Soil degradation and rising production costs have prompted grower interest in conservation tillage with high residue cover crops for peanut (Arachis hypogaea L.). The objective was to evaluate single and twin-row peanut production across three different strip tillage implements with and without a cover crop. Surface residue following planting, peanut yield, and total sound mature kernels (TSMK), were compared across cover crop treatments [fallow; rye (Secale cereale L.)], tillage implements (KMC, Orthman, Unverferth) and row configurations (single, twin) at two locations (Headland, AL; Tifton, GA) during the 2012 to 2014 growing seasons. Soil types were a Dothan sandy loam and Orangeburg loamy sand in Headland and a Tifton loamy sand in Tifton. Surface residue counts varied by location and cover crop treatment with values ranging from 15 to 83% at Headland and 1 to 81% at Tifton. In the fallow treatment at Headland, the KMC implement retained 36% more residue than the Orthman and Unverferth implements, while retaining 11% more residue than the Unverferth in the rye treatment. Peanut yields averaged 6% and 19% greater for twin-rows compared to single rows at Headland and Tifton over all three growing seasons. A significant year X row configuration interaction (P = 0.0190) was observed at Tifton that was attributed to a 29% yield decrease for single rows compared to twin rows in 2014. Average TSMKs all were above 72 each year with variability observed at Tifton in 2014 (Fig. 6). At Headland, the highest yielding treatment changed each year with twin rows greater than single row peanut yields in the rye treatment (data not shown). Peanut yields in the fallow treatment, while twin row peanut yields were only 2% increased 35%, while twin row peanut yields decreased 20%. Yield differences were generally greater than single row peanut yields in the rye treatment (data not shown). At Headland, the year X row configuration interaction (Pr > F = 0.0190) was observed for peanut yields, indicating a yield decrease for the 2014 growing season compared to the 2012 growing season (data not shown). Single row peanut yields decreased 35%, while twin row peanut yields decreased 20%. Yield differences among years were likely attributed to growing season precipitation. At Headland, a year X cover crop X row configuration interaction (Pr > F = 0.0124) was observed for peanut yields with twin row peanut yields 9% greater than single row peanut yields in the fallow treatment, while twin row peanut yields were only 2% greater than single row peanut yields in the rye treatment (data not shown). At Headland, the highest yielding treatment changed each year with twin rows consistently yielding higher at Tifton. Increased peanut yields for twin rows agree with recent research (Balck et al., 2010) indicating feasibility of twin row peanut production in conservation systems. TSMKs averaged above 72 across each year and location with the greatest variability observed at Tifton in 2014 (Fig. 6).

CONCLUSIONS

1. Cover crop biomass levels varied by Year and Location. Tifton biomass averaged 2555 kg ha⁻¹ (SE = 116), while Headland biomass averaged 6139 kg ha⁻¹ (SE = 228) over all three growing seasons.

2. As a result of differences in cover crop biomass for locations, surface residue counts were presented by location and cover (Fig. 2). The KMC implement generally left the most surface residue on the ground compared to the Orthman and Unverferth implements.

3. Surface residue counts were different between single and twin rows for the rye cover crop treatment at both locations (Fig. 3). At Tifton, surface residue was 10% greater in single rows compared to twin rows, while surface residue was 9% greater in twin rows compared to single rows at Headland.

4. Twin row peanut yields, averaged across all treatments, for the 2012-2014 growing seasons were ~6% greater at Headland and ~20% greater at Tifton compared to single rows (Fig. 4).

5. At Tifton, a Year X Cover Crop interaction (Pr > F = 0.0190) was observed for peanut yields, indicating a yield decrease for the 2014 growing season compared to the 2012 growing season (data not shown). Single row peanut yields decreased 35%, while twin row peanut yields decreased 20%. Yield differences among years were likely attributed to growing season precipitation.

6. At Headland, a Year X Cover Crop X row configuration interaction was observed and the same interaction was also shown from Tifton for comparison (Fig. 5). At Headland, the highest yielding treatment changed each year with twin rows consistently yielding higher at Tifton.

REFERENCES
