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NATIONAL PEANUT BOARD / SOUTHEAST PEANUT RESEARCH INITIATIVE

FINAL REPORT for WORK DONE UNDER RESEARCH AGREEMENT # 26-31-RE671-573 GACCP PNUT BEASL

QUARTER ENDING: 31 December 2014

INSTITUTION: University of Georgia

PROJECT TITLE: Peanut Response to Agronomic Management

RES. AGR. NO.: 26-31-RE671-573
PROJECT LEADER: Dr. John P. Beasley, Jr.

EXPIRATION DATE: 31 December 2014

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FINAL REPORT: The following trials were planted in Georgia in crop year 2013 evaluating peanut response to various agronomic management factors.

1) **Cultivar Response to Calcium**
Trials were initiated at three locations to determine large and medium seed size cultivar response to calcium levels and amendments. Georgia-06G served as the large-seeded cultivar and Georgia Greener served as the medium seed size cultivar. Trials were established at the Southwest Georgia Research and Education Center near Plains (a sandy, clay loam soil), on the UGA Ponder Research Farm in Tift County near Ty Ty (a loamy sand soil type), and on the Stripling Irrigation Research Park in Mitchell County near Camilla (soil type classified as a sand). The calcium level in the pegging zone immediately after planting was determined for each location. Calcium amendments were via gypsum (calcium sulfate, CaSO4) and applied at 500, 1,000, and 1,500 pounds of gypsum per acre. There was an untreated check to account for four treatments. At each location the experimental design was a randomized complete block in a 2 X 4 factorial arrangement of treatments. Plots were two rows by 40 feet in length and there were four replications. Gypsum was applied by hand at approximately 45 days after planting. Data collected were: pegging zone calcium levels at planting, prior to gypsum application (approximately 45 after planting), approximately 90 days after planting, and immediately prior to harvest; yield; grade; and seed germination percent.

Results – This project was established and conducted by Jason Arnold, M.S. degree student. The two tables below are the data from the 2012 and 2013 crop years as part of this research.

Yield and quality parameters by location and cultivar[a] in Georgia pooled over crop years 2012 & 2013.

Treatments	Yield and Quality Parameters						
	Yield	TSMK	Jumbo kernels	Medium kernels	Germination	Vigor	Seed Ca
	kg/ha	----------%----------					*mg/kg*
				Location			
Plains	6544 b	75.2 b	30.6 b	20.4 a	97.2	95.5	832.16 a
Tifton	7612 a	77.2 a	35.6 a	17.0 b	97.9	96.6	778.67 b
				Cultivar			
Georgia-06G	7187	76.2	35.9 a	17.7 b	97.6	95.7	786.11 b
Georgia Greener	6970	76.1	30.3 b	19.8 a	97.6	96.3	824.72 a

a. Means followed by the same letter within the same parameter are not significantly different at the P<0.05

Yield, TSMK, seed size and seed Ca by gypsum rate for peanut grown in Plains and Tifton, Ga pooled over crop years 2012 & 2013.

Gypsum rate	Yield	TSMK	Jumbo Kernels	Medium Kernels	Seed Ca (mg/kg) [a]	
kg/ha	*kg/ha*	----------%----------			*SWREC*	*CPES*
0	6898	76.0	33.5	18.6	710 c	735 b
560	7048	75.9	33.3	18.2	790 b	771 ab
1120	7141	76.3	32.9	18.9	912 a	790 ab
1680	7253	76.3	32.6	19.1	916 a	819

a. Means followed by the same letter within the same column are not significantly different at the P<0.05

Data in the second table indicates there was no statistical difference in yield at the different gypsum rates although the 560, 1120 and 1680 kg/hectare rates were numerically higher than the 0 rate.

2) **Cultivar X Row Pattern X Tillage**

A trial was established at the RDC Pivot on the University of Georgia's Tifton Campus to determine cultivar response to the interaction of row pattern and tillage. Cultivars were: Georgia-06G, Georgia-07W, Georgia-09B, Georgia-12Y, Florida-07, FloRun '107', TUFRunner '727, and Tifguard. The row patterns were single versus twin row and the tillage comparisons were conventional (deep turned with a moldboard plow) versus strip till with a KMC strip till unit. A wheat cover crop was planted in the fall of 2011. The wheat cover crop was sprayed

with glyphosate and paraquat approximately 30 days prior to planting at both locations. Planting date for the RDC Pivot location was May 16. Plot size was two rows by 40 feet in length. There were four replications. The experimental design was a split-plot with tillage serving as the main plot and the cultivar by row pattern interaction serving as the sub-plot. Data to be collected will be yield and grade factors. Objective is to determine if the current cultivars respond differently to the interaction of tillage and row pattern.

