CONTANS

Jeff Pewitt
Northern Plains Account Manager
Baxter, MN
(573) 881-3053
jpewitt@sipcamagro.com

What Every Grower Needs To Know About White Mold

What Is White Mold?

- One of the most yield-limiting diseases in soybeans, dry beans, carrots, lettuce and other crops
- Caused by the fungus Sclerotinia sclerotiorum
- Not visible until plants are severely infected
- Also known as “stem rot”
- Can result in yield loss of 40-60%
- If untreated, can remain in the soil up to 10 years
- Can return year after year

Photo: msue.anr.msu.edu, Michigan State University Extension

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A look at White mold symptoms

Often show up as patches in field. Combining and tillage will spread sclerotia. Spot treating infected areas can be effective

Sclerotia bodies formed and ready to drop back into field

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Infection Factors

- Sclerotia: small, dark, hard bodies in the soil, in which Sclerotinia can survive season-to-season
- Cool, moist and shaded soil
- Dense canopy during flowering typically associated with:
  - Early planting
  - Narrow row width
  - High plant populations
  - High soil fertility
  - Crop/variety susceptibility

Top Photo: msue.anr.msu.edu, Michigan State University Extension

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Cycle of Disease and Devastation

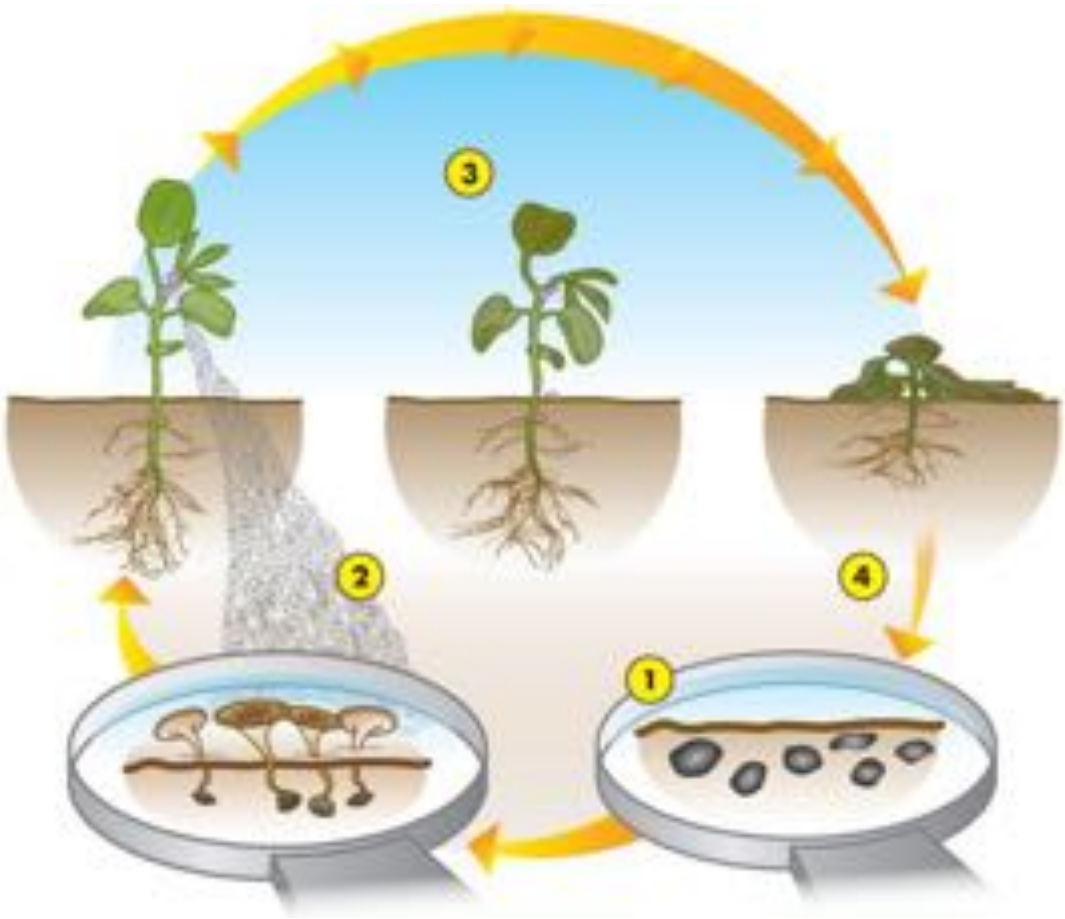
The disease source, sclerotia, can survive in soil for up to 10 years.

