Evaluation of Peanut Prescription Rx Program in Mississippi

Introduction:

The Peanut Prescription Rx Program was developed by researchers from Georgia, Alabama, and Florida in an effort to reduce the number of fungicide application made to peanuts. This program has proven successful in these areas for several years, and some growers in Mississippi are trying this on their farms. The program utilizes field history, variety, rotation, as well as other factors to determine the risk of infection from a particular disease. After the risk has been assessed, a prescription fungicide recommendation can then be made. Because of the relative newness of peanuts in Mississippi, disease inoculums should be low in many areas of the state. This study is designed to evaluate the effectiveness of this program in Mississippi.

Material and Methods:

This study was conducted in Lucedale, MS in 2009, and repeated in Lucedale and Hamilton, MS in 2010. To encourage disease development in the field, an older variety with less disease resistance was chosen. This was to help ensure that disease developed in the study site to determine if differences could be detected. Treatments in this study included the standard fungicide program, the Peanut Rx program, and an untreated check. The standard program received leaf spot applications beginning at 30, 45, 75, 105, and 120, days after emergence, as well as white mold applications at 60 and 90 days after emergence. The Peanut Rx program was modified slightly to increase the probability of disease. Each location was assumed to have had no history of peanuts. In reality, the Hamilton location was in its second consecutive year of peanuts, the Lucedale location in 2009 was in peanuts followed by 2 years of cotton prior to the study, and the Lucedale location in 2010 was peanuts followed by cotton followed by corn prior to the study. Leaf spot applications were made at 45 and 105 days after emergence, and white mold applications were made at 75 days after application. The untreated check was left untreated during the entire growing season for diseases.

Georgia Green peanuts were planted in each location, as they were one of the most susceptible varieties available. Planting dates were May 10 in Lucedale in 2009, May 11 in Lucedale in 2010, and May 26 in Hamilton. Treatments were arranged in a randomized complete block design with 4 replications. All plots at a location were maintained the same throughout the season with the exception of the fungicide treatments. All fungicide treatments were made with a boom type sprayer calibrated to deliver 15 gallons of water per acre.

Leaf spot ratings were taken using the Florida peanut leaf spot scoring system where 1 = no disease, 2 = very few spots on leaves in canopy, 3 = few leaf spots in lower and upper canopy, 4 = some leaf spots in lower and upper canopy with light defoliation (<10%), 5 = leaf spots numerous with significant defoliation (<50%), 7 = leaf spots numerous with heavy defoliation (<75%), 8 = numerous spots on few remaining leaves with severe defoliation (<95%), and 10 = plants defoliated or dead. Yield was determined by mechanically harvesting the center 2 rows of each plot.

Results:

There were no differences between the standard treatment and the modified Peanut Rx treatment at any location for leaf spot, white mold, or yield (Tables 1-3, Figures 1-9). Both fungicide programs did reduce disease levels for leaf spot and white mold as well as increased yields compared to the untreated check both years in Lucedale (Tables 1-2, Figures 1-6), however disease pressure was so low at the Hamilton location that no differences in disease or yield could be detected (Table 3, Figures 7-9). When data from all three locations was averaged together, both of the fungicide programs significantly reduced the level of disease and increased yield compared to the untreated check. There were no differences between the two fungicide programs (Table 4, Figures 10-12).

Discussion:

Due to the relative newness of peanuts in the state combined with the fact that growers have been doing a good job of rotating peanuts in Mississippi, disease inoculums remain low at this point. This study was designed to test the Peanut Rx program as much as possible and yields were not compromised. The number of fungicide applications was reduced from seven in the standard program to three in the Peanut Rx program at a cost savings of approximately $70 per acre. This is a significant savings to peanut producers in Mississippi and should give them a competitive advantage provided the system is not misused. Rotation is critical to reducing disease inoculums.

There are also newer varieties available that can provide not only higher yield potential, but disease resistance as well. By incorporating newer varieties into the Peanut Rx program, growers in Mississippi may be able to reduce the need for fungicides even more than shown here.

Table 1. Lucedale, 2009

Description Rating Type	Leaf Spot Damage 1-10 Lucedale, 2009	White Mold Hits/50 Feet	Yield Pounds/Acre
Trt Treatment No. Name			
1 Standard	2 b	2 b	4418 a
2 Peanut Rx	2 b	1 b	4410 a
3 Check	4 a	4 a	4233 b
LSD (P=.05)	0.6	1.0	56.7
Standard Deviation	0.4	0.6	32.7
CV	13.98	27.74	0.75
Grand Mean	2.67	2.17	4353.5
Bartlett's X2	0.0	0.078	0.802
P(Bartlett's X2)	.	0.962	0.67
Friedman's X2	6.125	6.5	6.0
P(Friedman's X2)	0.047	0.039	0.05

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 2. Lucedale, 2010

Description Rating Type	Leaf Spot Damage 1-10	White Mold Hits/50 Feet	Yield Pounds/Acre
Trt Treatment No. Name			
1 Standard	2 b	2 b	4521 a
2 Peanut Rx	2 b	2 b	4563 a
3 Check	5 a	4 a	4231 b
LSD (P=.05)	0.8	1.2	91.5
Standard Deviation	0.5	0.7	52.9
CV	17.68	28.44	1.19
Grand Mean	2.67	2.42	4438.33
Bartlett's X2	0.464	0.721	2.424
P(Bartlett's X2)	0.793	0.697	0.298
Friedman's X2	6.5	6.125	6.5
P(Friedman's X2)	0.039	0.047	0.039

