Row Crops Research Update




UF IFAS UNIVERSITY of FLORIDA

Hardeep Singh, Cropping Systems Specialist

Outline

- Cotton Nitrogen Management Studies
- Peanut Studies
- Variety testing
- 2024 Projects
- Questions

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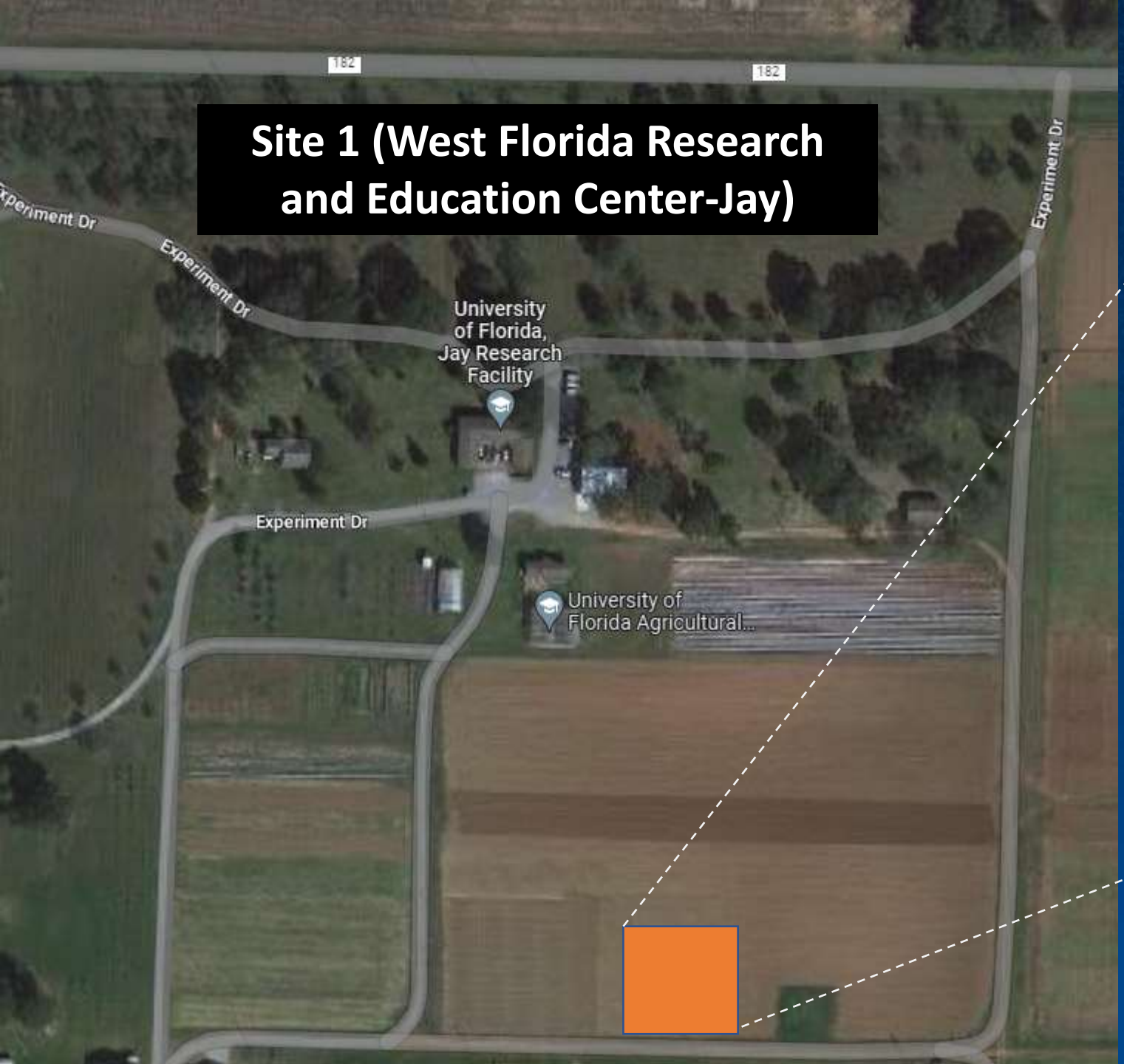
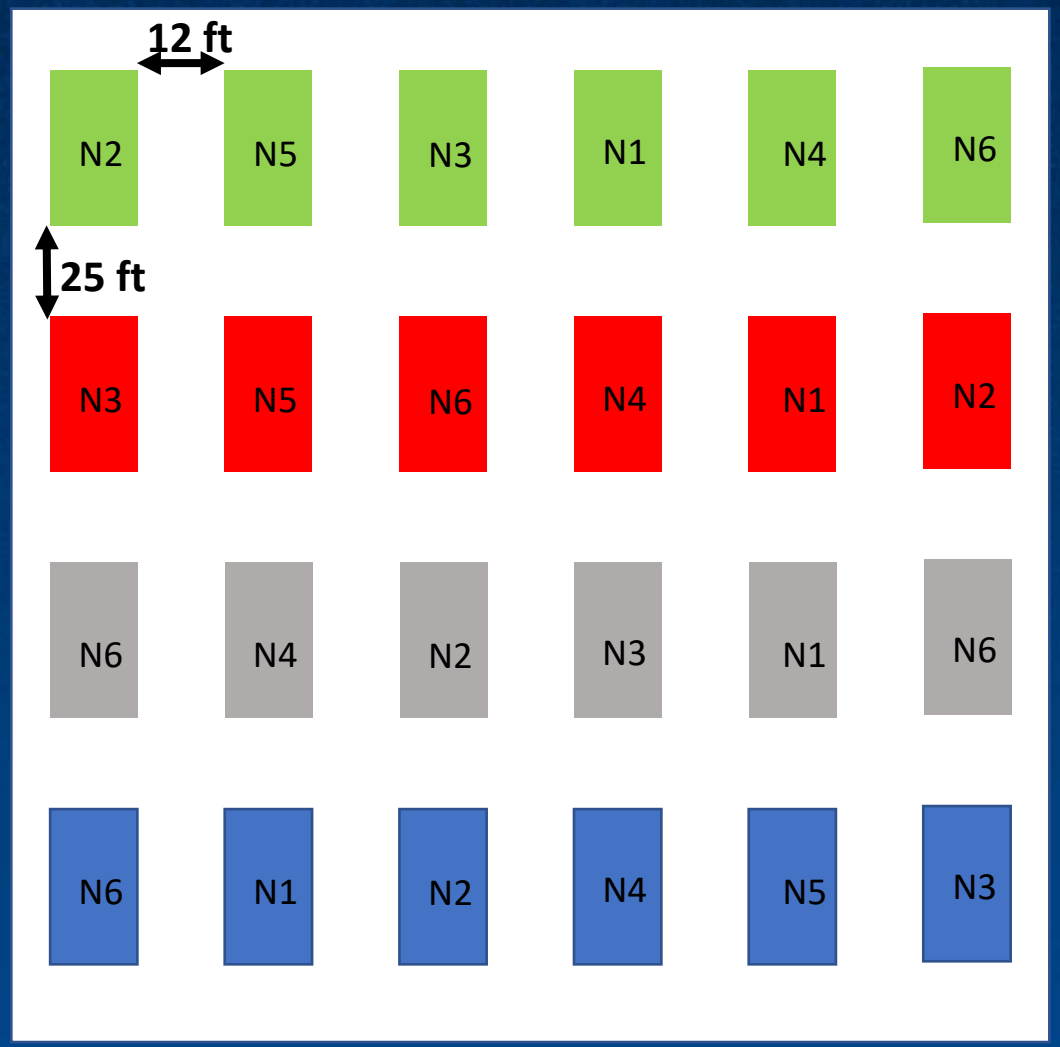
Site 1 (West Florida Research and Education Center-Jay)



2022 and 2023

2022

Site 2 (North Florida Research and Education Center-Marianna)