Tiny mushrooms, called apothecia, form from sclerotia when environmental conditions are favorable.

Infection sites initially appear as watery lesions that spread rapidly. White moldy growth forms on stems, nodes, pods and petioles.

Apothecia release millions of spores, which settle on non-living or senescent plant parts.

The plant begins to wilt and eventually dies. New sclerotia form and fall back to the soil, building inoculum.



Detecting White Mold Disease

- Very difficult to detect before yields are negatively impacted
- Disease develops well below the canopy and is not readily visible until plants are severely infected
- **Yields are lost before damage is detected**

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White Mold and Crop Loss

- Yield loss by reducing seed numbers and weight; seed quality is also affected
- Crop losses from white mold in edible beans **average 30% with individual field losses as high as 92%** — even when disease pressure appears minimal*
- In general, in beans, for every 10% increase in the incidence of white mold observed, the expected yield loss is 8% to 10%

*Crop Science, Sept-Oct, 2013

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The bottom-line effect of white mold on soybeans

Yield
50 Bu/A

White mold incidence
20%

Yield Loss

8-10 Bu/A

at
$9.25/bu

Profit Loss

$74-92

Per Acre

The bottom-line effect of white mold on dry beans

Yield
2,000 – 2,500 Lbs/A

White mold incidence
20%

Yield Loss

400-500 Lbs/A

at $28/cwt

Profit Loss

$112-140

Per Acre

Traditional Methods Of Managing White Mold

Note: White mold cannot be eliminated with these methods, but the effects can be minimized, particularly when using multiple management strategies.

Management Practice	Effectiveness	Reason
Recordkeeping	Low	Tracking disease levels by season, crop and field provides opportunity to assess future disease potential based on the volume of sclerotia in the soil
Crop Rotation	Low to Medium	Sclerotia can remain viable in the soil for as long as 10 years; a minimum of two to three years of non-host crops is recommended, but often impractical
Tillage	Inconclusive	Deep tillage can remove sclerotia from upper soil layer which can temporarily reduce the incidence of the disease; however, subsequent tillage can re-introduce the inoculum in top two inches of the soil profile; some studies indicate lower levels of infection with no-till practices
Canopy Management	Low	Later planting, wider rows, lower plant populations and soil fertility can reduce the rate of white mold infection; however, these practices typically reduce yields
Weed Control	Medium to High	Many common weed species are hosts to white mold infection; reducing the number of hosts through weed control can reduce the incidence of the disease

Management Practice	Effectiveness	Reason
Irrigation Management	Medium to High	Lower soil moisture during flowering can significantly reduce infection potential; in years with rainfall and cool temperatures prior to and during flowering, it is exceptionally difficult to control spore production and, ultimately, infection
Seed selection	Medium	There are no edible bean or soybean varieties that are completely resistant to white mold; if sclerotia are in the soil and environmental conditions are favorable, the disease will develop; however, some varieties are less susceptible than others
Foliar fungicides and herbicides	Low to Medium	While several foliar applied products show efficacy against white mold, their effectiveness is limited based on the location of the disease on the plant; white mold infects stems, pods and petioles *below the leaf canopy*. *Current fungicides cannot translocate from the leaves to lower parts of the plant!* Therefore, it is critical to apply products deep in the canopy. R1 applications are typically more effective than R3 applications; however, symptoms of the disease are often not readily visible in the field until R3 or later. Complete control of white mold using foliar fungicides or herbicides is not possible; they should be considered as part of a broader white mold management strategy.

Traditional Treatments: Takeaways

- Traditional treatments provide limited success
- “Waiting” to treat is problematic, because when you see the disease, yield is already lost
- After traditional treatments, disease continues to live in the soil
- Traditional methods do not reduce Sclerotinia in the soil

Contans® WG fungicide is the only product that destroys white mold in the soil, before it can damage crops