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 3. Hamilton, 2010

Description Rating Type	Leaf Spot Damage 1-10	White Mold Hits/50 Feet	Yield Pounds/Acre
Trt Treatment No. Name			
1 Standard	0a	0a	2319a
2 Peanut Rx	0a	0a	2281a
3 Check	1a	0a	2309a
LSD (P=.05)	0.6	0.8	186.9
Standard Deviation	0.3	0.4	108.0
CV	200.0	264.58	4.69
Grand Mean	0.17	0.17	2302.75
Bartlett's X2	0.0	0.0	0.286
P(Bartlett's X2)	.	.	0.867
Friedman's X2	1.5	0.375	0.0
P(Friedman's X2)	0.472	0.829	1.00

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 4. Average of all Locations

Description Rating Type	Avg Leaf Spot Dam.	Avg White Mold Hits	Avg Yield (Pounds/Acre)
Trt Treatment No. Name			
1 Standard	1b	1b	3753A
2 Peanut Rx	1b	1b	3751A
3 Check	3a	3a	3591b
LSD (P=.05)	0.4	0.6	48.4
Standard Deviation	0.2	0.3	28.0
CV	12.49	21.34	0.76
Grand Mean	1.83	1.58	3698.19
Bartlett's X2	1.345	0.12	0.629
P(Bartlett's X2)	0.511	0.942	0.73
Friedman's X2	6.5	6.5	6.5
P(Friedman's X2)	0.039	0.039	0.039

