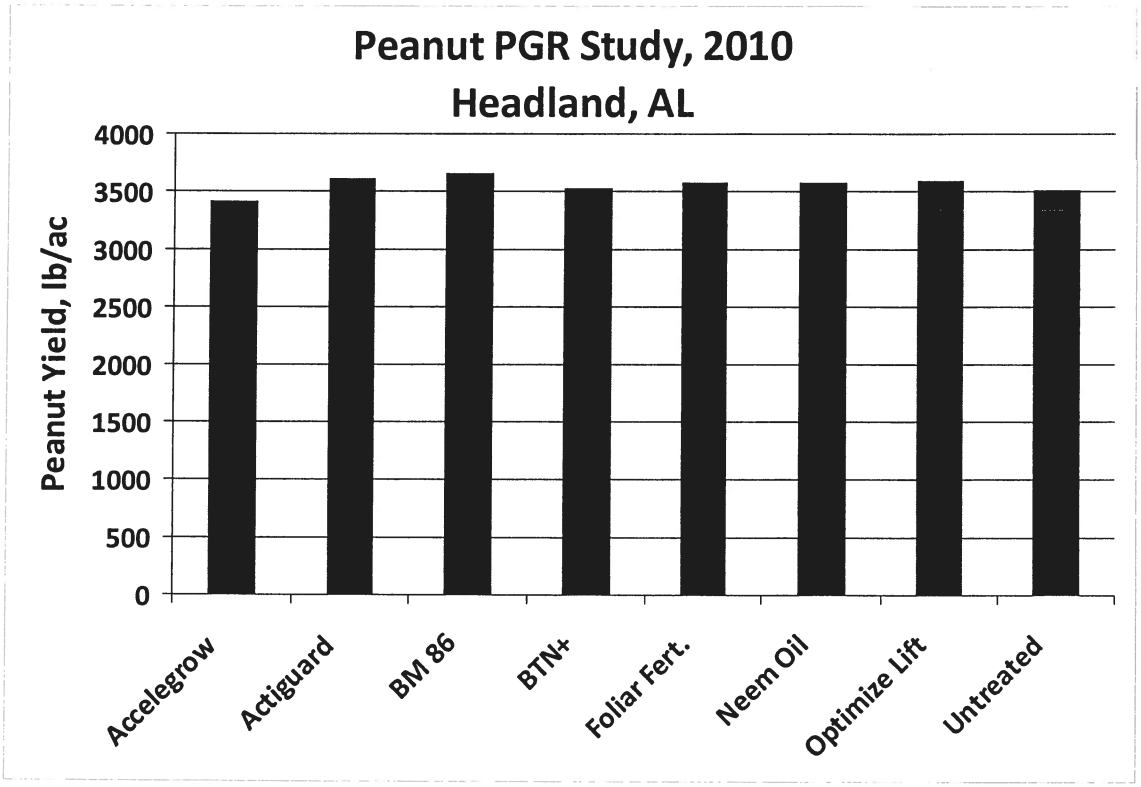
24+
AL-57
899
2010
final +
Summary

Project Title: Influence of foliar fertilizers and inoculants on peanut yield and grade.
Fund No. 367371 (APPA-RIA03-FOLIAR FERT-10)

Final Report of Progress: Research plots were established for the 2010 crop season at the Wiregrass Research and Extension Center in Headland, Al. as part of this multi-state project. The purpose of this research was to determine if there were any differences in yield and grade from the addition of various types of foliar fertilizers and inoculants. Plots were planted the 25th of May and harvested for yield. Data was analyzed for statistical differences.



After running statistical analyses on the data there were no significant differences between treatments.

297
899/900
2010

National Peanut Board
Southeastern Peanut Research Initiative
Project Annual Report / Summary
January 1 - December 31, 2010

Project Leader: Barry J. Brecke

Title: Influence of foliar fertilizers and inoculants on peanut yield and grade.

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Funding Period: January 1, 2010 to December 31, 2010

Objectives:
1. Examine several foliar fertilizers and soil inoculants to determine if they have yield enhancing qualities.
2. Determine if foliar fertilizers and soil inoculants improve peanut grade.
3. Determine if using foliar fertilizers and soil inoculants result in overall economic gain.

