

Using Contans (*Coniothyrium minitans*) for White Mold Management on Organic Farms

Alex Stone, Oregon State University

March 4, 2014



Welcome to the webinar!

- The webinar will start at the top of the hour.
- If you'd like to type in a question, use the question box on your control panel and we will read the questions aloud after the c. 45 minute presentation
- The webinar will be recorded and you can find the recording and a pdf handout of the slides at <http://www.extension.org/pages/69132>





Alex Stone
Oregon State University

Using Contans for White Mold Management in Organic Farming: a Western Oregon Example

Alex Stone, Horticulture
Ken Johnson, Botany Plant Pathology
Mikio Miyazoe
Aaron Heinrich, Horticulture

OSU Oregon State University

Questions

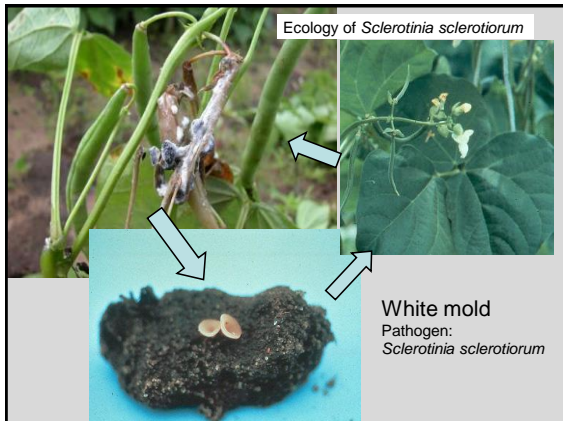
- What crops are hosts to white mold?
- What are white mold and *Sclerotinia sclerotiorum*?
- What are Contans and *Coniothyrium minitans*?
- How do *Coniothyrium* and *Sclerotinia* live in annual rotational systems?
- How does Contans suppress white mold?
- How can I best integrate Contans into an integrated white mold management system?

Poll Question 1

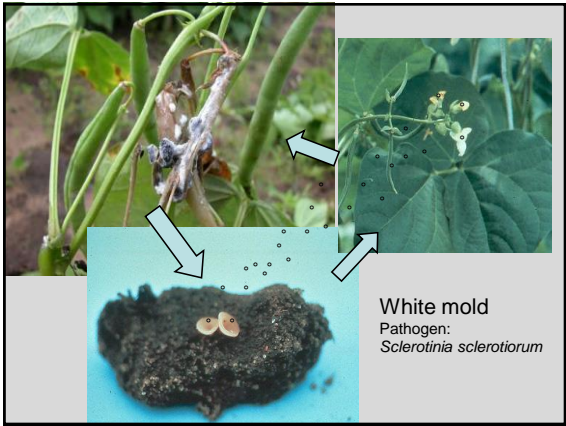
- Have you every used (or recommended) Contans for white mold control?
1. Yes
 2. No
 3. Not applicable to me

Poll Question 2

- If you have used or recommended Contans, was Contans effective in suppressing white mold?
1. Yes
 2. No
 3. Not applicable, I have never used or recommended Contans