12 ft
25 ft
N2
N5
N3
N1
N4
N6
N3
N5
N6
N4
N1
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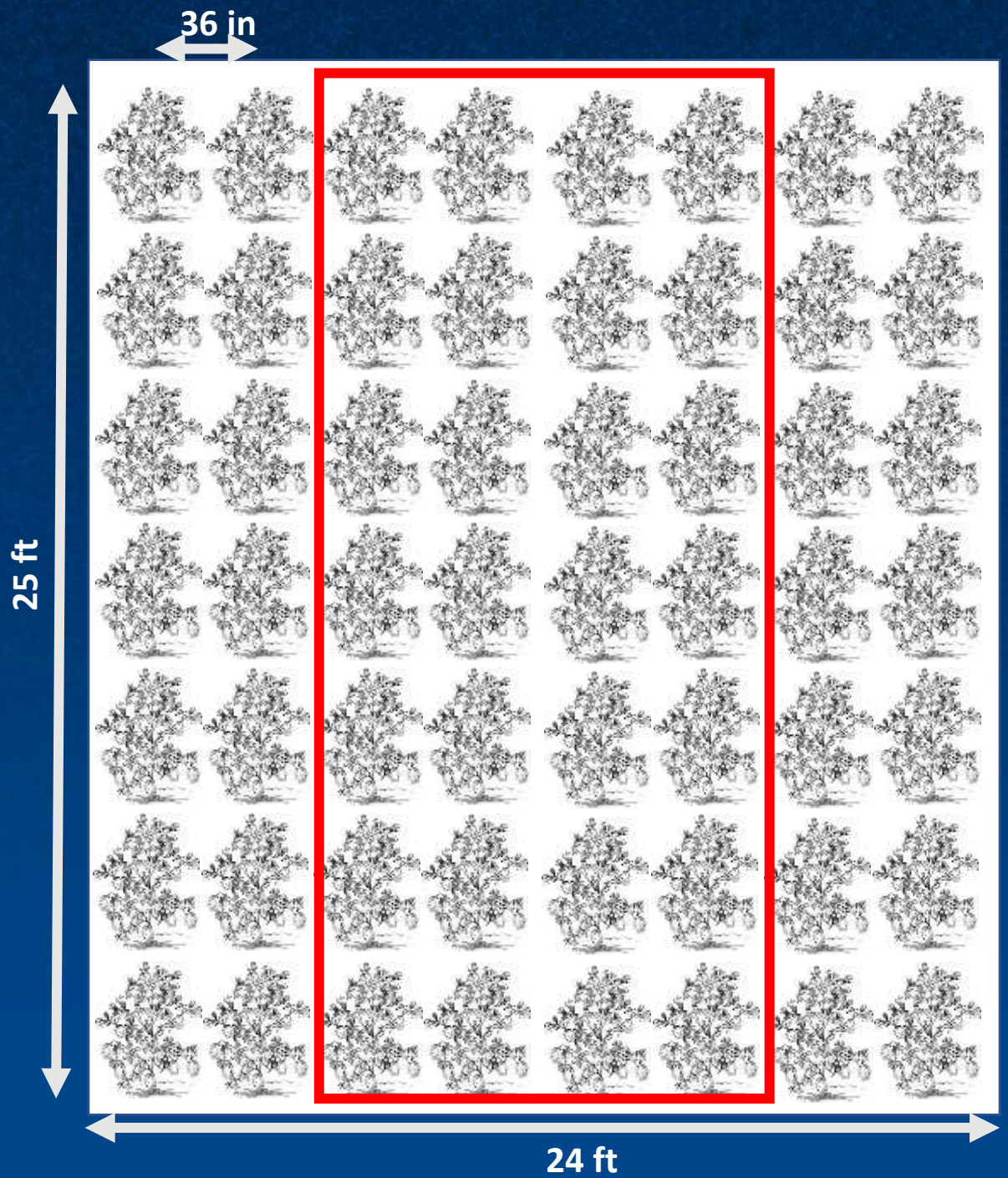
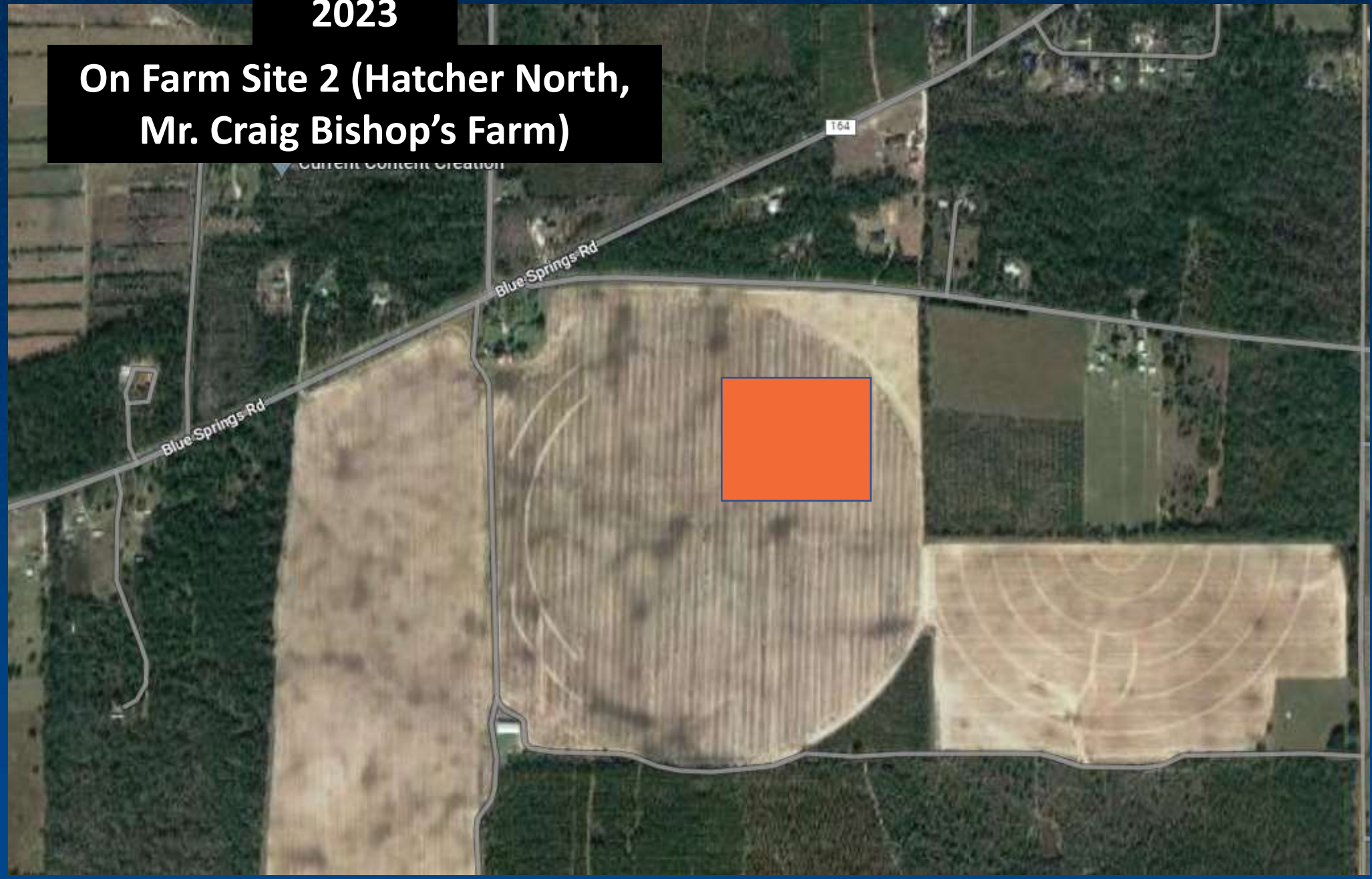

36 in
25 ft
24 ft

2023

On Farm Site 1 (Field- South Tandom, Mr. Larry Ford's Farm)

2023

On Farm Site 2 (Hatcher North, Mr. Craig Bishop's Farm)

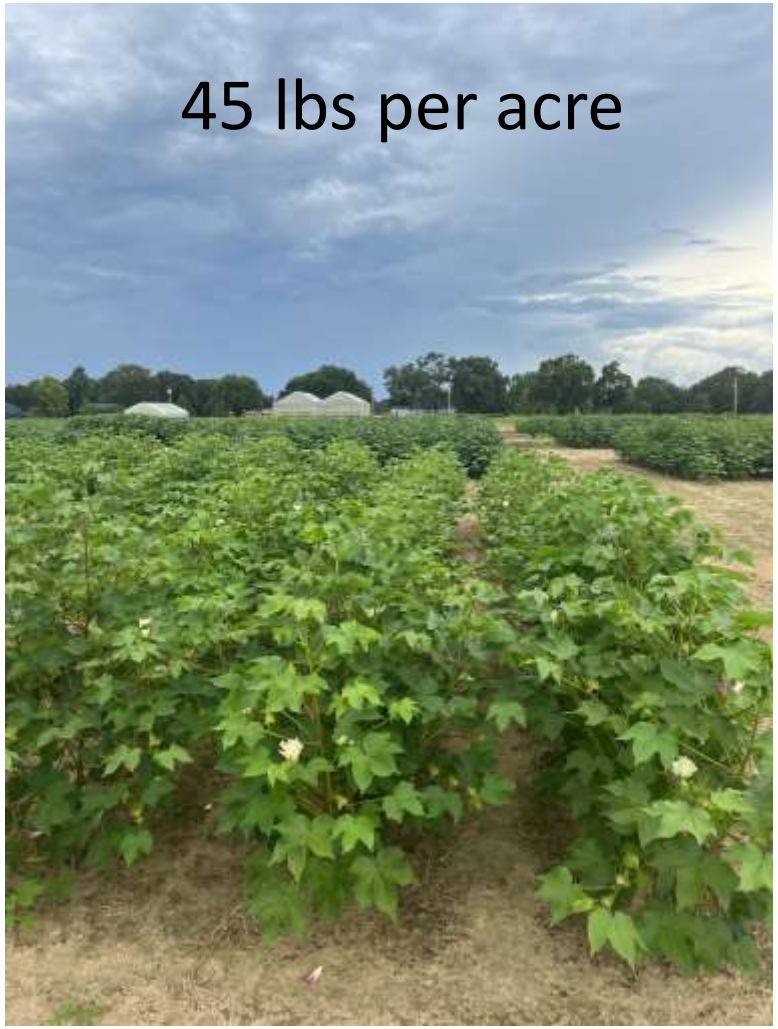


Materials and Methods

- Cultivar- DP 2038
- Plot size- 24 ft x 25 ft (8 row plot, 36 inch spacing)
- Urea mixed with ANVOL urease inhibitor