Progress Report

Studies were initiated in Florida, Georgia and Alabama during 2010 at the following locations: West Florida Research and Education Center, Jay, FL, Plant Science Research and Education Unit in Citra, FL, Auburn University Wiregrass Substation, Headland, AL and USDA Peanut Lab, Dawson, GA. The field sites were maintained weed-free and under irrigation throughout the experiment. Products tested included: BTN+, Optimize Lift, BM86, Actiguard, Accelegrow, Neem Oil, and Foliar Fertilizer at Headland AL, BTN+, StimuPro, Optimize/Lift, BM 86, Chaperone, Actiguard, Solubor, Apogee, Accelegrow, Foliar Fertilizer 20-20-20, and Inoculaid

at Dawson, GA and Citra FL and BTN+, StimuPro, Optimize/Lift, BM 86, Chaperone, Actiguard, Solubor, Apogee, Accelegrow, Foliar Fertilizer 20-20-20, Inoculaid, Radiate, Percplus, Calciumplus and CropKarb at Jay, FL (detailed in Tables 1a 1b and 1c).

At all locations Florida 07 peanuts were planted in mid-May into a conventionally prepared seedbed. Herbicides were applied for weed control and were selected to insure that the peanuts were not injured. Hand-weeding was also employed to remove any weeds that escaped control with the herbicides. All plots received broadcast applications of foliar fungicides as appropriate.

Stand counts were recorded for all the at-plant in-furrow treatments. In addition peanut canopy width and peanut row closure were recorded at Jay, Citra and Dawson.

At Jay and Citra we also utilized multi-spectral sensing as part of the data collection process. Plant light interception influences plant growth. Light that is intercepted by the plant is either absorbed, transmitted, or reflected. When a plant is under stress, reflectance of certain wavelengths changes. Therefore, by quantifying the reflected light, multi-spectral sensing technology can detect the level of plant stress. As the level of plant stress increase plant growth decreases and as the level of plant stress decreases, plant growth increase. The advantage of this technology is that plant stress can be detected before any symptoms such as changes in color, growth rate or density are visible.

At termination of the experiment, peanuts were yielded and graded.

Table 1a. Foliar Fertilizer and Inoculant Treatments - Jay, FL

Treatment	Application Rate	Application Timing
BTN+	8qt/A 4qt/A	At Plant 21 days after plant
StimuPro	2 fl oz/A 4 fl oz/A 4 fl oz/A	At Plant At Pegging 14 Days After Pegging
Optimize/Lift	17.5 fl oz/A	At Plant
BM86	1 qt/A 1 qt/A	At Pegging 14 days after Pegging
Chaperone	5 fl oz/A	At Pegging
Actiguard	1 fl oz/A	4 times beginning 30 days after planting - 15 day intervals
Solubor	1 qt/A 1 qt/A	30 days after planting 45 days after planting
Apogee	7.25 oz/A 7.25 oz/A	50% row closure 100% row closure
Accelegrow	4 fl oz/A 4 fl oz/A	30 days after planting 45 days after planting
Foliar Fertilizer 20-20-20	4.5 lb/A 4.5 lb/A	45 days after Planting 60 days after planting
Inoculaid	16 oz/A	7 applications
Radiate	1 fl oz/A	At Pegging
Percplus	24 fl oz/A	30 Days After Planting
Calcium Plus + Percplus	32 fl oz/A + 12 fl oz/A	3 applications (At Pegging, 14 days and 28 days After Pegging)
Crop Karb	32 fl oz/A	90 Days After Planting
Untreated Check		

Table 1b. Foliar Fertilizer and Inoculant Treatments - Citra, FL and Dawson, GA

Treatment	Application Rate	Application Timing
BTN+	8qt/A 4qt/A	At Plant 21 days after plant
StimuPro	2 fl oz/A 4 fl oz/A 4 fl oz/A	At Plant At Pegging 14 Days After Pegging
Optimize/Lift	17.5 fl oz/A	At Plant
BM86	1 qt/A 1 qt/A	At Pegging 14 days after Pegging
Chaperone	5 fl oz/A	At Pegging
Actiguard	1 fl oz/A	4 times beginning 30 days after planting - 15 day intervals
Solubor	1 qt/A 1 qt/A	30 days after planting 45 days after planting
Apogee	7.25 oz/A 7.25 oz/A	50% row closure 100% row closure
Accelegrow	4 fl oz/A 4 fl oz/A	30 days after planting 45 days after planting
Foliar Fertilizer 20-20-20	4.5 lb/A 4.5 lb/A	45 days after Planting 60 days after planting
Inoculaid	16 oz/A	7 applications
Untreated Check		