Celery	Carrot	leaf	50,000	1.7	0.3	3.8	half hardy	low	fine
Fennel	Carrot	leaf	n/a	n/a	n/a	n/a	half hardy	low	fine
Cucumber	Cucurbit	fruit	20,000	3.1	1.1	5.2	tender	moderate	medium
Melons ¹	Cucurbit	fruit	15,000	4.2	0.8	3.3	tender	high	medium
Pumpkin, winter squash	Cucurbit	fruit	30,000	5.4	1.2	n/a	tender	high	coarse
Summer squash	Cucurbit	fruit	17,000	1.8	0.4	n/a	tender	high	medium
Sweet corn	Grass	seed	11,000	5.0	0.7	2.5	tender	high	coarse
Bean, snap	Legume	fruit	6,000	4.0	2.0	5.0	tender	moderate	medium
Pea, in pods	Legume	fruit	9,000	n/a	n/a	n/a	hardy	low	medium
Endive etc. ²	Lettuce	leaf	23,000	n/a	n/a	n/a	half hardy	low	fine/medium
Lettuce	Lettuce	leaf	24,000	2.5	1.2	5.0	half hardy	moderate	medium ¹
Salad, sczonera	Lettuce	root	n/a	n/a	n/a	n/a	hardy	low	fine
Garlic	Lily	bulb	16,500	n/a	n/a	n/a	very hardy	low	medium
Leek	Lily	bulb	16,000	3.6	0.5	n/a	hardy	low	fine
Onion ¹	Lily	bulb	25,000	2.7	0.5	2.7	hardy	low	fine
Scallion	Lily	bulb	18,000	n/a	n/a	n/a	half hardy	low	fine
Okra	Mallow	fruit	15,000	n/a	n/a	n/a	tender	low	fine
Sweet potato	Morning glory	root	15,000	n/a	n/a	n/a	tender	moderate	medium
Broccoli, cauliflower	Mustard	flower bud	10,000	2.8	0.8	4.0	hardy	moderate	medium ¹
Brussels sprouts	Mustard	bud	10,000	9.4	1.2	7.8	hardy	moderate	medium ¹
Cabbage	Mustard	bud	35,000	3.1	0.8	3.3	hardy	moderate	medium ¹
Mustard greens ¹	Mustard	leaf	12,000	6.2	1.5	5.5	hardy	low	fine
Radish	Mustard	root	6,000	n/a	n/a	n/a	half hardy	low	medium ¹
Turnip, rutabaga, daikon	Mustard	root	3,650	n/a	n/a	n/a	hardy	moderate	fine
Eggplant	Night								
Pepper	Nights								

from Mohler and Johnson, Crop Rotation on Organic Farms



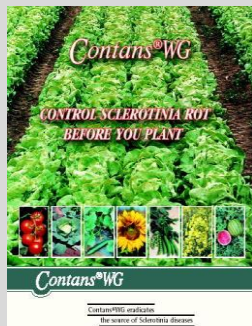


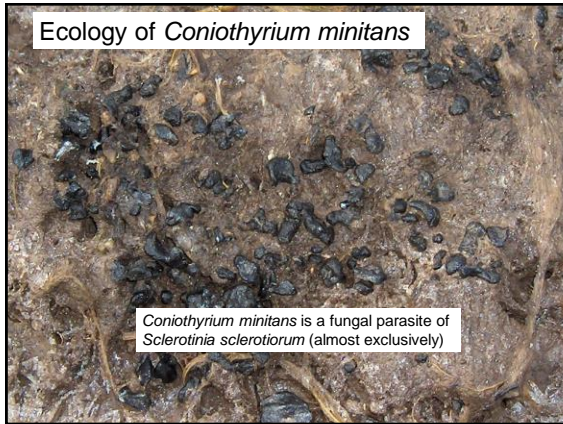
What is Contans?

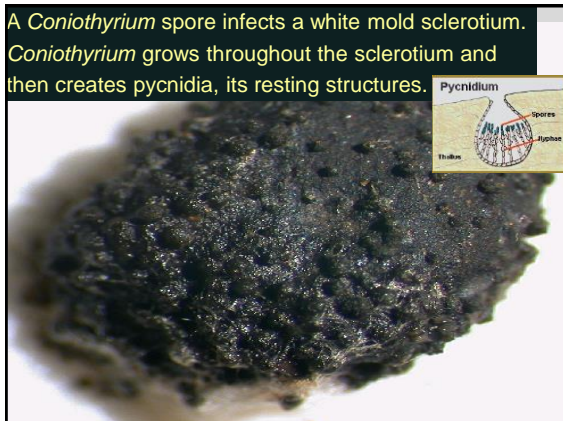
Coniothyrium minitans is a naturally occurring fungus that specifically destroys *Sclerotinia*.

