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NATIONAL PEANUT BOARD / SOUTHEAST PEANUT RESEARCH INITIATIVE

FINAL REPORT for work done under project agreement entitled:
"Tri-States Project to Evaluate Peanuts Planted in Thirty-Inch Rows".

NPB Project # 256
GPC Budget # 4-910-653-5
UGA Account #25-21-RF328-803

INSTITUTION: University of Georgia

Principle Investigator: Dr. R. Scott Tubbs

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FINAL REPORT: Peanuts have traditionally been grown on 36 inch row spacing in much of the peanut belt. However, as peanut production expands into new areas, and is being grown in rotation with crops that have been shown to respond to narrower row patterns, the question arises as to whether peanuts can be grown in narrower row spacing and meet or exceed yields of 36 inch peanuts. Corn and peanut are complimentary rotational crops in row crop systems to naturally reduce pest incidence and also broaden the spectrum of pesticide mode-of-actions that can be used on certain major pest issues like weeds, diseases, insects, and nematodes. This can alleviate concerns of pesticide resistance, which has become a serious issue in southeastern agriculture (such as glyphosate and ALS resistant pigweed). It is documented that corn yields can be improved in 30 inch row patterns compared to 36 inch rows. Therefore, corn growers that have their equipment set to accommodate 30 inch rows could save time and effort by growing peanuts on equivalent row spacing without having to alter equipment for various crops being grown.

A randomized complete block design with two factor factorial treatment arrangement - two peanut varieties ('Georgia Green' and 'C-99R') and three row spacing effects (36 inch twin rows, 36 inch single rows, and 30 inch single rows) was set up and planted on May 22, 2008 on University of Georgia's Tifton Campus. Early season stand counts were made on June 12 (21 days after planting [DAP]). Row widths were measured (by rep) starting on July 7 and completed on July 9, which was 46-48 DAP and corresponded with the R3 stage of growth (Boote, 1982). Tomato spotted wilt *Tospovirus* (TSW) ratings were made on October 2, 2008. Georgia Green peanuts were dug on October 15 and harvested on October 21, 2008. C-99R peanuts were dug on October 31 and harvested on November 7, 2008.

It is important to note that to keep plant population on a per acre basis equivalent among the different row effects, seeding rates had to be adjusted. The University of Georgia Extension recommendation is to plant six seed per linear foot of row in single row pattern on 36 inch spaced peanuts, and the equivalent to this on 36 inch twin rows is three seed per foot of row per twin, which totals 87,120 seed planted per acre. In 30 inch spacing, to achieve the equivalent plant population on a per acre basis, only five seed per linear foot of row are planted. The planters used in this experiment were Monosem precision air planters. This trial used the closest match to equivalent plant population settings that were possible. For the 36 inch twin rows, 3060 plates were used with a gear setting of A24-B23 for 6.16 seed per foot of row = 89,443 seed per acre. For 36 inch single rows, 4860 plates were used at the C5 gear setting for 6.0 seed per foot of row = 87,120 seed per acre. For the 30 inch single rows, 4060 plates were used at the C5 gear setting for 5.05 seed per foot of row = 87,991 seed per acre.

Table 1. Pod yield, early stand, and average plant width at three row spacing effects; Tifton, GA, 2008.

Row Effect	Pod Yield (7% moist. – Lb/Ac)		Early Stand (Plants/foot of row)		R3 - Average Plant Width (inches)	
30 inch single	6102	A	3.4	B	29.2	C
36 inch single	5391	B	3.6	B	30.8	B
36 inch twin	5423	B	5.1	A	32.8	A

Differences among row effects are indicated by alphabetical notation, where a different letter indicates a statistical difference at the P<0.05 level according to Fisher's Protected LSD test.

There were statistical differences among the three row spacing patterns for pod yield, early season stand count, and average plant width (Table 1). Yields were higher for the 30 inch single row pattern than for either the 36 inch single or twin row pattern. This can be attributed to the fact that narrower row spacing translates into more linear row feet on a per acre basis. There are 14,520 linear row feet in one acre on a 36 inch row spacing, while there are 17,424 linear row feet in one acre in 30 inch row spacing. That equates to an additional 2904 row feet of peanuts being grown per acre. Despite having lower yields on a given linear foot basis, the additional beds that would be gained by having a narrower row spacing would compensate and allow for higher overall yields.

