroxad, 250 g/L pyraclostrobin	120 to 160 mL
Gauntlet	Nufarm Agriculture	3,11	150 g/L azoxystrobin, 150 g/L prothioconazole	400 mL
Lance AG	BASF Canada	7, 11	70% boscalid (A); 250 g/L of pyraclostrobin (B)	132 mL (A); 140 g (B)
Maxentis	Adama Agricultural Canada	3, 11	120 g/L azoxystrobin, 90 g/L prothioconazole	443 mL
Miravis Star	Syngenta Canada Inc	7, 12	150 g/L fludioxinil, 100 g/L pydiflumetofen	404 to 485 mL
Priaxor	BASF Canada	7, 11	167 g/L fluxapyroxad, 333 g/L pyraclostrobin	180 mL
Proline Gold	Bayer	3, 7	200 g/L fluopyram, 200 g/L prothioconazole	253 mL
Viatude	Corteva Agriscience	3, 11	187.5 g/L picoxystrobin, 62.5 g/L prothioconazole	300 ml
Viking Kannus	Viking Crop Production Partners Inc	3, 11	250g/L azoxystrobin (A), 480 g/L prothioconazole (B)	202 ml/acre (A) + 128 ml/acre (B)
Zetigo PRM	Corteva Agrisciences	11, 21	50 g/L florylpicoxamid, 100 g/L pyraclostrobin	324 to 405 mL

Note: Products in this table are registered as fungicides for sclerotinia (*Sclerotinia sclerotiorum*) use on canola as of the Crop Protection Guide (CPG) 2026 publication date - please refer to the most recent company label or CPG for updated registration and use details.

Appendix Table 2. Seed Treatment Products Registered for Blackleg (*Leptosphaeria maculans*) on Canola (2026)

Product	Company	Group	Active Ingredient	Control
Helix Saltro	Syngenta Canada Inc.	3,4,7, 12	Pydiflumetofen 500g/L Difenoconazole 16 g/L Metalaxyl-M and S-isomer 5 g/L Fludioxonil 1.7 g/L Sedaxane 3.4 g/L	seed and air-borne blackleg
Helix Vibrance	Syngenta Canada Inc.	3, 4, 12, 7	16 g/L difenoconazole, 5 g/L metalaxyl-M and S isomer, 1.7 g/L fludioxonil, and 3.4 g/L sedaxane	seed-borne blackleg
Prosper EverGol	Bayer	4, 7, 11	10.7 g/L penflufen, 7.15 g/L trifloxystrobin, 7.15 g/L metalaxyl	seed-borne blackleg
Rancona V RS	UPL AgroSolutions Canada Inc.	3, 7	9.38 g/L ipconazole and 87.5 g/L carbathiin	seed-borne blackleg
LumiGEN with Lumiscend	Corteva Agriscience	3,4,7,11	ipconazole & picoxystrobin, metalaxyl, and inpyrfluxam 381	seed and air-borne blackleg

Appendix Table 3. Foliar Fungicides Registered for Use on Blackleg (*Leptosphaeria maculans*) in Canola (2026)

Product brand	Company	Group	Active ingredient content	Rate (per acre)
Azoshy 250 SC	Sharda Crop Chem Canada	11	250 g/L azoxystrobin	200mL
Emissarius	Parijat Industries India Ltd.	11	250 g/L azoxystrobin	200mL
Quadris	Syngenta Canada	11	250 g/L azoxystrobin	200mL
Quasi	AgraCity Crop & Nutrition Ltd.	11	250 g/L azoxystrobin	200mL
Razor	Albaugh	11	250 g/L azoxystrobin	200mL
Viking Azoxystobin Fungicide	Viking Crop Production Partners	11	250 g/L azoxystrobin	200mL
Bumper 432 EC	ADAMA Canada	3	432 g/L propiconazole	120 mL
CO-OP Pivot	Federated Co-operatives Limited	3	418 g/L propiconazole	120 mL
Fitness	Loveland Products	3	418 g/L propiconazole	120 mL
Modo	NewAgco Inc.	3	250 g/L propiconazole	200 mL
Pivot 418 EC	Interprovincial Cooperative Ltd.	3	418 g/L propiconazole	120 mL
Princeton	Sharda CropChem	3	418 g/L propiconazole	120 mL
Propel	Syngenta Canada	3	250 g/L propiconazole	200 mL
Propi Super 25 EC	Sharda CropChem	3	250 g/L propiconazole	200 mL
Tilt 250E	Syngenta Canada	3	250 g/L propiconazole	200 mL
Viking Propiconazole Fungicide	Viking Crop Production Partners	3	251 g/L propiconazole	201 mL
Headline EC	BASF Canada	11	250 g/L of pyraclostrobin	121 to 161 mL
Preach	Sharda Crop Chem Canada	11	250 g/L of pyraclostrobin	121 to 161 mL

