

MATERIAL FACT SHEET

CONIOTHYRIUM MINITANS

MATERIAL NAME: *Coniothyrium minitans*

MATERIAL TYPE: Microbial

U.S. EPA TOXICITY CATEGORY: III, Caution

USDA-NOP – considered nonsynthetic, allowed. Preventive, cultural, mechanical and physical methods must be first choice for pest control, and conditions for use of a biological material must be documented in the organic system plan (NOP 2000).

MATERIAL DESCRIPTION:

Coniothyrium minitans is a fungus that can be utilized as a biological control against the fungal pathogens *Sclerotinia sclerotiorum* and *Sclerotinia minor* (causal agents of white mold on many plant species). First identified in 1947, *C. minitans* is naturally occurring and can be found in soils world-wide. (Pavlitz and Belanger 2001).

This biocontrol fungus is sold as conidia (spores) which are dried and mixed with glucose. The product is then mixed with water and sprayed onto the soil (Fravel 1999, NYDEC 2001).

HOW IT WORKS:

C. minitans attacks and destroys the sclerotia (overwintering structures) of *S. sclerotiorum* and *S. minor* in the soil (Kuepper 2001). Normally these sclerotia will germinate in the spring and summer, producing spores that infect many crops, enabling white mold disease to develop. If *C. minitans* is applied either in the fall just after harvest or in early spring, many of the sclerotia will be destroyed.

There is currently only one strain of *C. minitans* (CON/M/91-08) labeled for use as a biological control. This product is sold under the tradename Contans®.

TYPES OF PESTS IT CONTROLS:

C. minitans controls only two pests; *S. sclerotiorum* and *S. minor*. These sclerotinia pathogens have a wide host range of several hundred species of

plants (including many vegetables and ornamentals). They commonly cause white mold on cole crops and beans, and are occasionally found on tomatoes and peppers. Additionally they cause leaf drop on lettuce and white mold in carrots, especially storage carrots.

FORMULATIONS AND APPLICATION GUIDELINES:

Contans® is sold as a water dispersible granular compound. Contans® is applied directly to the soil surface and it is necessary to achieve thorough and uniform coverage. Following treatment, the fungal spores must be incorporated into the top inch or two of soil before planting and then the soil not disturbed below that depth because that would bring up new sclerotia. This incorporation can be done by water or cultivation. Contans® can also be applied to plant debris after harvest in the fall.

The shelf life of dried conidia is greater than 6 months. The manufacturer states that after 18 months the activity is reduced by 25%.

Contans® is harmful if swallowed, absorbed through skin or inhaled. The label requires applicators to wear long-sleeved shirt, long pants, waterproof gloves and shoes plus socks. Additionally, all mixer/loaders and applicators must wear a dust/mist-filtering respirator.

OMRI LISTED PRODUCTS:

Coniothyrium minitans strain CON/M/91-08

Contans® WG Marketed by Encore Technologies, LLC

Manufactured by Prophyta Biologischer Pflanzenschutz GmbH

REENTRY INTERVAL (REI) AND PRE-HARVEST INTERVAL (PHI):

The EPA Workers Protection Standard requires a minimum of 4 hours before reentering a local of application.

EFFECT ON THE ENVIRONMENT:

Risk to the environment appears to be low. *C. minitans* is resistant to decomposition by light, but not resistant to high temperatures (above 104 degrees F). It is insoluble, and has been found to have low toxicity to fish and algae. In the absence of host sclerotia (a food source), its biocontrol ability is thought to persist at low levels, if at all.

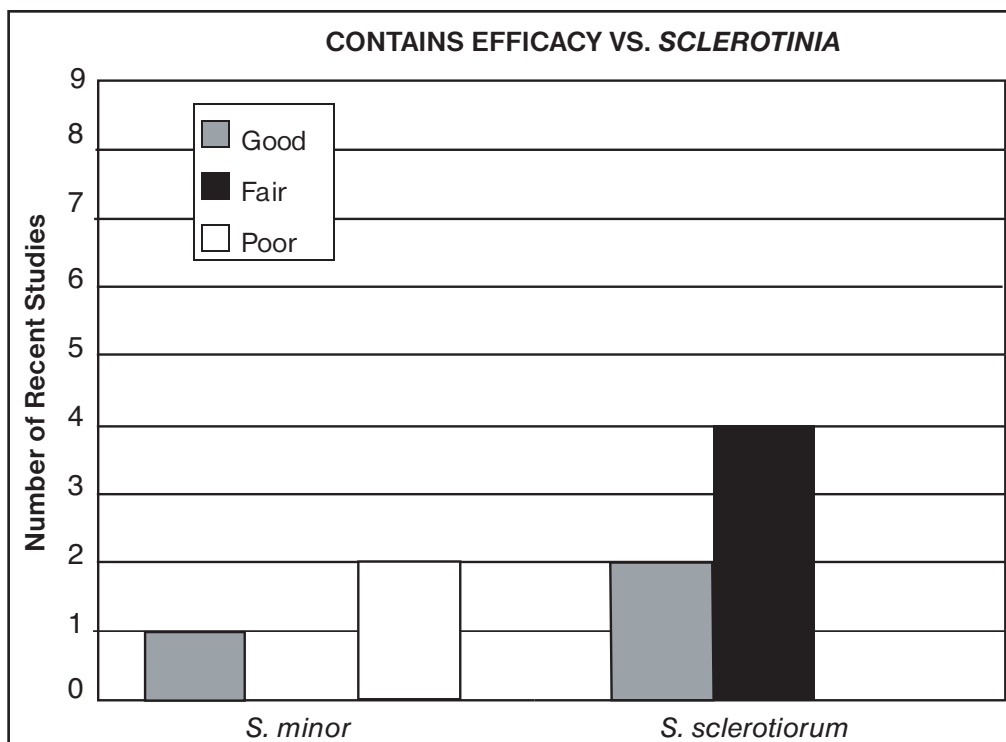
EFFECTS ON HUMAN HEALTH:

Risk to public health appears to be minimal.

Acute oral LD50 (rat)	Relatively non-toxic (>2500mg/kg)
Acute dermal LD50 (rat)	Relatively non-toxic (>2500mg/kg)
Acute intraperitoneal LD50 (rat)	Relatively non-toxic (>2000mg/kg)
Acute inhalation toxicity (rat)	Relatively non-toxic (>12.74 mg/liter air)
Eye irritation (rabbit)	None
Skin irritation (rabbit)	None

EFFICACY:

The *C. minitans* product is variable in its effectiveness, as are many biological products. It can be effective against both *S. sclerotiorum* and *S. minor*. It is not clear what factors cause the variability in field trial results.



REFERENCES

Fravel, Deborah. 1999. Commercial biocontrol products for use against soil-borne crop diseases. United States Department of Agriculture, Beltsville, MD. January 1. <http://www.barc.usda.gov/psi/bpdl/bioprod.htm#Contans>.

Kuepper, G. 2001 Organic Control of White Mold on Soybeans. ATTRA, NCAT. <http://attra.ncat.org/attra-pub/whitemold.html>

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NY DEC. 2001. M. Serafini, NY State Dept. of Environmental Conservation. <http://pmep.cce.cornell.edu/cgi-bin/FMPro.acgi>

Paulitz, T. C. and R. R. Belanger, 2001. Biological control in greenhouse systems. Annual Review of Phytopathology 39:103-133.