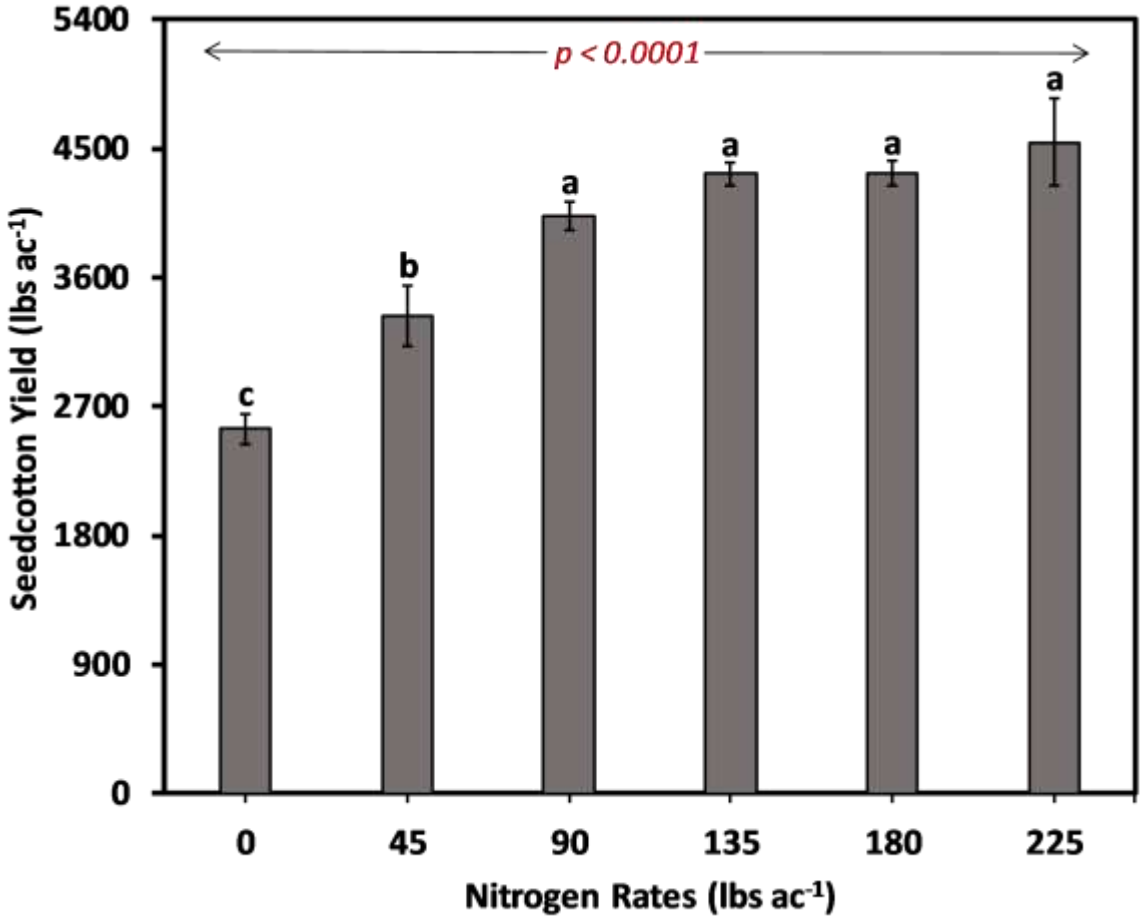
Trt	N rate (lbs/ac)	At-plant (lbs/ac)	Top-dress (lbs/ac)
1	0	0	0
2	45	18	27
3	90	18	72
4	135	18	117
5	180	18	162
6	225	18	207

Nitrogen Rate Effect

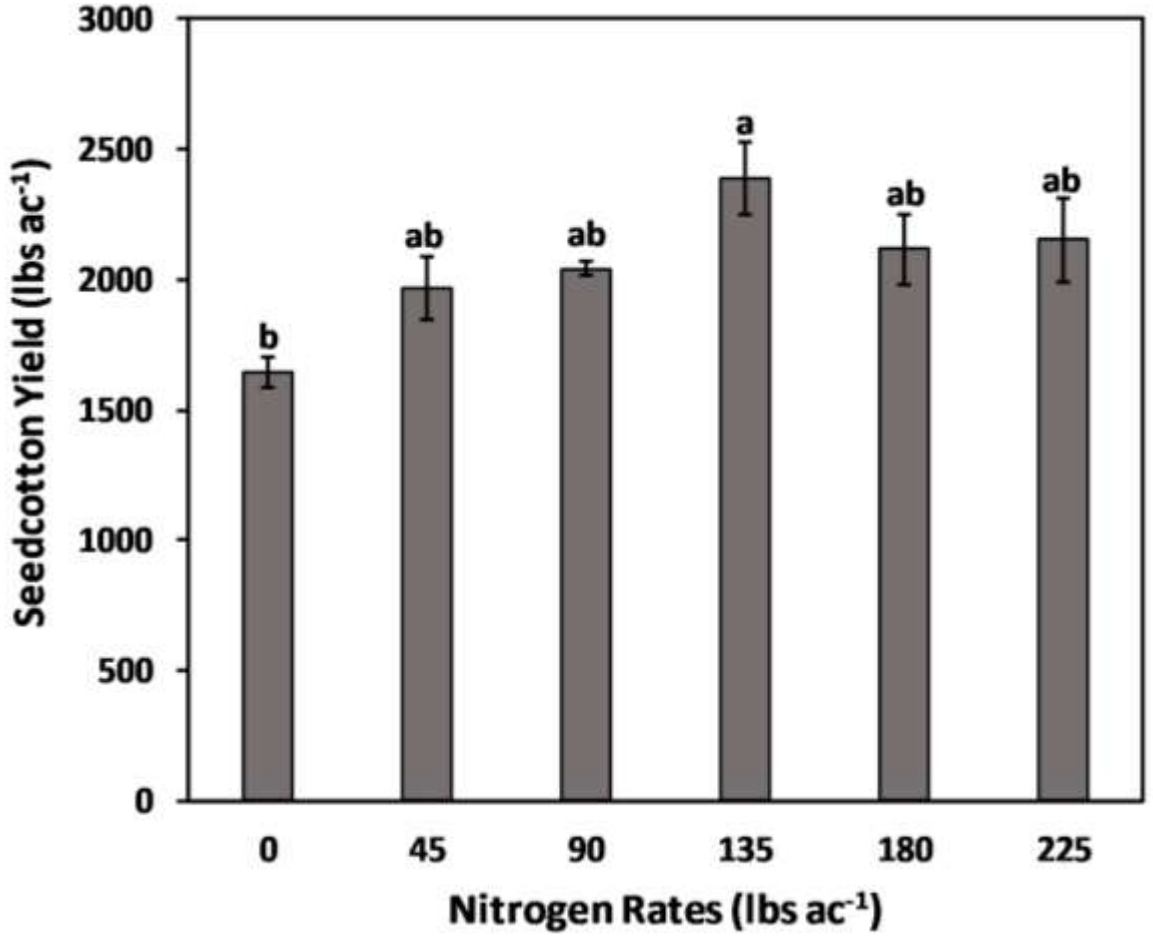


Results (Yield- Jay Site)

