

# AGRONOMIC ALERT



## White Mold Potential in Soybean Fields

Soybean fields affected by white mold (*Sclerotinia stem rot*, *Sclerotinia sclerotiorum*) in 2009 have been planted to soybeans in 2011. Understanding the conditions favorable for development of the disease, in conjunction with local weather, can help determine the potential for disease.

### Conditions that Favor White Mold

To understand if white mold could be a threat this year, it is important to understand how it develops and which conditions favor development. 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 1). Some details about white mold development and conditions that favor development are as follows:

- 1) White mold overwinters as sclerotia, which are hard black structures that resemble rat droppings.
- 2) Sclerotia on or within the top 2 inches of the soil surface produce apothecia (mushroom-like structures) (Figure 2). Extended periods of cool soil temperatures (41-70° F), moderate air temperatures (72-85° F), moist soil conditions (half to full field capacity but not saturated), and partial canopy closure are ideal for apothecia development<sup>1,2</sup>.
- 3) Apothecia produce ascospores (two to three million per apothecia), which can infect the soybean plant through dying or dead soybean flowers<sup>2</sup>. Spore movement can commonly reach 20 to 40 feet by wind and can move as far as 150 feet<sup>2</sup>.
- 4) After infection, lesions girdle and damage stems. As a result, moisture and nutrient uptake and movement can be inhibited. The pathogen produces a white, cottony mycelium (white mold) that develops on lesions, and sclerotia that can serve as a future source of inoculum. If sclerotia are abundant in harvested grain, it may cause a discount at the grain elevator.
- 5) Each 10% increase in diseased plants has been estimated to result in a 3.75 bu./acre yield loss<sup>1</sup>.

In summary, white mold is most likely to occur if canopy closure, soybean flowering, apothecia development, and favorable weather conditions occur at the same time.

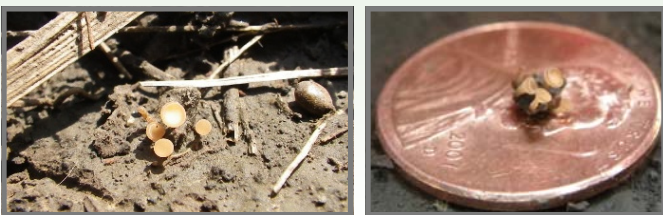
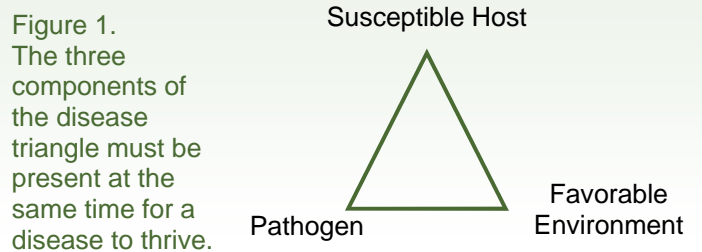


Figure 2. Apothecia from a soybean field.



### Conditions that Limit White Mold

Soil temperatures and air temperatures through June have been moderately favorable for white mold development in parts of the Midwest. A period of warmer air temperatures (88° F or higher) can slow or stop the development of the lesions<sup>2</sup>. In addition to air temperature, white mold development may slow or cease when canopy temperatures of 82° F or greater are combined with dry leaves and stems for the majority of the day over a few consecutive days<sup>1</sup>. Canopy closure reduces air flow, allowing the leaves and stems to stay damp for an extended period of time. Many soybean fields have not canopied yet, which also reduces the risk of white mold.

### Summary

In parts of the Midwest this season, conditions have been favorable for development of white mold, with cool soil and air temperatures and a decent inoculum load from 2009. However, open canopies and warmer temperatures as soybeans enter the reproductive phases will likely reduce the risk of white mold infection for soybean fields across the Midwest.

Sources:

<sup>1</sup> Hartman, G.L. et. al. 1999. Compendium of soybean diseases. APS Press. Minnesota. 46-48.

<sup>2</sup> X.B. Yang and G. Munkvold. 1997. Soybean white mold. Iowa State University Extension. PM-1731.

<sup>3</sup> White mold. Plant Health Initiative. <http://www.planthealth.info>. 7/1/11.

Open soybean canopies and warmer temperatures as soybeans enter reproductive phases will likely reduce the risk of white mold infection for fields across the Midwest.

Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible. **ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.** Technology Development by Monsanto and Design® is a registered trademark of Monsanto Technology LLC. All other trademarks are the property of their respective owners. ©2011 Monsanto Company. 07.06.2011.EJP