FUNGICIDE SENSITIVITY OF *SCLEROTIUM ROLFSII* (CAUSING WHITE MOLD) FROM PEANUT IN GEORGIA

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One of the hardest diseases to control with fungicides is white mold, or stem rot caused by *Sclerotium rolfsii*. This is due to the fact that the disease occurs deep in the plant canopy near the soil surface, and can even grow down under the soil to rot pegs and pods below ground. Irrigation and night sprays can help compensate for this, but control is seldom equal to that of foliar diseases such as leaf spot where the leaves are easily sprayed. When white mold control failures occur, it is usually not known if the cause is fungicide resistance, or perhaps a lack of fungicide ever reaching the target because it is intercepted by the leaves. One possible reason for a fungicide failure is the occurrence of fungicide-resistant isolates. Franke, Brenneman and Stevenson (1998) published an extensive study of the sensitivity of *S. rolfsii* from Georgia peanut fields about 25 years ago. There has been heavy use of these fungicides during those years, and the current level of sensitivity is not known.

Another possible issue that can affect fungicide efficacy is the length of residual control offered by the fungicide. This is particularly true for soilborne pathogens were conditions are more consistently favorable for infection, and the fungicide is exposed to many more microbes that are capable of metabolizing it, thus rendering it ineffective. Some fungicides, such as the dicarboximides used on peanuts for Sclerotinia blight, are broken down rapidly by soil microbes. For example, Rovral has a ½ life of 35 days in virgin soil, and only 2 days after 3 prior applications of Rovral (Slade et al., Pesticide Science). This "enhanced biodegradation" has not been evaluated with our peanut white mold fungicides, but it could also explain some of the unpredictable efficacy, especially in fields where these products have a long use history.

Progress Report

The first phase of this project is complete, ie. the collection of approximately 400 isolates of the pathogen from peanut fields in Georgia. The sensitivity of those isolates to tebuconazole (Folicur) and flutolanil (Convoy) was determined using exactly the same concentrations as were used in the 1990's. There were some differences among locations, and overall there was approximately 30% less control of current isolates with both fungicides than was recorded in the 1990's. Apparently there is some erosion of sensitivity occurring, but it is more of a gradual change as would be expected with this chemistry. We also evaluated isolates from our "disease nursery" fields and the sensitivity of those was similar to the grower fields. Currently these same isolates are being tested for sensitivity to the active ingredients in Elatus and Provysol. These are our newest white mold fungicides and are in the same chemical classes (3 and 7) as tebuconazole and flutolanil. We need to know if sensitivity to the older chemistries will also influence sensitivity to these newer products. Additional tests will show just how resistant these isolates are to even higher concentrations as well. The most and least sensitive isolates will be put in peanut microplots and sprayed with the various treatments to determine how the sensitivity in the lab affects disease control in the field. This was done in 2021 and the data are still being evaluated. These isolates will also be assessed for growth rates, production of sclerotia, virulence, etc. to see if fungicide sensitivity affects any of those parameters that would influence how competitive such isolates would be in the field. The final objective is evaluating the persistence of flutolanil in the soil, especially in soil from fields where the chemical has been used frequently over the years. Data collected so far have demonstrated that flutolanil is very persistent in the soil. It is somewhat less persistent in soil that has been autoclaved, indicating that the biotic component of soil is involved with breaking it down. However, there is little difference among fields either previously treated or not, and the overall high level of persistence indicates that enhanced biodegradation is not likely to be responsible for any reductions of disease control that may be observed.