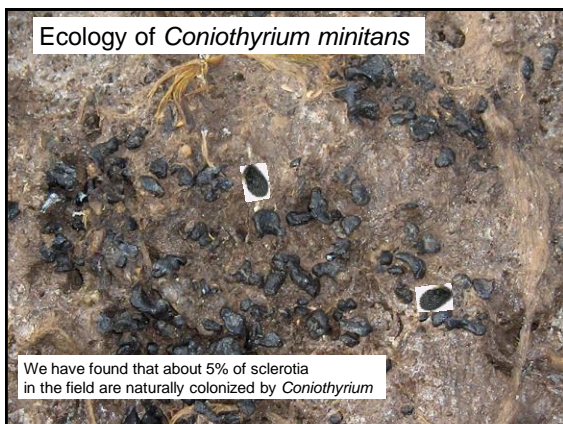
Contans is the water dispersible granular formula of this fungus.

Contans is allowed for use on organic farms.



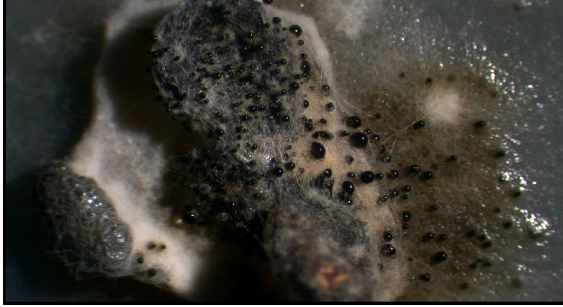




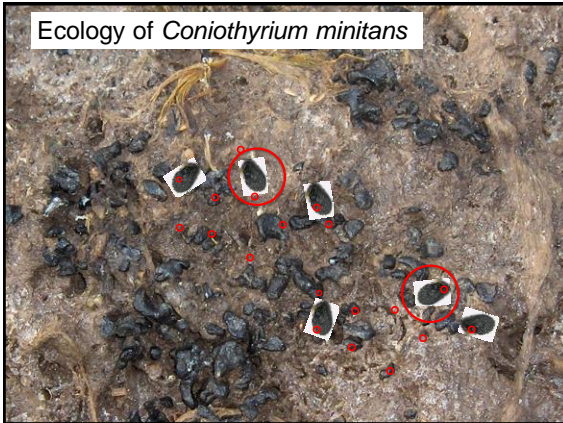


The pycnidia ooze spores.

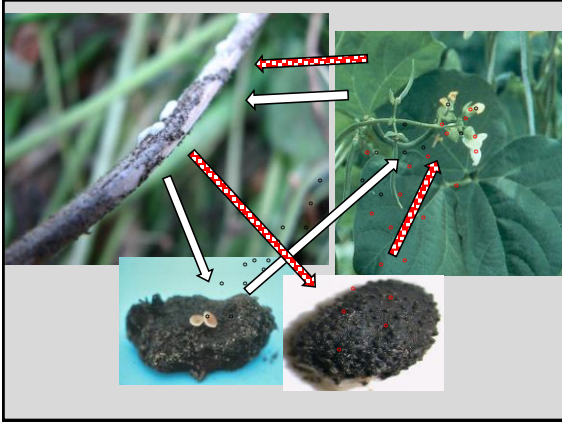
The spores splash when it rains and land on other sclerotia. Coniothyrium grows throughout those sclerotia and develop pycnidia, which then ooze and splash.....



Ecology of *Coniothyrium minitans*







What is Contans?

Coniothyrium minitans is a naturally occurring fungus that specifically destroys *Sclerotinia*.

Contans is the water dispersible granular formula of this fungus.

Contans is allowed for use on organic farms.