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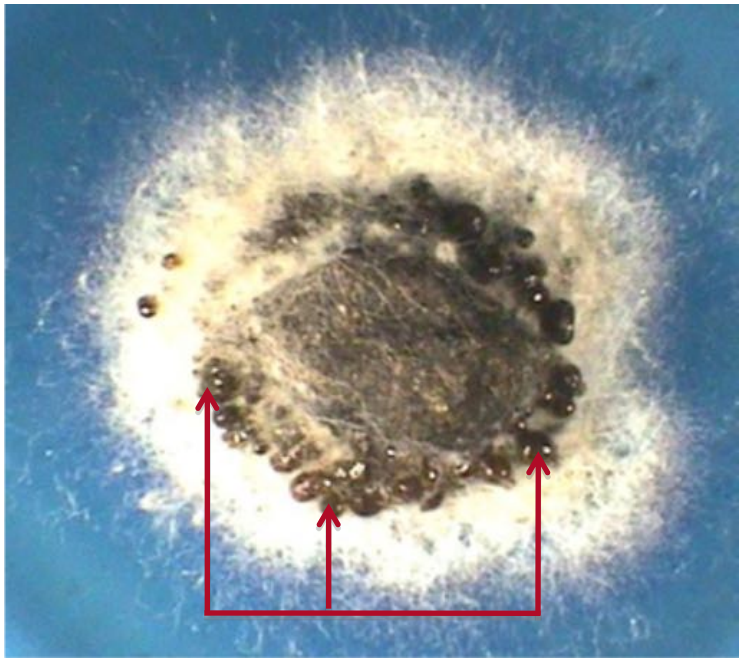
Take Control Of White Mold

What is Contans® WG?



C. minitans forming pycnidia (red arrows) and propagating on a sclerotium

- Attacks and destroys sclerotia in the soil
- Soil-applied
- **Breaks the cycle of white mold**
- **Reduces sclerotia in the soil by as much as 80-85% *each year it's used***

Source: A.v. Tiedemann, K. Hedke & R. Mogling Dept. of Phytomedicine, Faculty of Agriculture, University of Rostock, Germany

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How To Apply Contans® WG

- Soil-applied in the spring or in the fall (at or before planting)
- Applied at a rate of 1- to 2-pounds per acre
- Post harvest treatment
- Prior crop treatment. Ex corn this year followed by soybean next year. Time is your friend
- Can be applied with pre and ppi chemicals. No 28%

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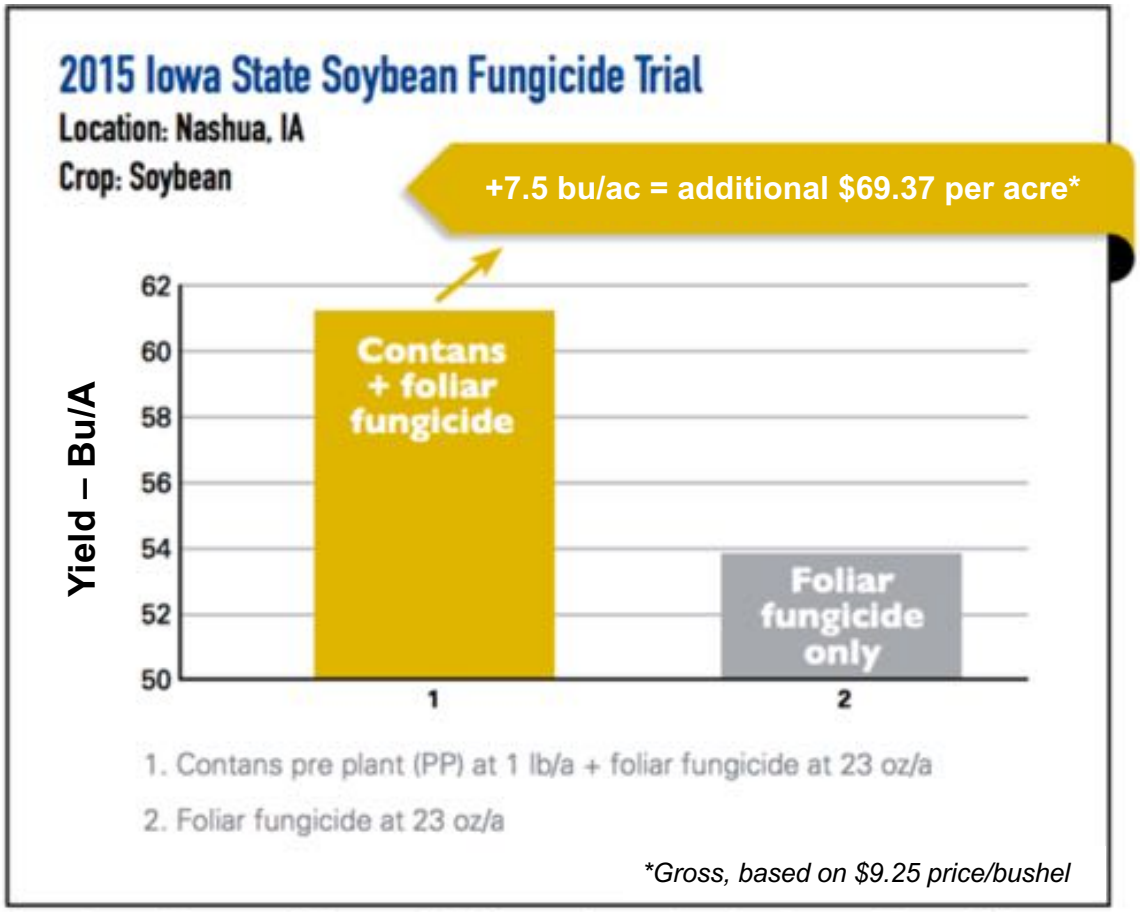
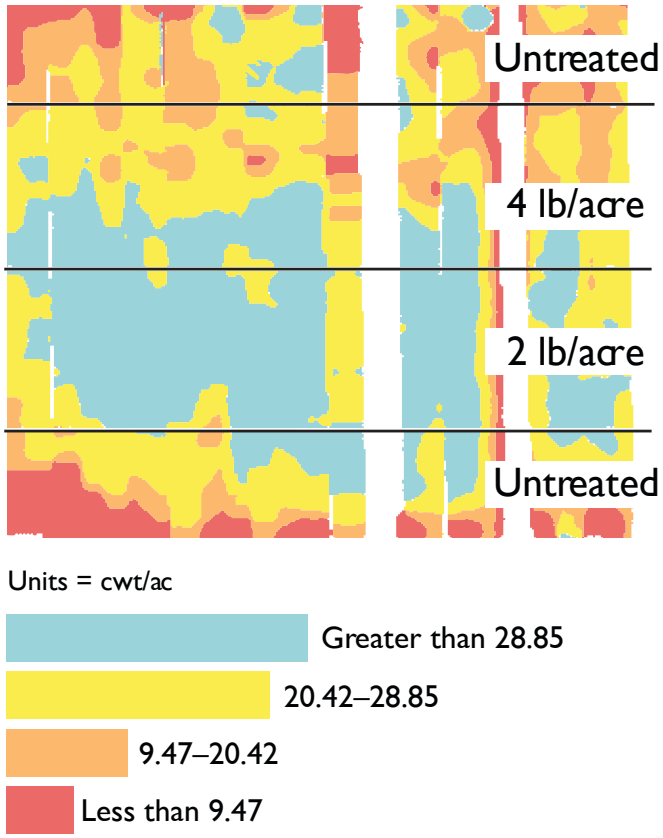
Proven Results, Year After Year

