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Evaluation

Strip Tillage Systems for Single and Twin-Row Peanut Production with and without a Cover Crop

Final & Summary for AL portion only

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Locations

Headland, AL; Tifton, GA

Summary

This report describes second year results of a study to compare three strip tillage implements across single and twin row patterns with and without a cover crop during the 2013 crop year in Headland, AL. The KMC and Orthman tillage implement maintained the highest surface residue levels, regardless of cover crop level, while twin rows produced numerically more surface cover compared to single rows, although the differences were not significant. When averaged over all treatments, twin rows were superior to single rows, but the cover crop did appear to depress yields compared to fallow plots, particularly in twin rows.

Methods

This experiment was designed to compare three strip tillage implements (KMC, Orthman, Unverferth) in single and twin row patterns with and without a cover crop. To date, the study has been conducted at two locations during the 2012 and 2013 growing seasons. The following report will focus on the results at Headland, AL in 2013.

Surface Residue

The average rye biomass production at termination was 7260 lb/ac across the experimental area at Headland, AL. A summary of the remaining surface residue across treatments is shown in Figs. 1 and 2. Fig. 1 shows the difference in measured surface residue cover between cover crop treatments for each tillage implement averaged over row patterns. The surface residue that remained where there was no cover crop present was old cotton stalks and additional weeds that were not controlled adequately, although weeds were terminated prior to planting. Surface residue cover averaged 39% across all tillage implements where no cover crop was planted (Fig.1). There was a significant difference measured between the KMC and Unverferth

implements with KMC leaving 45%, Orthman leaving 41%, and Unverferth leaving 31%. The surface residue that remained where the cover crop was present averaged 83% across all tillage implements (Fig.1). In the cover crop treatment, the KMC and Orthman implement left more residue on the soil surface compared to the Unverferth implement with KMC leaving 85%, Orthman leaving 89%, and Unverferth leaving 76% (Fig. 1).

Fig. 2 shows the difference in measured surface residue cover between cover crop treatments for each row pattern averaged over tillage implements. When no cover crop was present, the average surface residue remaining was 39%, but there was no difference between row patterns (Fig. 2). Average surface residue remaining when the cover crop was present averaged

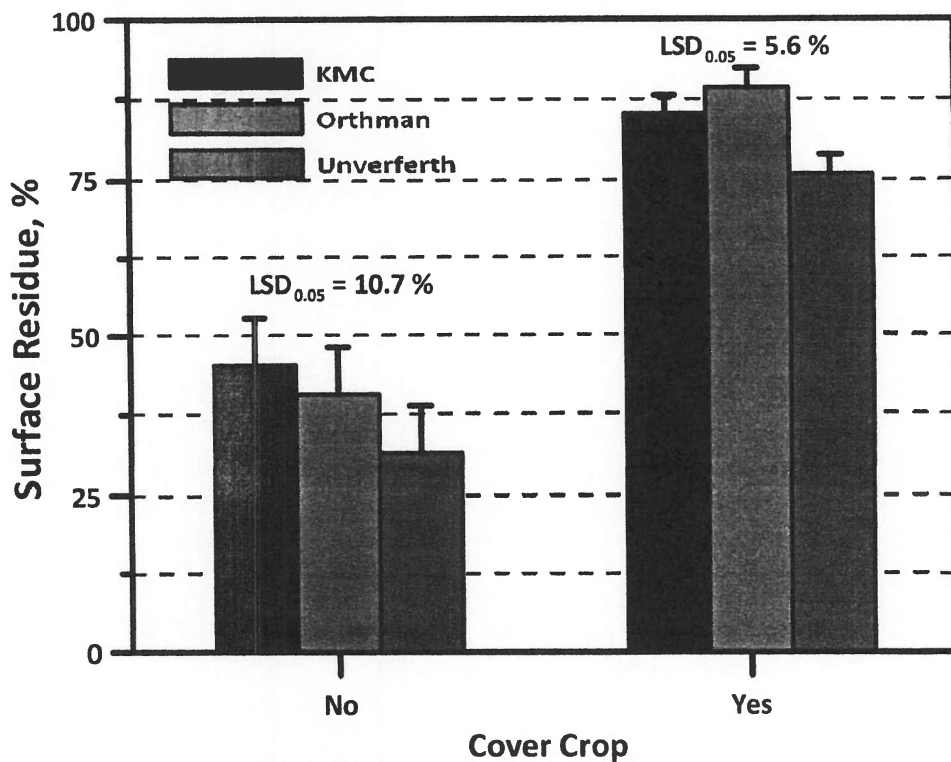


Figure 1. Measured surface residue remaining in the field following each tillage and planting operation averaged over row patterns in each cover crop category at the Wiregrass Research and Extension Center in Headland, AL during the 2013 growing season.