2022

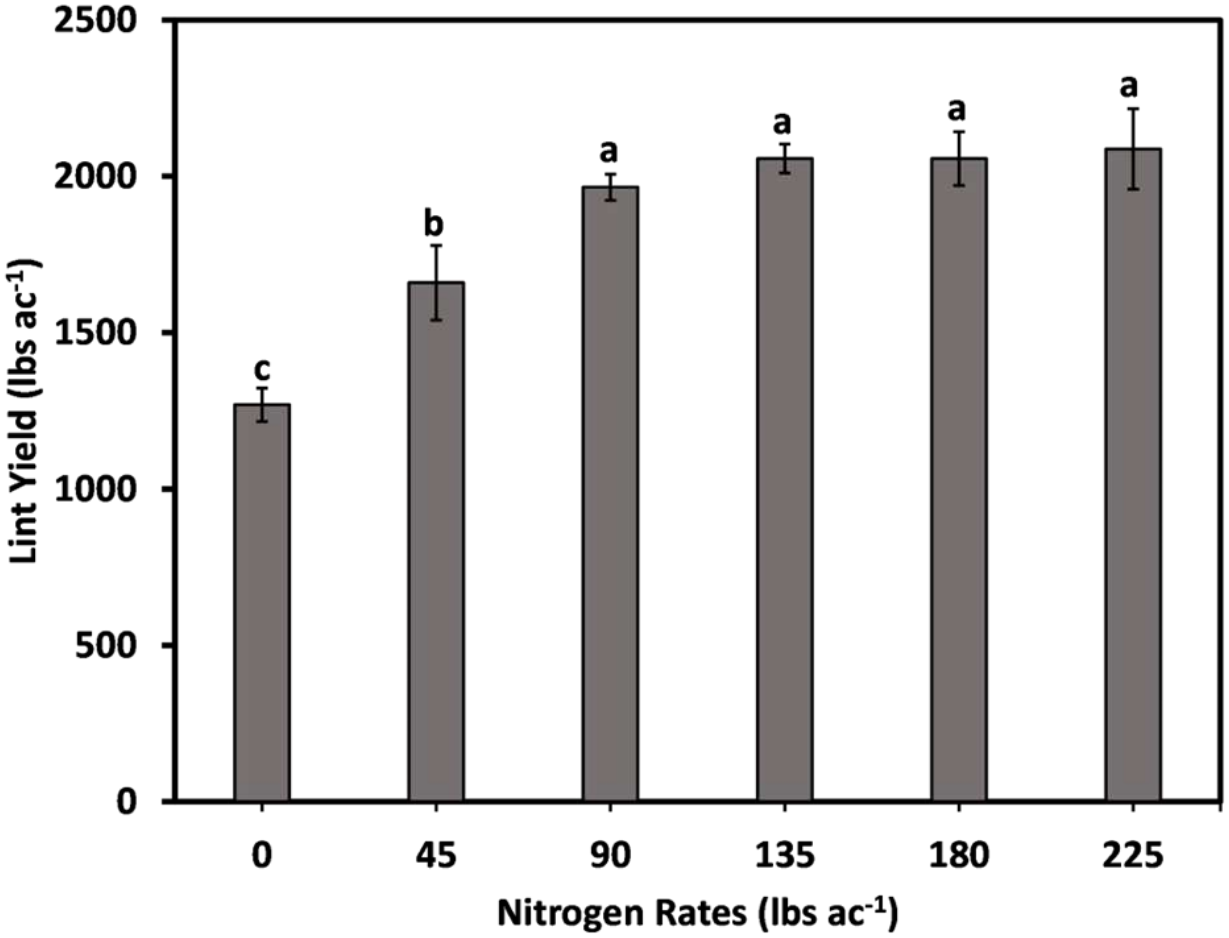


2023

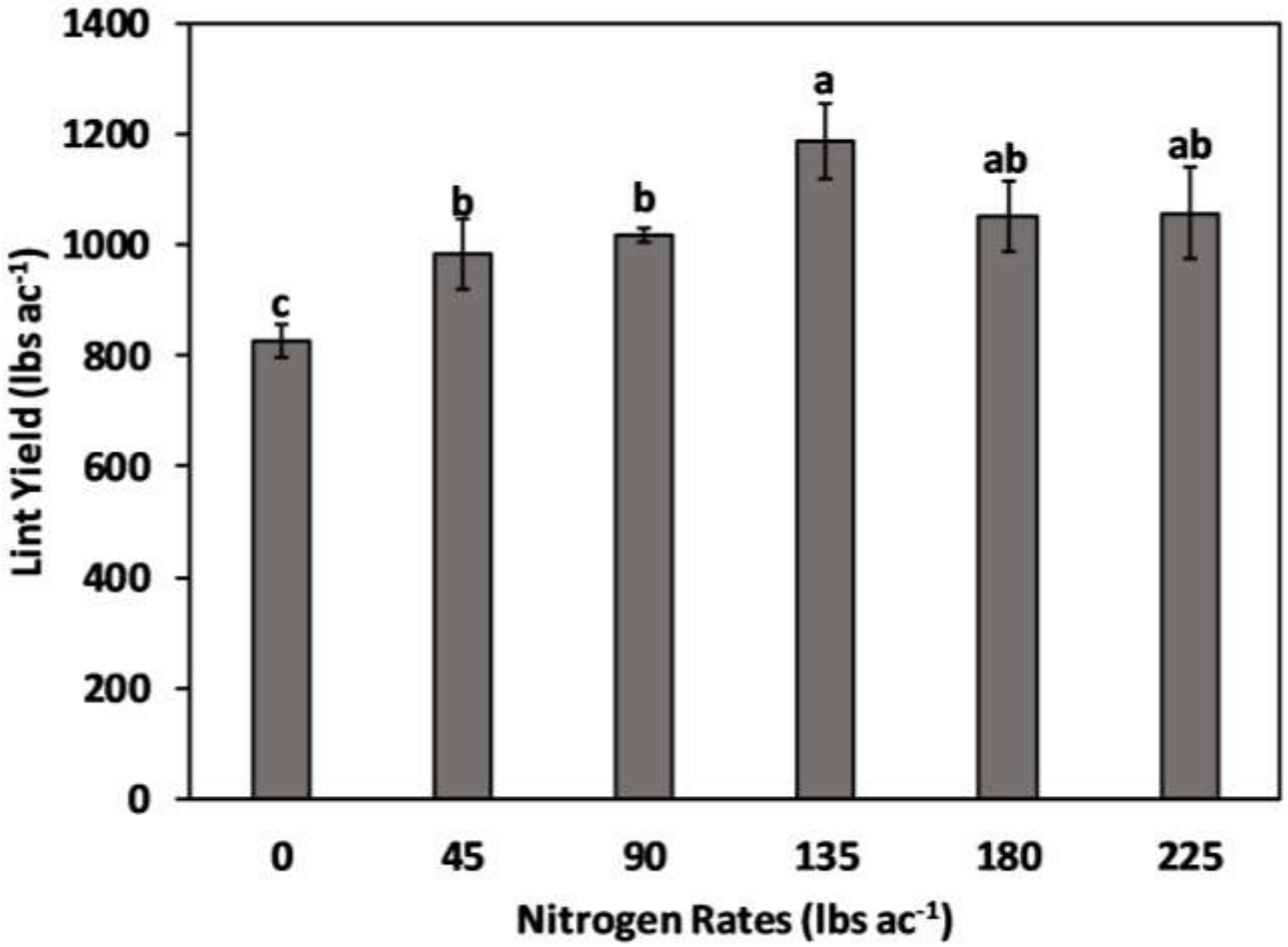


Results (Yield- Jay Site)

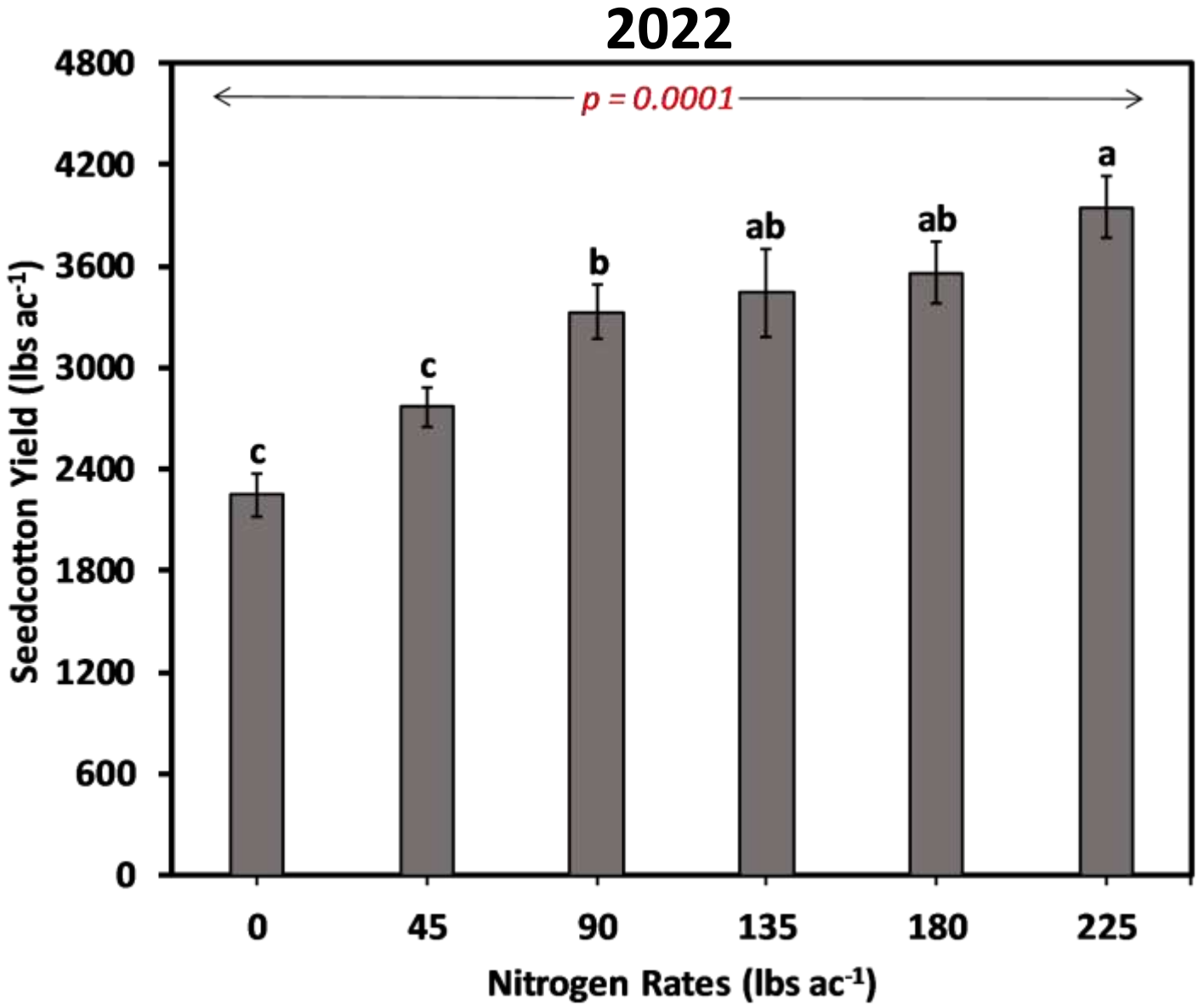
2022



2023



Results (Yield- Mariana Site)



Results (Yield- Mariana Site)

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UF/IFAS PEER REVIEWED SS-AGR-478
https://doi.org/10.32473/edis-AG474-2023

Sulfur Deficiency in Cotton: Causes, Symptoms, and Considerations[1]

Hardeep Singh, Ethan Carter, Lakesh Sharma, Sudeep Sidhu, and Peter Omara[2]

Cotton is a crop that is farmed for its fiber all over the globe. Adequate nutrient availability is a critical part of achieving increased yields and improved cotton quality. Nitrogen, phosphorus, and potassium are the elements that are most limiting for cotton production, but other nutrients, such as sulfur and boron, are also critical for optimum cotton yield and quality. In all plants, the synthesis of specific amino acids that are essential components of proteins, enzymes, and chlorophyll depends on sulfur. Sulfur makes up around 3% of the plant's tissue. The purpose of this article is to provide information to cotton farmers, Extension agents, and crop consultants about the symptoms of sulfur deficiency, the various sources of sulfur, and its interaction with changing rates of other major nutrients such as nitrogen.