2015 Iowa State Trial: Contans WG With Traditional Foliar Fungicide



An early application of Contans WG fungicide combined with a traditional foliar fungicides resulted in a 7.5 bushel yield increase and an additional $69.37 per acre.

2011 North Dakota Grower: 8X ROI



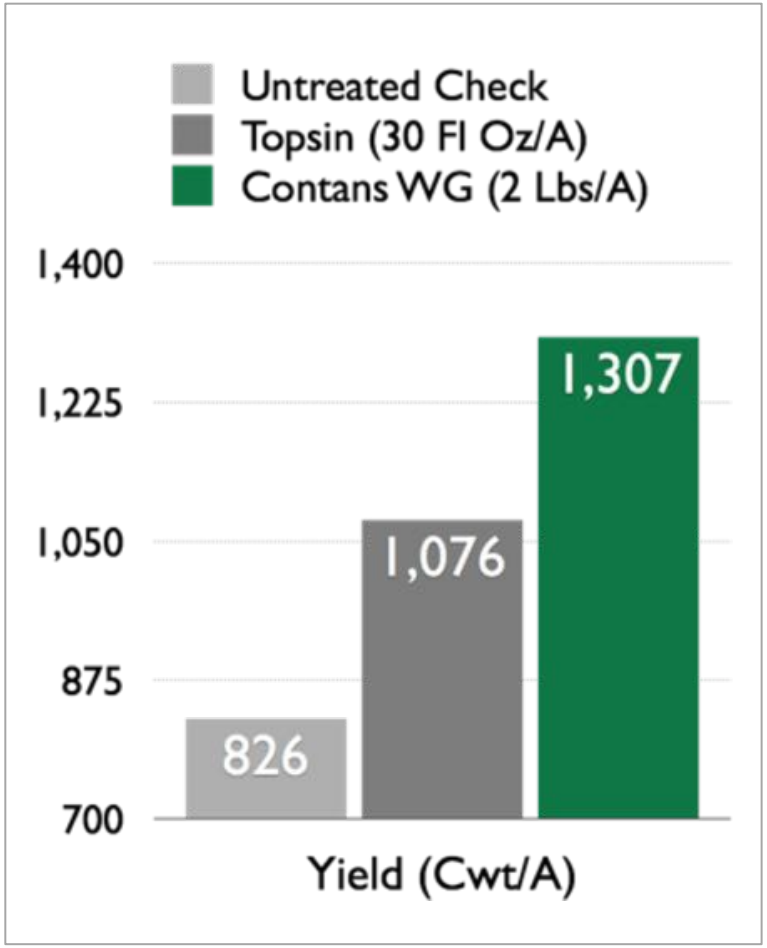
Contans Performance Over Untreated in Dry Beans

