National Peanut Board

Proposal for Southeastern Peanut Research Initiative for 2017

I. Identification

a. Project Title: Comparison of nematicide/insecticides in peanut with an optimal vs. less than optimal rotation
b. Funding Year- Jan.1, 2017-Dec. 31, 2017
c. Principal Investigators-
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OBJECTIVE

To compare a 4 year rotation comprising 2 years of bahiagrass followed by peanut and cotton (sod-based rotation; SBR) (optimal rotation) with a conventional 3 year rotation comprising 1 year of peanut followed by 2 years of cotton (conventional rotation-less than optimal rotation) in terms of peanut yield and quality.

METHODS

The study was part of a long term research initiative being conducted at the North Florida Research and Education Center in Quincy, FL. The soil is a Dothan sandy loam consisting of 85% sand, 5% silt, and 10% clay. A 4 year sod-based rotation (SBR) (Bahia-Bahia-Peanut Cotton with either oats or carinata as the winter cover crop) was compared to a 3 year conventional rotation (Peanut-Cotton-Cotton rotation with oats as winter cover crop) both with and without irrigation in terms of its influence on peanut yield and quality.

On March 21, 2017, Roundup at 22 oz/A was applied to all plots without Bahia to kill the winter cover crop. Planting date 1 (PD1) study was planted on May 2 (all plots following oats except half of the SBR plots that still had carinata as the winter crop). Half the rows of the conventional rotation received Velum Total at 18 oz/A applied into the seed furrow. Planting date 2 (PD2) study was planted on June 9 only in the SBR plots (that is peanuts following Bahia with carinata as the winter crop). GA 06G peanuts inoculated with liquid primo inoculant were planted using a single row Monosem planter at the rate of 6 seed/ft of row. Immediately after planting, Strongarm@0.45 oz/A + Pendimethalin @ 40 oz/A + Liberty (29 oz/A) were broadcast sprayed on all peanuts. Fungicide regimen included the following applications: Parazone @ 6 oz/A + Induce @ 16 oz/100gal + Stalwart @ 21oz/A at approximately 25 DAP, Cadre @ 2oz/A + Echo @ 24 oz/A at 36 DAP, Stalwart @ 21 oz/A + Induce @ 16 oz/100 gal and Priaxor at 8 oz/A at 57

DAP, Artisan at 21 oz/A + Echo at 16 oz/A+ Dimlin at 2 oz/A at approximately 70 DAP, Provost at 9oz/A at approximately 80DAP, Provost at 9 oz/A at 97 DAP, Topsin at 10 oz/A+ Echo at 16 oz/A at 113 DAP and the same application again at 127 DAP. Plots received irrigation at 0.6 inches each on May 10, July 5, August 8, and August PD 1 peanuts were inverted and harvested on Oct. 2 while PD2 peanuts were harvested on October 26. All samples were weighed, a10 lb subsample was taken from each for calculating yield on a 10% moisture basis. Grading was done on a 600g sub-sample to determine percentages of sound mature kernels, damaged kernels and other kernels.

RESULTS

Planting Date 1: Comparing treatments that received no velum, average peanut yield in the SBR was 6187 lb/A and in the conventional rotation was 5160 lb/A. Irrigated plots yielded slightly greater than non-irrigated plots (6051 lb/A and 5652 lb/A, respectively). Non-irrigated conventional peanuts had significantly lower yield than irrigated conventional treatment and both irrigated and non-irrigated SBR treatments. Only conventional rotation received velum fir the PD1 study. There were no significant differences in yield between treatments that received Velum and those that did not. Planting Date 2: Yields for planting date 2 were significantly lower than PD1. Non irrigated plots yielded slightly lower than the irrigated plots. Use of Velum did not significantly affect yield

Table 1: Yield comparisons for irrigated and non-irrigated sod based rotation and conventional rotations with or without Velum application for an early (PD1) and late planting (PD2)

Rotation	**Irrigation**	**Velum**	**Yield (lb/A)-PD1**	**Yield (lb/A)-PD2**	**Grade (%)**	**Sound Mature Kernel (%)**	**Other (%)**	**Damaged (%)**
SBR	YES	NO	6481 aA	4452 aB*a*	76/78.5	92.7/ 90.3	5.2/9.0	1.4/0.6
Conv	YES	NO	5525 ab*a*		73	92.4	4.0	2.0
SBR	NO	NO	5891 abA	4257 aB*a*	76/78	91.7/ 92.8	7.0/5.0	0.71/1.7
Conv	NO	NO	4795 b*a*	-	76.1	93.1	4.7	1.6
SBR	YES	YES	-	4793a*a*	78.2	96	2.5	0.8

Conv	YES	YES	5145*a*	-	74.4	93.1	5.5	2.4
SBR	NO	YES		4164a*a*	78.6(PD2)	96.0(PD2)	2.3(PD2)	1.0(PD2)
Conv	NO	YES	4780*a*	-	75.4	84.1	14.3	1.0

Means with the same letter are not significantly different. Lowercase letters indicate significance within column (rotation and irrigation) while upper case letters indicate significance within row (planting date); italicized letters indicate significance within a column (use of velum). For SBR (without velum) two values are reported for grade, SMK, other and damaged for PD1 and PD2.

DISCUSSION

The SBR peanut yielded higher than the conventional rotation. Lack of significant differences seems to be due to a block effect this year. As we have seen in most years non-irrigated peanuts in the SBR yielded higher than the irrigated peanuts in conventional rotation and significantly greater than the non-irrigated conventional peanuts indicating the resilience of the SBR especially under dry conditions. Peanut quality was not significantly different in any system, regardless of irrigation. Cover crops in the conventional system make that system competitive with the SBR. However, SBR clearly helps maintain an economically significant lead in yield especially in rain fed systems. Late planted peanuts were affected in terms of yield but not quality. This is unlike in 2016 where late planted peanuts yielded higher than the early peanuts. Optimum planting and harvesting dates as well as late season disease management for late planted peanuts needs to be evaluated. Application of Velum did not seem to have an impact on yield in the conventional rotation both under irrigated and non-irrigated conditions. However in the SBR under irrigated conditions Velum seemed to have an yield advantage over plots that did not receive Velum. Continued research will help understand if and why these two systems respond differently to Velum. Impact of these systems on soil health and resource use efficiency can also be better understood from continued work.