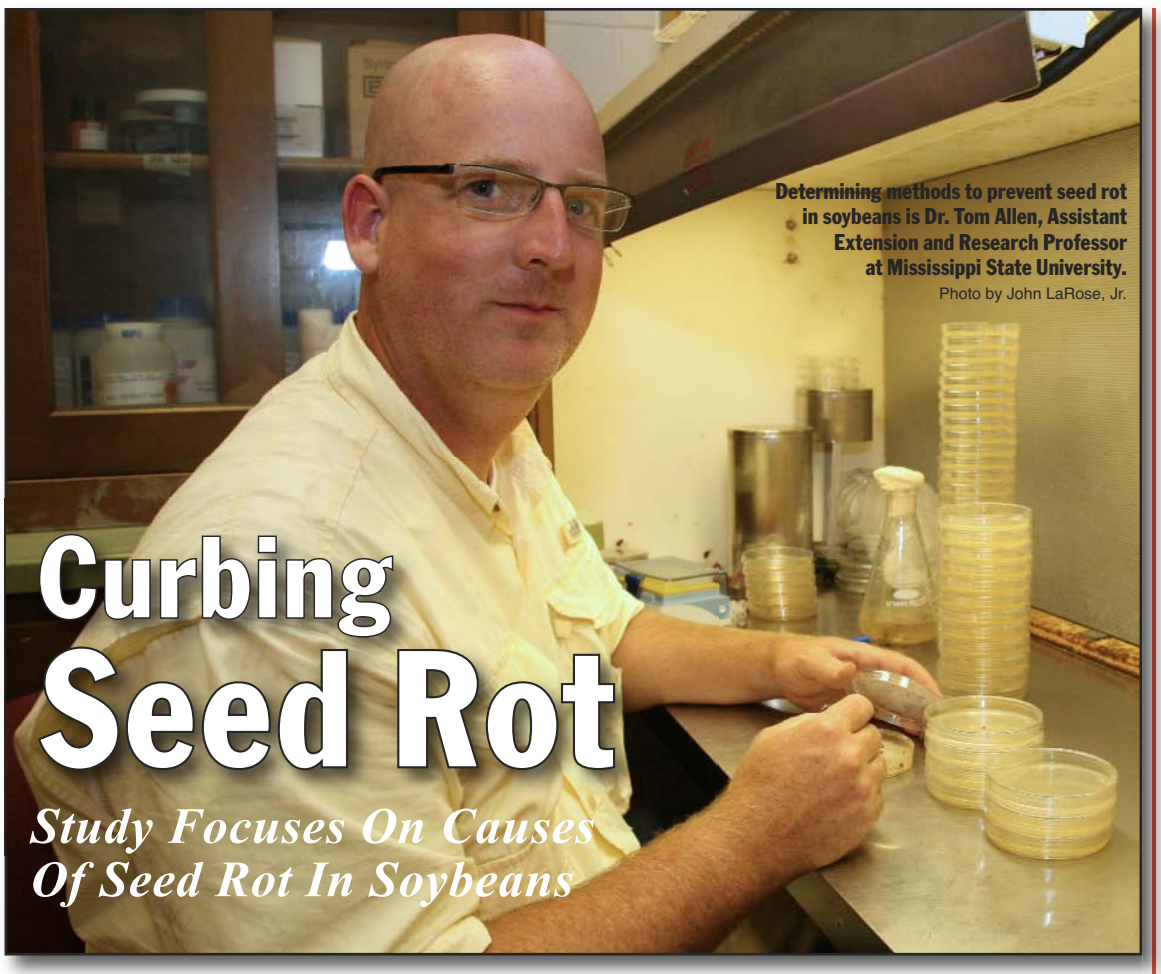

Determining methods to prevent seed rot in soybeans is Dr. Tom Allen, Assistant Extension and Research Professor at Mississippi State University.
Photo by John LaRose, Jr.

# Curbing Seed Rot

## *Study Focuses On Causes Of Seed Rot In Soybeans*

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Managing seed rot in soybeans was discussed by Dr. Tom Allen, assistant extension and research professor at Mississippi State University.

