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CANOLA ADVANTAGE

Canola Disease Identification & Sclerotinia Risk Assessment Card

1 Sclerotinia Disease Cycle

What are sclerotia? Sclerotia are hard black fungal resting bodies up to 2 cm (0.8") long. They can remain dormant in soil for up to 5 years or more.

Sclerotia overwinter in soil and on canola residue. Sclerotia germinate apothecia during subsequent growing seasons (see section 3). Ascospores are released from apothecia and dispersed by the wind.

Infection eventually causes premature ripening and stems become bleached, brittle and will easily shred to reveal sclerotia forming in stem cavity.

Lesions progress up and down stems

Early infection appears as a soft grayish white rot, and affected leaves wilt. Infection progresses leading to initial stem infection.

Infected petals collect in high moisture areas (e.g. on leaves or in leaf axils).

These moist conditions allow infections to begin.

Spores land on petals then germinate and feed on them as they decay. Dying petals drop into the canopy.

Early flowering is the best time for risk assessment. Fungicides must be applied between early and full bloom, prior to petal drop.

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2 Assessing the Risk for Sclerotinia Stem Rot in Canola

Sclerotinia incidence can vary greatly among fields and years, making scheduled spraying of fungicides unprofitable. However, if applied when sclerotinia risk is high, preventative fungicide applications can effectively lower disease severity and improve yield. Assessment of disease risk within each field is essential to improve the odds that fungicides are only applied when it is economical to do so.

This checklist developed in Sweden can be useful in helping to assess disease risk in fields. Growers should fill out the checklist for each field shortly after first flower (when 75% of the canola plants have at least 3 open flowers).

What are apothecia? Apothecia are small fruiting structures that look like tiny mushrooms germinating from sclerotia. They are slightly cupped (similar to the top of a golf tee) with a diameter of between 5 and 15 mm (0.2" to 0.6"), with a stalk no more than 50 mm (2") long that is often mostly below ground. The apothecia release many spores, called ascospores, which are the infectious agents of the fungus (see Section 1).

The same moist soil conditions conducive to apothecia production can also favour the development of many other types of mushroom or fruiting bodies. Accurate identification of apothecia is critical to effectively determine the risk of sclerotia stem rot.

Petal testing can also provide important additional information regarding the proportion of petals that are actually infested with spores of sclerotinia, which has been correlated with risk of development of stem rot. However, the test is a snap shot of the particular moment when the petals were collected and subsequent infection and disease development in the crop is strongly influenced by weather conditions, particularly precipitation and relative humidity. Nevertheless petal testing throughout the flowering period can indicate fields where the risk of sclerotinia is low and spraying is not warranted, even if yield potentials are high and weather conditions are favourable. Conversely, high levels of petal infestation during the flowering period in conjunction with moisture conditions, moderate temperatures and good yield potentials (>40 bu/acre) can indicate the need for fungicide. The petal test was developed at the University of Saskatchewan and is available from Discovery Seed Labs in Saskatoon (at time of publication).

Sclerotinia Stem Rot Checklist

(For each risk factor circle the risk points that apply to your field).

RISK FACTOR	POSSIBLE ANSWERS	RISK POINTS
NUMBER OF YEARS SINCE LAST CANOLA CROP	More than six years	0
	Three to six years	5
	One to two years	10
DISEASE INCIDENCE IN LAST HOST CROP	None	0
	Low (1 to 10%)	5
	Moderate (11 to 30%)	10
	High (31 to 100%)	15
CROP DENSITY	Low	0
	Normal	5
	High	10
RAIN IN THE LAST TWO WEEKS	Less than 10 mm (0.3")	0
	10 to 30 mm (0.3 to 0.1 ")	5
	More than 30 mm (0.1")	10
WEATHER FORECAST	High pressure	0
	Variable	10
	Low pressure	15
REGIONAL RISK FOR APOTHECIA DEVELOPMENT	None found	0
	Low numbers	10
	High numbers	15

TOTAL RISK POINTS FOR ALL RISK FACTORS =

❸ Examples of Apothecia of Sclerotinia Stem Rot

Typical apothecia of Sclerotinia sclerotiorum

The cup or top parts of the apothecia seldom protrude much above the soil surface.

Apothecia of sclerotinia stem rot will always germinate from sclerotia in the soil. If mushrooms are growing from crop residue, check for sclerotia inside infected plant tissue or gently dig apothecia from the soil to try to find sclerotia.

Apothecia do not always appear perfectly round, particularly if they are growing close together or against crop debris. Apothecia tend to be honey-coloured, ranging from light tan to dark brown depending on their age.