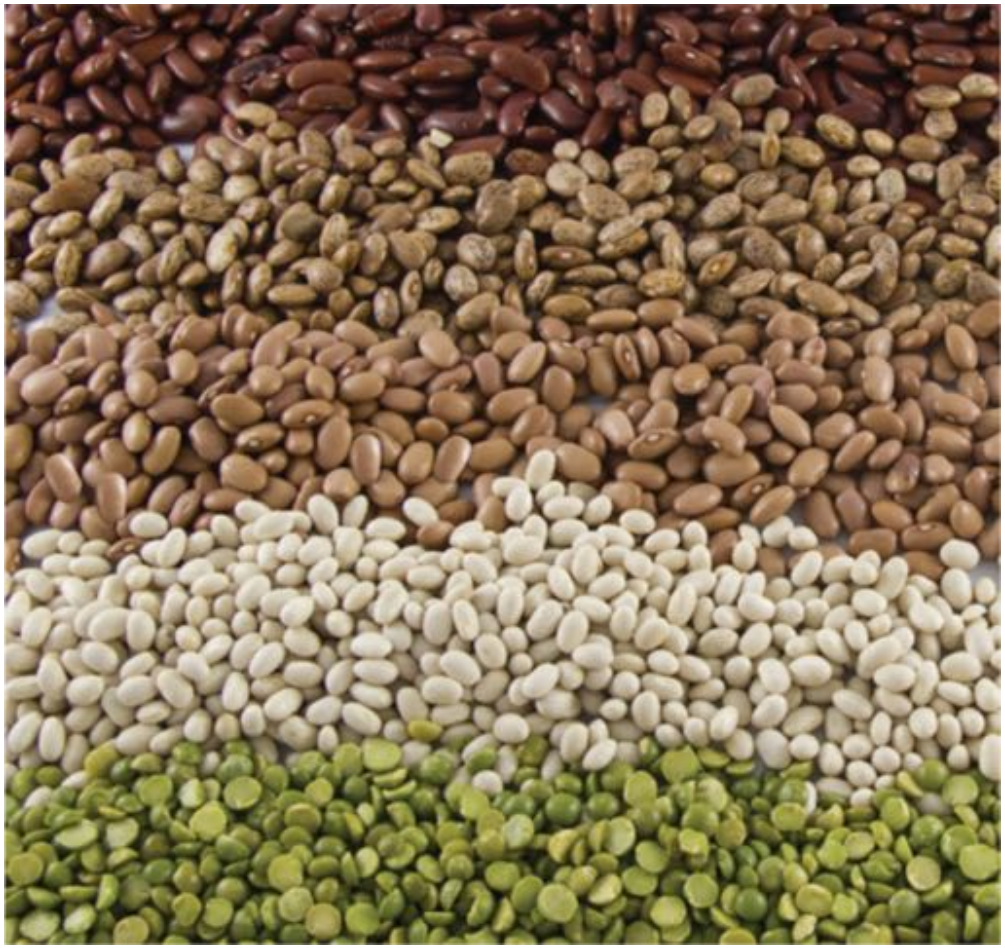
+450 - 550
lbs/A

+52%
Lbs/A

Dry Bean Variety: Black Turtle.