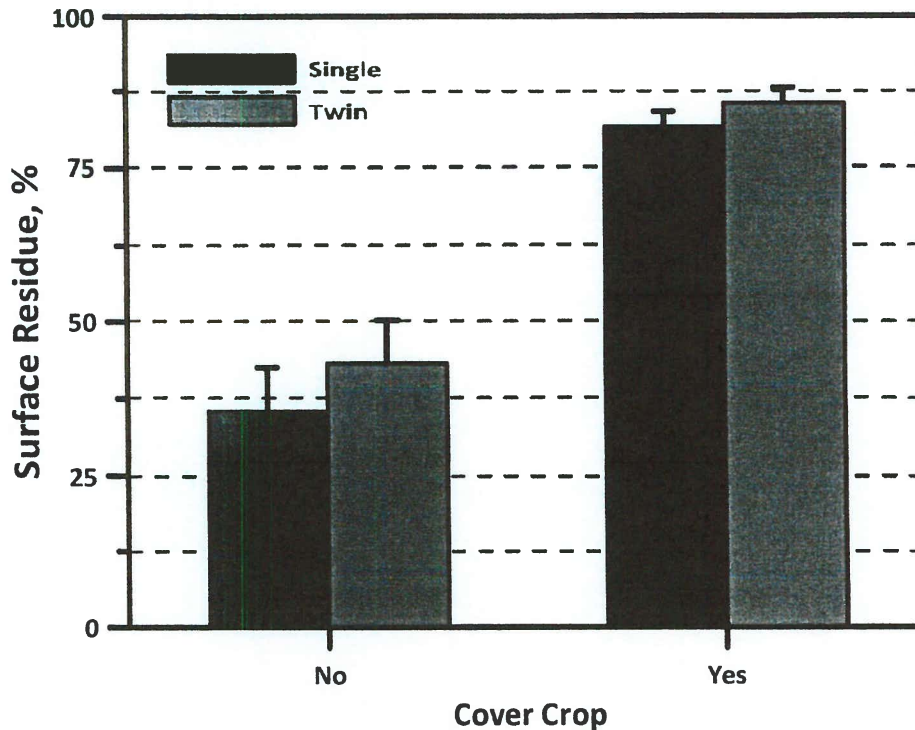


Figure 2. Measured surface residue remaining in the field across row patterns following each planting operation averaged over tillage implements in each cover crop category at the Wiregrass Research and Extension Center in Headland, AL during the 2013 growing season.

83.5%, but no difference was observed between row patterns. The twin row pattern averaged 85% compared to 82% for the single row pattern. This was unexpected because the twin row pattern typically results in more residue disturbance and less remaining surface cover.

Peanut Yields

Peanut yields measured at the Headland location during the 2013 growing season were very good, but there was no difference observed among tillage implements. An interaction ($p=0.0005$) was observed between cover crop and row patterns (Fig. 3). Twin yields produced the highest yield where no cover crop was grown. Single and twin row yields with a cover were equivalent, but twin rows with a cover crop were no better than yields from single row without a cover. Further analyses will examine stand counts to determine if peanut yields were affected by lack of emergence associated with planter issues or if yields were just not as great where the cover crop was grown. Cover crop had no effect on peanut yields. Total sound mature kernels, a measure of peanut quality, averaged in the mid-70s, but slight differences were detected between some treatments. Fallow plots in single rows appeared to have slightly higher total

sound mature kernels than rye plots in twin rows during the second year of this experiment at Headland.

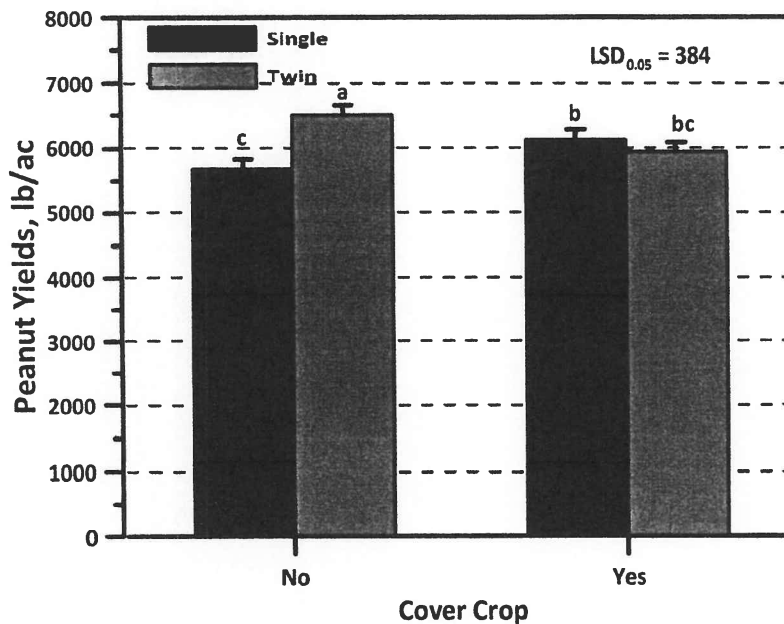


Figure 3. Peanut yields measured across cover crop and row patterns at the Wiregrass Research and Extension Center in Headland, AL during the 2013 growing season.

Conclusions

These results represent the second year of data collection at Headland. Overall yields seem to be good and more treatments separation was observed in 2013 compared to 2012. We plan to repeat this study again during the 2014 growing season at Headland and Tifton.