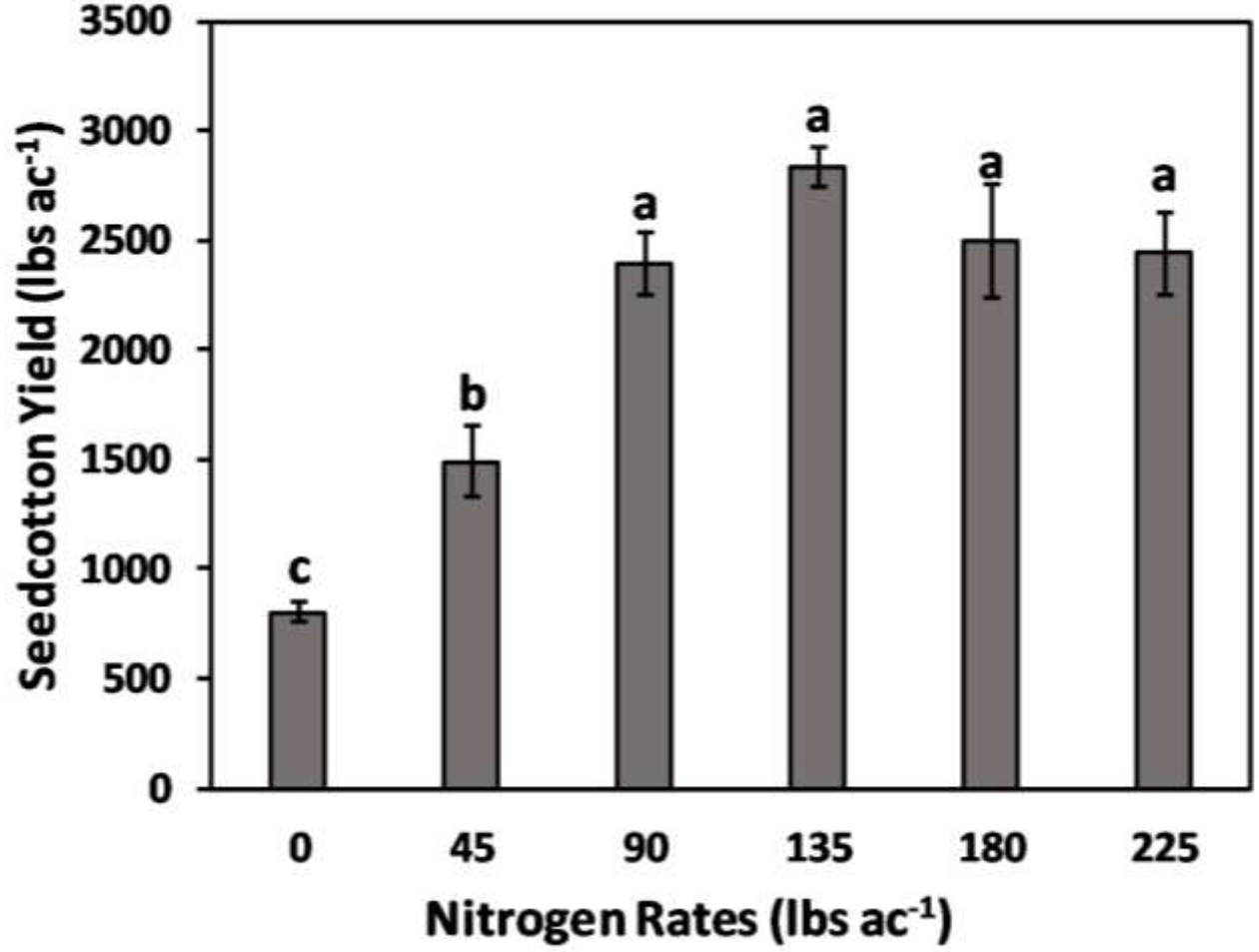
Sulfur Requirement for Cotton

Based on the literature, in the majority of cases, cotton needs 15–25 lb of sulfur applied per acre in order to achieve its full potential for lint production (Tucker 2000). However, in sandy soils with limited nutrient-holding capacity and high leaching potential, additional application may be necessary to compensate for the leached sulfur that was previously pre-plant applied. Because of this, an increase in lint output may occur as result of the use of sulfur fertilizer in sandy soils compared to loamy soils. Our observations confirmed deficiency in sandy soils in north Florida cotton-producing areas but not in the far-west part of the Florida Panhandle with comparatively heavy soils. It is advised for sulfur to be used as part of the pre-plant fertilizer application to ensure adequate and timely supply. This approach is meant to address any possible sulfur deficits that may have been identified in the past or that may develop throughout the growing season. If pre-plant sulfur application is not possible, including sulfur in the nitrogen side-dress is essential. In a study conducted in Alabama, it was found that the application of 19.6 lb of sulfur per acre resulted in a 21% increase in cotton lint yield when averaged over a span of three years (Mullins 1998).

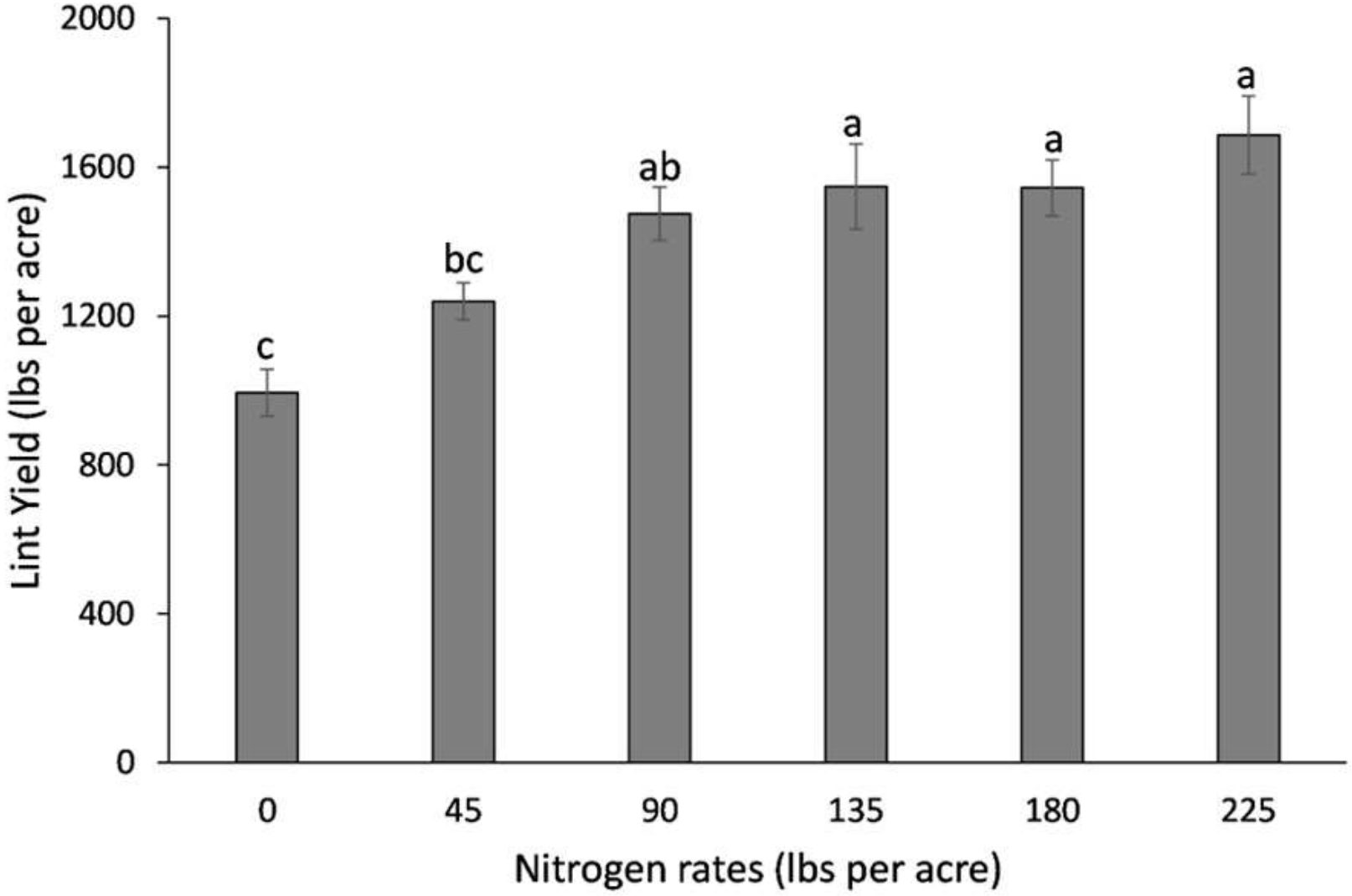
Reasons for Sulfur Deficiency

In recent years, it has become more common to see sulfur deficiencies in crops. Several factors play a role in sulfur deficiency. Historically, rainfall deposition provided a plentiful supply of sulfur (approximately 10 to 20 pounds). However, farmers can no longer rely on that sulfur supply due to changes in air quality after the implementation of the U.S. Clean Air Act of 1970. About a 90% reduction in sulfur emissions has been reported from manufacturing plants and diesel fuels since 1990. The video, sourced from the National Atmospheric Deposition Program/National Trends Network (https://nadp.slh.wisc.edu/), shows the

