Single and Dual Shank Subsoiling and Inoculant Rate Evaluation for Twin Row Peanut. 2018 crop season. R.S. Tubbs and W.S. Monfort

Bradyrhizobia inoculants for use in peanut production have been extensively researched over the last 20 years. However, there has been minimal research conducted on different rates of inoculants in twin row peanut, and especially on "virgin" ground (land that has not been planted to peanut in the last 30+ years). Extension specialists throughout the Southeast are consistently asked whether the standard rate of liquid inoculants (1 oz per 1000 ft of row, or 14.5 oz/acre in a standard 36 inch single row planting pattern) is still the recommended rate for twin row. Plus, there are some recommendations that suggest doubling the rate when planting on virgin ground to insure adequate nodulation and *Bradyrhizobia* survival.

In addition, UGA extension has received questions in recent years about using single shank subsoilers (centered halfway between each twin row pair) compared to using a double-shank subsoiler that places a shank directly under each individual twin row. This experiment accounts for a factorial arrangement of all possible treatment combinations that include a comparison of single vs dual subsoilers, and using six inoculant treatments consisting of 1) Non-treated check, 2) Water alone applied in-furrow (0.0 oz/ac inoculant), 3) 0.5 oz inoc/1000 ft of row (0.5x rate), 4) 1.0 oz inoc/1000 ft (1x rate), 5) 2.0 oz inoc/1000 ft (2x rate), and 6) 4.0 oz inoc/1000 ft (4x rate). Experiment was conducted on virgin ground at the UGA Bowen Farm in Tift County, GA that had not been planted to peanut in over 30 years. All plots were planted with Georgia-06G peanut in twin rows on June 9, dug on November 12, and harvested on November 30, 2018.

Differences between subsoil shanks included four days quicker lapping, 1.2 inches taller canopy height, and 5.5% fewer active nodules using dual shanks than for single shank tillage. There were often differences between inoculation treatments, but it did not equate to differences in yield or grade (see Table below). The lack of differences in yield and grade are mostly attributed to poor growing conditions with an extremely wet growing season, so production was limited by additional factors than just treatments.

There were few benefits to increasing inoculant rate above the standard per furrow rate. Despite no statistical differences in yield or grade, a recommendation to apply inoculant would still have been a worthwhile investment in these conditions based on a 4x return on investment using the 1x rate and a 5x return on the 2x rate.

	Yield	Nodule weight	Veg Biomass[a]	Lapping
Inoculant[b]	lb/ac	g/plant	g/plant	days after planting
None	2246 b	0.53 b	15.8 d	71 a
Water Only	2261 b	0.67 ab	17.4 cd	63 b
0.5 oz/1000 ft	2220 b	0.75 a	22.0 b	56 c
1.0 oz/1000 ft	2448 ab	0.80 a	23.8 ab	55 c
2.0 oz/1000 ft	2740 a	0.81 a	21.5 bc	53 c
4.0 oz/1000 ft	2204 b	0.83 a	27.0 a	53 c
SE[c]	± 251	± 0.10	± 2.1	± 2.3

[a] Total dry matter of above ground plant material, 73 days after planting, average of 5 plants per plot.

[b] Inoculant rates applied with 4.5 gal water/ac as a carrier, directly on top of seed placed in-furrow. Averaged over both single and dual subsoiler treatments.

[c] Standard Error of the mean.

Means within a column followed by the same letter are not different according to pairwise t-tests.