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Figure 1. Lucedale, 2009

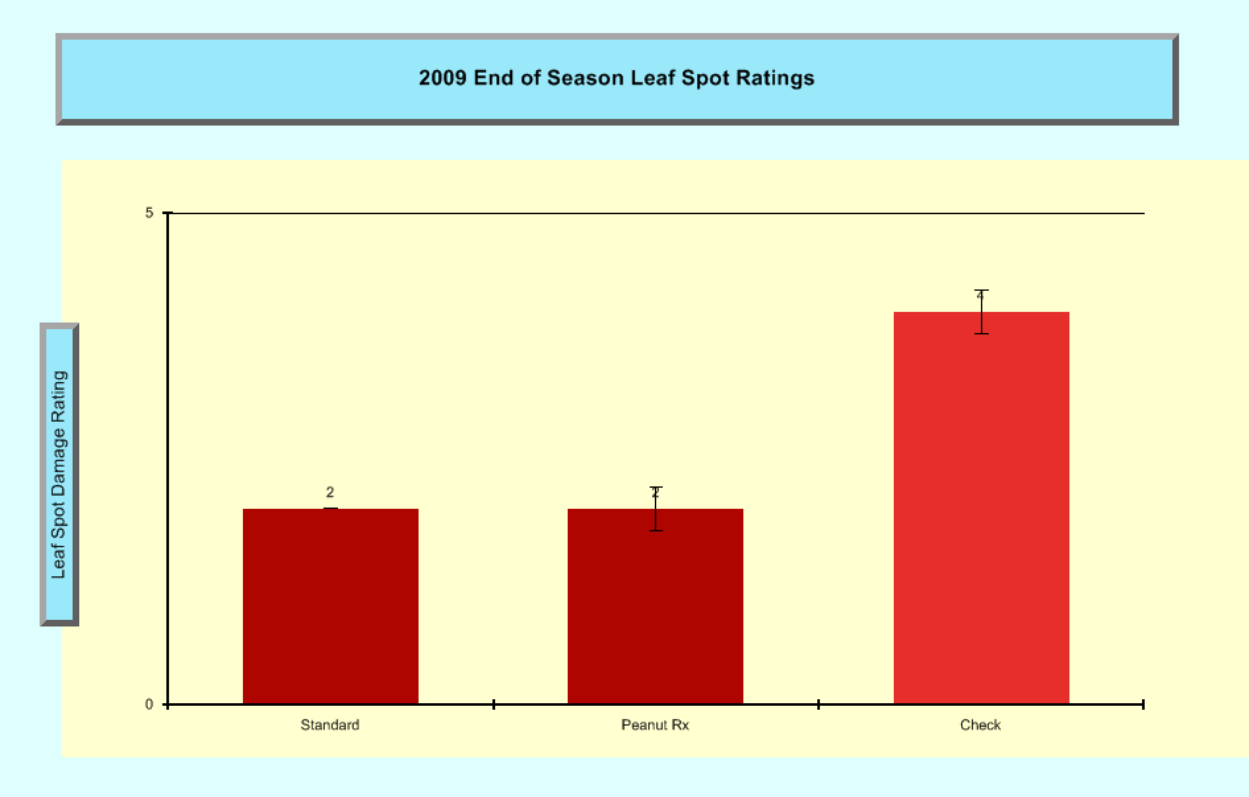


Figure 2. Lucedale, 2009