2023 (Ford)

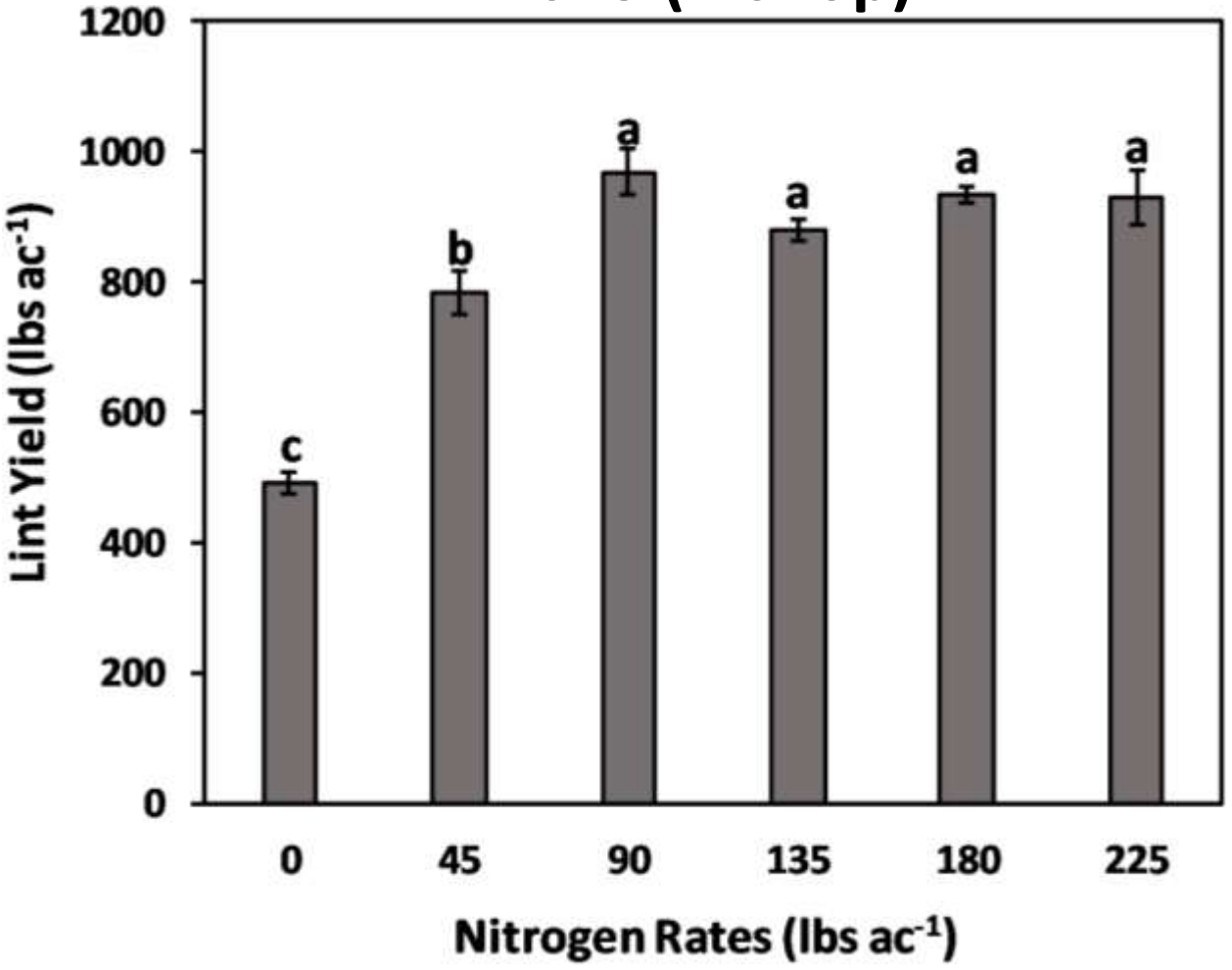


Results (Yield- Mariana Site)

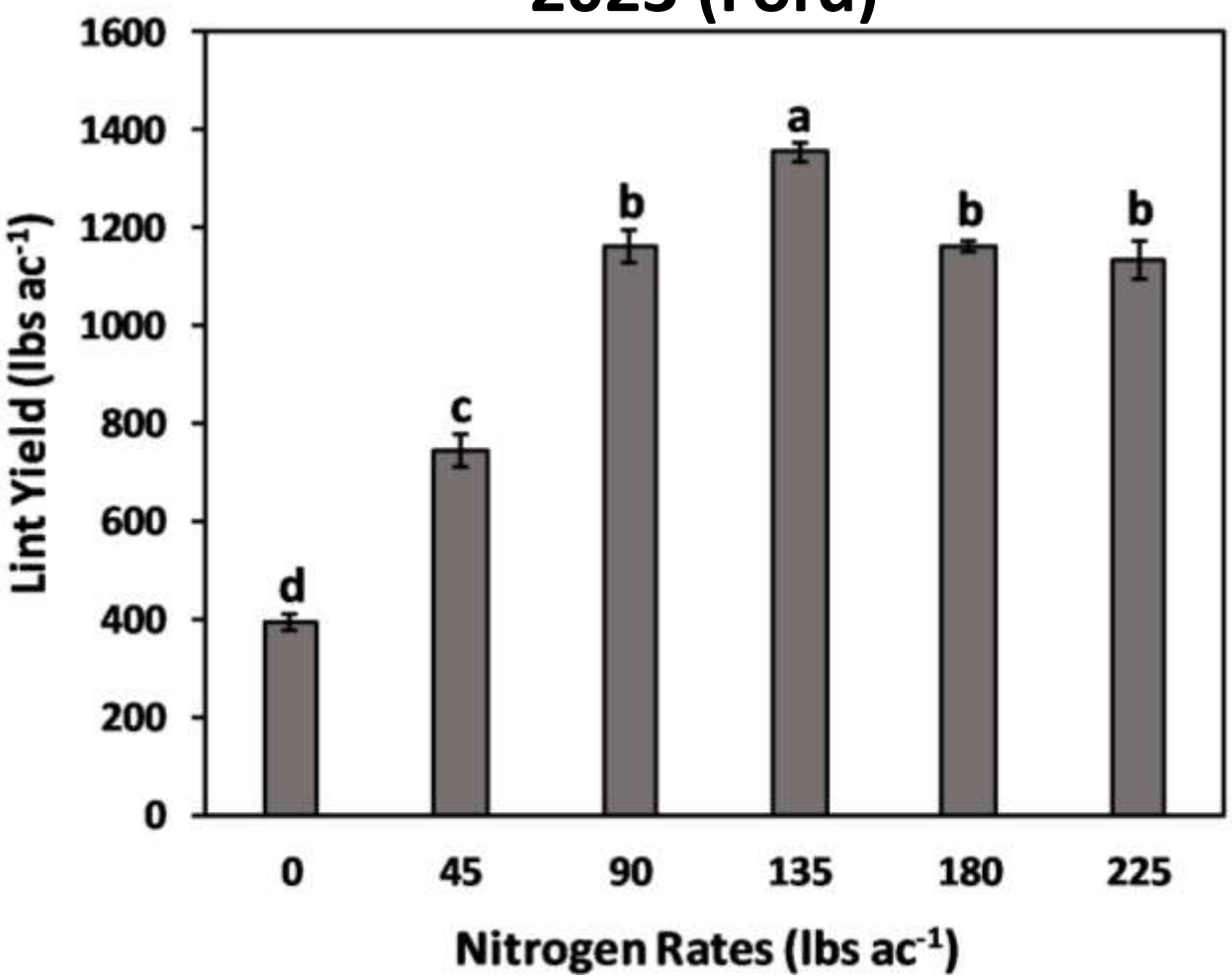


Results (Yield- Mariana Site)