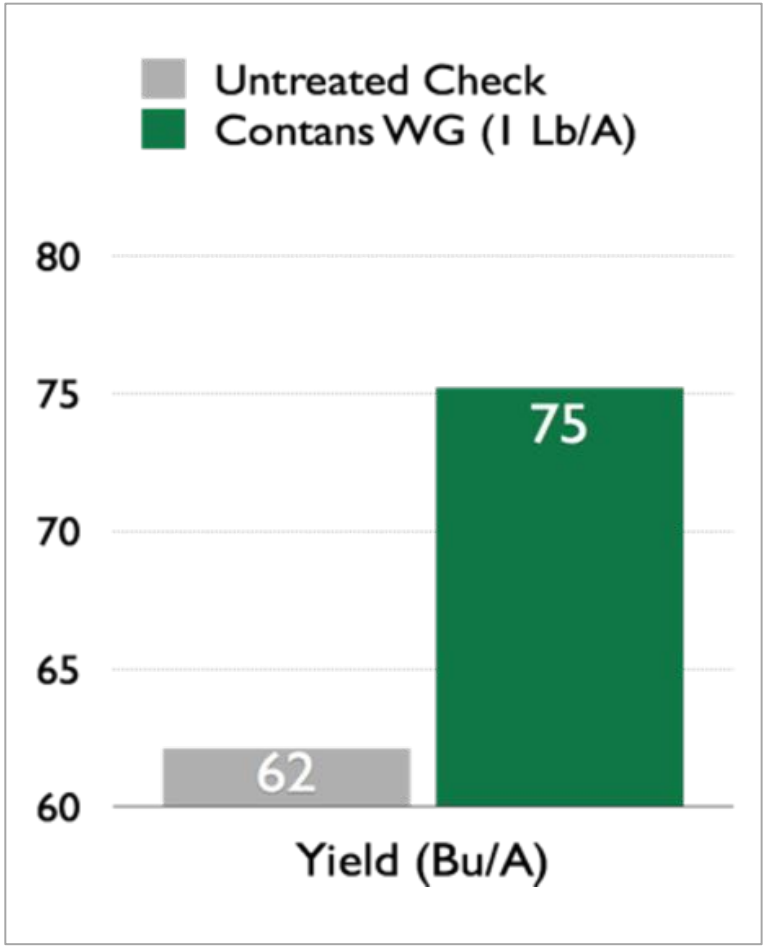
2013 Michigan State Dry Bean Trial





Dry Bean Variety in this trial: Navy Bean.

2013 Michigan State Soybean Trial



Contans Performance Over Untreated

+13
Bu/A

+21%
Bu/A

Return On Investment Assumption: soybean price of $9.25/Bu

2015 Alan Peterson, Santiago, Minnesota

2015 Trial Minnesota

Crop: Dark red kidney beans
Rate: 2 lbs spring applied (5/29)
Treated area: 3060/lbs acre
Untreated area: 2700/lbs acre

Yield increase of 360/lbs acre
Contans Cost: Approx $42/ac
Application cost: Approx $8/ac
Contracted price $.30=$108
Less Contans+app=
$58 net profit beans