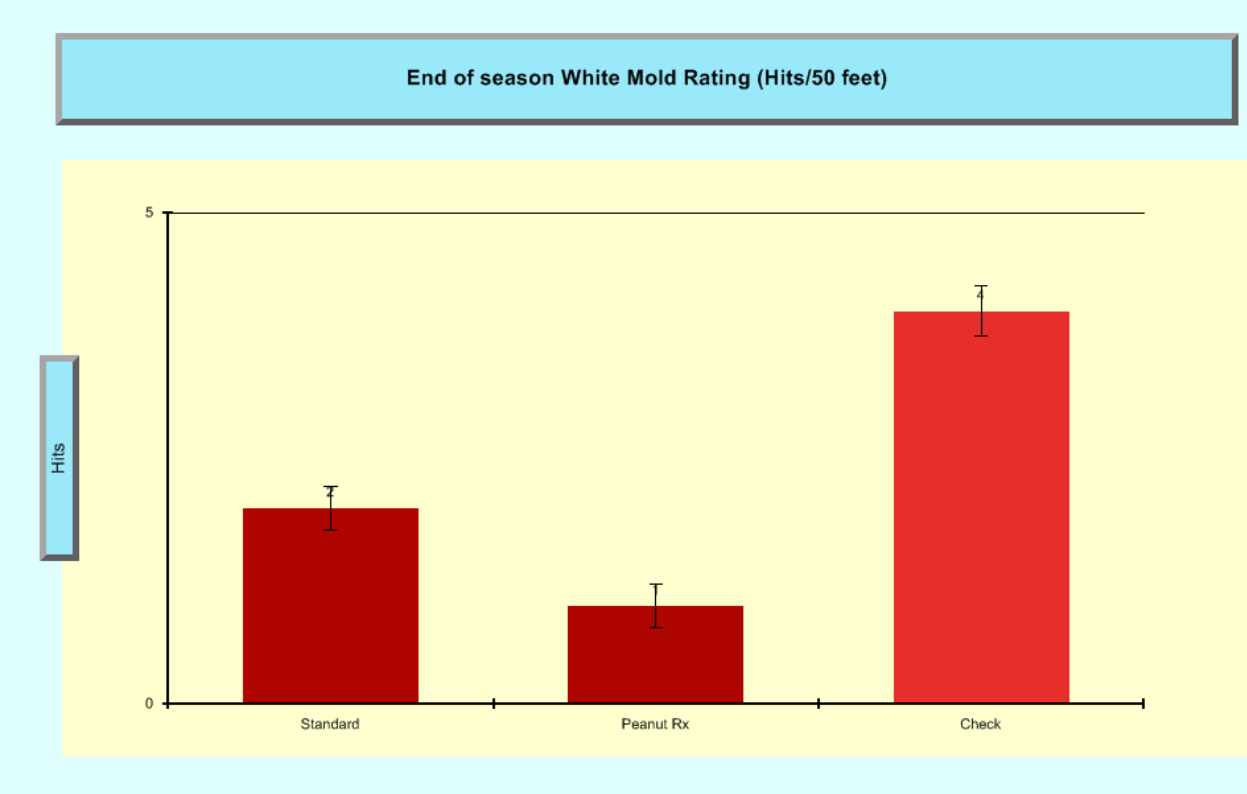


Figure 3. Lucedale, 2009

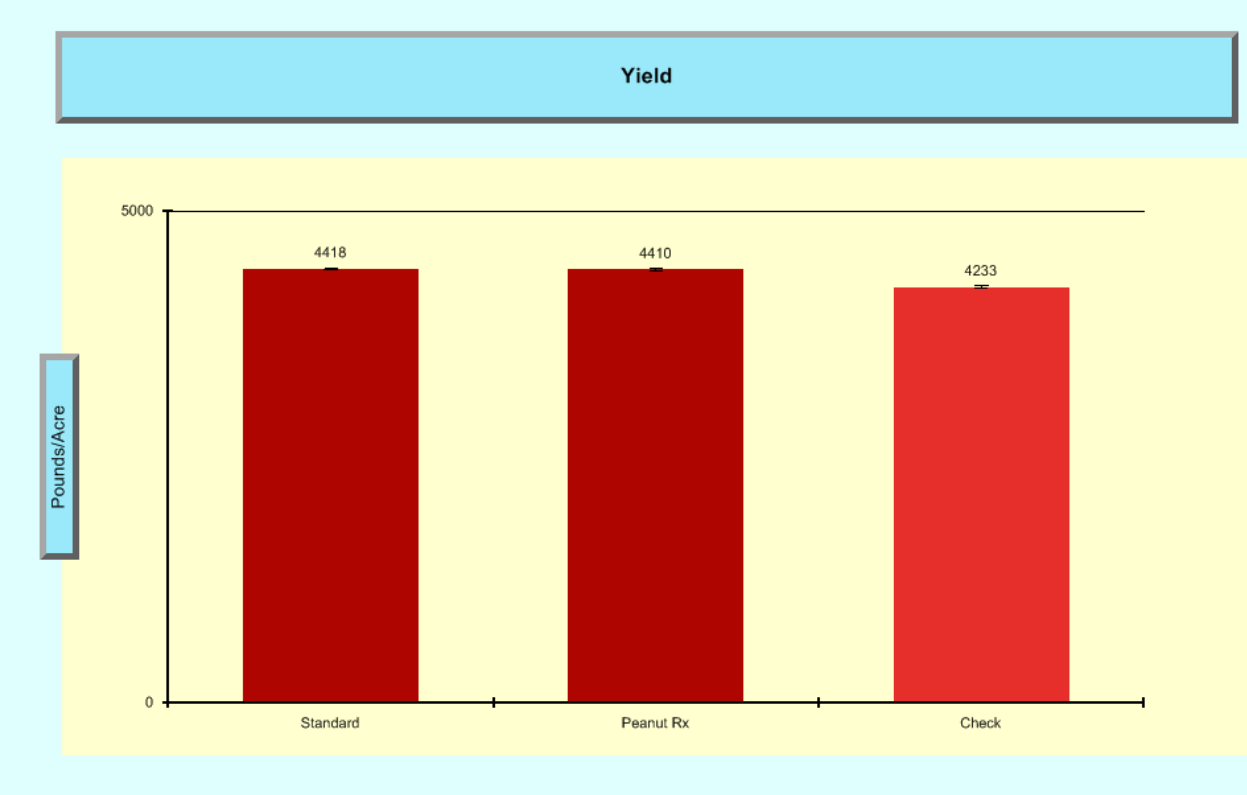


Figure 4. Lucedale, 2010

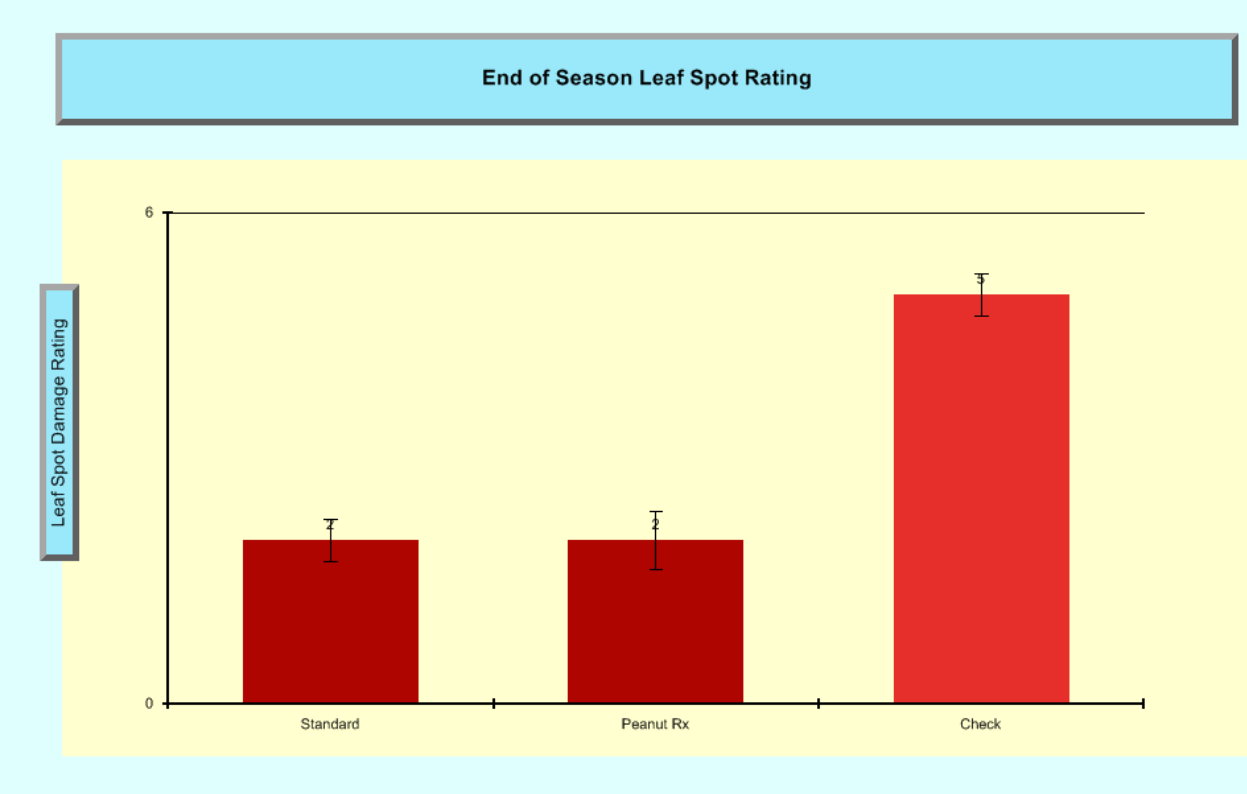


