

LALSTOP

CONTANS WG

THE ONLY FUNGICIDE ON THE
MARKET THAT CONTROLS THE
SOURCE OF WHITE MOLD



LALLEMAND

Bio-RATIONAL FUNGICIDE

Enhancing crop protection to
break the cycle of *Sclerotinia*
in soil



Keep your crops safe from *Sclerotinia*

Sclerotinia disease can be devastating. It's estimated to reduce crop yields significantly in the USA and on occasion result in total crop losses.

Now you can help ensure the health, quality and yields of your crops with an effective biological control to integrate with conventional foliar treatments: Lal Stop Contans® WG biological fungicide from Lallemand Plant Care.

A different way to crop performance

Whereas conventional foliar treatments target *Sclerotinia* disease in-season, Lal Stop Contans WG decreases *Sclerotinia* loading right from the start.

Based on a naturally occurring fungus, it neutralizes and eliminates the source of the disease, limiting the potential for infection and spread in your crops.

A sustainable crop protection solution

LalStop Contans WG is a vital rotational tool to reduce disease loading as part of IPM (Integrated Pest Management) or ICS (Integrated Crop Solution) programs.

It enhances pest and residue management, and is safe to beneficial insects and organisms, making Contans WG an ideal option across the whole food chain.

The product is approved for all edible and non-edible crops and can be used on its own or to complement chemical-based treatments to improve long-term *Sclerotinia* disease management.

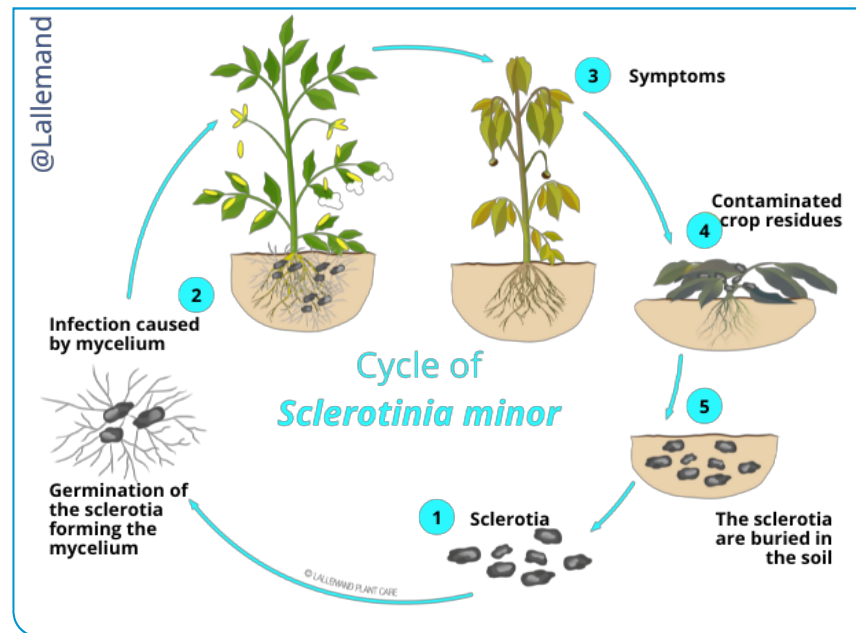
Now, discover more about Lal Stop Contans WG.

Why *Sclerotinia* builds up in the soil

Sclerotinia is very difficult to control using traditional foliar treatments alone. The reason is simple: it's a continuous cycle that is replenished from one season to the next where sensitive crops are grown. *Sclerotia* (resting bodies) of *Sclerotinia* can survive for several years; indeed, viable *sclerotia* have been seen after 10 years in the soil.

Sclerotia germinate and develop *apothecia* if within the top 3-5 cm, so annual cultivations can continue to bring problems to the surface even when sensitive crops have not been grown in the rotation for several years.

Life-cycle of *Sclerotinia* spp.