Contans Performance Over Untreated in Dark Red Kidney Beans

+360
lbs/A

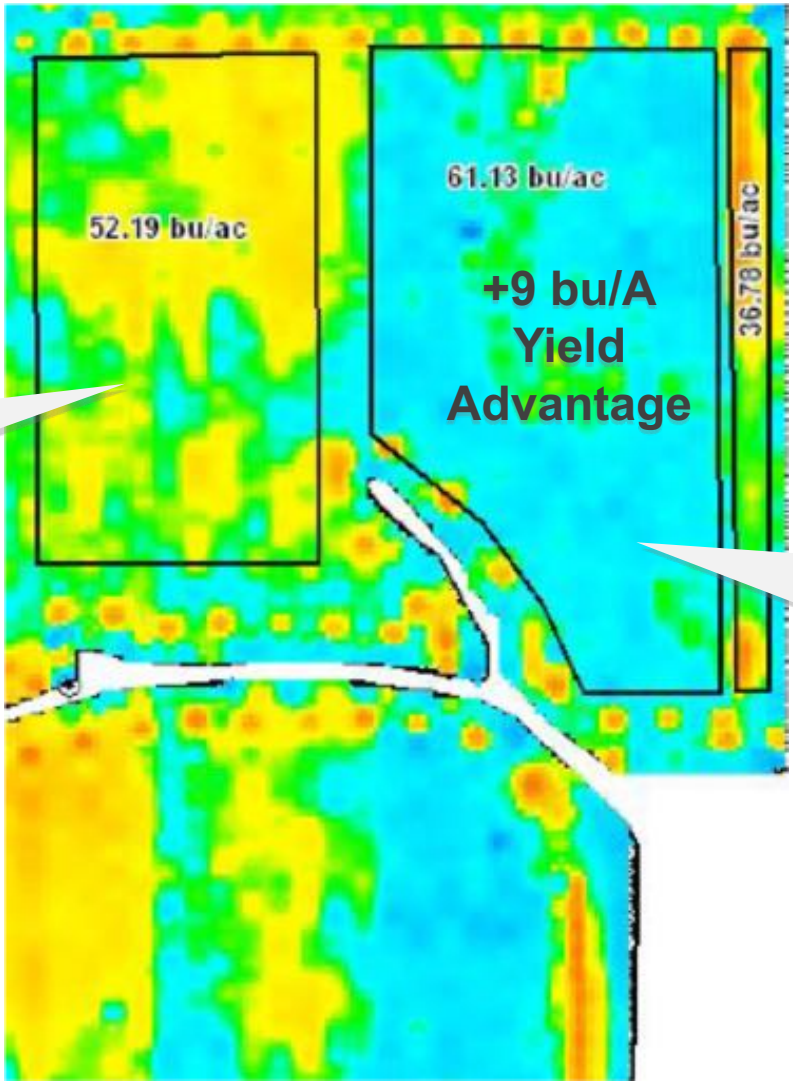
+12%
Increased Yield

ROI
2.2X

ROI Assumption: dark red kidney bean price of $12/Bu

* Field infestation levels light to moderate.

Contans® WG Application

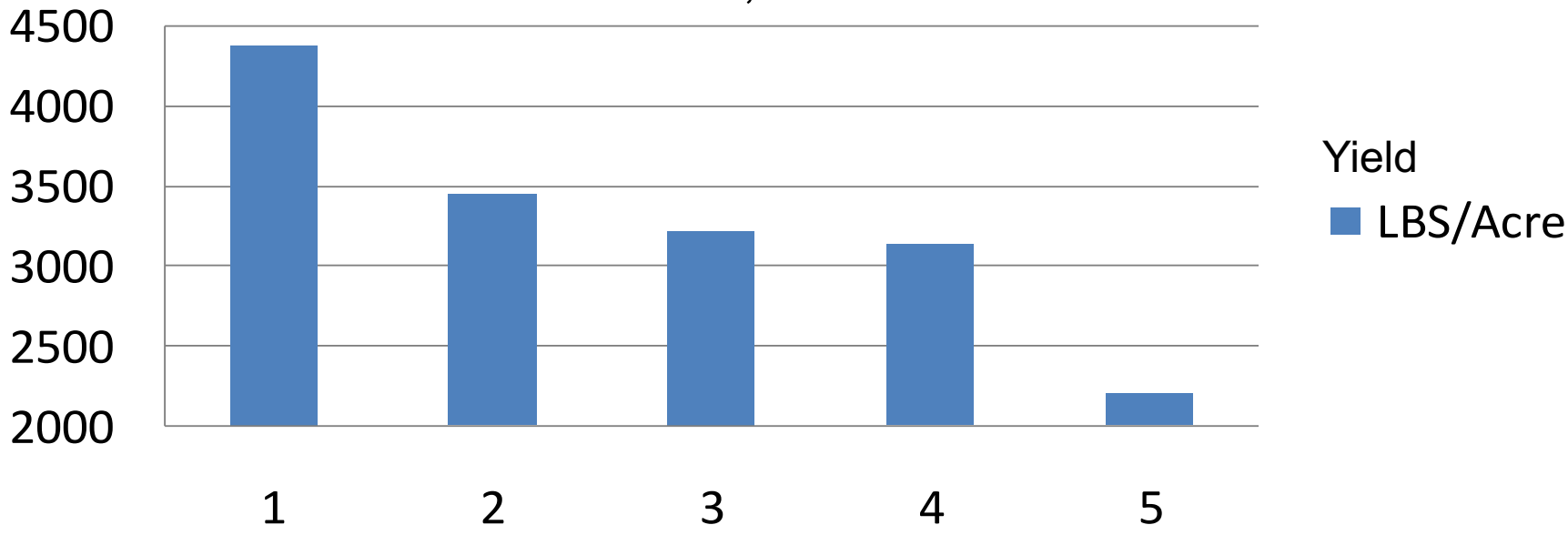


Untreated
52 bu/A

Treated with
Contans® WG
61 bu/A

Contans® WG, 1 lb/A, Spring

2016-3-MI: MSU Dry Bean Fungicides Trial
White Mold – Yield
DeWitt, MI



1. **Contans 2 lbs/A applied pre-plant fb Andiamo fungicide 5 oz/A**
2. **Proline 5 oz/A**
3. **Headline 6 oz/A**
4. **Andiamo 5 oz/A**
5. **Untreated Check**

White Mold - Pressure Heavy (86.6%); Dry Bean Variety – “Black Bean”

