

“Compare High Oleic Cultivars for Physiological Trait Relationships for Seed Germination and Vigor with Respect to Harvest Timing: Year 1” – Tim Grey

Previous research documented the tremendous impact of maturity on peanut grown for next year's seed supply, with respect to germination and emergence. It has also shown that immature seed of some peanut cultivars show subsequent plant growth and development delays and that some cultivars are more affected by seed immaturity than others. For example, emergence and other physiological parameters were shown to be reduced in TUFRunner™ '727' as compared to FloRun™ '107', indicating that the yellow, immature seed of TUFRunner™ '727' was more detrimentally impacted by its level of maturity. Currently the demand for high oleic (HO) cultivars in Georgia has increased due to consumer and industry demand. Examining vigor associated with seed physiological traits will help correlate how HO cultivars will assist with future research when new ones are released. Results from previous research has identified that late season seed maturity affects harvesting quality of seed. Developing a baseline for establishing the differences in seed vigor with consistent performance each year by looking at additional physiological traits will assist in understanding if there is generational continuity from one season to the next season for new cultivars, especially those with HO traits.

Recently, a novel, nondestructive technology for rapidly measuring oleic acid (%) of individual peanut seed using Qsorter scanning technology has entered the market. JLA of Albany has been working with UGA to establish some baseline information on seed quality traits. In addition to rapidly measuring oleic acid (%) on a single kernel basis, this technology also allows for seed to be nondestructively sorted based on their measured oleic acid content, appearance, and other variables (Figure 1). The impact of sorting seed lots based on maturity and HO ratio, could lead to significant improvements in seed germination and vigor. These data may assist with future cultivar development when these same measures are employed

Experiments performed in Ty Ty and Plains, GA were performed to compare quantifiable data of current and future peanut cultivars, such as oleic content with respect to maturity. Current peanut cultivars TifNV-HO, GA-16HO, GA-06G, and FL331 were planted and maintained under UGA agronomic recommendations for the duration of the season. Each cultivar was replicated four times per harvest. Growing season data collected included plant density, plant width, and yield. Post-harvest data included average percent of foreign material. Inversion was performed at approximately 130, 140, and 150 days after planting at both locations. After harvest, seed were shelled and sorted into appropriate sizes. The will be processed through a Qsorter as a means to non-destructively measure oleic content and other variables quickly.

Analysis of yield data indicated differences at both locations. In Plains, as harvest date increased, yield increased for all cultivars. Yield increased in a linear manner with respect to each cultivar. GA-06G yielded the highest at 4,745 lb/ac, followed by FL331 at 4,658 lb/ac, next was GA-16HO with 4,231 lb/ac, and finally TifNV-HO with 4,000 lb/ac when harvested 150 days after planting. In Ty Ty, the data indicated a general trend in which as harvest date increased, yield also increased. The highest yielding cultivars included FL331 at harvest 150 days after planting, followed by harvest 140 days after planting with 6,024 and 5,827 lb/ac, respectively. Next, GA-16HO at 5,729 lb/ac at 140 days after planting, and the fourth highest yield was noted as TifNV-HO harvested at 5,525 lb/ac at 150 days after planting. Seed will be subjected to Qsorter and germination testing in the coming weeks.

Seed will then be subjected to thermal gradient germination testing to determine germination differences for vigor. These collected data will assist growers in decision making and understand the differences that may occur when planting HO cultivars.