

PROFITABILITY OF RTK AUTOGUIDANCE AND ITS INFLUENCE ON PEANUT PRODUCTION

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ABSTRACT

Efficient harvest of peanuts (*Arachis hypogea* L.) requires that the digging implement be accurately positioned directly over the target rows. Small driving errors can produce large harvest or more importantly yield losses. Producers have traditionally relied solely on tractor operator skills, without the help of GPS-based autoguidance systems, to harvest peanuts. However, as peanut production has shifted to new growing regions in the US, particularly in Alabama, producers face difficulties in having inexperienced tractor operators for peanut digging operations. Further, new varieties with higher yields, on the order of 4 metric tons/ha or more, make accurate digging much more difficult even for experienced operators. The goal of this study was to quantify the impact that deviations from the planted row during peanut digging might have on peanut yield and to determine the economic return of using GPS-based autoguidance systems on peanut production. The study consisted of a factorial combination of tillage (conventional and strip tillage), row patterns (single and twin) and deviations from the target row (0, 9, and 18 cm). The treatment of “0 cm deviation” corresponded using a RTK GPS-based autoguidance system (RTK level or cm level accuracy) during digging. Results indicated differences in peanut yield between tillage and row patterns with yield losses increasing as the deviation from the target row increased. Peanut yield under conventional tillage conditions was 672 Kg/ha higher than strip tillage with more than 530 Kg/ha on twin rows with respect to single rows. If deviations of 9 cm and 18 cm occur, a producer can expect yield losses of 15% and 32%, respectively in relation the use of RTK autoguidance. Under strip tillage conditions, yield losses due to deviations from the target row were similar to conventional tillage conditions. A cost analysis for the conventional tillage conditions showed that producer’s profitability decreased as deviation from the target row increased. Although the same trend was not observed for the strip tillage treatment, a producer might expect a reduction in profit if deviations from the target row during digging occur.