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**Subject:** Final Report March 23, 2009  
*Summary*  
**Title:** Testing for Interactions between Leafspot Resistance, O/L Ratios, Yield Potential, TSWV Resistance, and Sclerotinia Resistance  
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This project was designed to aid the breeding project in identifying the most efficient and effective method for selecting leafspot resistance while maintaining yields and resistance to *Sclerotinia* and *Tomato spotted wilt virus*. Two F<sub>1</sub> plants from the cross Tamrun OL07 X Tx964117 were selected for the study. Tamrun OL07 has resistance to both *Sclerotinia* and Tomato spotted wilt virus while breeding line Tx964117 has resistance to early leafspot. Unfortunately, Tx964117 has low yield potential and no resistance to either TSWV or *Sclerotinia*. The purpose of the study is to examine heritability estimates for various traits including yield, grade, *Sclerotinia* resistance, TSWV resistance, and leafspot resistance and whether or not there are any interactions between the different traits. Knowing the associations between each of these traits will help us to determine the proper methods for selection to try and develop breeding lines with all of the above mentioned traits.

One hundred and fifty F<sub>2</sub> progeny harvested from the two selected F<sub>1</sub>'s mentioned above were planted in the Spring of 2008 in our greenhouse for seed increase. The resulting F<sub>3</sub> seeds were then planted in the Summer of 2008 at the College Station nursery for seed increase. The intentions were to harvest enough seed from the College Station nursery to be able to plant replicated trials during the 2009 season at four different nurseries for testing; TSWV nursery in Pearsall, Leafspot nursery in Yoakum, *Sclerotinia* nursery in Stephenville, and the research farm at Brownfield. Unfortunately, seed numbers were lower than expected so, we will be planting seed increase plots again in 2009 at the research farm in Brownfield and we will plant back-up plots at the College Station nursery. Provided we get enough seed from the 2009 increase, we will begin yield testing in 2010 at all of the nurseries.