Results – data analysis for yield indicated there was no interaction among the three parameters (tillage, cultivar, row pattern) and there was no two-way interactions between tillage and cultivar, tillage and row pattern, or cultivar and row pattern. The only parameter in which there was a difference indicated by statistical analysis was for cultivars. The table below indicates the mean yield for cultivars when averaged over tillage and row pattern.

	Cultivar	Yield (lbs/A)	Spotted Wilt (%)	TSMK (%)
1	Georgia-06G	6292	6.42	76.8
2	Georgia-07W	5842	6.81	76.1
3	Georgia-09B	5837	7.98	75.4
4	Georgia-12Y	6855	4.43	73.1
5	Georgia Greener	5698	7.54	76.7
6	Florida-07	5855	12.71	72.1
7	FloRun '107'	5970	11.46	73.9
8	TUFRunner 727	6006	14.66	75.3
9	Tifguard	5618	7.99	75.1
	LSD (0.05)	352	3.63	1.1

Statistical analysis of spotted wilt disease indicated no three-way or two-way interactions but there was a significant difference for row pattern (single row pattern = 10.3% and twin row pattern = 7.5%) when averaged over tillage and cultivar and for cultivar (data in table above) when averaged over tillage and row pattern. Data analysis for percent total sound mature kernels (TSMK) indicated no three-way or two-way interactions and the only difference was for row pattern (single row pattern = 74.7% and twin row pattern = 75.2%) and cultivar (data in table above).

3) **On-Farm Trials**

On-farm trials were established with University of Georgia County Extension Agents on producers' fields to evaluate cultivars planted in large plots on growers' fields. Irrigated cultivar trials in 2013 were established in Early, Berrien, and Effingham Counties. Non-irrigated trials were established in Berrien and Jenkins Counties. All locations were established as a randomized complete block with the plot size varying in length (length of field) and width (planter width). Most trials were at least 6 rows wide by approximately 1,000 feet in length. The number of cultivars included at each location also varied. Data to be collected at each site will be yield and grade factor data.

Results – The data from the Berrien County irrigated trrial is in the table below.

Treatment Name	Yield Lbs/A	TSMK %	Other Kernels %	Stand Plts/ft
TUFRunner 727	5715.5 c	75.0 d	2.0 d	47.8 a
Tifguard	5941.5 bc	75.0 d	3.0 c	38.3 a
Georgia-07W	5987.5 ab	76.0 c	3.0 c	38.0 a
Georgia-09B	6030.5 ab	77.0 b	3.0 c	42.3 a
Georgia-06G	6095.5 ab	78.0 a	2.0 d	45.5 a
FloRun '107'	6128.8 ab	72.0 e	4.0 b	35.3 a
Georgia-12Y	6247.3 a	72.0 e	5.0 a	42.5 a
LSD (P=.05)	265.87	0.00	0.00	12.93

The data from the Berrien County non-irrigated trial is in the following table.

Treatment Name	Yield Lbs/acre	TSMK %	Other Kernels %	Stand Plts/ft
Georgia-06G	5080.5 cd	76.0 a	2.0 d	37.8 c
Georgia-07W	5538.8 ab	76.0 a	2.0 d	45.3 b
Georgia-09B	5634.0 a	75.0 b	3.0 c	40.0 bc
Georgia-12Y	5304.0 abc	72.0 c	3.0 c	54.8 a
Tifguard	5131.8 bcd	72.0 c	3.0 c	43.5 bc
FloRun '107'	5415.3 abc	75.0 b	4.0 b	52.5 a
TUFRunner 727	4853.8 d	72.0 c	5.0 a	29.8 d
LSD (P=.05)	420.44	0.00	0.00	6.48

The data from the Effingham County Cultivar Trial is in the table below.

Treatment Name	Yield Lbs/acre	TSMK %	OK %
Georgia-09B	3449.3 a	71.7 ab	5.7 a
Georgia-06G	4073.0 a	72.0 ab	4.7 a
FloRun '107'	4147.1 a	68.0 c	6.9 a
Georgia Greener	4164.0 a	72.7 a	4.3 a
Florida-07	4348.0 a	68.3 c	6.0 a
Georgia-07W	4600.5 a	69.5 bc	6.4 a
LSD (P=.05)	763.30	2.67	1.83

This data indicates no difference in yield among the cultivars but there were differences in percent TSMK.