Agronomy Update
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Sclerotinia stem rot in canola – 'To spray or not to spray'

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The 2009 growing season in Western Canada was moister and cooler than normal. This resulted in prolonged flowering and higher than average yield potential in canola.

However, this combination of factors also favours Sclerotinia development and growers are forced to make decisions on fungicide application in their crop management.

Core issues – Sclerotinia is everywhere!

All broad leaf species are susceptible to Sclerotinia. Drier areas as well as areas where host crops (Sunflower, beans and many others) were not grown in the last 3-6 years, are likely to produce less inoculum (resulting in lower disease pressure) in comparison with wetter areas or fields where susceptible crops were grown recently. Sclerotinia can also be introduced directly into the field in non-Certified seed lots.

Fig 1. Apothecia releasing Sclerotinia ascospores in the field

Core issues – Weather and crop development

Moisture is essential for both the initial inoculum release and the subsequent disease development.

It takes a minimum of 7 days with soil moisture at or above field capacity to enable release of Sclerotinia ascospores that colonize canola petals. Ascospores are released from golf-tee-shaped apothecia (Fig 1). Lush canola crops can facilitate ascospore release through moisture retention.

Sclerotinia infects wet leaves through dropped petals. The first disease symptoms will be observed within 4 days on foliage. Further development of Sclerotinia on the leaves and eventually stems depends on moisture. Canopy density determines moisture retention so higher yield potential translates into higher Sclerotinia potential.

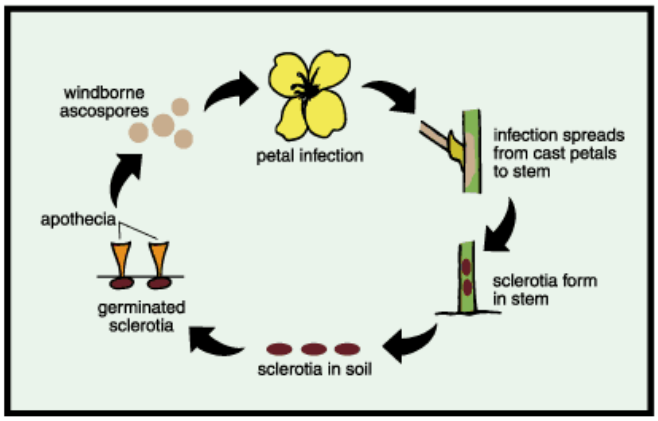

Fig 2. Sclerotinia disease lifecycle (courtesy of the Canola Council of Canada)

Core issues – Fungicide application or not?

Timing is everything in Sclerotinia development and fungicide application.

When conditions favor disease development, it is prudent to apply a fungicide at 30% bloom.

Experts like Rob Park of Manitoba Agriculture also advise waiting to spray if conditions are not right for disease development as fungicides provide 10-14 days of protection only.

If soil moisture becomes available during flowering, it is safe to wait up to 7 days, or until apothecia are noticed, and stretch your fungicide protection.

Murray Hartman of Alberta Agriculture recommends a split application strategy for low to moderate disease pressure. The full fungicide rate is split with the first application at 30% flowering, and the second at a later

date to protect the crop for a longer period. If the canopy dries out as flowering progresses, the second application is not done which reduces the overall cost.

Extreme situations do occur as well. Sclerotinia was very damaging in Manitoba in 2009 after extended periods of wet weather. Such a situation may require two fungicide applications in order to protect development of a lush, high yielding crop.

Spraying fungicide is usually not advisable with low moisture conditions and/or when the crop does not have a high yield potential.

Yield penalties – To spray or not to spray!

Yield losses depend on the crop's yield potential, weather and time of infection.

A field with 60% disease incidence on the main stems of plants (50% yield loss per plant) would result in approximately 30% yield loss.

In years with extended wet periods at flowering, regular fungicide applications can reduce such early/damaging impact of Sclerotinia significantly.

If Sclerotinia affects the crop at later growth stages due to weather conditions, both disease incidence and severity are reduced resulting in lower yield losses.

Sclerotinia and high yield potential are directly related. Therefore, high yields are worth protecting if weather conditions are right as 3-4 bushels can usually pay for the fungicide application. For instance, preventing a 20% early disease infection in a 40-bushel canola crop will pay for the fungicide application.

Why do we see differences in Sclerotinia development?

Yield potential, timing and quantum of petal drop and moisture/inoculum availability explain most of the variation observed in the field. If all these factors are high, extent of disease development is also high.

Variation in any of these factors within a field planted to a single canola variety or hybrid translates into variation in disease development. For instance, lower spots in the field get more Sclerotinia due to poorer aeration and more moisture availability for a longer time. A longer flowering period and higher inoculum release can occur in these spots as well.

In a uniform field, two canola products will still differ in yield potential, canopy development, length and extent of petal drop. Depending on the timing of conditions favourable for disease development, two hybrids or varieties are likely to differ for the extent of Sclerotinia development. Early disease pressure will affect earlier flowering products and the other way around.

Are there differences among varieties?

Rob Park and Murray Hartman have not seen significant variation in the actual level of susceptibility of different canola varieties and hybrids in farmers' fields. They emphasize that traits like good standability can help in disease reduction but all canola products currently on the market are susceptible!

While winter canola products grown in Europe are all susceptible as well, some differences have been documented in the field performance of Chinese rapeseed/canola varieties.

What can a grower do to reduce development of disease?

Three year or longer rotations excluding Sclerotinia-susceptible crops like sunflower and beans can reduce inoculum availability, reducing disease pressure. Additional inoculum can be blown in from adjacent fields, but that is usually a minor source compared to inoculum generated within the field.

Higher than recommended plant density can lead to more Sclerotinia. Therefore, growers should pay attention to seed size and adjust seeding rate accordingly.

These measures can decrease disease pressure and reduce the impact of Sclerotinia, but only fungicide application can control the disease.

Incorporating Sclerotinia Resistant Canola!

Pioneer Hi-Bred, has developed canola hybrids capable of withstanding Sclerotinia disease pressure better than current products. Pioneer Hi-Bred Protector Brand 45S51 was the first canola hybrid with improved resistance to Sclerotinia. This successful launch was followed by 2 more enhanced offerings with the commercialization of 45S52 (2010) and 46S53 (2011). These products offer increased resistance levels to Sclerotinia and improved yields. These products offer protection from the uncertainly of Sclerotinia infections built into strong agronomic packages.