Contans Application Directions

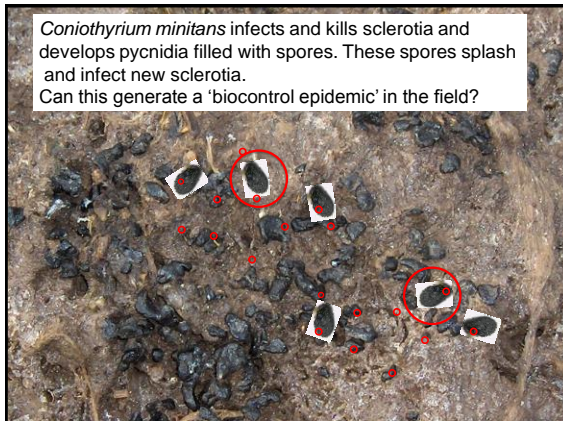
- Apply Contans WG at a rate of 1-4 pounds per acre to the soil prior to or at planting or at time of transplant.
- If incorporated at greater than 2 inch depth, increase application rate to 3-6 pounds/A.
- Contans may also be applied to plant debris after harvest.
- Contans costs \$20-25 per pound

<http://www.sipcamadvan.com/contans-wg>

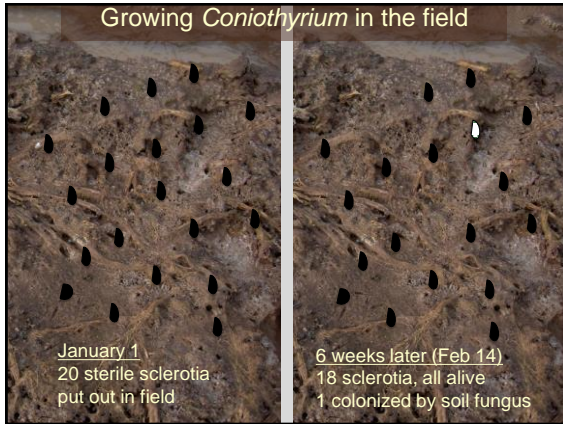
Contans Application Directions

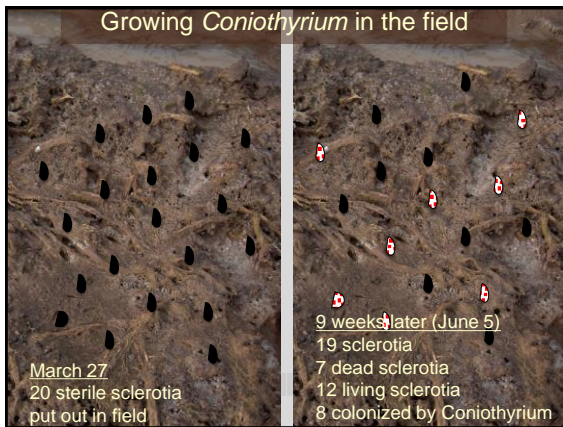
- Apply Contans WG at a rate of 1-4 pounds per acre to the soil prior to or at planting or at time of transplant.
- If incorporated at greater than 2 inch depth, increase application rate to 3-6 pounds/A.
- **Contans may also be applied to plant debris after harvest.**
- Contans costs \$20-25 per pound