Figure 5. Lucedale, 2010

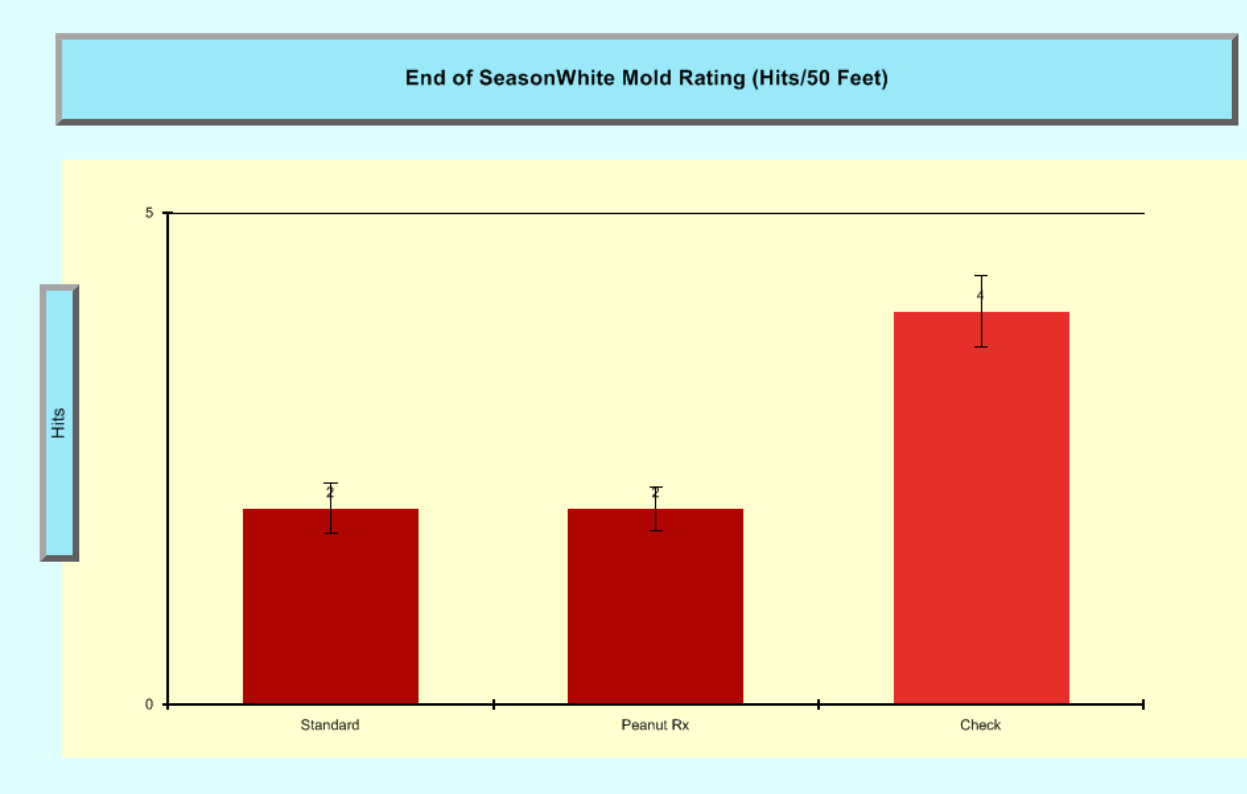


Figure 6. Lucedale, 2010

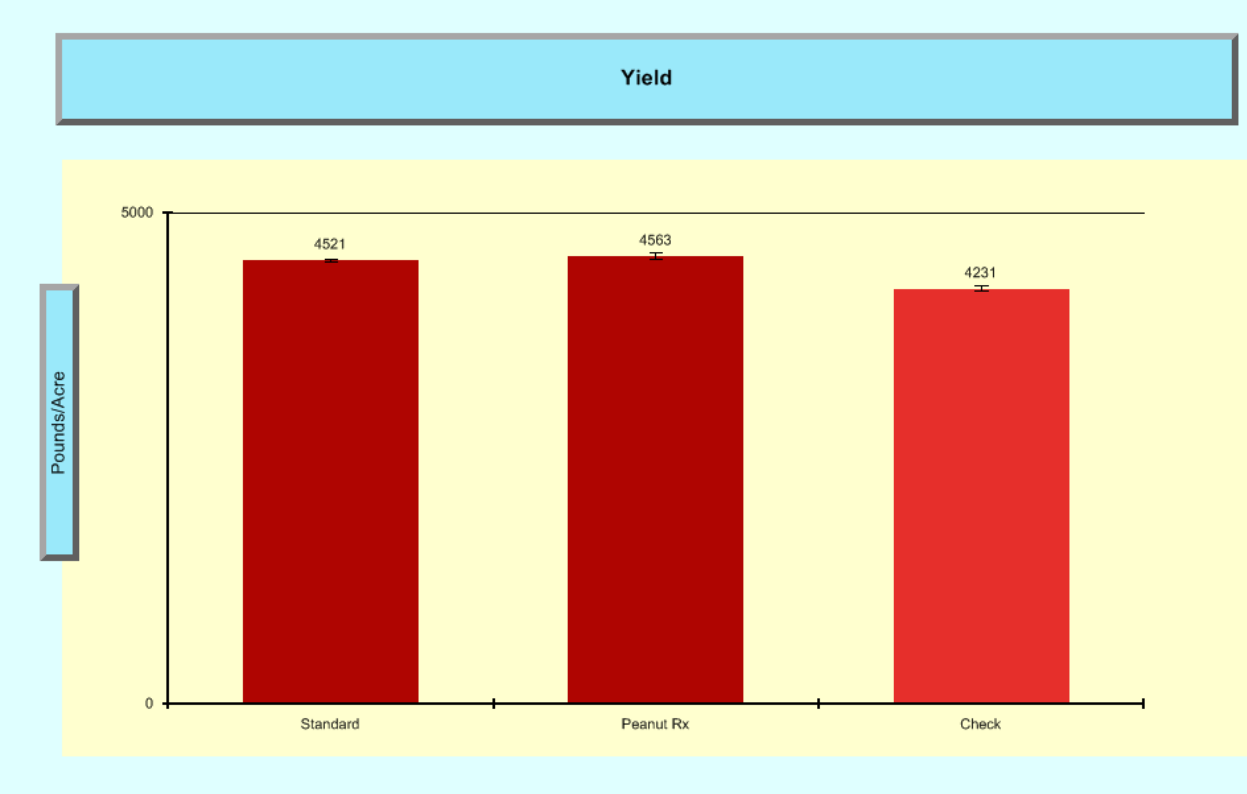


Figure 7. Hamilton, 2010