1. *Sclerotia* (resting bodies) of *Sclerotinia* germinate and develop *apothecia*.
2. These *apothecia* produce ascospores that are released into the air. They attach to senescent parts of the plant such as old leaves and fallen petals. Depending on climatic conditions (temperature and moisture), these spores can germinate and infect the plants via leaves, flowers, fruit and stems.
3. Meanwhile, the mycelium resulting from the sclerotia germinating in the soil can infect the roots of certain host plants. Symptoms of infection vary between plant species and can appear rapidly.
4. White mycelium develops and new sclerotia appear on the infected plant parts or inside the stem. The infected plant parts start senescing, typically resulting in plant death.
5. The newly formed *sclerotia* return to the soil and can be viable for several years.



Surviving struc (*sclerotia*) of *Sclerotinia* are viable in the soil for several years



Sclerotia germinate and develop into apothecia



Apothecia formed from *S. sclerotiorum* can develop up to 2" long

Sclerotinia sclerotiorum

Sclerotinia sclerotiorum can infect many crops, particularly oilseed rape, lettuce, carrot, potato, beans (field and fresh), peas (combined, vining and fresh), vegetable brassicas and celery. See a full list below.

When within 3-5 cm of the soil surface, its *sclerotia* classically develop apothecia that produce and release ascospores (stages 1 and 2, opposite) into the air. The spores may germinate and infect susceptible plants, as can the mycelia resulting from sclerotial germination in the soil (stage 3).

Sclerotinia minor

Sclerotinia minor particularly infects lettuce. It requires more intensive treatment than *Sclerotinia sclerotiorum* as its *sclerotia* are smaller and more numerous. *Sclerotinia minor* very rarely develops *apothecia* and the attack does not occur via *ascospores* (stage 2). Instead, the *sclerotia* germinate in the soil and the mycelium infects the roots, the base of the stem and the parts of the plant in contact with the ground (stage 3). The following stages (4 and 5) are identical to those of *Sclerotinia sclerotiorum*.



Sclerotia build-up in OSR stem



Fresh mycelia and *sclerotia* on lettuce



Accumulation of *sclerotia* and mycelia on celery



Sclerotia from *S. minor* on lettuce

Sclerotinia spp. can affect a wide range of crops

Field crops	Vegetables	Herbs	Ornamentals
Alfalfa/Lucerne	Artichoke	Endive	Aster
Clover	Asparagus	Fennel	Begonia
Field Bean	Bean (Dwarf French, broad, runner)	Lettuce	Calendula
Lupin	Broccoli	Onion	Chrysanthemum
Mustard	Cabbage	Pea (vining, fresh)	Fuchsia
Oilseed Rape	Carrot	Radish	Gerbera
Pea (combined)	Celery	Sweet Pepper	Lupin
Potato	Chicory	Tomato	Pelargonium
Sunflower	Cucumber	Turnip	Petunia
	Cucurbits (courgette, squash, pumpkin)		Poppy

The performance you need to ensure yields

Contans WG effectively cleanses your soil and improves its health by reducing the source of *Sclerotinia* disease.

