

Management Options for Soybean Fields Previously Infected with White Mold

Several soybean fields affected by white mold (*Sclerotinia stem rot*) in 2009 are likely to be planted to soybeans in 2011. White mold, which needs moist conditions and below-average temperatures, is not generally an annual threat across much of the Midwest. However, with high sclerotia pressure in fields that were infected in 2009, it is important to remember management practices that can be implemented to help reduce the risk of white mold.

White Mold Symptoms and Damage

As seen in 2009, white mold can cause significant yield loss in soybeans. The pathogen infects the plant and causes lesions that girdle and damage the stem, which inhibits moisture and nutrient uptake and movement in the plant (Figure 1). As the disease progresses, dead plants become noticeable in the field (Figure 2). Under extreme conditions, the presence of sclerotia (hard, overwintering, fruiting bodies of the pathogen that resemble rat feces) can be abundant in the grain and potentially cause a discount at the elevator (Figure 2).

The Potential for White Mold in 2011

Disease development is dependent upon the three components of the disease triangle (susceptible host, pathogen, and favorable environment) being present at the same time (Figure 3). The extended cool, damp environment that favors white mold is not as common as the warm, moist environment that favors other common pathogens. Because little can be done to manage cool, damp environmental conditions, most management options are focused around manipulating the other two factors in the disease triangle: the host and pathogen.



Figure 1. White mold can girdle and damage the soybean stem, inhibiting moisture and nutrient uptake and movement in the plant, which can result in loss of yield potential.

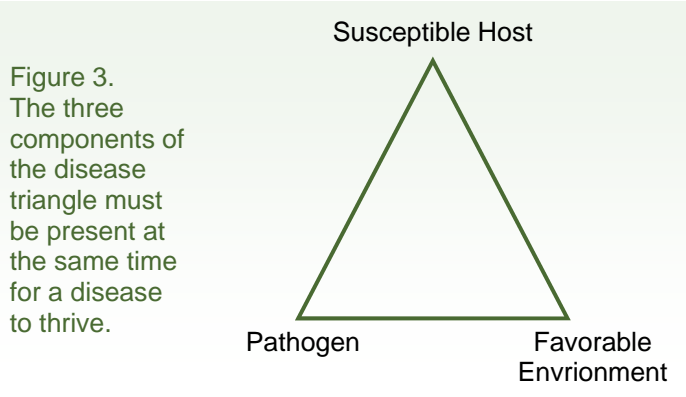
Management Options for White Mold Prior to Planting

Crop Rotation. Short crop rotations, such as a soybean-corn rotation, can eventually lead to a buildup of sclerotia. Most sclerotia die over a three- to four-year period between soybean crops¹. Thus, a sufficiently long rotation with a non-host crop such as corn or wheat can be effective in minimizing pathogen buildup over time. Avoid growing other host crops such as alfalfa, canola, and sunflower in rotation with soybean^{2,3}.

Tillage. Sclerotia within the top two inches of soil germinate
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Figure 2. As white mold progresses, dead plants can be seen scattered in the field (left). The elongated black debris in the soybean grain is sclerotia and under extreme conditions can result in a discount at the grain elevator.



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and produce spores to infect plants. Sclerotia can survive deep in the soil for up to seven years. Deep tillage to bury infected residue can prevent germination of sclerotia, but additional tillage brings sclerotia to the surface where they can germinate¹. In no-till fields, sclerotia remain on the surface and a large number germinate during the corn or other rotational crop years. This reduces the amount of viable sclerotia left to germinate when soybeans are again planted. Tillage may spread sclerotia within the field. Therefore, in no-till fields sclerotia may remain confined to hot spots.

If white mold occurs for the first time in fields, tillage can be used to bury the sclerotia. Tillage in subsequent years should be avoided. Reduced tillage and no-till are preferable for fields with a history of white mold infestation¹.

Variety Placement. Variety selection is important in determining the efficacy of other control measures. No soybean varieties are completely resistant to white mold, but tolerant varieties can be effective in managing white mold and maintaining yield potential (Figure 4). Target partially resistant varieties for fields with a history of significant white mold. Avoid planting highly susceptible varieties in fields with a history of white mold, low lying areas, or with natural barriers to wind movement such as tree lines. Susceptible or moderately susceptible varieties can be planted in fields with little history of the disease.

Canopy Management: Planting Date. Research at the University of Wisconsin demonstrates that in fields where white mold has been severe, late planting can provide some avoidance⁴. This may be due to a delay in canopy closure.

Canopy Management: Row spacing. In low to moderate disease pressure environments, white mold increases as row spacing narrows. Under high disease pressure, white mold severity is similar between wide and narrow rows. Increased row

Figure 4.
Variety selection is a critical tool to help manage white mold. Note the increased white mold symptoms in the variety on the right.



Options to Help Manage White Mold Prior to Planting:

- 1) Variety Selection
- 2) Extended Crop Rotation
- 3) Reduced Tillage or No-till
- 4) Manage the Canopy
 - Planting Date
 - Row Width
 - Planting Population

spacing generally results in a decrease in the amount of white mold, but does not necessarily correspond with an increase in yield. The University of Wisconsin recommends planting 15-inch rows to help maximize yield potential while minimizing the effect of white mold⁴.

Canopy Management: Plant population. Avoid high populations of 200,000 plants per acre in the presence of white mold. Instead populations of 125,000 to 150,000 plants per acre are recommended.

Chemical Options In-Crop

Especially in fields where white mold has been an issue previously, it is critical to use management options such as variety selection, crop rotation, and reduced tillage. However, options exist for combating white mold in-crop. Outbreaks may be reduced by applying fungicide during flowering. This requires accurate application timing and prediction of disease onset.

There is some evidence that herbicides that shorten plant height are associated with a lower incidence of white mold, especially when used in an environment that favors white mold development. The application of 6 fl oz/A of Cobra® herbicide just prior to R1 has been shown to suppress white mold in moderately susceptible soybean varieties⁵.

Always read and follow pesticide label directions.

Sources:

¹ A.E. Dorrance & D. Mills. Sclerotinia Stem Rot (White Mold) of Soybean. The Ohio State University Extension Fact Sheet AC-45-08.

² A. Westphal et al. Diseases of Soybean: White Mold. Purdue University Extension. BP-43-W.

³ White mold. Plant Health Initiative. <http://www.planthealth.info>. 3/23/11.

⁴ C.R. Grau and J.E. Kurl. White Mold in Soybean. University of Wisconsin-Madison. A3695.

⁵ Personal communication. Valent Corporation.

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