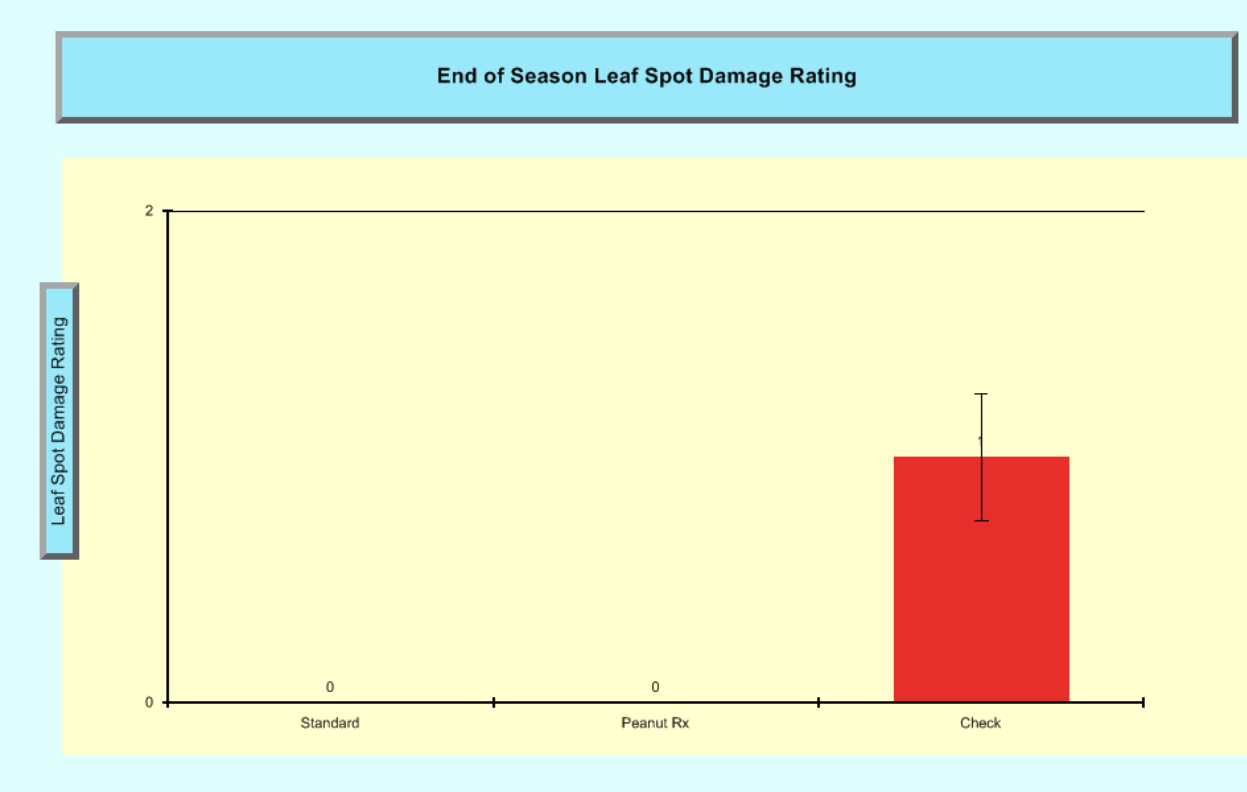


Figure 8. Hamilton, 2010

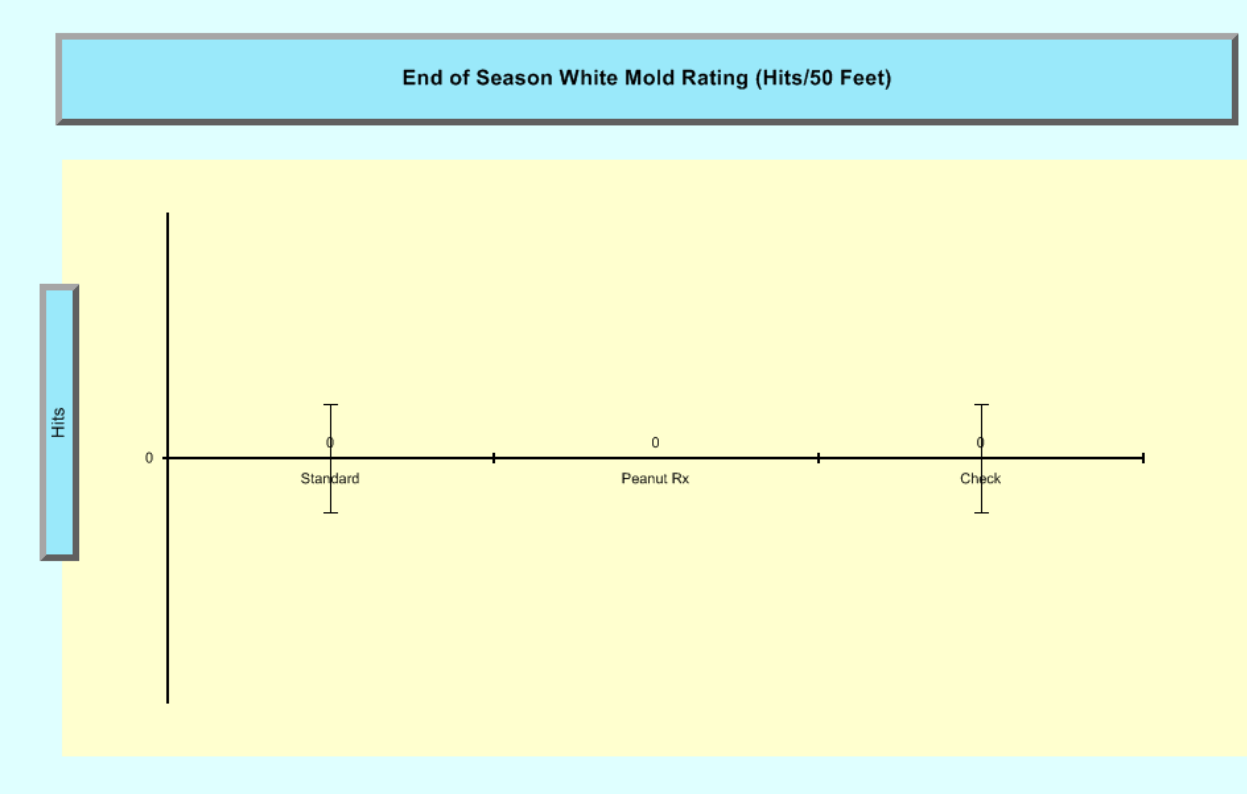


Figure 9. Hamilton, 2010

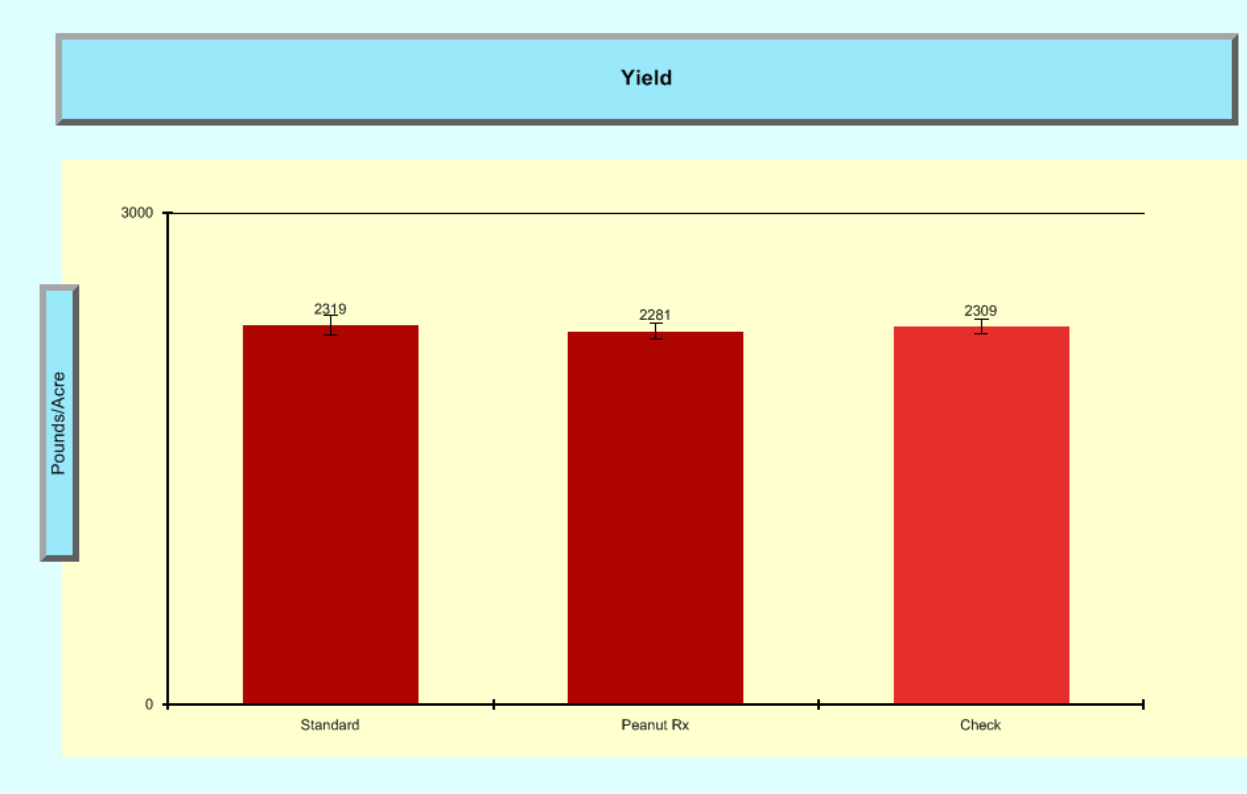