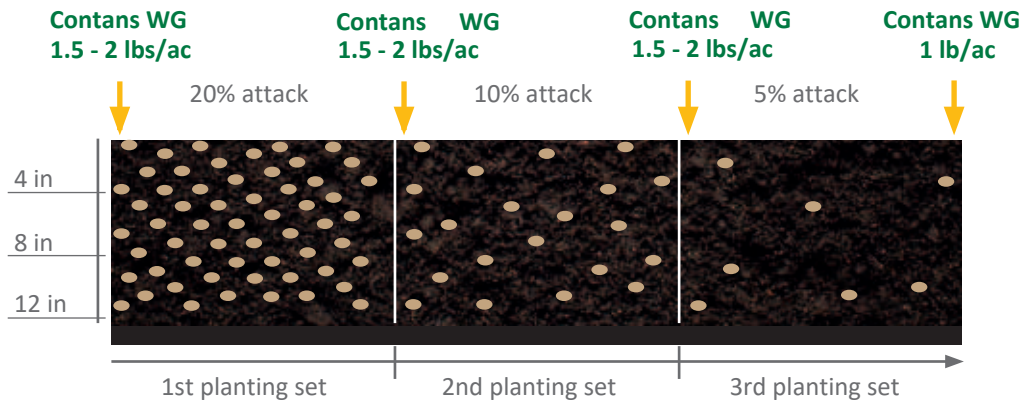
The active ingredient, spores of the naturally-occurring fungus *Coniothyrium minitans*, attacks and destroys the *sclerotia* and mycelium of *Sclerotinia spp.* in the soil. With a highly effective concentration of 1×10^{12} active spores per kilogram, it interrupts the life-cycle of the plant pathogen before the *sclerotia* can infect the crop.

Following application and incorporation of Contans WG, the spores of *C. minitans* germinate and produce mycelium, attacking and preventing the infected *Sclerotinia sclerotia* from generating *apothecia* or their mycelium. Total destruction generally takes 6 to 12 weeks but *sclerotial* viability is typically inhibited much sooner, depending on factors such as soil temperature and soil moisture.

Rotational application gives lasting control

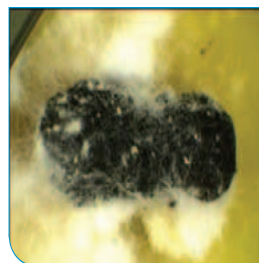
In situations of heavy infestation with *Sclerotinia* (high level of sclerotia in the soil), a one-time application of Contans WG or conventional chemical foliar treatments is unlikely to give adequate control. In such cases, best effects can only be achieved with multi-year or multi-crop rotational treatments as illustrated below.

Reduced crop losses from *Sclerotinia spp.*

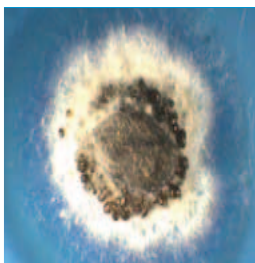


With every application of Contans WG, on average 80-95% of *sclerotia* in the soil layer of the application area are destroyed. As a result, the *Sclerotinia* pressure is strongly reduced from one application to the next. However, in situations with heavy infestation a considerable number of uncontrolled *sclerotia* may remain viable. An integrated program with foliar products can offer sustainable control and improve the effectiveness of long-term *Sclerotinia* disease-management programs.

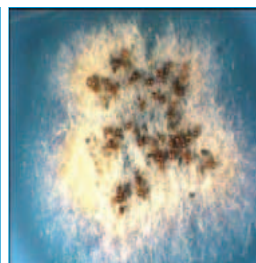
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Intact sclerotium



Sclerotium attacked by *C. minitans* (arrows: pycnidia spores and spore slime of *C. minitans*)



Sclerotium being degraded by *C. minitans* (arrows: pycnidia spores and spore of *C. minitans*)

How to use Contans WG

General guidance

Contans WG is sprayed and incorporated into the soil using conventional spraying equipment. For best results, the treated soil surface must be well and homogeneously mixed into the upper soil layer by using a rotary hoe or similar machinery. Shallow incorporation (2 in max.) is preferred. Under good conditions (e.g. soil temperature: 53-77°F and sufficient moisture) *C. minitans* needs 2-3 months to destroy fully the sclerotia structures in the soil, but *sclerotial* viability is typically inhibited much sooner. For best results, apply Contans WG no more than three days before preparation/ incorporation.