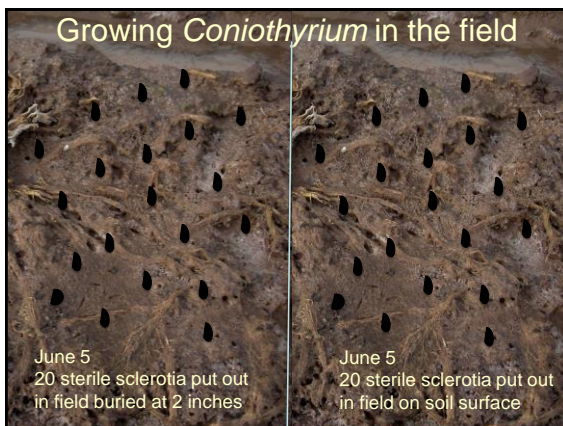
<http://www.sipcamadvan.com/contans-wg>

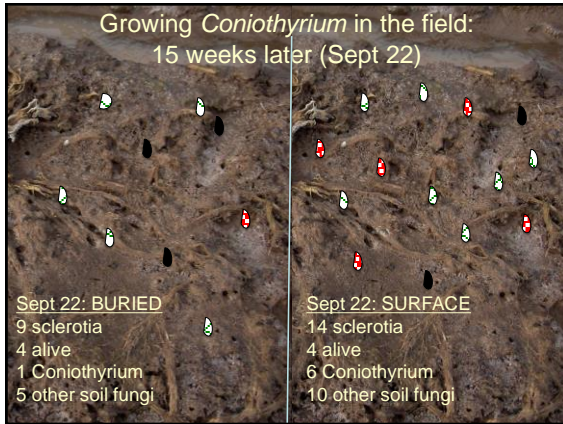








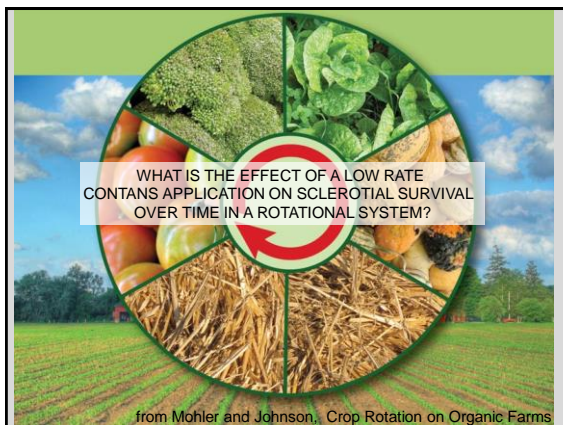


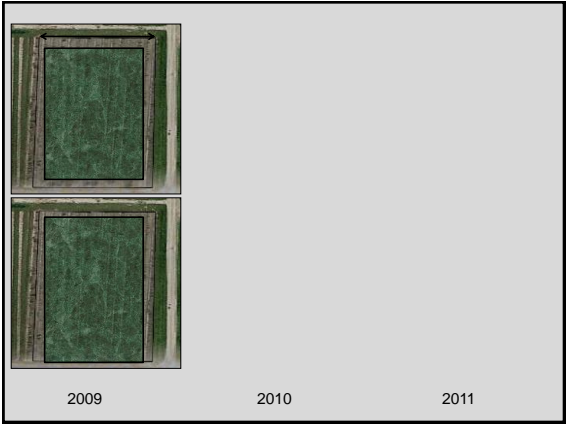


Most common native soil fungi cultured from
sclerotia (and shown to kill sclerotia)

- *Coniothyrium minitans*
- *Trichoderma hamatum*
- *Fusarium* spp.
- *Paecilomyces lilacinus*

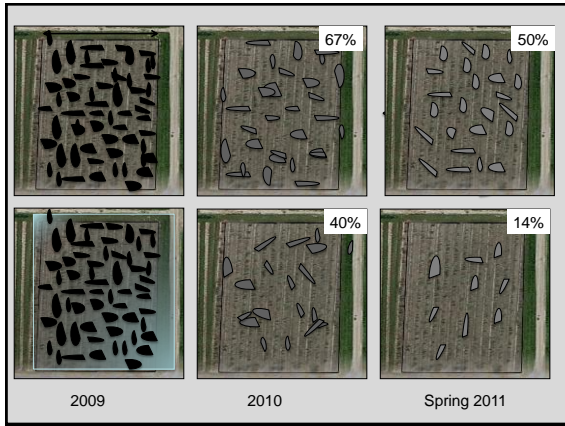
More active at warmer soil temperatures and when sclerotia were buried
Contributed significantly to sclerotial death
Some fields had more of these than others