Figure 10. Average of all Locations

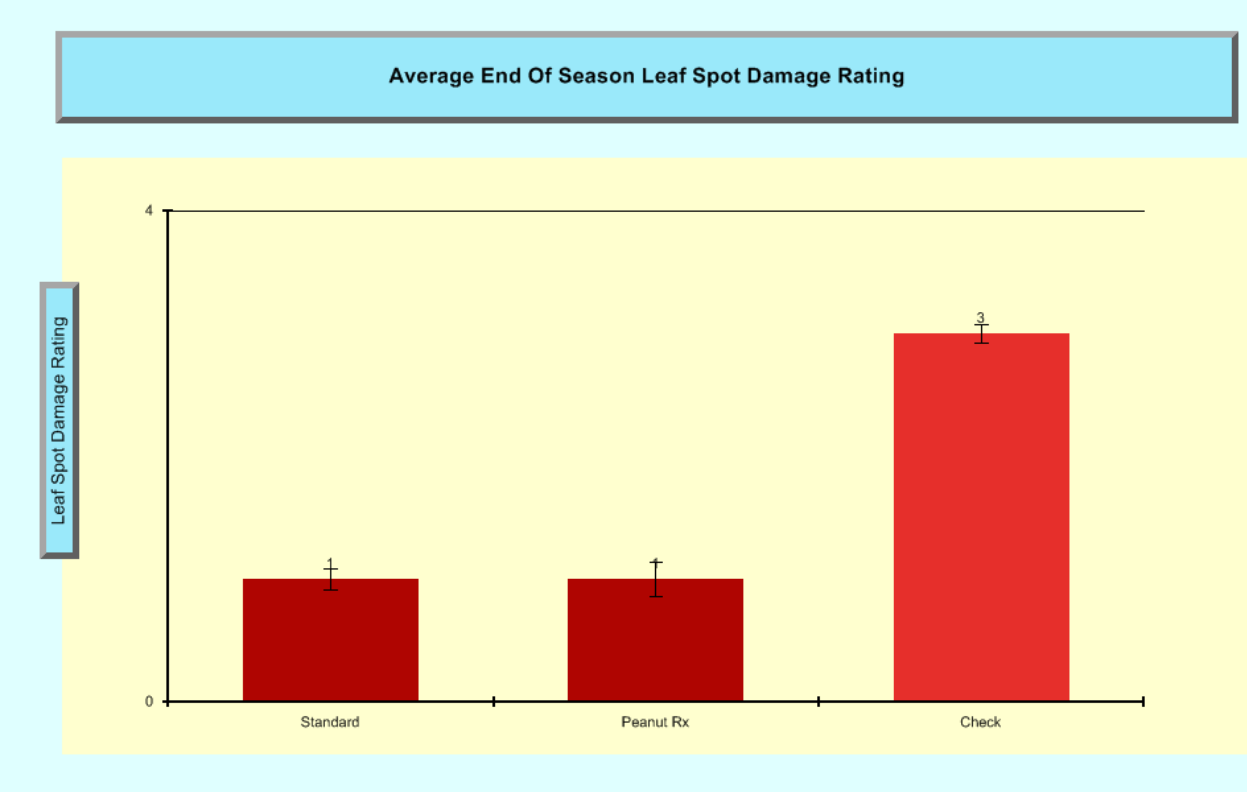


Figure 11. Average of all Locations

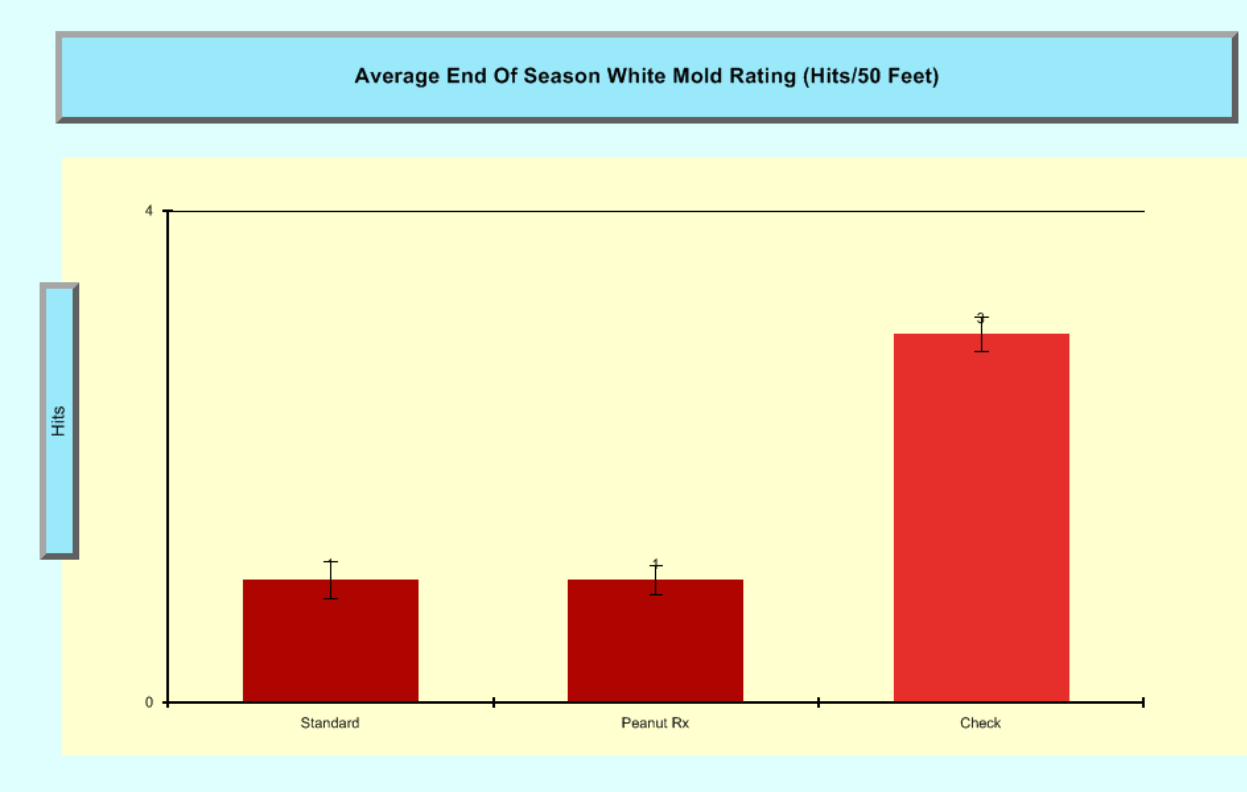