Table 1c. Foliar Fertilizer and Inoculant Treatments - Headland, AL

Treatment	Application Rate	Application Timing
BTN+	8qt/A 4qt/A	At Plant 21 days after plant
Optimize/Lift	17.5 fl oz/A	At Plant
BM86	1 qt/A 1 qt/A	At Pegging 14 days after Pegging
Actiguard	1 fl oz/A	4 times beginning 30 days after planting - 15 day intervals
Accelegrow	4 fl oz/A 4 fl oz/A	30 days after planting 45 days after planting
Foliar Fertilizer 20-20-20	4.5 lb/A 4.5 lb/A	45 days after Planting 60 days after planting
Neem Oil		
Untreated Check		

Results:

Jay, FL Location

Peanut stress (calculated from light reflectance data) was measured several times during the growing season at Jay. Only Crop Karb reduced peanut stress compared to the Untreated when measured 64 days after planting (Table 2a). When measured 83 days after planting, there were no differences between any of the treatments.

Of the in-furrow treatments studied, StimuPro and Optimize/Lift improved peanut stand by 15% compared to the untreated 7, 14 and 21 days after planting (Figure 1). BTN+ and Inoculaid, the other in-furrow treatments had no effect on peanut stand.

There were some noticeable differences between treatments in peanut canopy rate of growth or time to canopy closure at Jay. Apogee did reduce canopy closure to 56% compared to 67% row closure for the untreated when evaluated 8 wk. after planting (Figure 2). This was expected since Apogee is a plant growth regulator used to reduce foliar growth. Actiguard and BM86 also reduced canopy closure to 56 and 58%. None of the treatments resulted in faster canopy closure than the untreated.

Peanut yield was not affected by most of the treatments at Jay(Figure 3). Radiate (750 lb/A more than untreated) and Accelegrow (500 lb/A more than untreated) appeared to have some positive effect on peanut yield while BM86 and BTN+ may have slightly reduced yield. Peanut grades (Figure 4) were not affected by any of the treatments at Jay.

Citra, FL Location

Peanut plant stress was also measured at Citra, FL. None of the treatments affected plant stress when evaluated 42, 60 or 86 days after planting (Table 2b).

None of the in-furrow treatments improved peanut stand compared to the untreated when evaluated 7, 14 or 21 days after planting (Figure 5). It appears that BTN+ reduced initial stand by about 30% and Optimize/Lift reduced stand by about 20% at the Citra, FL site.

Rate of canopy closure was not affected by any of the treatments at the Citra, FL location. Canopy closure ranged from 57 to 63% when evaluated 56 days after planting (Figure 6).

Peanut yield was not improved by any of the treatments applied to peanut at Citra. Actigard, however, caused about a 10% decrease in yield compared to the untreated. Peanut grade was very similar across all treatments at Citra and did not vary from the untreated (Figure 8).

Headland, AL Location

Of the two in-furrow treatments applied at Headland, AL, neither BTN+ or Optimize/Lift had any effect on rate of peanut emergence (Figure 9). There was little variation between the in-furrow treatments.

There was also no difference in peanut yield between treatments at Headland, AL (Figure 10). Likewise, there was little difference in peanut grade among the treatments (Figure 11). It did appear that grade improved from 70% for the untreated to 73% for the Optimize/Lift treatment even though yield was not impacted (Figure 11).

Dawson, GA Location

None of the peanut yields at Dawson, GA were better than the untreated (Figure 12). However, it appears that Apogee, Chaperone, Optimize/Lift and StimuPro may have reduced yields by about 1000 lb/A.

Summary:

The foliar fertilizers and plant growth regulators evaluated in this study provided little in the way of positive results. In instances where improvements were observed at one site, no change or negative effects were observed for the same treatments at other locations. None of the treatments provided consistent improvement in crop growth, yield and/or grade. These results are similar to those observed in general with plant growth regulators. Effects are inconsistent and can range from positive to no effect to negative at different locations within the same growing season or at the same location over several growing seasons. The results observed with these treatments is dependent on local conditions during the growing season.

Table 2a. Effect of Foliar Fertilizers and Inoculants on Peanut Plant Stress, Jay, FL - 2010.

