Article supplied by Bayer Crop Science

Innovations in the control of Sclerotinia

Over the last few years, the incidence of Sclerotinia has increased in oilseed crops, including soya beans, sunflowers and canola, causing significant yield losses. Fortunately, the past season was a dry one, resulting in lower incidence of the disease.

This disease, which is caused by *Sclerotinia minor* and *S. sclerotiorum*, has been a challenge to control due to its wide host range, robust survival structures in soil and its efficient way of spreading to its target host.

It is important to bear in mind that the sclerotia resting structure can survive for approximately five to ten years in soil. The sclerotia germinate after a rain event and create spores producing structures (apothecia) in the top 3 to 5cm of soil (*Figure 1*).

These structures produce ascospores that are released in the air ten to twelve days after rainfall. The spores infect petals and leaves within two days of their release. Sclerotia can also germinate in the soil and infect the roots (*Figure 2*).

Figure 1a: An example of the spore producing apothecia often hidden between organic matter.

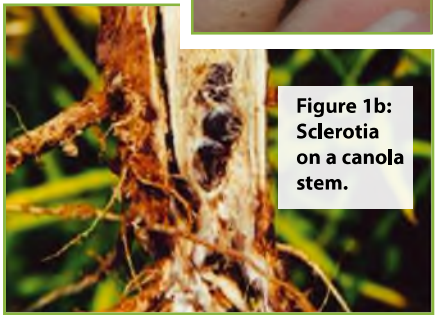


Figure 1b: Sclerotia on a canola stem.

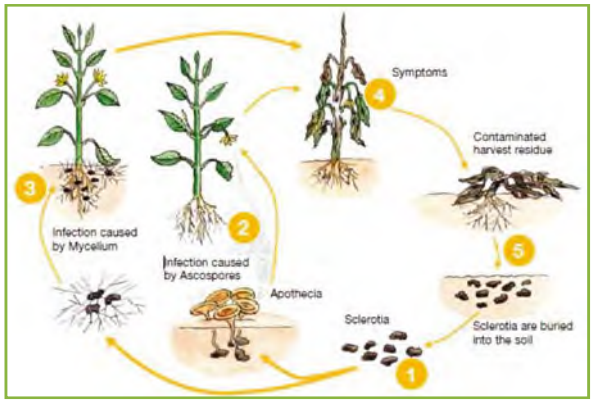
Environmental triggers

For Sclerotinia to develop, the following is required:

- Wet conditions on the soil surface with a temperature of 11 to 15°C trigger sclerotia germination and result in spore release from the apothecia after 10 to 14 days.
- Extended dampness, particularly during flowering (>25mm rain).
- High humidity and leaf dampness during petal drop and lodging will result in stem infection. This is linked to temperatures of 20 to 25°C.
- Infection is halted when dry conditions occur.

Sclerotinia remains a challenging disease to control. This is attributed to the fact that both the soil and aerial infection phases exist, requiring different control strategies. The basis of a control strategy is breaking the life cycle (*Figure 2*).

Figure 2: Sclerotinia life cycle.

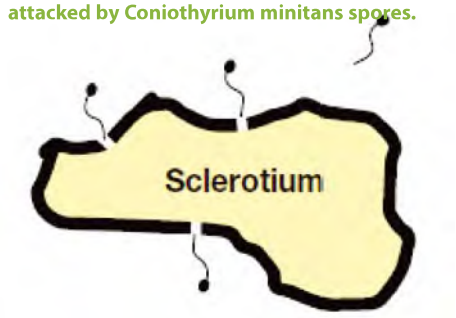


The life-cycle consists of the following:

1. Sclerotia can survive in soil for many years. This phase can be controlled with the new biological fungicide, Contans®.
2. Sclerotia produce apothecia that release spores which infect the susceptible host. On canola, this can be controlled by Prosaro®.
3. Sclerotia can also germinate and infest the roots of host plants.
4. Mycelia colonise the plant, causing it to die.
5. New sclerotia are produced, surviving for many years in the soil.

Bayer has introduced a biological compound which contains a pathogen for *Sclerotinia minor* and *S. sclerotiorum*. This organism contains *Coniothyrium minitans* which attacks the sclerotia stages as shown in *Figure 3*. It prevents the sclerotia from developing, which reduces root infection and the production of spores.

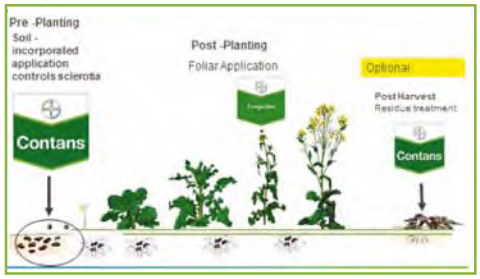
Figure 3: An illustration of a sclerotium being attacked by Coniothyrium minitans spores.



It is, however, also important to apply a fungicide during the early flowering stage. This is particularly critical when favourable conditions exist for the development of the disease. Such conditions include prolonged dampness during flowering.

To ensure effective control, it is key to integrate strategies which include the control of sclerotia with Contans®, a foliar application with a registered fungicide and adapting cropping practices by means of crop rotation and cultivar choice. *Figure 4* illustrates the method for the application of Contans®.

Figure 4: How to position Contans®.



For more information, visit the Bayer website *www.bayer.co.za*.