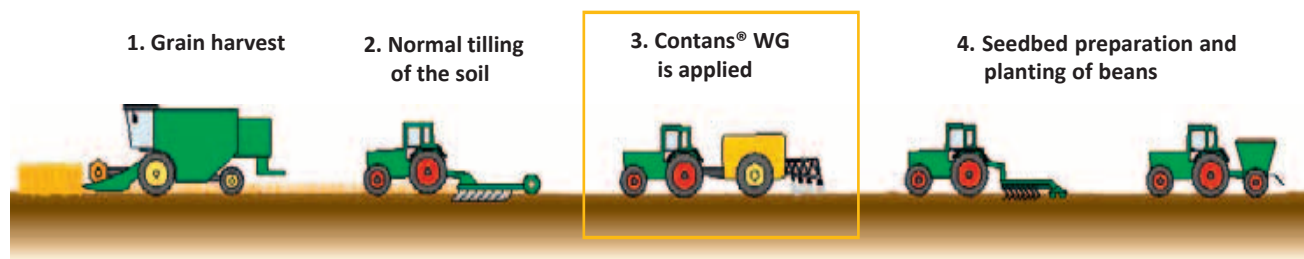
Specific crops

Arable

Contans WG can be sprayed and incorporated in the topsoil layer before planting, either when preparing seedbeds by cultivation or when using a combined seed drill. The recommended dose in the preplanting application is 1-2 lbs / acre.

After application, Contans WG must be incorporated thoroughly within the recommended depth, preferably using a rotary cultivator. Depending on cultivation practice and equipment type, the drill pass may also be suitable for incorporation.

Deeper incorporation will dilute the concentration per soil volume and may influence the efficacy. Ensure that subsequent cultivations prior to planting a susceptible crop are not below the depth of incorporation of Contans WG, otherwise *sclerotia* may be brought up from untreated soil lower in the profile.



Vegetables

Contans WG can be sprayed and incorporated in the topsoil layer before planting or during seedbed preparation. The recommended dose in the preprinting application.

Use a higher dose of up to 4 lbs / acre where *Sclerotinia* infection levels are high and deeper incorporation is needed (7-8 in max.) is used.

The application rate is related to the infestation level in the soil. Even if the *inoculum* source has been reduced, Contans WG applied at a lower rate can prevent further build-up of *sclerotia*.

Application – further information

The applied dose depends on a number of factors such as *Sclerotinia* inoculum level in the soil, crop rotation, depth of the incorporation and timing of use.

Reduction of the *inoculum* level in relation to the infestation level depends on disease pressure. Crop rotations of susceptible crops like soybeans, dry beans, lettuce, carrots, sunflowers and potatoes are likely to result in higher *sclerotia* density and lower tolerance to *Sclerotinia* pressure in the soil.

Contans WG offers good but much slower activity at lower than recommended soil temperatures (53-77°F). even at 41°F the *sclerotia* of the pathogen are infected by *C. minitans*. When the soil temperature decreases below 32°F or rises above 80°F, *C. minitans* ceases its activity and rests in the soil. The fungus will not be destroyed during this period and will continue to grow once the temperature rises above 34°F or declines below 80°F.

Safety and compatibility

The acute and chronic toxicity of Contans WG is very low and cause no undesired side-effects to humans, wildlife or non-target organisms (e.g. beneficial insects, bees or earthworms).

Contans WG is susceptible to acids and alkalines. Avoid tank-mixing with liquid fertilizer and consult field service staff for approved products as tank-mix partners.

Packaging

Contans WG spores are available as water-dispersible granules in pack sizes of 25 lb bags.

Storage

Contans WG should be stored at low temperatures, but not below freezing. If stored at 39°F, shelf-life is up to 24 months from the time of production. Store in a dry, cool place away from direct sunlight and heat.

Learn more about Contans WG

Contans WG is distributed by Sipcama Agro USA. To learn more about Contans WG, visit www.sipcamagrousa.com or call (877) 898-9514.

LalStop Contans WG contains viable spores of *Coniothyrium minitans*, strain CON/M/91-08. Always read the label and product information before use. Pay attention to the risk indications and follow the safety precautions on the label.

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