Treatment	Peanut Stress[1] 64 days	Peanut Stress[1] 83 days
BTN+	0.350	0.297
StimuPro	0.335	0.290
Optimize/Lift	0.326	0.290
BM86	0.360	0.304
Chaperone	0.348	0.303
Actiguard	0.389	0.319
Solubor	0.340	0.293
Apogee	0.344	0.293
Accelegrow	0.319	0.301
Foliar Fertilizer	0.359	0.299
Inoculaid	0.348	0.291
Radiate	0.330	0.286
Percplus	0.361	0.301
Calcium Plus + Percplus	0.335	0.293
Crop Karb	0.310*	0.292
Untreated	0.387	0.304
LSD	0.070	NS

[1]. Peanut stress is calculated from the light reflectance data that was collected. The lower the value, the less stress, the higher the value, the more stress.
* = better than Untreated
** = worse than the Untreated

Table 2b. Effect of Foliar Fertilizers and Inoculants on Peanut Plant Stress, Citra, FL - 2010.

Treatment	Peanut Stress[2] 42 days	Peanut Stress[2] 60 days	Peanut Stress[2] 86 days
BTN+	0.5951	0.8777	0.9090
StimuPro	0.5659	0.8723	0.9061
Optimize/Lift	0.5801	0.8643	0.9039
BM86	0.6107	0.8780	0.9083
Chaperone	0.5770	0.8750	0.9018
Actiguard	0.5879	0.8833	0.9096
Solubor	0.5870	0.8861	0.9044
Apogee	0.5941	0.8869	0.9060
Accelegrow	0.6366	0.8904	0.9106
Foliar Fertilizer	0.5607	0.8743	0.9029
Inoculaid	0.5432	0.8740	0.9085
Untreated	0.5354	0.8706	0.9059
LSD	NS	NS	NS

[1]. Peanut stress is calculated from the light reflectance data that was collected. The lower the value, the less stress, the higher the value, the more stress.
* = better than Untreated
** = worse than the Untreated

Figure 1. Foliar Fertilizer and Inoculant - 2010
Peanut Seedling Emergence/10 ft. row - *Jay, FL*

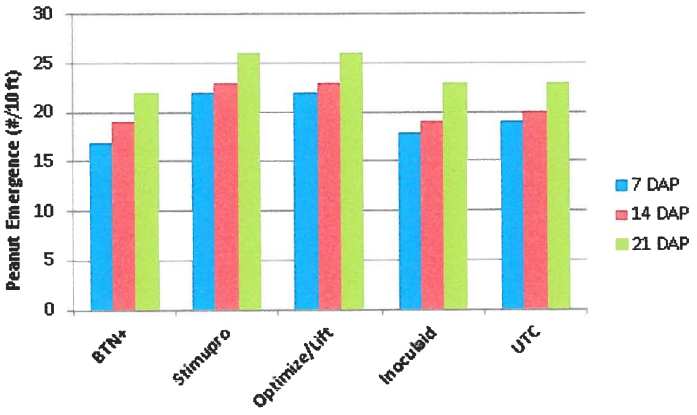

Figure 2. Foliar Fertilizer and Inoculant Study - 2010
Peanut Row Closure 8 wk After Planting – *Jay, FL*