"Here at Mississippi State University, several scientists are involved in a project to determine methods to prevent seed rot, specifically in maturity Group IV soybeans," he said. "In 2008, some Mississippi soybean producers sustained seed damage from late-season rain, and in 2009 we implemented a seed quality project at three locations. Our goal was to determine whether or not existing management practices could be implemented to limit the seed rot that was occurring as a result of prolonged inclement environmental conditions prior to physiological maturity."

In the past, stink bugs have been associated with seed rot since they feed by piercing. Wounding of soybean pods by puncturing could potentially allow moisture into the pod and increase the risk of fungal infection resulting in a seed rot situation.

"Generally speaking, high temperatures and a period of pod wetting and drying, typically occurring during periodical wet periods, can directly influence harvested seed quality," Allen explained. "So to implement the project we considered managing stink bugs with an insecticide and building off of the typical R3/R4 strobilurin fungicide application. We specifically considered azoxystrobin and bifenthrin alone and as a tank mix combination. Applications were made at several different timings, including the more typical R3/R4 growth stage timing. However, in the Mississippi production system the timed strobilurin (e.g. Headline or Quadris) fungicide application, is most beneficial in situations with continuous soybean on irrigated ground, or what is more regularly considered to be a 'high-yielding' situation. Not only does the R3/R4 growth stage application provide a minor yield enhancement, the application prevents some late-season diseases. But, with that said, the R3/R4 application does not provide season long protection from fungal diseases especially in the case of seed rotting organisms."

Prior to 2009, it was suggested that applying a fungicide at mid R5 (R5.5) through mid R6 was considered a viable option to reduce the likelihood of seed rot based on observational reports. So the project implemented in 2009 included some later fungicide timings for that very purpose.

"More specifically an R3, R4, R5, and in some cases an R6 application was made at each timing and in sequential applications and overall seed rot assessed at the end of the season," he reported. "Trials were conducted at three locations in 2009. Each location sustained different amounts of seed rot as a result of the varying local environments, especially since a tremendous amount of rain dominated the end of the 2009 season on a statewide basis."

One research site on the eastern side of the state in Starkville, received six weeks of rain that delayed normal harvest timing and regardless of either insecticide, fungicide or tank mix sustained excessive seed damage. One location in central Mississippi sustained 50 percent loss regardless of application active ingredients; and one on the western side of the state, received limited damage because plots were harvested on time and not exposed to extended inclement weather.

"The most interesting piece of information from 2009 was our results suggest fungicides tended to decrease observable seed rot especially in central and east Mississippi, the two sites with measureable seed rot. However, if the environment remained conducive for an extended period of time and seed rot continued, the fungicide could only prevent so much rot," Allen said.

The project continued in 2010 and 2011 but neither year provided insight into seed rot because the environmental conditions at the end of the season were not conducive for seed rot to occur.

Following three years of research, the scientists feel that preventing seed rot is a moving target and almost completely depends on environment.

"We still have a lot of work to do to completely understand soybean seed rot," Allen concluded. "More often than not all soybean seed rot is blamed on Phomopsis seed decay, but it is possible other organisms may be involved. However, that's all going to depend on the environment. From a plant disease standpoint, the environment comprises more than 95 percent of whether or not a seed rotting issue will likely occur. The environment means timing a fungicide and/or insecticide application is the most important part to consider. But, as we all know, predicting the environment is almost an impossible endeavor."

Allen expects that some breeding lines may be able to handle weathering a bit better in the future.

"We definitely know there are varieties that have more of a weathering issue associated with them," he said. "As a whole, maturity Group IV soybean varieties don't weather as well as maturity Group V. Additionally, grey pubescent soybean varieties don't weather near as well as red pubescent. However, pinning down the specifics with regards to the reason why there are differences between grey and red varieties is a completely different project at this point. Some varieties may just have a greater susceptibility to pod rotting organisms, or a nutritional component could influence the situation." Δ

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