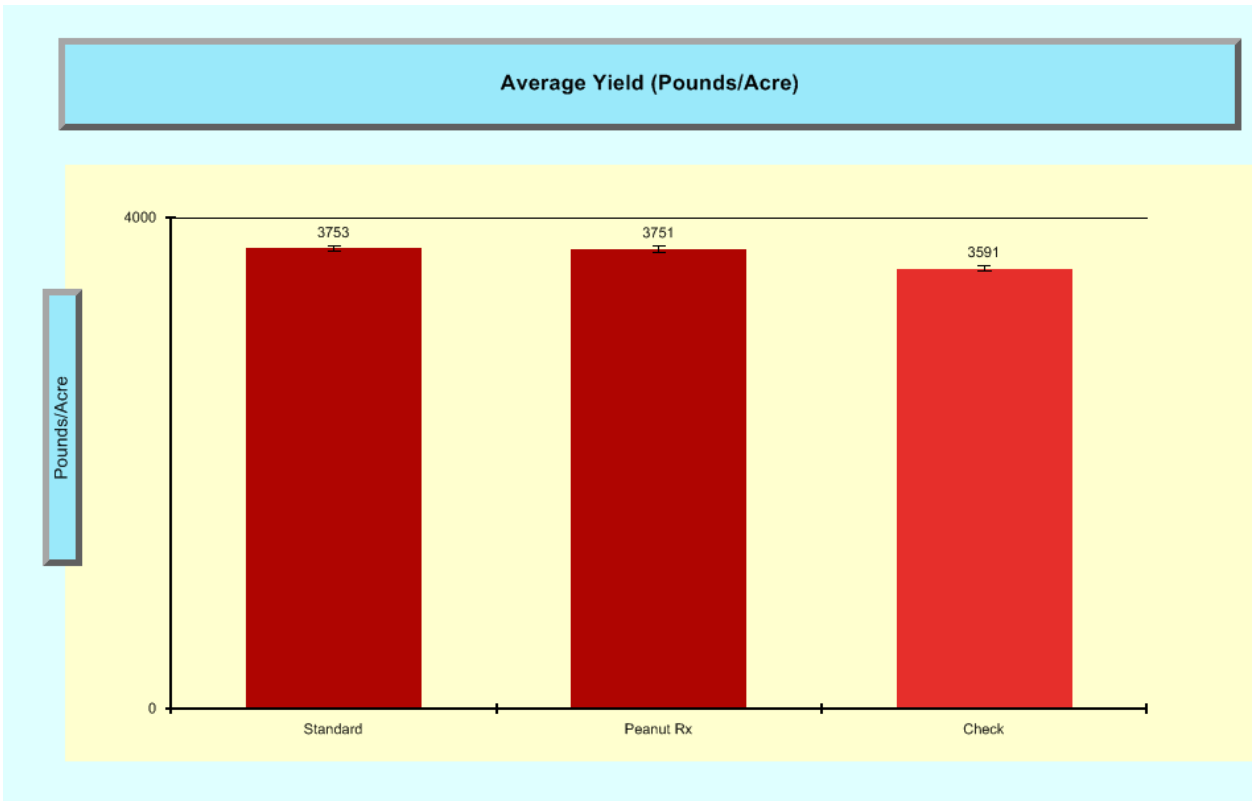


Figure 12. Average of all Locations


Average Yield (Pounds/Acre)
Pounds/Acre
4000
0
3753
3751
3591
Standard
Peanut Rx
Check