❹ Examples of Fungal Fruiting Bodies *That Are Not Apothecia of Sclerotinia Stem Rot*

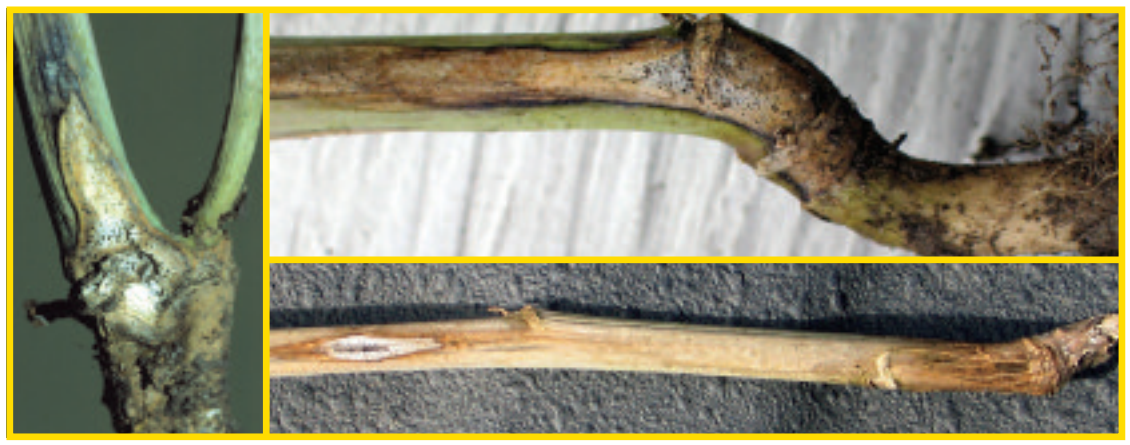
Other fungal structures or mushrooms are often produced by saprophytic fungi, meaning that they survive on decaying crop residue. The tiny mushrooms on this wheat stalk are only 1 to 2 mm in diameter, while apothecia are typically 5 to 15 mm across.

Mushrooms of bird's nest fungus are often abundant in wet conditions, but differ considerably from apothecia *(circled here)*.

Above the soil surface the stalks of apothecia tend to be short, so mushrooms with long stalks above the soil surface are unlikely to be apothecia.

Mushrooms with rounded tops or bright colours are not likely apothecia of the sclerotinia fungus.

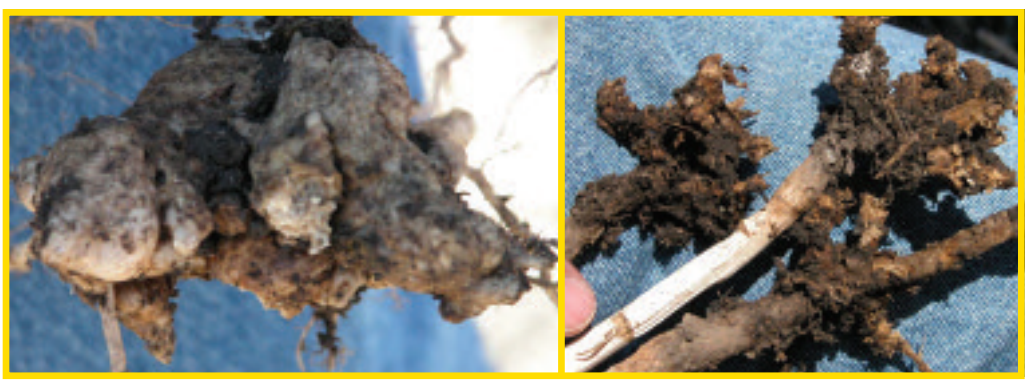
❺ Late Season Scouting *Other Diseases That Cause Premature Ripening*



Blackleg lesions can occur on leaves, but it is the basal stem cankers that can girdle the stems. This can lead to premature ripening and plant death, followed by bleaching of the plant in the sun. Look for small black pycnidia (slightly raised spots) embedded in the lesions.

Fusarium wilt is another fungal disease that can cause premature wilting and death of plants. The most identifiable symptoms are the vascular discolouration that causes reddish brown or yellow streaking. This often occurs on only one half of affected stems, or on individual branches.

Alternaria black spot causes small black lesions on canola pods, stems and leaves. It does not typically cause premature plant death. However, it can cause desiccation of pods, predisposing them to shattering. As a result, crops with significant alternaria are not good candidates for delayed swathing or straight cutting.



The galls created on canola roots by the fungal disease called clubroot severely hinder the ability of plants to take up moisture and nutrients, causing wilting and premature plant death. Bleaching of stems and deterioration of the galls then follows.

Photos and assistance supplied by - Dr. Kelly Turkington and Dr. Randy Kutcher, Agriculture and Agri-Food Canada; Murray Hartman, Alberta Agriculture, Food and Rural Development; Canola Council of Canada Agronomists; David Kaminski, Manitoba Agriculture, Food and Rural Initiatives; Penny Pearse, Saskatchewan Agriculture, Food and Rural Development.

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