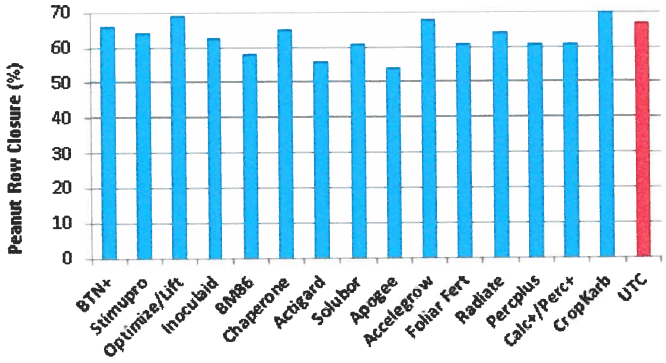

Figure 3. Foliar Fertilizer and Inoculant Study - 2010
Peanut Yield – *Jay, FL*

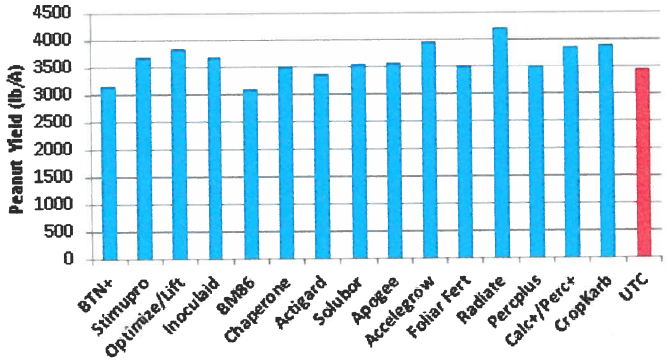

Figure 4. Foliar Fertilizer and Inoculant Study - 2010
Peanut Grades – *Jay, FL*

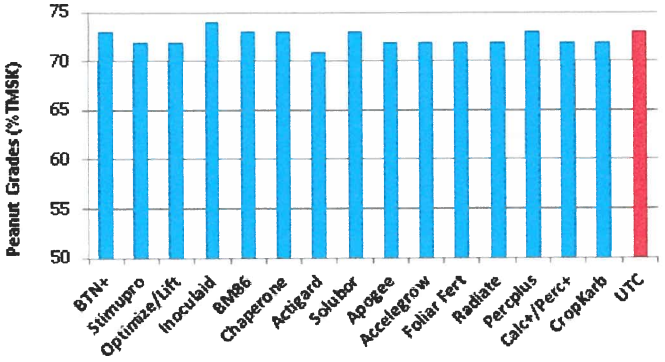

Figure 5. Foliar Fertilizer and Inoculant - 2010
Peanut Seedling Emergence/10 ft. row - *Citra, FL*

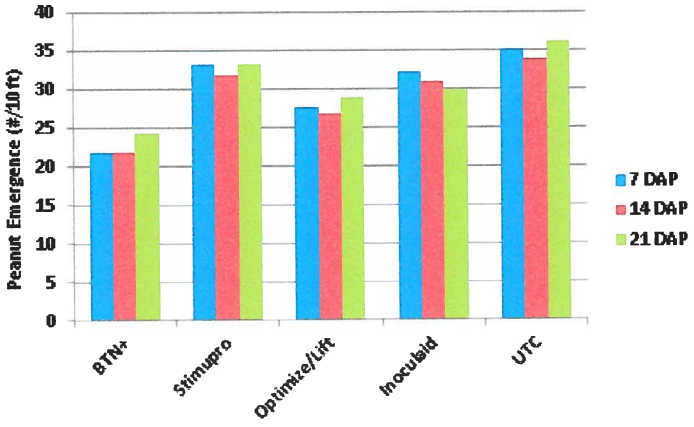

Figure 6. Foliar Fertilizer and Inoculant Study - 2010
Peanut Canopy Width 56 Days After Planting – *Citra, FL*

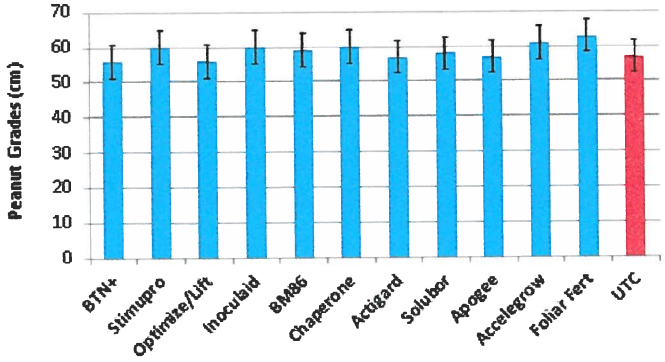

Figure 7. Foliar Fertilizer and Inoculant Study - 2010
Peanut Yield – *Citra, FL*

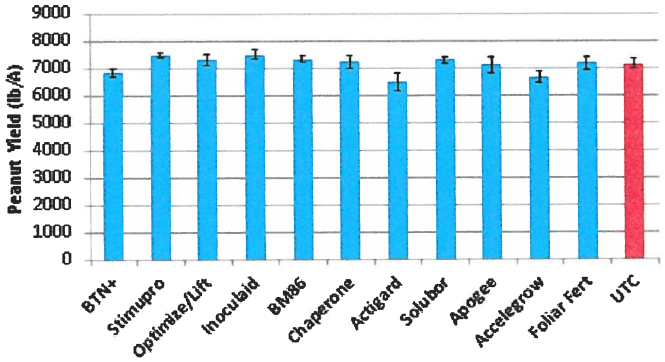

Figure 8. Foliar Fertilizer and Inoculant Study - 2010
Peanut Grades – *Citra, FL*

