

MANAGEMENT OF WHITE MOLD IN BEANS



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Context

Sclerotinia, a serious bean disease

It is the sclerotia, the survival organs of the fungus, which initiate attacks in a crop. These sclerotia reactivate each time that a favourable crop is planted allowing the sclerotinia to develop. Sclerotia are able to remain viable in the soil for at least 10 years. The plot history is therefore a crucial element in assessing the level of contamination.

Sclerotinia (commonly known as white rot) is undoubtedly the dominant disease in these crops, and especially the most damaging in cases of heavy attack.

Symptoms & damage

Symptoms mainly due to the presence of *Sclerotinia sclerotiorum* usually appear at the beginning of flowering. The leaves may show **yellow spots, with a whitish netting of mould at the base**. The **leaves wilt**. **Irregularly shaped wet spots appear on the stems and pods**. A soft rot with a whitish cottony matting appears on the stems, petioles and pods of the bean. White and then black sclerotia appear inside the stems and pods. When these sclerotia are in direct contact with the roots, they can lead to the formation of a soft rot at the base of the stem or the collar that can, in cases of significant spreading, lead to the death of the plant.



Photos of damage from sclerotinia (or white rot) on beans from the page Wikipedia - *Sclerotinia sclerotiorum*



Biology

Characteristics

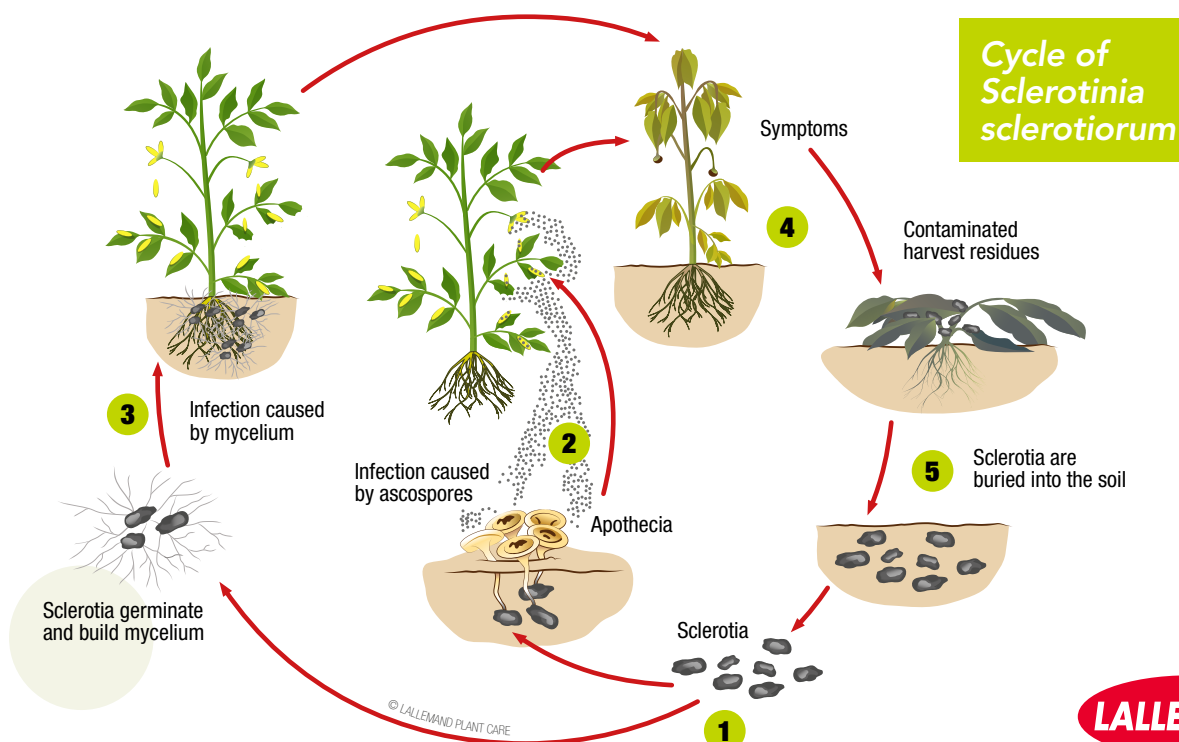
At the end of the winter, the sclerotia germinate and form mycelia which will reach the roots (primary contamination). They can also produce ascospores which, carried by the wind, will contaminate other plants (secondary contamination) if their growth stage is sensitive, at flowering for example. The fungus penetrates senescent tissue (saprophytic phase) then progresses into healthy tissue. When the ambient humidity is favourable, the fungus produces sclerotia.

