

# White Mold Poses Significant Threat To Soybean And Dry Bean Yields

RALEIGH, N.C.

Soybean and dry bean growers across the Midwest and North Central U.S. need to prioritize white mold when evaluating their 'disease watch list' for 2012.

White mold, also known as Sclerotinia stem rot, was first discovered in the United States in the late 1800's on tomatoes. Since then, the pathogen has been found on hundreds of other crops and by 1992 it had established itself as a wide-spread problem in geographies where climate provided optimum condition for disease proliferation.

When left untreated, white mold can cause yield loss or total crop loss depending on the infected crop and with the added challenge of lingering in the soil for up to 10 years.

The reason behind the rapid increase of white mold has yet to be determined, but it is thought to be related to changes in cultural practices that promote a greater canopy density. The increase in white mold is also believed to be influenced by changes in the genetic base of current soybean and dry bean varieties, or changes in the white mold pathogen. In the Northern U.S., it may be related to wet climate cycles that have persisted year after year.

"The optimal climatic conditions throughout North Central states can make white mold a serious threat for our growers," says Dr. Sam Markell, Extension plant pathologist at North Dakota State University (NDSU) in Fargo. "Combine that with the lush, dense canopy that you find with many high producing varieties of soybeans and you just have a great environment for the disease."

## Fostering conditions of white mold

White mold typically rears its ugly head in late-spring and early summer around the time that both soybeans and dry bean plants begin to bloom. The disease thrives in cool temperatures ranging between 59 and 75 degrees Fahrenheit and moisture-rich soil conditions caused by heavy spring rains. Combined with a dense crop canopy that can stay moist until the late morning hours, Markell says the environment can become "a perfect storm" for the disease to infect throughout a field. Infection occurs when ascospores, released from the white mold pathogen land on senescing flower petals, then germinate and form mycelium.

"The spores are generally unable to infect the plants directly, but can easily digest the senescing flower petals," Markell says. "Shortly after the infection occurs, the fungus will form a lesion, causing significant damage to the plant and disrupting nutrient uptake."

Portions of the plant stem, above the area or infection, die and dry up. The disease then hollows out and shreds the stem at the spot of the lesion. At this point, the plant is non-productive, if not dead, resulting in significant yield loss for that season and sclerotia in the soil for years to come.

Land grant universities across much of the Midwest and Northern regions are placing greater attention on the disease. Many are completing yield impact studies to determine the changing significance of the issue across varying geographies. The results have shown that yields can be reduced by 10, 20, 30 and even as high as 50 percent depending on disease severity, conditions and control practices. With a low end reduction of just 20 percent on an expected 60 bushel per acre crop means 12 bushels will never be harvested. And at \$12 per bushel as an average soybean price, that quickly equates to \$144 an acre eliminated from a grower's profit potential.

"A grower only has to look back as far as the 2009 season to see the economic impact white mold can have on a crop," says Markell. "There is traditionally a white mold outbreak at some point and on some crop in North Dakota due to our climate. But in 2009, growers as far South as Iowa and Illinois experienced white mold pressure and the severity it can have on yield."

Iowa State University reports about the 2009 white mold outbreak pointed to losses totaling more than \$10,000 per field for soybeans alone. In North Dakota, growers saw significant yield reductions in soybeans and total crop destruction in some dry bean fields.

Markell adds that the 2009 epidemic was an eye-opening experience for a lot of growers, and with a repeat in 2010 of high white mold pressure in certain geographies, he says every soybean and dry bean grower should have the disease on their radar. He continues by saying

that there is still plenty of white mold inoculum in the soil, making it necessary to take precautions to minimize the disease risk for the 2012 crop.

## Minimizing white mold risk

David Feist, project development leader with MANA Crop Protection, reminds growers that white mold is not your typical disease where traditional management practices and generalized inputs are guaranteed to work as normally expected.

"White mold will persist in the soil for years and germinate when it comes in contact with a sensitive host crop like soybeans, dry beans, alfalfa or clover. Weeds like pigweed, ragweed and lambsquarters also provide a haven for white mold to survive, season after season. Unfortunately, there is no single factor that will prevent white mold from developing," Feist says. "Relying on a preventative approach to get ahead of the problem is the best defense strategy."

In recent years the industry has struggled with full-scale solutions for white mold due to limited crop protection tools that could zero-in on mastering control. The good news is that MANA Crop Protection has prioritized white mold as a critical focus for technical development - bringing a new-age tool to the rescue.

Incognito™ 4.5F fungicide is the company's recent solution for effective management of white mold in soybeans, dry beans and other crops. While providing superior protection against white mold, Incognito also delivers broad-spectrum control over a range of other diseases like Frogeye leaf spot, Brown rot, Anthracnose, Stem and Pod Blight, scab and rusts.

Specific to white mold on soybeans, MANA Crop Protection recommends one application of Incognito at early bloom (R1 to R2 stage) followed by a second application seven to 14 days later if conditions are favorable for disease pressure. Feist notes that thorough coverage of soybean blossoms at time of application is critical for high level success using 15 to 20 ounces per acre during each application. For disease control beyond white mold on soybeans, Incognito rates can range from 10 to 20 ounces per acre.

On dry beans, the manufacturer recommends one spray pass of Incognito when 100 percent of plants have at least one open bloom or when conditions are favorable for disease development. For single-application use, apply between 30 to 40 ounces per acre. When multiple applications are required, first application should be 20 to 30 ounces per acre and administered when 10 to 30 percent of the plants have at least one open bloom followed by sequential applications on a four- to seven-day interval.

## Timing critical for success

As with most fungicides, application timing is critical to achieve desired success over disease challenges. White mold control is no different. To quantify the importance of application timing with Incognito on white mold, the University of Illinois completed a study of the product's active ingredient, thiophanate-methyl, at varying times of treatment on soybeans. Results showed that applications completed during the R1 stage had a 38 percent improvement of disease incidence with a 15 bushel yield improvement at the first check during the season, and 12 percent improvement in disease management and yield with eight bushels added the second year. Applications made after the disease was already present in a field (at the R3 phase) offered no significant disease or yield protection during the trial.

Feist, along with leading plant pathologists who are experienced with white mold, encourage strategic fungicide use as part of an integrated disease management approach that includes crop rotation, selection of disease-resistant soybean and dry beans varieties, deep-tillage adoption and wide-row spacing at time of planting.

"When it comes to white mold management, selecting a fungicide tool specific to the disease with proper attention placed upon the most advantageous time of application goes a long way in reducing yield losses," Feist says. "Knowing and responding to the risk placed upon your crop, combined with other good farming practices, will yield the kind of results growers desire while putting more money in their pocket. Plus, new tools like Incognito fungicide are available as a targeted and more exclusive solution in keeping white mold in check." Δ



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