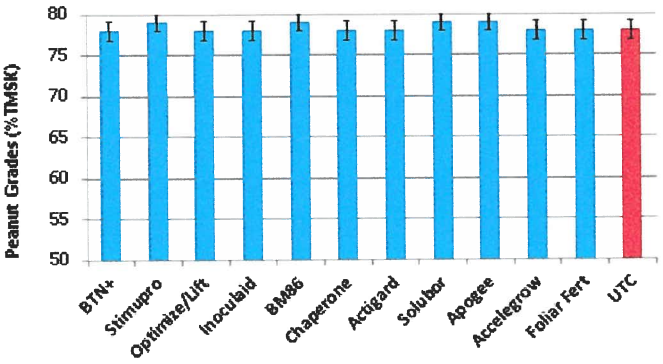

Figure 9. Foliar Fertilizer and Inoculant - 2010
Peanut Seedling Emergence/10 ft. row – *Headland, AL*

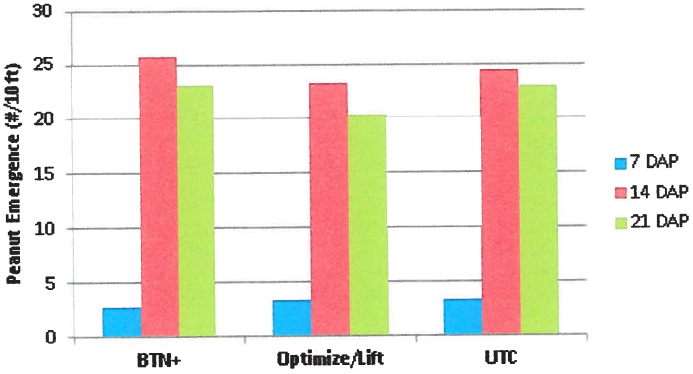

Figure 10. Foliar Fertilizer and Inoculant Study - 2010
Peanut Yield - *Headland, AL*

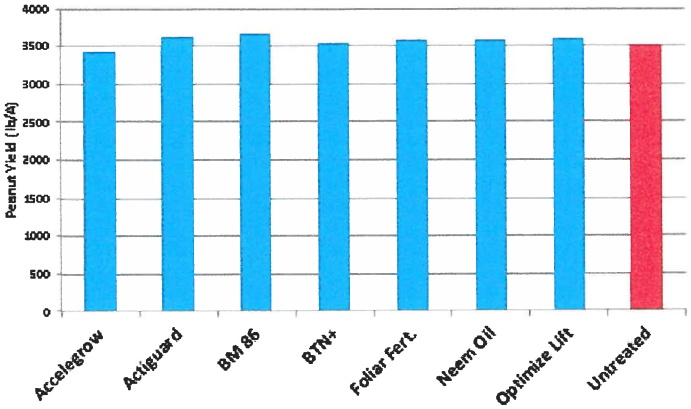

Figure 11. Foliar Fertilizer and Inoculant Study - 2010
Peanut Grades – *Headland, AL*

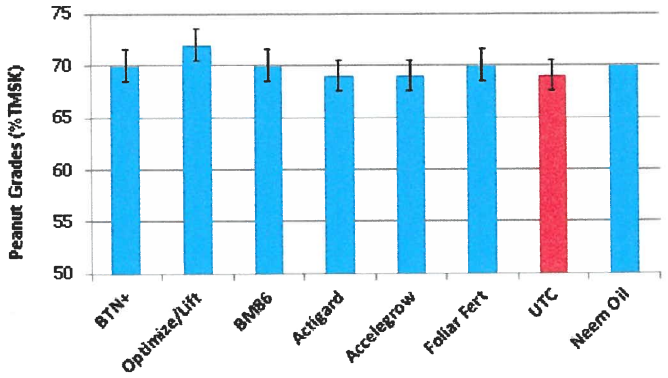

Figure 12. Foliar Fertilizer and Inoculant Study - 2010
Peanut Yield - *Dawson, GA*