

Evaluating Peanut Cultivars Planted by
Conventional + Reduced Tillage methods
& Twin vs Single Row Patterns

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Title: Impact of tillage, row spacing and variety on peanut yield and diseases

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Objectives: 1. Investigate impact of tillage, row spacing and variety on yield, percentage of Tomato Spotted Wilt Virus (TSWV) and Leaf Spot (LS) on peanut. 2. Determine pod quality and economic significance.

Experimental Design: A split-split plot design with six replications (blocks) was used with two tillage treatments (main treatment), three row spacing treatments (split-plot treatment), and three varieties (split-split plot treatments (see tables for treatment description)). Statistics was standard ANOVA with appropriate mean separation by F test or LSD.

Management: Previous winter cover crop was rye. Rye was tilled in three weeks before planting for conventional tillage and rye was killed with Roundup for strip till three weeks before planting. The 30 and 36-inch treatments were planted with KMC strip till planters. The twin 10-inch rows over 36 inch centers were planted with a modified Brown-Harden strip till planter. Peanut was planted on 21 April 2005 at a rate of 120 pounds viable seed per acre adjusted for stated germination. Irrigation was applied as needed. Fertilization and pest management was based on standard recommendations for high yield production. Peanut crop was harvested at 152 days after planting 19 September 2005 and dried to 9% moisture in forced air wagons. Sub-samples were saved for pod and seed quality testing (will be completed in winter 2006).

Data: Data on pod yield and pest incidence is found in Tables 1 to 8. Conclusions are stated at the bottom of each table.

NPB
ID-156

Table 1. Peanut pod yield averaged over three varieties as impacted by interaction between tillage and row spacing, PSREU, 2005.

Row Spacing	Tillage	
	Strip	Conventional
Pod yield, pounds/acre		
30 inch	6102 A	5736 B NS
Twin-10 inch on 36 inch centers	5483 B	6294 A *
36 inch	5632 B	5286 B NS

Values in columns within tillage treatment not followed by the same letter are significantly different at $p = 0.05$ or higher according to LSD. Values in rows between tillage treatments within a row spacing are significantly different at $p = 0.05$ or higher if designated by a * or are not significantly different if designated by NS according to LSD.

Conclusions:

30 inch and 36 inch: equal yield between tillage treatments

Twin-10 inch on 36-inch centers: higher yield for conventional tillage compared to strip till

Twin-10 inch on 36 inch centers and 36 inch: equal yield but lower than 30 inch for strip till

30 inch and 36 inch: equal but lower yield than twin-10 inch on 36 inch centers for conventional tillage

Table 2. Peanut pod yield averaged over three row spacing as impacted by interaction between tillage and peanut variety, PSREU, 2005.

Variety	Tillage	
	Strip	Conventional
Pod yield, pounds/acre		
Georgia Green	5771 A	5537 B NS
FL 3081R	5843 A	5817 AB NS
GA 03L	5602 B	5962 A *

Values in columns within tillage treatment not followed by the same letter are significantly different at $p = 0.05$ or higher according to LSD. Values in rows between tillage treatments within a variety are significantly different at $p = 0.05$ or higher if designated by a * or are not significantly different if designated by NS according to LSD.

Conclusions:

Georgia Green and FL 3081R: equal yield between tillage treatments

GA 03L: higher yield for conventional tillage compared to strip till

Georgia Green and FL 3081R: equal but higher yield than GA 03L for strip till

GA 03L and FL 3081R: equal yield for conventional tillage

FL 03L and Georgia Green: equal yield for conventional tillage

GA 03L: higher yield than Georgia Green for conventional tillage

Table 3. Infestation of Tomato Spotted Wilt virus (TSWV) on peanut averaged over three varieties and three row spacing as impacted by tillage, PSREU, 2005.

Tillage	
Strip	Conventional
TSWV infestation, %	
18.91	31.49 *

Values between tillage treatments designated by a * are significantly different at $p = 0.05$ or higher according to F test.

Conclusions:

Greater TSWV infection for conventional tillage compared to strip till

NPB
ID-156

Table 4. Infestation of Tomato Spotted Wilt virus (TSWV) on peanut averaged over two tillage and three varieties as impacted by row spacing, PSREU, 2005.

Row Spacing		
30 inch	Twin 10 inch on 36 inch centers	36 inch
TSWV infestation, %		
26.22 W	22.79 W	26.59 W

Values among row spacing followed by the same letter (W) are not significantly different at $p = 0.10$ according to F test.

Conclusions:

Row spacing did not affect TSWV infestation

Table 5. Infestation of Tomato Spotted Wilt virus (TSWV) on peanut averaged over two tillage and three row spacing as impacted by peanut variety, PSREU, 2005.

Peanut variety		
Georgia Green	FL 3081R	GA 03L
TSWV infestation, %		
26.41 W	17.32 X	31.86 W

Values among row spacing not followed by the same letter (W, X) are significantly different at $p = 0.05$ or higher according to LSD.

Conclusions:

Less TSWV infestation was found on FL 3081R compared to the other varieties
Georgia Green and GA 03L had equal infestation of TSWV

Table 6. Infestation of Leaf Spot (LS) on peanut averaged over three row spacing and three peanut varieties impacted by tillage, PSREU, 2005.

Tillage	
Strip	Conventional
LS rating (1 no infection to 10 completely infected)	
1.4	1.5 NS

Values between tillage treatments designated by NS are not significantly different at $p = 0.10$ according to F test.

Conclusions:

Tillage did not affect LS rating

Table 7. Infestation of Leaf Spot (LS) on peanut averaged over two tillage and three peanut varieties as impacted by row spacing, PSREU, 2005.

Row Spacing		
30 inch	Twin 10 inch on 36 inch centers	36 inch
LS rating (1 no infection to 10 completely infected)		
1.4 W	1.4 W	1.5 W

Values among row spacing followed by the same letter (W) are not significantly different at $p = 0.10$ according to F test.

Conclusions:

Row spacing did not affect LS rating

Table 8. Infestation of Leaf Spot (LS) on peanut averaged over two tillage and three row spacing as impacted by peanut variety, PSREU, 2005.

Peanut variety		
Georgia Green	FL 3081R	GA 03L
LS rating (1 no infection to 10 completely infected)		
1.3 X	1.6 W	1.4 X

Values among varieties not followed by the same letter (W, X) are significantly different at $p = 0.05$ or higher according to LSD.

Conclusions:

Higher rating of LS was found on FL 3081R compared to other varieties