FUNGICIDE DEGRADATION AND 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 on peanuts as well as other rotational crops, 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. This is the last year of a multi-year study.

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The data reported on fungicide sensitivity are based on a collection of approximately 240 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 study. There were some differences among locations, and there was some erosion of sensitivity since the 1990's, but large differences were not found. The bigger question was how much those isolates had really changed. This was addressed by looking at the most and least sensitive isolates from the cultures collected. Determing EC50 concentrations of these isolates to flutolanil, tebuconazole, solatenol and mefentrifluconazole showed the EC50's of the least sensitive isolates were not much higher than those of the most sensitive. In other words, while some low level sensitivity changes have occurred in the last 25 years, the changes are modest and we found no highly resistant isolates capable of overcoming the fungicide. This was verified in field microplots where the most and least sensitive isolates were inoculated on peanut plants and responded similarly to field applications of fungicide.

The final objective was evaluating the persistence of flutolanil in the field, especially in soil from fields where the chemical has been used frequently over the years. Data collected so far have demonstrated that flutolanil is persistent in the soil, degrading by only 10-20% over 30 days. It is somewhat less persistent in soil that has been autoclaved, indicating that the biotic component of soil is involved with breaking it down over longer periods of time. However, there were not big difference among fields either previously treated with fungicide or not, and nowhere near the level of enhanced degradation found with Rovral. The overall level of persistence indicates that enhanced biodegradation is not likely to be responsible for significant reductions of disease control. The good news is that our fungicides for control of white mold should continue to provide reliable disease control when used appropriately. Getting them to the target site continues to be the biggest challenge.