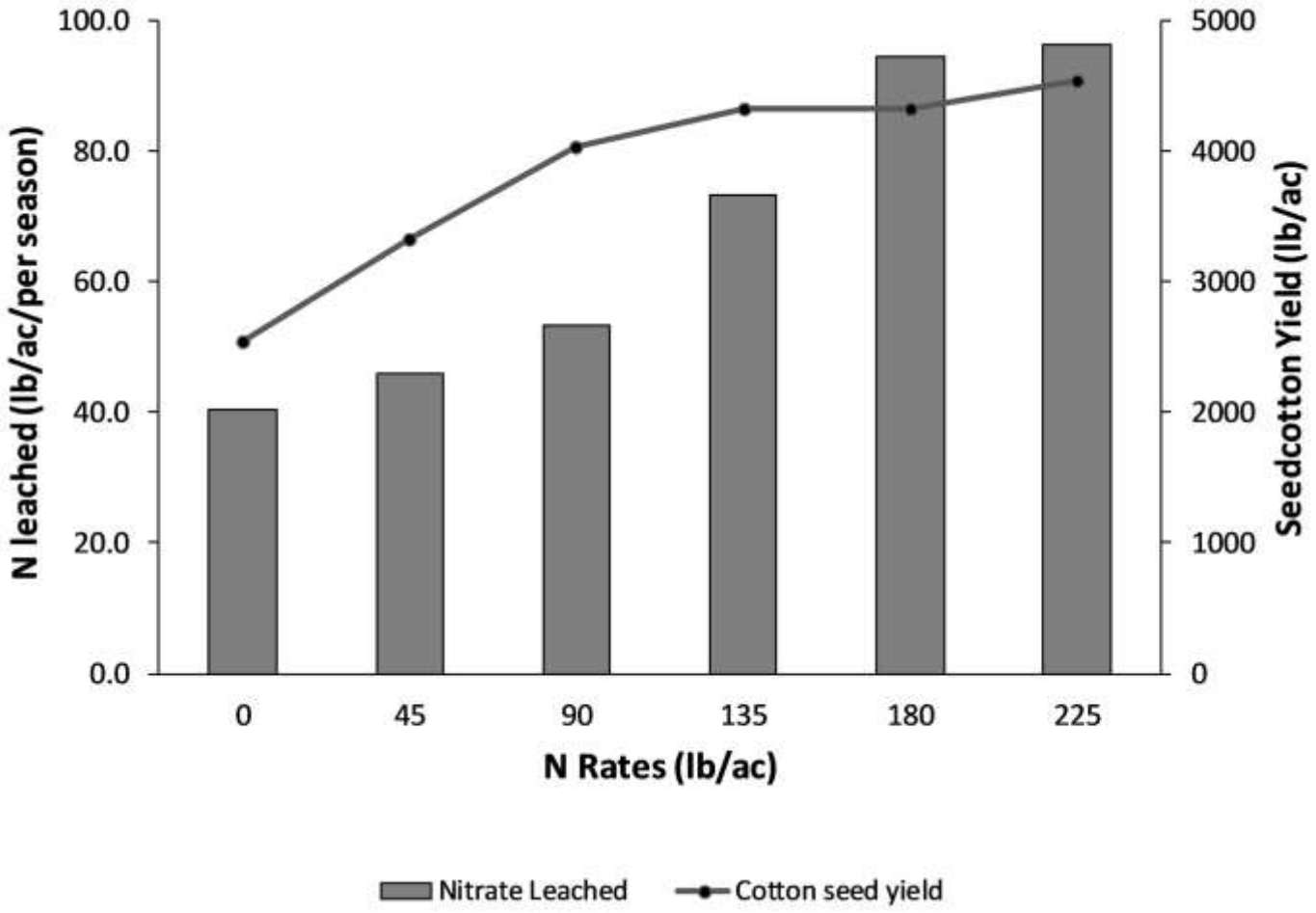
2023 (Bishop)



2023 (Ford)



Nitrate Leaching



Procedure to Update Recommendations

Conduct research → Publish the results → PNOC Committee → Recommendations to the ESTL

Peanut Growth Regulator Experiment

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Treatments

Treatment (#)	Rate of Prohexadione Calcium (Apogee) (oz/acre)	Percent of labeled rate (%)	Single/Split application
1	0 (Control)	0	None
2	10.87	75	Single
3	10.87(5.43+5.43)	75	Split
4	14.5	100	Single
5	14.5(7.25+7.25)	100	Split
6	18.12	125	Single
7	18.12(9.06+9.06)	125	Split

- Cultivar- Georgia 12Y (7 plants per foot-twin rows)
- Applied in split application

  First application: 50% of laterals touched (81 DAP)

  Second application: 16 days after first application.

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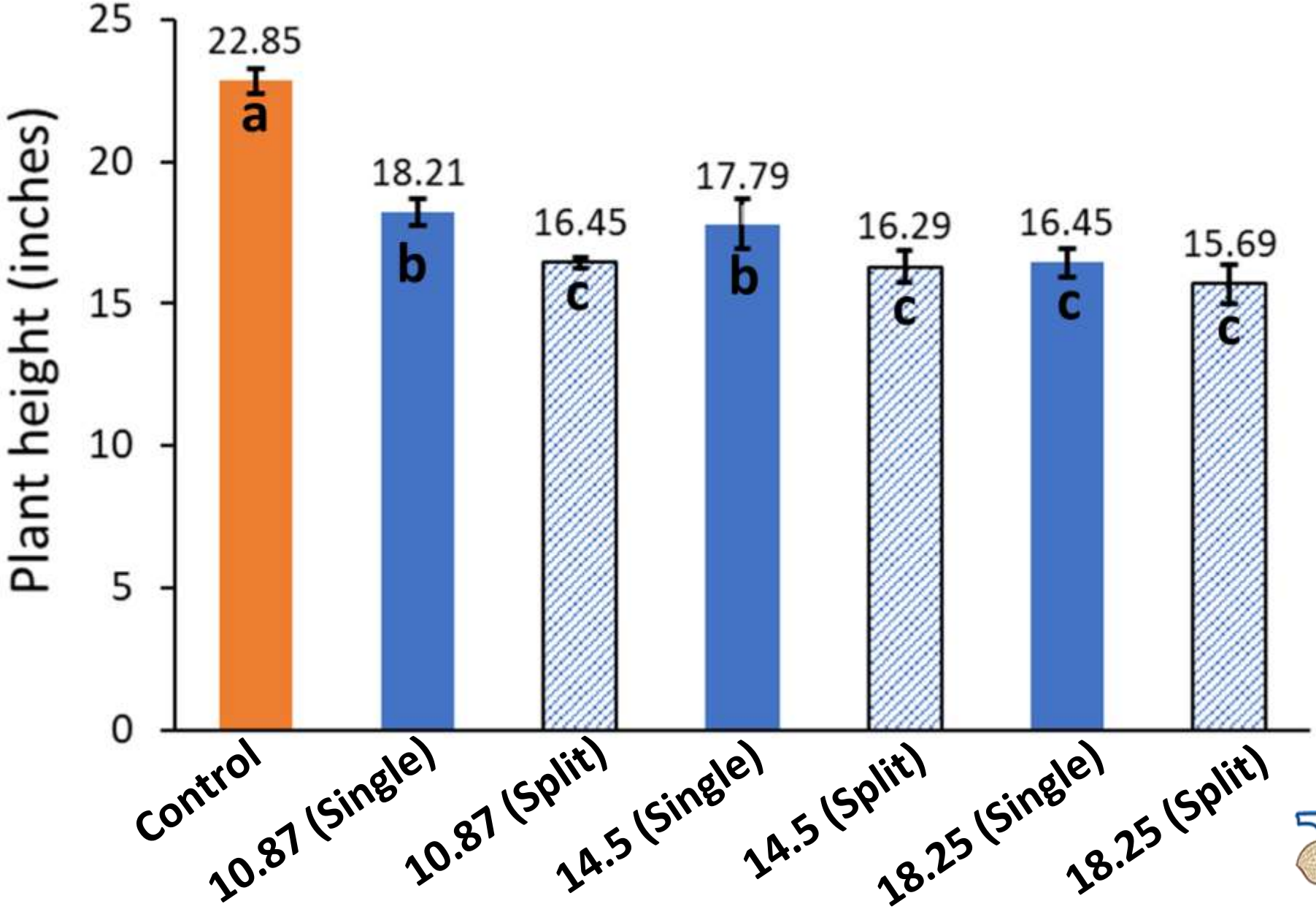
Results (Plant Height)



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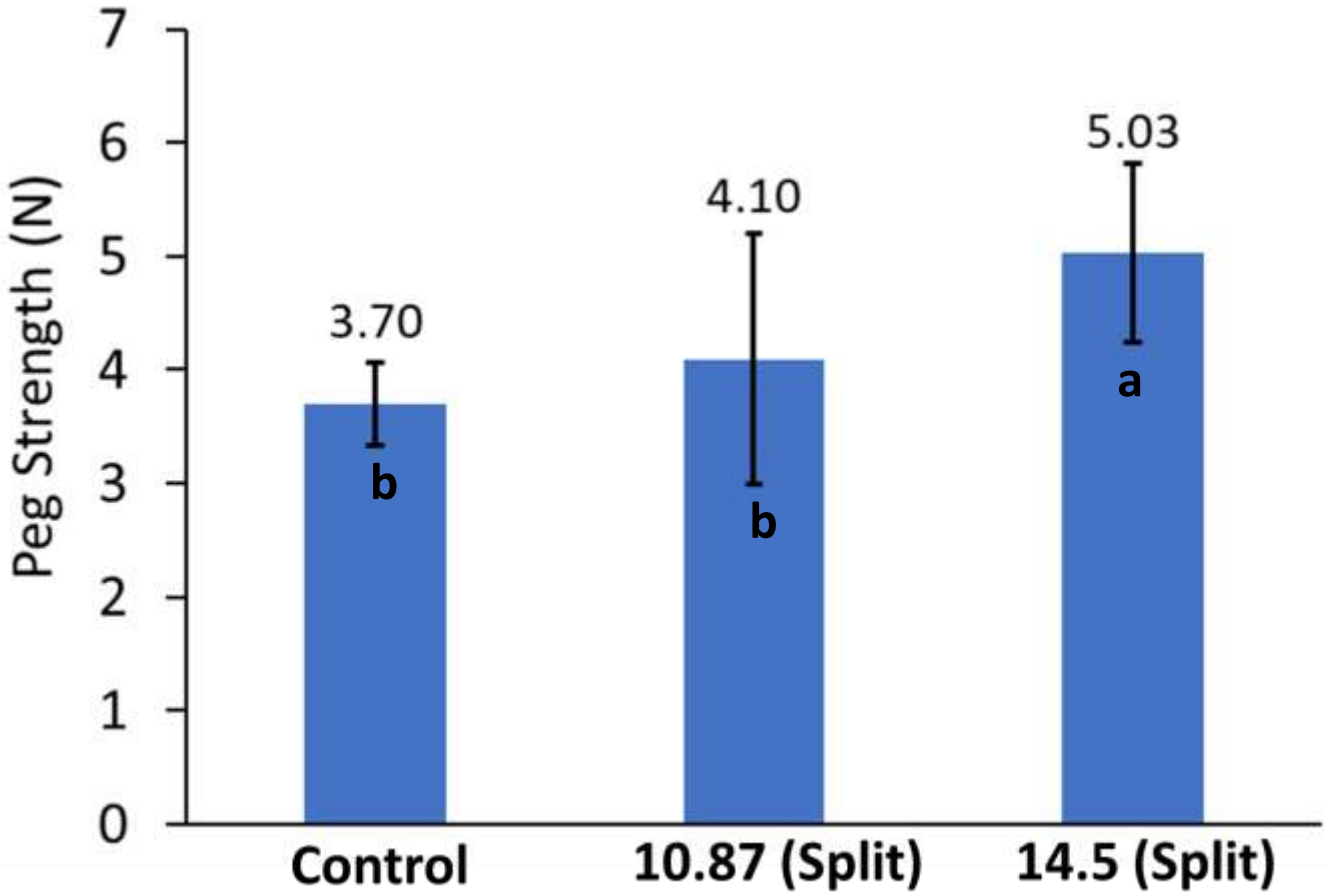
Results (Peg Strength)