Raclos	Albaugh	11	250 g/L of pyraclostrobin	121 to 161 mL
Pyraline 250	Vincere Agri Solutions Ltd.	11	250 g/L of pyraclostrobin	121 to 161 mL
Tide Pyraclostrobin Shield	Tide International Canada Inc.	11	250 g/L of pyraclostrobin	121 to 161 mL
Dyax	BASF Canada	7, 11	250 g/L of fluxapyroxad and 250 g/L of pyraclostrobin	120 to 160 mL
Fungtion SC	Sharda CropChem Limited	3, 11	75 g/L azoxystrobin and 125 g/L propiconazole	405 mL
Nexicor	BASF Canada	3, 7, 11	30 g/L fluxapyroxad, 200 g/L pyraclostrobin and 125 g/L propiconazole	200 mL
Quilt	Syngenta Canada	3, 11	75 g/L azoxystrobin and 125 g/L propiconazole	405 mL
Priaxor	BASF Canada	7, 11	167 g/L of fluxapyroxad and 333 g/L of pyraclostrobin	90 to 120 mL
Veltyma	BASF Canada	3, 11	200 g/L mefentrifluconazole and 200 g/L pyraclostrobin	152 to 202 mL
Zetigo PRM	Corteva Agriscience	11, 12	100 g/L pyraclostrobin and 50 g/L florylpicoxamid	324 - 405 mL
Rambler Pro (Co-pack of Quasi and Rambler)	NewAgco Inc.	3, 11	250 g/L azoxystrobin and 480 g/L prothioconazole	202 mL/acre Quasi + 128 mL/acre Rambler
Viking Kannus (Co-pack of VIKING Azoxystrobin and VIKING Prothioconazole)	Viking Crop Production Partners	3, 11	250 g/L azoxystrobin and 480 g/L prothioconazole	202 mL/acre VIKING Azoxystrobin + 128 mL/acre VIKING Prothioconazole

Glossary

Apothecia - small, golf-tee shaped structures which produce ascospores. Plural for apothecium.

Ascospore - microscopic asexual spores that typically become airborne.

Condia - single-cell spores, such as those that Verticillium species form

Disease Incidence - the severity of the plant disease on a specific plant, referred to as a percentage of plants infected

Disease Prevalence - the proportion of plants surveyed which are infected with the disease, referred to as percentage of crop which is infested

Disease Severity - proportion of plant tissue or organ area that is visibly affected or damaged by a pathogen

Fungal Hyphae - microscopic, thread-like tubular filament of which fungus grows and spreads

Microsclerotia - tiny, hardy spores or fungal propagules

Mycelium - microscopic fungal filaments

Necrotic - darkened, wilting of plant tissue that is a product of plant tissue death

Pathogen - a disease-causing organism

Protist - a diverse group of mostly unicellular organisms that are not classified as true plants, animals or fungi

Pseudothecia - fruiting bodies produced by fungus which cause disease. Plural for pseudothecium.

Pycnidia - a type of fruiting body that appears as pepper-like spots

Pycnidiospores - masses of tiny spores

Root Exudates - diverse organic compounds released by plant roots into the surrounding soil

Sclerotia - hard, black resting bodies made of compact masses of hyphae. The plural term for sclerotium.

Stomata - microscopic pores in the leaf and stem epidermis that regulate gas and water vapour exchange

Xylem - primary complex vascular tissue responsible for the upward transport of water and dissolved minerals

Zoospores - spores which disperse short distances in response to external stimuli. Ex. zoospores from the Pythium species swim in soil water towards canola seeds and roots, attracted by root exudates.

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