Photo of sclerotia from the website « Ephytia »



The conditions favourable for the contamination of plants are:

Contamination from 10 days if temperature is $>5^{\circ}\text{C}$ with high humidity ($>92\%$)
 from 16 to 24 hours if temperature is optimal ($15\text{-}20^{\circ}\text{C}$) with high humidity ($>92\%$).





Management of the disease on a plot at risk

Prophylactic methods

There are a number of preventive measures:

- Prefer varieties with less foliage and a light, upright habit if possible.
- Promote aeration of the foliage (sowing at a wide distance, sowing lines in the direction of the prevailing winds).
- Avoid irrigation during flowering and allow the soil to dry out between irrigations.
- Rationalise fertilisation and irrigation to avoid excess vegetation.
- Practise appropriate rotations by avoiding risky previous crops such as peas, cabbage, fennel, lettuce, endive or celery.

Rationale for intermediate crops:

This is particularly relevant for intermediate nitrate trap crops and other winter cover crops. Many of them are actually vectors of the disease. **This is the case for crucifers (mustard, radish, turnip...), legumes (clover, vetch...) and even borage on which «devastating» attacks of sclerotinia have been observed.** These cover crops, which have experienced strong development under the effect of agri-environmental measures, consequently multiply the inoculum without any control. The choice of species is therefore crucial and must absolutely be integrated into the rationale for the control of sclerotinia. Only grasses allow a real break and the avoidance of any soil recontamination risk: ryegrass, or rye whose rapid establishment is suitable after the late harvests of September-October. More generally, it is the whole rotation that must be managed as well as possible in the face of sclerotinia. The presence of cereals remains fundamental and the ideal would be to respect a minimum delay of 4 years between two susceptible crops.

Strategy for crop protection:

Against this disease with a strong economic impact, phytosanitary control consists of using chemical and/or biocontrol products in order to minimise damage. LALSTOP Contans WG is the only biofungicide product based on the fungus *Coniothyrium minitans* CON/M/91-08 (usable in organic farming) that effectively reduces and destroys soil sclerotia (the source of inoculum of the disease). **As it is used in the rotation, the stock of sclerotia in contaminated soils is reduced. The regular application of this product is important to achieve the required effectiveness.**



LALSTOP Contans WG therefore makes it possible for the soil to be cleaned of sclerotia over time. When the presence of sclerotia is still too substantive (beginning of the use of LALSTOP Contans WG) or after only a few applications, the use of plant protection products during the bean crop cycle is indispensable when conditions are favourable for infection. They make it possible to stop secondary contamination due to the presence of sclerotinia spores on the foliage and flowers, emitted by sclerotia.

The main active ingredients are:

- Fludioxonil
- Fluopyram
- Trifloxystrobin
- Boscalid
- Pyraclostrobin
- Cyprodinil
- etc.

Integrated advice on LALSTOP Contans WG :

- Avoid growing more than 3 sensitive crops in a period of 10 years.
- Avoid any sensitive crop on a plot for at least 4 years.
- Beware of sensitive intercrops.
- Utilise LALSTOP Contans WG pre-sowing on plots contaminated by sclerotia and if damage is observed on the crop in place, also use the product after harvest when incorporating the crop residues.
- Quantify the number of sclerotia in the field (LALLEMAND Service) in order to estimate a potential risk and whether or not to trigger control measures integrating LALSTOP Contans WG.
- **Apply LALSTOP Contans WG at least once a year whatever the crop in place** (always after ploughing) when conditions are optimal for the product.

Prospects for the use of the product LALSTOP Contans WG :

Like all vegetable sectors, the bean sector tries to provide quality products while reducing the impact of its practices on people and the environment. In this context, numerous trials are taking place combining the use of LALSTOP Contans WG at reduced doses with products of chemical origin in order to reduce the Treatment Frequency Indicators (TFI) and the presence of residues potentially found in the harvested crops.





Bibliography

- Article Unilet Informations n°121 Juillet 2005 « La lutte biologique en traitement de fond contre le sclérotinia ».
- Article Unilet *Guide de protection 2018* « Contans WG contre le sclérotinia ».
- Articles Unilet *Guide de protection 2022* « Contans WG contre sclérotinia mode d'emploi » and « Hasclerix et Avizio Haricot des outils de gestion du sclérotinia sur haricot ».
- Article Ephytia website « Pourriture à *Sclerotinia sclerotiorum* ».
- Lallemand presentation « LALSTOP Contans WG ».

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