Early season plant stand was higher for the 36 inch twin row pattern than for either of the single row patterns. Since there is less intra-row competition between adjacent plants in the twin row pattern by spacing the seed over two nearby rows instead of squeezing plants every two inches in single rows, these types of results are common. Also, the drop in seeding rate to five seed per foot of row on a linear row foot basis contributed to lower plant stands in the 30 inch single row treatment, but was not statistically lower than the 36 inch single row pattern which had six seed per linear row feet planted.

The average plant width at the R3 stage of growth was significantly different for all three row spacing treatments, with the widest coverage at 36 inch twin rows and the narrowest row width in the 30 inch single pattern. However, since rows were not as wide in the 30 inch single row pattern, plants actually covered a larger percentage of the row at this measurement (97%) than the 36 inch single (86%) or 36 inch twin (91%) row patterns. Earlier lapping of row middles can aid in suppressing mid-season weed escapes.

There were also statistical differences between varieties for early season stand count, grade, and incidence of TSW (Table 2). Georgia Green had a better early season plant stand and had a better grade than C-99R. However, Georgia Green is more susceptible to TSW than C-99R, which is indicated in the TSW ratings in this experiment.

Table 2. Early stand, grade, and tomato spotted wilt (TSW) incidence for two peanut varieties; Tifton, GA, 2008.

Variety	Early Stand (Plants/foot of row)		Grade (% total sound mature kernels)		% TSW	
Georgia Green	4.2	A	78.2	A	10.7	A
C-99R	3.9	B	76.3	B	4.0	B

Differences between varieties are indicated by alphabetical notation, where a different letter indicates a statistical difference at the $P<0.05$ level according to Fisher's Protected LSD test.

Summary

These results show that a reduction in row spacing to 30 inches between adjacent rows could result in improved yields. This would be a savings in time and effort for growers whose operations are already set up for 30 inch row spacing, if they were able to find peanut equipment that matched such spacing or modify existing 36 inch equipment to meet these specifications. Supplemental experiments should be warranted to further explore the possibilities of narrow row spacing for peanuts, including addressing 30 inch twin row patterns and also adjustment of seeding rates to maximize yield and profit potential since the recommended seeding rate of six seed per linear foot of row would cause a 20% increase in seed cost on a 30 inch row spacing.

Literature Cited

Boote, K.J. 1982. Growth stages of peanut (*Arachis hypogaea* L.). Peanut Sci. 9:35-40.

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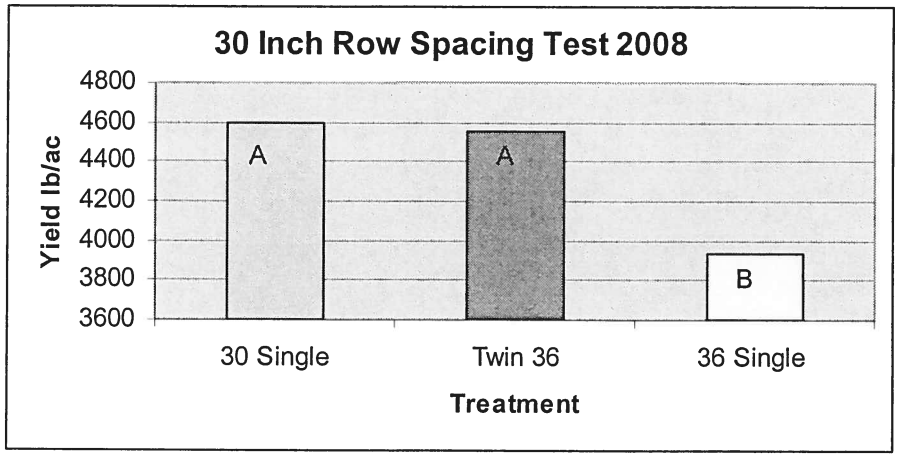
2008 field summary

