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"INTEGRATED MANAGEMENT OF TOMATO SPOTTED WILT, FUNGAL DISEASES AND INSECT PEST OF PEANUT."

Final report of the results from tests conducted in 2010 evaluating different seed densities and reduced fungicide applications upon the incidence of Peanut diseases on five peanut varieties.

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Summary

Impact of Seed Density upon Peanut Diseases.

When data from all varieties were combined differing seed density per row-ft. did not have an effect upon the incidence of Early Leaf Spot but did have an impact upon the incidence of Rust and TSWV; lower seed density showed lower levels of Rust and higher levels of TSWV. Varieties Florida 06 and Georgia 07 had significantly less Early Leaf Spot and TSWV. Rust incidence was only significantly different between Georgia Green (more susceptible) and Tifguard and York (less susceptible).

Impact of Reduced fungicide application frequencies upon Peanut diseases.

When data from all varieties were combined the reduction of fungicide applications from 7 per season to 4 per season did not have a significant impact upon the incidence of Early Leaf Spot and Rust. The incidence of TSWV was not affected by the reduction of fungicide applications during the growing season. Georgia Green was significantly more susceptible to specific peanut diseases than a number of the other peanut varieties tested

We recommend that this test be conducted during at least two more growing seasons to validate the efficacy of reduced fungicide application to take into consideration possible weather variations. Regarding the weather for 2010, it should be noted that several environmental events may have impacted the occurrence and severity of the various diseases of peanuts evaluated. In January and February there were more than 30 consecutive days of below 30° F night time temperatures at the experimental site. During the growing season we experienced two conditions of note the first was 45 consecutive days of 95° F days which had rainfall that was limited to several events that produced almost all of the rainfall for this period. Lastly, in September and October we experienced a period in excess of 30 days without rain.

This test evaluated the impact of three seed densities per foot of planted row upon the incidence and severity of Early leaf spot, Late Leaf Spot, Rust, White Mold, and Tomato Spotted Wilt on five peanut varieties.

The experiment was located at the UF PSREU in Citra, FL and planted in Myakka fine sand soil that had Bahia grass cover for the past three years. The field experiment was designed as split plots with five replicates of paired 20-foot-rows evaluated for each treatment. The seed density per row-ft. was the independent variable and variety was the dependent variable. The varieties were randomized within each seed density block, and each seed density block was also randomized within each replicate block. There were five replicated blocks planted. Data for each disease was collected biweekly throughout the test starting in June and ending in September. Fungicide applications were made on the weeks not sampled. Disease data collected was disease severity recorded as percent infection.

Results by seeding density based on combined data from all varieties:

The impact of seeding density upon severity of disease was only obvious for f Rust and Tomato Spotted Wilt Virus (TSWV) (Table 1). Rust severity was lowest at three seeds/row ft. and highest at six seeds/row ft. The reverse was true for TSWV. Early Leaf Spot severity was not affected by the changes in seeding density in this test.

The impact of the seeding density upon specific disease is as follows:

- Early Leaf Spot (*Cercospora aradicola*) severity was not significantly different at any of the seeding densities evaluated.
- Late Leaf Spot (*Cercosporidium personatum*) was not present in the plots this growing season.
- Rust (*Puccinia aradicola*) was most severe at the highest seeding density
- White Mold (*Sclerotium rolfsii*) was not present in the plots this growing season.
- TSWV incidence was greatest at the lowest seeding density

Results by variety:

The impact of seeding density upon the incidence of disease in each of the test varieties is as follows:

Early Leaf Spot was significantly lower in varieties Georgia 07 and Florida 06 compared to the varieties Tifguard, York and Georgia Green. Evaluating the disease progress throughout the growing season using AUDPC showed that the variety Tifguard had the greatest amount of Early Leaf Spot and was significantly different from varieties Florida 06, York and Georgia Green which were not significantly different from each other but were significantly different from Tifguard and Georgia 07. Georgia 07 had the lowest incidence of Early Leaf Spot

Rust. York had the lowest Rust severity and Rust-AUDPC and Georgia Green" the highest with the other varieties being intermediate

Tomato Spotted Wilt Virus incidence was the highest in Georgia Green and the other varieties did not differ in incidence of the virus. Evaluation of TSWV using AUDPC showed that 'Georgia Green' had significantly greater levels of infection than York, Georgia 07 and Tifguard but was not significantly different from Florida 06.

Table 1- Evaluation of the effect of three, four, and six seed per foot of row upon the incidence of selected peanut diseases in five peanut varieties.

