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

Principal Investigators

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Locations

Headland, AL; Tifton, GA

Summary

This report describes first 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 2012 crop year in Headland, AL. The KMC tillage implement maintained the highest surface residue levels, regardless of cover crop level, while twin rows surprisingly maintained more surface cover compared to single rows. No yield differences were observed among tillage implements, but twin rows averaged ~9% greater than single 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 growing season. The following report will focus on the results at Headland, AL.

Surface Residue

The average rye biomass production at termination was 5140 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 averaged 15% across all tillage implements (Fig.1). There was a significant difference measured between the KMC and Unverferth implements with KMC leaving 21%, Orthman leaving 15%, and Unverferth leaving 11%. The surface residue that remained where the cover crop was present averaged 73% across all tillage implements (Fig.1). In the cover crop treatment, the KMC implement left

more residue on the soil surface compared to the Orthman and Unverferth implements with KMC leaving 80%, Orthman leaving 70%, and Unverferth leaving 69% (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 15.5%, but there was no difference between row patterns (Fig. 2). Average surface residue remaining when the cover crop was present averaged

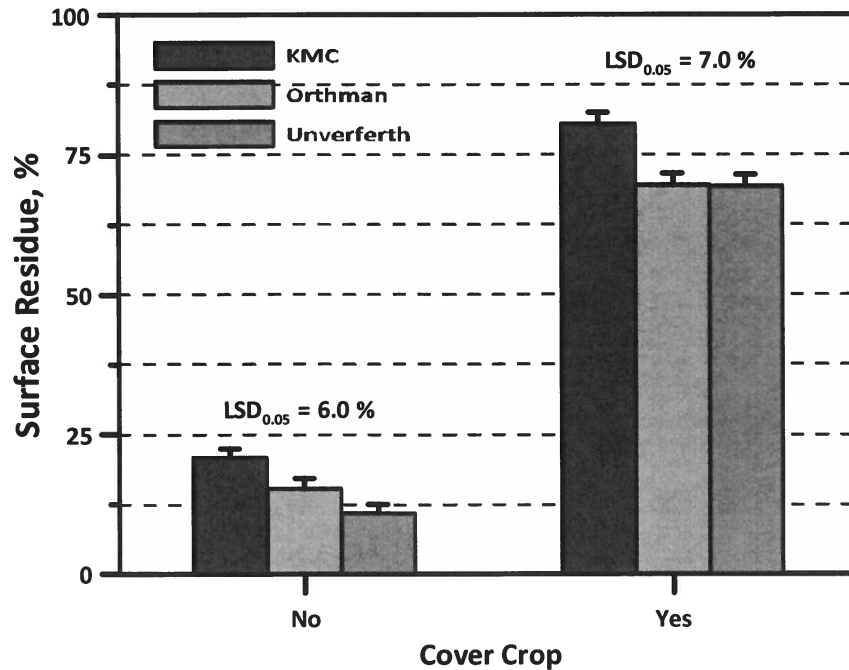


Figure 1. Measured surface residue remaining in the field following each tillage and planting operation averaged over row patterns in each cover crop category at the Wiregrass Research and Extension Center in Headland, AL during the 2012 growing season.

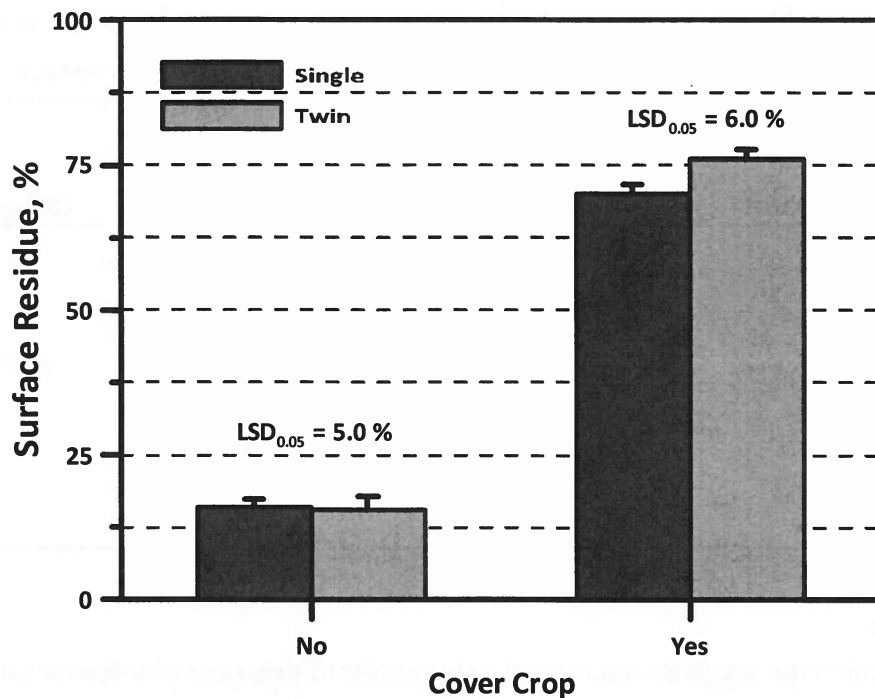


Figure 2. Measured surface residue remaining in the field across row patterns following each planting operation averaged over tillage implements in each cover crop category at the Wiregrass Research and Extension Center in Headland, AL during the 2012 growing season.

73%, but the twin row pattern averaged 76% compared to 70% 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 2012 growing season were very good, but there was no difference observed among tillage implements. Measured yields among tillage implements were within 150 lb/ac of each other (Table 1). There was a difference observed between single and twin row patterns with twin rows producing higher yields (Table 1). Cover crop had no effect on peanut yields. Total sound mature kernels, a measure of peanut quality, averaged in the mid-70s, but were not affected by any of the treatments during the first year of this experiment at Headland.

Table 1. Peanut yields measured across row patterns and tillage implements at the Wiregrass Research and Extension Center in Headland, AL during the 2012 growing season.

<i>Tillage implement</i>	<i>Row Pattern</i>			<i>LSD_{0.05}</i>
	<i>Single</i>	<i>Twin</i>	<i>Mean</i>	
	-----lb/ac-----			
<i>KMC</i>	<i>5727</i>	<i>6129</i>	<i>5928</i>	
<i>Orthman</i>	<i>5533</i>	<i>6235</i>	<i>5884</i>	<i>332</i>
<i>Unverferth</i>	<i>5847</i>	<i>6212</i>	<i>6030</i>	
<i>Mean</i>	<i>5703</i>	<i>6192</i>		
<i>LSD_{0.05}</i>	<i>270</i>			

Conclusions

All results at this time are preliminary and only represent one year of information. No plant stand counts are included. Data indicated that stand counts decreased as time passed. This could be attributed to the fact that separating individual peanut plants for counting as they grow older and larger created some problems with the count data. We plan to repeat this study again during the 2013 growing season at Headland and Tifton.