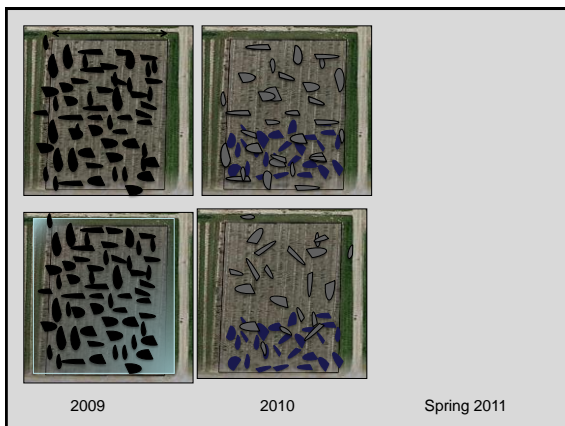


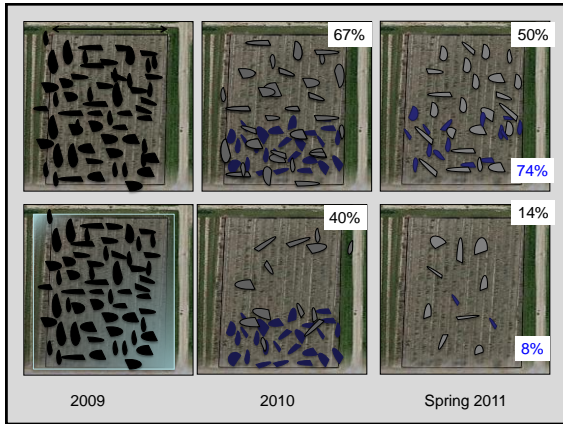












Ken Johnson Lab
OSU Botany Plant Pathology

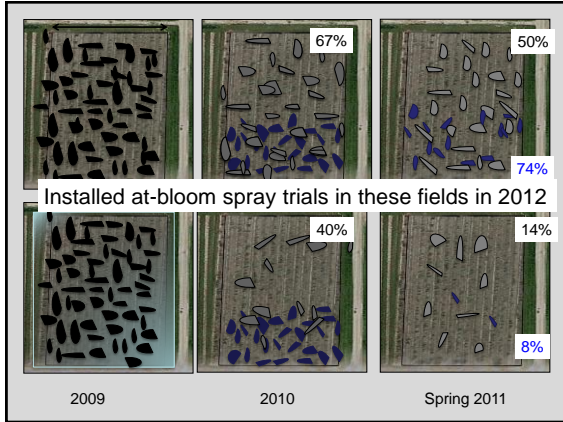
Applied 1 lb/A Contans to snap beans at bloom

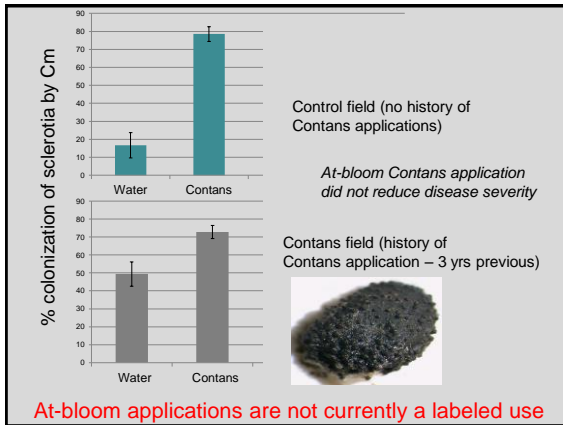
- 80-95 Cm spores per blossom
- 50 percent reduction in white mold incidence (low disease pressure)

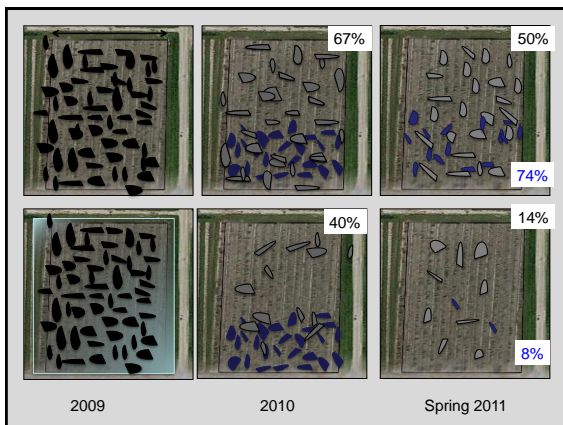
At-bloom applications are not currently a labeled use

Ken Johnson Lab
OSU Botany Plant Pathology

25 percent of pods and 63 percent of stems were colonized by *Coniothyrium minitans*







Contans Summary

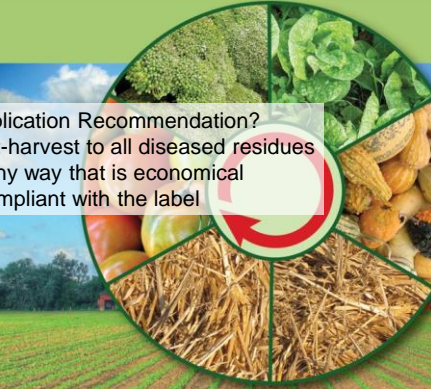
Contans applications are effective in destroying Ss sclerotia over time.

