Sclerotinia Stem Rot of Canola

Disease Facts

- Sclerotinia stem rot is a soil borne pathogen, also known as white mould. It is a disease that affects western Canadian crops on a yearly basis including canola, sunflowers, peas, soybeans, dry beans, lentils and chickpeas.
- A challenging aspect of managing Sclerotinia stem rot is diagnosing the threat before it appears, as most fungicide control options are protective and not curative.
- Incidence and severity of infection can be sporadic, but in high rainfall/humidity regions the disease can cause significant yield loss.
- Yield loss can vary from year to year and field to field but generally the yield loss is estimated to be half the level of infection (i.e., 50% infection = estimated 25% yield loss).

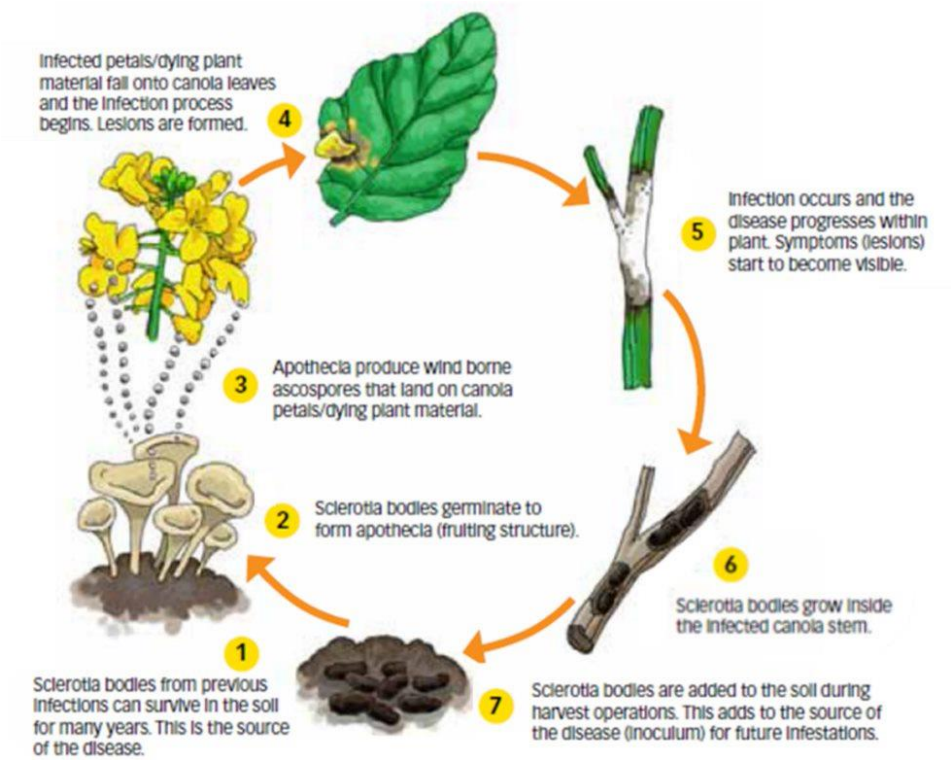

Figure 1. Sclerotinia Life Cycle

Disease Life Cycle

- Infection occurs during the flowering period of canola from airborne spores and is highly dependent upon moisture conditions prior to and during canola flowering.
  - Temperatures between 20-25°C and prolonged soil moisture/high humidity favour disease development.
- Spores can persist for years in soil via structures of hardened mycelial masses, called sclerotia, which function like seeds.
- Apothecia germinate from the sclerotia and produce millions of spores that are wind blown and land on canola petals. These spores begin to colonize dead plant tissue, particularly senescing canola flower petals.
- Infection is favoured in dense canopies with minimal airflow and high moisture.
- Petal drop generally starts between 6-9 days after flowering begins.
- This coincides with a plant that is approximately at the 30% bloom stage.
- When infected petals fall off the floret and land on the leaf or stem axels of a plant and stick, the sclerotinia can then flourish and infect the stem and branches.
- Infection results in premature ripening and yield loss.

Disease Identification & Symptomology

- Infection begins as a soft, watery rot on infected leaves or stems.
- Lesions can completely girdle the main stem, resulting in plant wilting, lodging, and eventual death.
- The infected area dries up and becomes bleached.
- During harvest, the diseased tissues shred and sclerotia bodies are released from the infected stems, contributing inoculum to the soil for successive years.

