

Grower Education on the Effect of Tillage Practice Related to Peanut Water Availability and Usage

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Strip-till cultivation is the most commonly used minimum tillage systems implemented in Brooks County conservation tillage planting programs. Benefits of strip-till production include: improved soil health, decreased soil erosion, and reduced trips across the field, resulting in savings of both time and money. Strip-till systems have been applied in the production of numerous crops, including peanuts. However, peanut producers have questioned yields achieved with strip-till programs compared to typically higher harvestable peanut yields acquired through conventional tillage systems. In addition, the role of season long water availability, consumption, and usage by the peanut plant has not been defined in a strip-till management system. A commercial peanut field research trial was conducted for analysis of the comparison between soil moisture in conventional tillage compared to conservation tillage and the resulting peanut yields. The main objective of study was to implement an applied research trial in both irrigated and dryland commercial peanut fields to evaluate the effect of conventional tillage and conservation tillage, as it relates to: plant water availability, usage, consumption, and yield. The information obtained from this trial will serve as a grower educational tool for peanut production in conservation tillage systems. Peanuts were planted with two field cultural practices; bottom plow utilized for the conventional tillage treatment and strip-tillage for the conservation tillage treatment. Plots were replicated as strips three times within each field. AquaCheck capacitance soil moisture sensors (SMS) were installed in each replicated plot to monitor the difference in soil moisture at soil depths of 8, 16, and 24 inches. Soil moisture data were collected hourly during the entire season. Plots were mechanically harvested and weighed by treatment strip to determine yield.

The trial results revealed an increase in yield with the bottom plow tillage treatments over the strip-tillage treatments. However, no significant differences in season long soil moisture was observed or recorded between the conventional and conservation tillage systems. Nonetheless, there were variations in available soil moisture within replicated plots located across the field. Therefore, peanut yield increase with conventional tillage was not attributed to available soil moisture and usage. In addition, soil moisture data indicates that differences in soil type and variations within a field are closely associated with soil water availability, independent of cultural practice implemented at planting.