Treatment Var/ Seed Density	Percent Early Leaf Spot	AUDPz ¹ - Early Leaf Spot	Percent Rust	AUDPC- Rust	TSWV/ Row-ft. infected	AUDPC- TSWV	Yield lbs/Plot	Yield lbs/A	Pesticide cost/A
Georgia 07	32.0B ^y	832.5C	48.66AB C	340.5BC	4.32B	340.67BC	14.04A B	6115.8	\$83.52
Florida 06	34.66B	1097.5B	55.33AB	382.67A B	3.0B	382.67AB	14.57A	6346.6	\$83.52
Tifguard	47.66A	1822.17 A	46.33BC	333.67B C	6.37B	333.67BC	13.61B	5928.5	\$83.52
York	48.0A	1099.33 B	40.33C	296.33C	4.18B	296.33C	11.68D	5087.8	\$83.52
Georgia Green'	48.0A	1191.67B	60.33A	422.33A	17.55A	422.33A	12.05C	5248.98	\$83.52
3 Seed/Ft row	44.8A	1154.8B	45.4B	309.4B	9.87A	309.40B	12.99B	5658.4	\$83.52
4 Seed/Ft row	40.0A	1131.3B	48.6AB	355.6AB	6.97AB	355.60AB	13.13B	5719.4	\$83.52
6 Seed/Ft row	41.4A	1339.8A	56.6A	400.4A	4.41A	400.40A	13.72A	5976.4	\$83.52

^zAUDPC = area under the disease progress curve

^yValues followed by the same letter are not significantly different from each other P<0.05. ANOVA and LS means were determined using SAS 9.2.

Table.2 Evaluation of peanut variety susceptibility to selected diseases when seedling density is varied.

Var/sd	Early Leaf Spot			Rust			TSWV		
	3	4	6	3	4	6	3	4	6
Georgia 06	30.0B ^z	32.0B	34.0A	49.0A	46.0B	51.0AB	0.7B ^y	0B	0.5A
Florida 07	34.0B	29.0B	41.0A	54.0A	45.0B	68.0A	0.6B	0.2B	0.1A
Tifguard	54.0A	42.0AB	47.0A	38.0A	46.0B	57.0AB	1.08AB	0.28B	0.4A
York	48.0A	49.0A	47.0A	43.0A	38.0B	42.0B	0.32B	0.4B	2.0A
Georgia Green	58.0A	48.0A	41.0A	46.0A	68.0A	67.0A	2.16A	2.36A	0.18A0.7A

^z Values followed by the same letter are not significantly different when the data is analyzed using ANOVA and means are separated using Fisher's LSD test when P<0.05.

^y Values reported under TWSV are foot of plot(x/40) infected with the virus

This test evaluated the impact of three fungicide application frequencies upon the incidence and severity of Early Leaf Spot, Late Leaf Spot, Rust, White Mold, and Tomato Spotted Wilt on five peanut varieties.

The experiment was located at the UF PSREU in Citra, FL and planted in Myakka fine sand soil that had Bahia grass cover crop for the past three years. The field plot was designed as split plots with five replicates of paired 20-foot-rows evaluated for each treatment. The fungicide application frequency was the independent variable and variety was the dependent variable. The varieties were randomized within each fungicide application frequency block, and each fungicide application frequency block was also randomized within each replicate block. There were five replicated blocks planted. Data for each disease was collected biweekly throughout the test starting in June and ending in September. Fungicide applications were made on the week's not sampled (Table 3). Disease data collected was severity recorded as percent infection.

Results by fungicide application frequency:

The impact of fungicide application frequency was apparent when looking at the severity of Early Leaf Spot and Rust (Table 4 and 5). The higher frequency of fungicide application produced significantly less disease than the less frequent fungicide applications. TSWV infection was not affected by the fungicide application frequency (Table 4). The impact of the fungicide application frequency upon specific disease is as follows:

Early Leaf Spot was significantly lower when seven fungicide applications were made throughout the growing season compared to three fungicide applications. However, the amount of disease was not significantly different when seven or four fungicide applications were made during the growing season.

Late Leaf Spot was not present in the plots this growing season.

Rust was significantly less when comparing seven or four fungicide applications throughout the growing season compared to three applications.

White Mold was not present in the plots this growing season.

TSWV incidence was not significantly different at any of the fungicide application frequencies tested.

Results by variety:

The impact of fungicide application frequency upon the incidence of disease in each of the test varieties is as follows:

Early Leaf Spot. Georgia 07 had significantly less Early Leaf Spot than Georgia Green and Tifguard, however the amount of Early Leaf Spot was not significantly different between Georgia 06 and Florida 07. When examining Early Leaf Spot using AUDPC for the entire growing season Georgia Green and Tifguard had the greatest amount of Early Leaf Spot and were not significantly different from each other but were significantly different from Georgia 07, Florida 06 and York.

