

## Peanut project (2015) report to the Georgia Peanut Commission

Project title: Water use efficiency of single vs. twin-row peanut from bloom to peak pod fill

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Peanut is an important crop in the southeastern US, especially in Georgia. Water availability for peanut production has reduced due to rapid urban development in Georgia, and the frequency of both water stress and drought associated with climate variability increased. It is becoming increasingly critical to improve water-use efficiency (WUE) while maintaining high peanut yields through different management practices. There is little micrometeorological data being collected in peanut, even though this type of information could assist with determination of more precise recommendations on when peanut may have a better chance of responding to certain management practices. The objectives of this trial are to initiate a baseline for water use efficiency in single vs. twin-row pattern for peanut.

In 2015, experiments were conducted in two adjacent, large, flat, irrigated peanut fields at the Southwest Research and Education Center in Plains, GA, with single-row planting pattern in one field, and twin-row in another field, both with peanut cultivar Georgia-O6G. Evapotranspiration, carbon dioxide exchanges with the atmosphere, and water use efficiency in each field were measured and calculated with the eddy-covariance method. Meanwhile, soil CO<sub>2</sub>, soil temperature and soil water content were also simultaneously monitored in each field. Leaf area index in each field was measured each week. The information would help explain the difference in peanut water use efficiency between different planting patterns.



Peanut eddy-covariance data have been processed. Evapotranspiration, CO<sub>2</sub> fluxes, and water-use efficiency are being calculated and analyzed. Preliminary results suggest that both CO<sub>2</sub> fluxes and evapotranspiration of twin-row (TR) peanut are higher than those of single-row (SR) peanut. TR peanut has better water-use efficiency than SR peanut (See Fig.1). Further analysis of the results with plant properties (LAI, height, etc.) and the environmental factors (solar radiation, air temperature, soil temperature and soil moisture, etc.) is still ongoing. Based on the initial experiments, we have applied for funding for the national peanut board for further study on this issue.

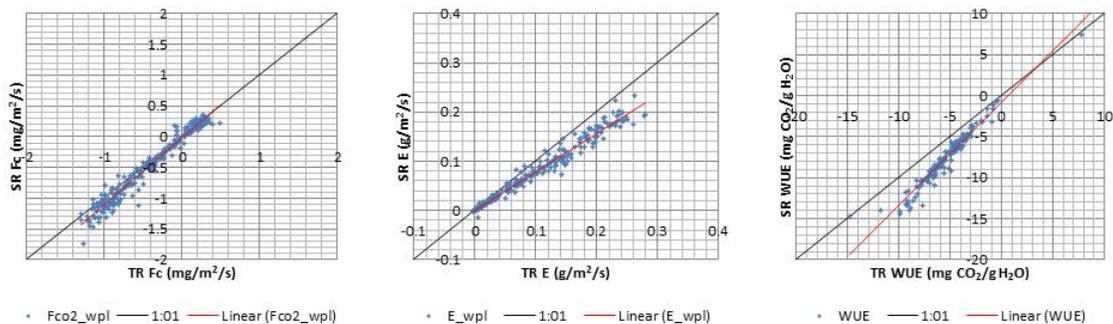


Fig. 1 Comparison of CO<sub>2</sub> fluxes (Fc, left), evapotranspiration (E, middle), and water use efficiency (WUE) between single-row (SR) and twin-row (TR) peanut