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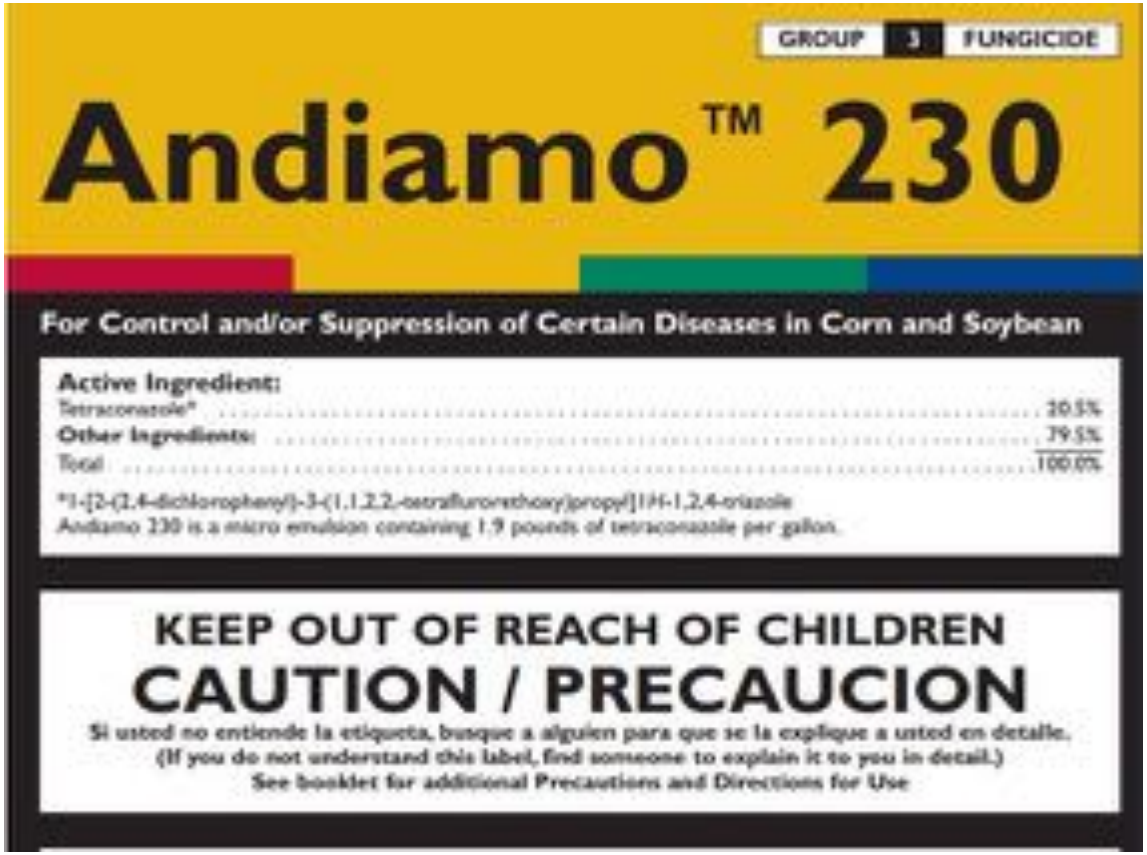
Andiamo® 230 is a valuable companion to Contans® WG.

Andiamo 230 provides the foliar protection needed to battle white mold while Contans WG reduces the sclerotia in the soil.



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Contans® WG – Your Takeaways

- Destroys the sclerotia fungus that causes white mold
- Reduces sclerotia in the soil up to 80-85% each year it is used
- Breaks the disease cycle
- Applied pre-plant, at planting, after cultivation, or post-harvest
- Fits both conventional and organic production — OMRI Listed®
- Increases yield and improves ROI

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Introducing the 2018 Break the Mold Program!

- Removes the risk associated with managing a white-mold infested field
- Open to soybean growers
- Purchase and apply Contans® WG, along with a foliar application of Andiamo® 230 fungicide (tetraconazole)
- Submit application with internet sign up and follow up yield data in fall
- If the yield difference between treated and untreated acres of each enrolled field does not cover the per acre product cost, Sipcam Agro USA will return the dollar value difference to the grower Max $40.00/acre (about 4 bushels)

BREAK THE MOLD

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Introducing the 2018 Yield Contest!

- Open to edible bean and soybean growers
- Purchase and apply Contans® WG
- Submit application and yield data
- One edible bean winner, and one soybean winner
- Winners choose one of two vacation packages

Guanacaste, Costa Rica

Whistler, BC, Canada

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Thanks for your time and support!

Questions?

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