Figure 2. Symptoms of sclerotinia stem rot within canola crop canopy.

Figure 3. Canola stems infected with sclerotinia stem rot.

Disease Risk and Forecasting

- Determining if fungicide control is warranted can be difficult due to the sporadic nature of the disease and growers often ask, "How do I manage risk of a disease I cannot see?"
- Myriad practical risk factors growers should consider prior to applying fungicides include:

1. Level of disease infection in their own and neighboring canola fields over the past several years.
2. Amount of precipitation and humidity 10-14 days prior to first flower and during flowering (soil at field capacity).
3. Plant density.
4. Crop rotation.
5. Long range precipitation forecast.
6. Proper fungicide timing.

- Various predictive tools exist to aid in measuring the presence of the disease in fields such as petal tests, spore traps and scouting for the presence of apothecia.
- The Canola Council of Canada publishes a Sclerotinia Stem Rot Checklist (www.canolacouncil.org)
- The checklist assigns numeric risk factors to variables affecting the presence of sclerotinia (i.e., weather forecast, crop rotation, etc.)
- Once a score of >40 points is achieved, a fungicide may be warranted.
- It is important to note that fungicide costs and commodity prices are not factored into the checklist and must be taken into account.

Disease Management

1. Fungicides

- Fungicides are the most effective management tool in combating sclerotinia when disease risk is high.
- However, due to disease variability within a field and on plants (incidence and severity), prophylactic applications are often uneconomical.
- Forecasting models are available. Although not perfect, they do provide directional guidance on whether a fungicide application is warranted (See Canola Council of Canada Sclerotinia Checklist)
- Most fungicides are protective – aim to protect the flower petals which are the food source for the disease.
- Generally, most fungicides are applied between 20-50% bloom with optimal being 30% bloom (when most petals are open).
- Refer to individual product labels for complete details on application, timing, and staging.

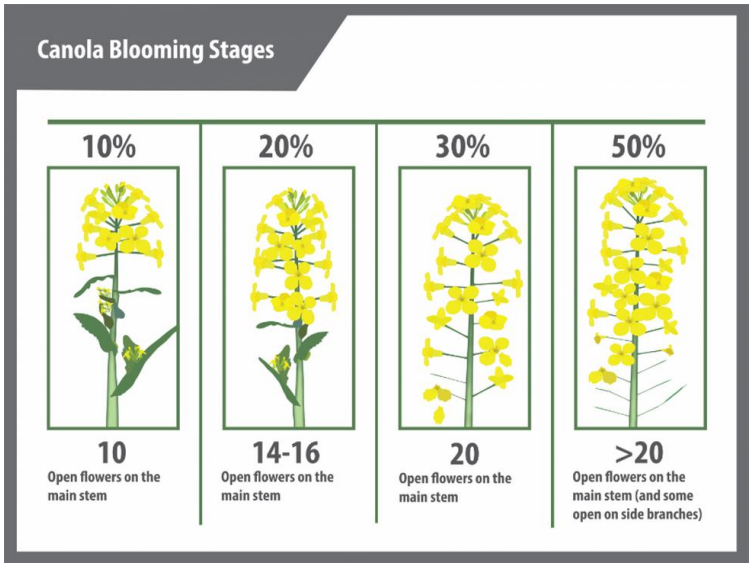

Figure 4. Canola bloom stage assessment. Courtesy of the Canola Council of Canada.

2. Genetic Resistance

- Brevant Seeds ® brand canola offers hybrids with built in resistance to sclerotinia. This genetic resistance confers the ability of the plant of overcome the pathogen's ability to infect.
- These resistant hybrids have been shown to reduce sclerotinia incidence by over 60%, as well as reducing overall disease severity.
- Utilizing genetic resistance provides season long protection from sclerotinia and convenience, as the protection is planted with the seed.
- Resistant genetics also aid in managing disease risk over large geographies and acres.
- Resistant hybrids offer growers peace of mind in providing protection under low to moderate disease infection levels and increased flexibility when timing fungicide applications to proactively managing sclerotia.
- Both resistant canola hybrids and/or fungicides work to reduce the amount of sclerotinia inoculum returned to the soil.

3. Cultural Controls

- This would include management strategies such as crop rotation, management of host weed species, etc.

Figure 5. Sclerotia bodies in infected canola stem. Photo courtesy of the Canola Council of Canada

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