Contans applications to sclerotia left on the soil surface 'grew up' *Coniothyrium minitans* (biocontrol epidemic) and provided a long term reservoir of *Coniothyrium minitans* in the field.

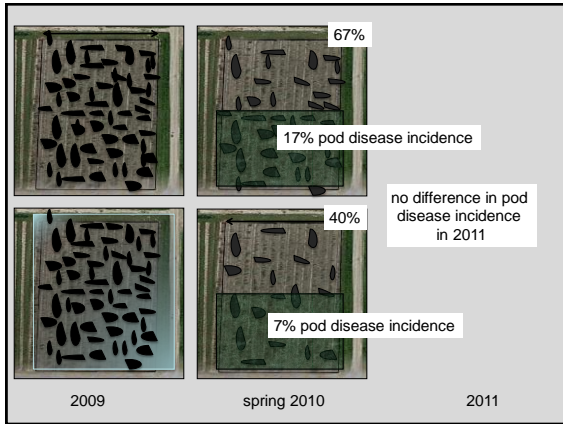
- *Coniothyrium minitans* destroys sclerotia more rapidly when introduced earlier in the process of white mold and sclerotia development on the plant.

Contans Application Recommendation?

- Apply post-harvest to all diseased residues
- Apply in any way that is economical and is compliant with the label



from Mohler and Johnson, Crop Rotation on Organic Farms



Use Contans as one component of a systems white mold management strategy

- Integrated management during the production season
 - Plant genetic resistance and architecture
 - Irrigation management (↑ canopy drying)
 - Plant spacing (↑ drying)
 - Row orientation w/prevailing winds (↑ drying)
 - Nitrogen management (manage plant/canopy size, ↑ drying, reduce tissue susceptibility)
 - Cultivation (destroys apothecia)

Systems White Mold Management:

- Integrated management throughout rotation cycle
 - Rotation with non-host crops and cover crops
 - 4 yrs out of susceptible crops, or less in combination with Contans and other strategies
 - Sanitation – flail diseased plants ASAP to stop disease progress
 - Tillage – leave sclerotia on surface after Contans application, but bury them otherwise
 - Irrigation of fields infested with sclerotia – it speeds sclerotial death
 - Cover cropping? Don't know. *Brassicas and legumes are hosts!*

Contans

Contans is distributed by Advan LLC
 300 Colonial Center Pkwy
 Roswell, GA 30076
www.advanllc.com
 800-250-5024

Available as 25 and 50 pound units, \$20 - 25 per pound. Can be frozen.

Poll Question 3

- Do you intend to use Contans for white mold control in the future?
1. Yes
 2. No
 3. Not sure
 4. Not applicable to me

Thanks to



Mikio Miyazoe
OSU Horticulture



Ken Johnson, OSU
Botany Plant Pathology



Aaron Heinrich
OSU Horticulture

- This project has been supported by grants from:
- Oregon Processed Vegetable Commission
 - Western Region IPM
 - Western SARE



Questions?



Alex Stone Oregon State Horticulture stonea@hort.oregonstate.edu



- Find all upcoming and archived webinars at <http://www.extension.org/pages/25242>.
- Find the recording and pdf handout for this webinar at <http://www.extension.org/pages/69132>
- Have an organic farming question? Use the eXtension Ask an Expert service at <https://ask.extension.org/groups/1668/ask>
- We need your feedback! Please respond to an email survey about this webinar which you'll receive later.
- Thank you for coming!