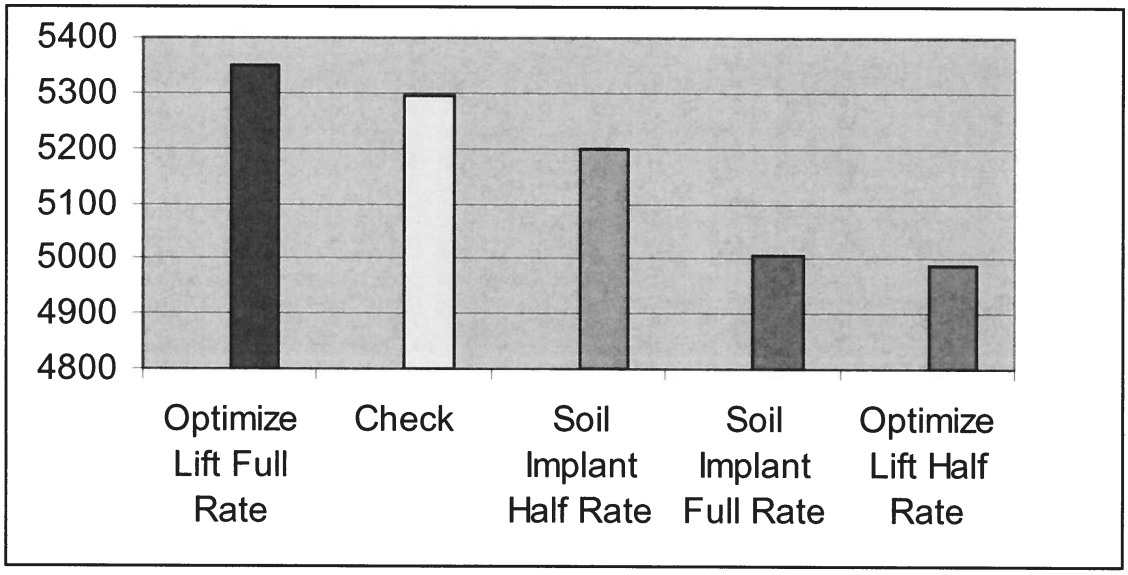
Project Title: Tri-States Project to Evaluate Peanuts Planted in Thirty Inch Rows
Fund No. 367348 (APPA-RIA03-30 INCH ROWS)

Report of Progress: Research plots were established in 2008 at the Wiregrass Research and Extension Center in Headland, Al. as part of a multi-state project. Plots were planted in May with Ga O3L in a complete randomized block design. Plot size was 12 feet by 40 feet with six replications. The three row spacings made up the treatments which are single 30 in., single 36 in., and twin 36 in. rows. Plots were monitored and managed season long for insect, weed, and disease populations. Disease ratings were made pre-harvest. Plots were harvested in October for yield and grade. Data was analyzed for statistical differences. We concluded from our results that there was no difference between single 30 inch and twin 36 inch rows. However both the single 30 and twin 36 inch rows were significantly higher than the 36 inch single rows.



Project Title: Tri-States Project to Evaluate the Need for Peanut Innoculum in Non-Traditional Areas of Peanut Production.
Fund No. 367350 (APPA-RIA03-PNUT INNOCULUM)

Report of Progress: Research plots were established in 2008 at the Gulf Coast Research and Extension Center as part of a multi-state project under the leadership of Kris Balkcom, Principal Investigator. Plots were 12 X 45 ft. wide in a complete randomized block design with six replications. Treatments consisted of two different types of innoculum with three different rates: full rate, half rate, and a check without innoculum. Plots were monitored season long for insect, weed, and disease populations. Tomato spotted wilt virus ratings were taken pre-harvest and soil borne disease ratings were taken post-harvest as well as yield and grade data. Plots were harvested and yield data as well as disease ratings were analyzed for statistical analysis. There were no statistical differences in crop yield, grade, or disease ratings from the four different rates of innoculum compared to the check.



Lsd. 493 lb/ac. No differences between treatments.

Research shows after two years there has not been a benefit to using an innoculant on land after it has been in peanuts for at least three years.