

Introduction

Organic peanut production is centered in West Texas with some estimates indicating that as much as 98% of all organic peanuts in the U.S. are being produced in the region. Organic producers face limited options for control of several key production issues. The lack of the ability to apply fungicides and herbicides both at planting and during the season is a major factor in how organic peanuts are managed. The lack of the ability to use commercial seed treatments in organic production systems often results in poor germination and stand establishment which is also a factor in weed control throughout the season.

Results and Discussion

2020 Season

A study was conducted by the Texas A&M AgriLife Research Peanut Breeding Program. Sixteen advanced breeding lines and commercial checks were evaluated for emergence in the 2020 season. Analysis of Variance (ANOVA) and Fisher's Least Significant Difference tests were conducted on the data that was collected. Data analysis is ongoing however the results for plant height is presented. Analysis of Variance was highly significant a p-value of < .0130. Fishers. Least Significant Difference test for plant to have the tallest plant height at 49.3 cm and Tx144932 to have the shortest with a height of 34.7 cm. Excessive plant height can be an issue at digging and is less that desirable because it causes plant to not invert properly. This results in issues with field drying and increased harvest losses.

Analysis of Variance				
Source	DF	Squares	Mean Square	F Ratio
Model	39	1114.9167	28.5876	2.5793
Error	20	221.6667	11.0833	Prob > F
C. Total	59	1336.5833		0.0131*

Effect Tests					
Source	Nparm	DF	Sum of Squares	F Ratio	Prob > F
REP	1	1	0.10000	0.0090	0.9253
ENTRY	19	19	697.91667	3.3142	0.0053*
REP*ENTRY	19	19	416.90000	1.9797	0.0691

Connecting Letters Report	
Level	Mean
TxL076221-24 A	49.333333
TxL076225-28 A	49.333333
TxL076239-12 A	49.000000
TxL076224-24 A	48.666667
TxL076221-06 A	48.333333
GP of Toalson A	47.666667
Tamnut OL06 A	47.666667
TamVal OL14 A	47.666667
TxL076226-18 A B	47.000000
TxL076225-48 A B	46.000000
TxL076224-08 A B	45.666667
Tx144923 A B	45.333333
TxL076239-16 A B	45.333333
TxL076229-53 A B	45.000000
Olin A B	44.000000
TxL076225-04 A B	44.000000
TxL076236-04 A B	43.333333
Schubert A B	43.000000
TxL076225-24 B C	40.666667
Tx144932 C	34.666667

Levels not connected by same letter are significantly different.



Materials and Methods

The Texas A&M AgriLife Research Peanut Breeding Program initiated an evaluation of current germplasm in 2020 in an on-farm trial in Terry Co. Texas. Twenty breeding lines and cultivars were evaluated. Each entry was replicated 3 times without the commercially available seed treatment. Plots were planted on 5/15/20. Plots were arranged in a randomized complete block design in 1m by 3m plots. Stand counts were taken at 7, 14, 21 and 28 days. A Mavic Pro 2 UAS was flown on the day of each stand count for correlation with hand measurements. In addition, plot data was collected and evaluated for plant height, visual greenness, pod rot, yield and grade. Differences were observed. This project will be repeated in 2021 and expanded on in order to develop breeding lines specifically suited for the unique needs of organic peanut producers.



Conclusions

A total of 16 breeding lines and 4 check varieties were evaluated in two locations. One of the checks under evaluation are from germplasm that was released before commercial fungicides were commonly available and is being evaluated for seedling disease and pod rot resistance. Analysis is ongoing however differences were observed in plant height under organic conditions. Our intention is to use these yield and quality data as well as height and disease resistance data to establish a breeding program focused on the needs of organic peanut producers.

Other goals of this project:

- Allows us hands on training environment to teach graduate students field screening methodologies.
- We are currently developing UAS methodologies for stand counts and disease evaluation

References

- Cantonwine E.G., C.C. Holbrook, A.K. Culbreath, R.S. Tubbs and M.A. Boundreau. 2011. Genetic and Seed Treatments Effects in Organic Peanut. Peanut Science 38:115-121.
- Jaenicke E. C. 2016. U.S. Organic Hotspots and their Benefit to Local Economies. Organic Trade Association Report.
- USDA-ERS. 2013.Organic Production. <https://www.ers.usda.gov/Data-Products/Organic-Production> (Accessed Nov. 8, 2020).