The in-field life cycle of *Sclerotinia sclerotiorum*

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Sclerotinia sclerotiorum is a yield-limiting fungal plant pathogen. It is present on every crop-producing continent and affects over 500 known susceptible host plants, including weeds. In South Africa, hosts include but are not limited to, cabbage, canola, cauliflower, dry bean, hubbard squash, soya bean, sunflower, pea and potato.

Some distinguishing features characterise the diseases caused by *S. sclerotiorum*. These features are a wilted appearance in the field (*Figure 1: 4A*), followed by white, cottony mycelia (*Figure 1: 4C and 4D*), a shredded appearance (*Figure 1: 4E*) and ultimately melanised mycelium, known as sclerotia (*Figure 1: 6*). These resting structures can be found within and on the stems, as well as inside pods. Sclerotia are crucial to the life cycle of this pathogen because they are the pathogen's survival structures. They can survive for up to eight years in and on the soil (*Figure 1: 1*).

Two types of inoculum

This pathogen is complicated because the sclerotia afford it the opportunity to form two inoculum types, namely mycelia and ascospores. These germination pathways are induced under different environmental conditions. Carpogenic germination (*Figure 1: 2B*) usually occurs under lower temperatures than that of myceliogenic germination (*Figure 1: 2A*). However, both pathways prefer high relative humidity, moisture or leaf wetness.

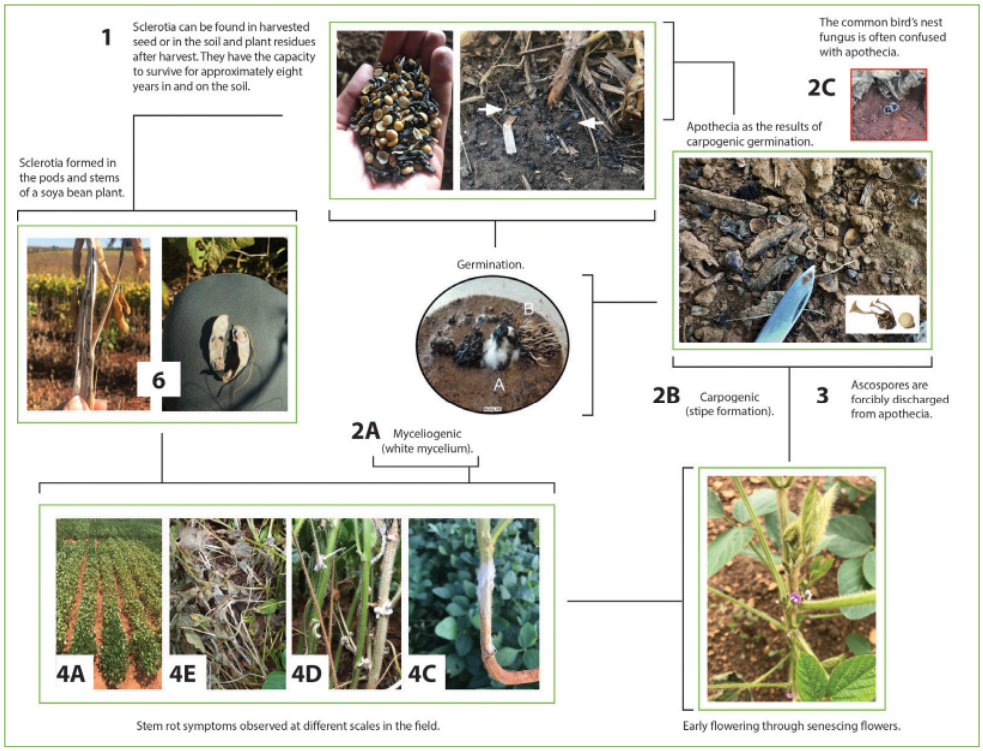
The initiation of the stipes from sclerotia leads to the development of apothecia (*Figure 1: 3*), a mushroom-like structure, which looks much like a saucer. Ascospores, which are infection propagules, are forcibly discharged from apothecia when air pressure changes are observed within the canopy. Spores are then dispersed widely. Apothecia are frequently misidentified as the common bird's nest fungus, which belongs to the *Nidulariaceae* family (*Figure 1: 2C*).

An integrated approach

As a result of the wide host range, pathogen biology and environmental dependence, the management of *Sclerotinia* diseases requires an integrated approach. The matter is further complicated by host crops' lack of conventional resistance to the pathogen.

Management strategies have thus relied on reducing the opportunity for the sclerotia to germinate, which limits the sclerotial population and disease initiation risk. Varying planting dates, crop rotations, population densities, tillage practices, biological and chemical control have all effected limited (and at times inconsistent) control of *Sclerotinia* diseases. Procymidone is the one registered active ingredient for controlling sclerotinia stem rot of soya bean in South Africa.

Figure 1: Soya bean stem rot caused by *Sclerotinia sclerotiorum*.



Photographs supplied by Lisa Rothmann and Marlese Meiring. For more information, contact Lisa Rothmann at info@sclerotinia.co.za, visit *www.sclerotinia.co.za* or follow the South African Sclerotinia Research Network on Facebook, Instagram and Twitter.