Late Leaf Spot was not present in the plots this growing season.

Rust. Georgia Green had a significantly higher rust severity than Tifguard but not greater than Georgia 07, Florida 06 and York. Georgia Green had the highest rust AUDPC and Tifguard the lowest while the other varieties tested were intermediate.

White Mold was not present in the plots this growing season.

Tomato Spotted Wilt Virus. Georgia Green had a significantly higher TSWV incidence of Georgia 07, Florida 06, Tifguard and York. An examination of the AUDPC for TSWV showed the same results.

Table 3- Application dates and fungicides rates applied at differing frequencies.

Treatments	Product/Rate	A ²	B	C	D	E	F	G
Treatments 1-5	Headline 2.35oz/A	1.48 ml						
	Provost 8 oz/A			5.04 ml				
	BravoWeatherstik 1.5Pt/A						14.8 ml	
Treatments 6-10	Headline 2.35oz/A	1.48 ml						
	Provost 8 oz/A		5.04 ml		5.04 ml			
	BravoWeatherstik 1.5Pt/A						14.8 ml	
Treatments 11-15	Headline 2.35oz/A	1.48 ml						
	Provost 8 oz/A		5.04 ml	5.04 ml	5.04 ml	5.04 ml		
	BravoWeatherstik 1.5Pt/A						14.8 ml	14.8 ml

²Application dates June 2, 2010=A; June 16, 2010=B; July 8, 2010=C; July 22, 2010=D; August 5, 2010=E; August 19, 2010=F; and August 31, 2010=G. Three fungicide applications were (ACF); four fungicide applications were (ABDF); and seven fungicide applications were (ABCDEFG).

Table 4- Evaluation of the impact of three, four, and 7 fungicide applications upon the incidence of selected peanut diseases on five peanut varieties’.

Treatment Var/App Freq	Percent Early Leaf Spot	AUDPC ^z - Early Leaf Spot	Percent Rust	AUDPC- Rust	TSWV Row- ft.infected	AUDPC- TSWV	Yield/Plot	Yield/A (LBS/A)	Pesticide cost/A
Georgia 07	41.33B ^y	975.2B	67.33AB	538.33AB	5.48B	5.07B	10.12BC	4408.3	
Florida 06	48.0AB	1010.3B	68.66AB	552.33AB	3.48B	2.138B	11.38AB	4957.1	
Tifguard	59.0A	1827.5A	51.33B	376.0B	1.2B	1.448B	12.32A	5366.6	
York	53.33AB	953.2B	68.33AB	506.0AB	2.58B	2.838B	8.08C	3519.6	
Georgia Green	63.0A	1462.7A	79.0A	647.0A	13.3A	13.246A	11.0AB	4809.0	
3 Applications	59.0A	1314.2A	78.2A	583.6A	5.7A	4.615A	10.30A	4486.68	\$27.90
4 Applications	52.8AB	1230.6A	63.4AB	528.2AB	5.39A	3.922A	10.18A	4434.41	\$44.56
7 Applications	47.0B	1192.5A	59.2B	460.0B	4.53A	6.306A	11.25A	4900.5	\$83.52

^z-AUDPC = area under the disease progress curve

^y Values followed by the same letter are not significantly different from each other at P<0.05. ANOVA and LS means were determined using SAS 9.2.

Table.5 Evaluation of peanut variety susceptibility to selected diseases when fungicide application frequency is varied.

Var/FAF ^y	Early Leaf Spot			Rust			TSWV		
	3	4	7	3	4	7	3	4	7
Georgia 06	43.0B	42.0A	39.0B	75.0A	59.0AB	68.0A	1.2A ^x	0.34B	0.1B
Florida 07	55.0AB	46.0A	43.0AB	80.0A	68.0AB	58.0AB	0.5A	0.4B	0.15B
Tifguard	65.0AB	56.0A	56.0A	70.0A	47.0B	37.0B	0.13A	0.15B	0.1B
York	58.0AB	60.0A	42.0AB	79.0A	65.0AB	61.0AB	0.24A	0.04B	0.1B
Georgia Green	74.0A	60.0A	55.0A	87.0A	78.0A	72.0A	0.78A	0.96A	2.24A

^z Values followed by the same letter are not significantly different at P<0.05. ANOVA and LS means were determined using SAS 9.2.

^y FAF is fungicide application frequency.

^x Values reported under TWSV are foot of plot(x/40) infected with the virus.