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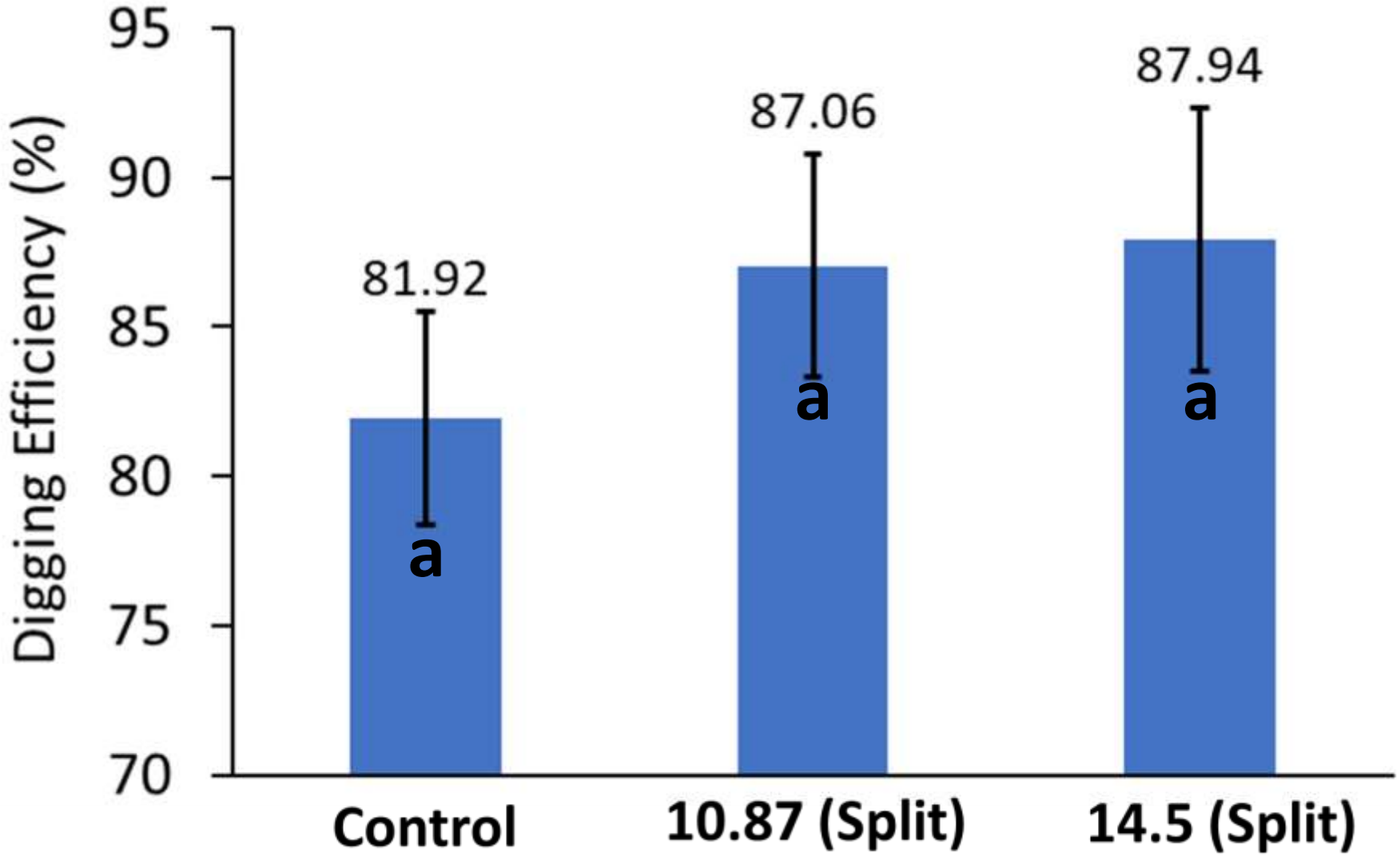
Results (Digging Efficiency)



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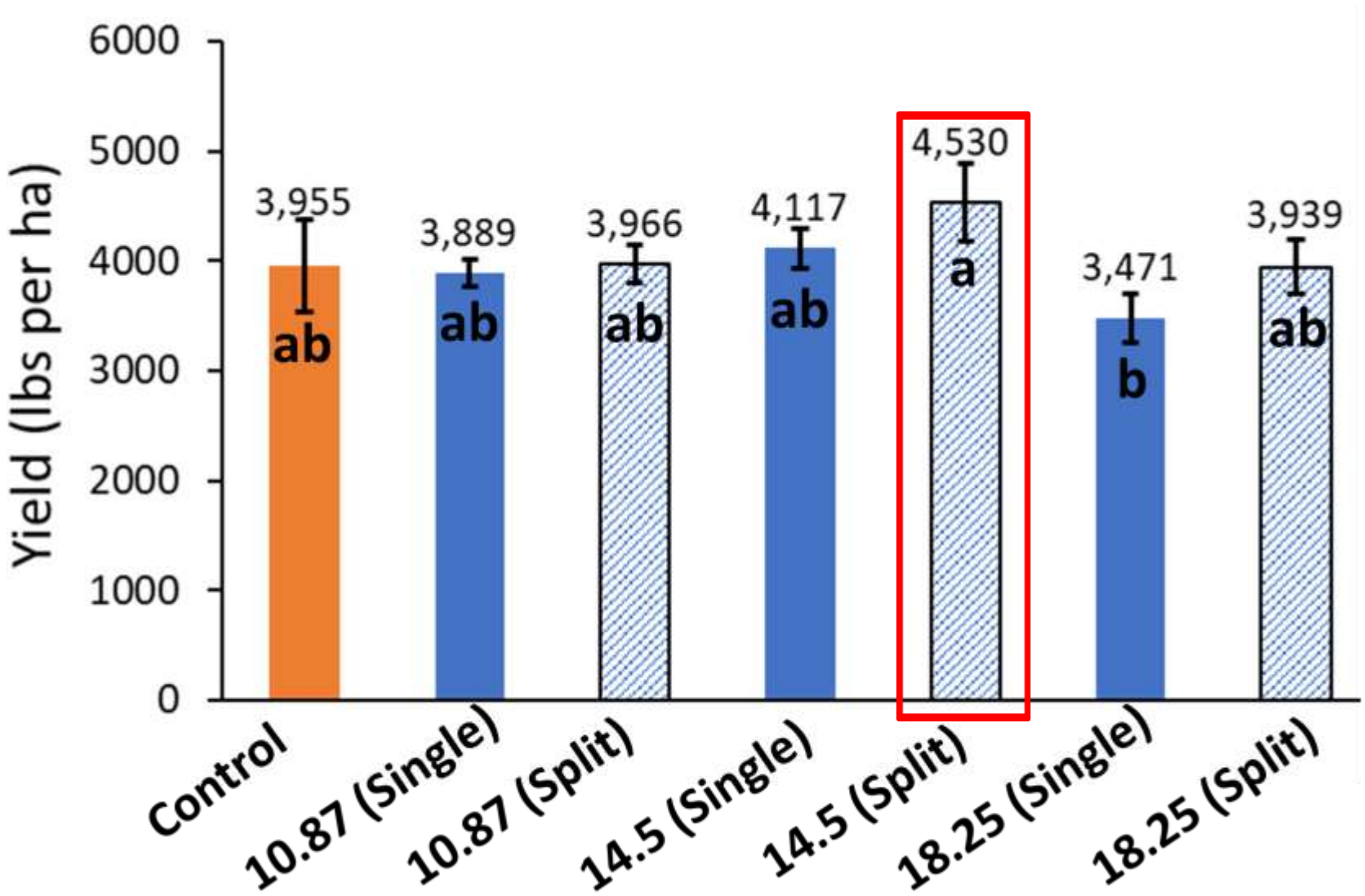
Results (Yield)



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Conclusions

- Plant height significantly reduced as compared to control
- Peg strength significantly increased at 100% labeled rate when compared to control.
- Digging efficiency was increased by 5%.
- Above label application reduced yield.
- Future research is needed investigating potential of Prohexadione Calcium in reducing disease incidence.

Calcium Fertilization in Peanuts

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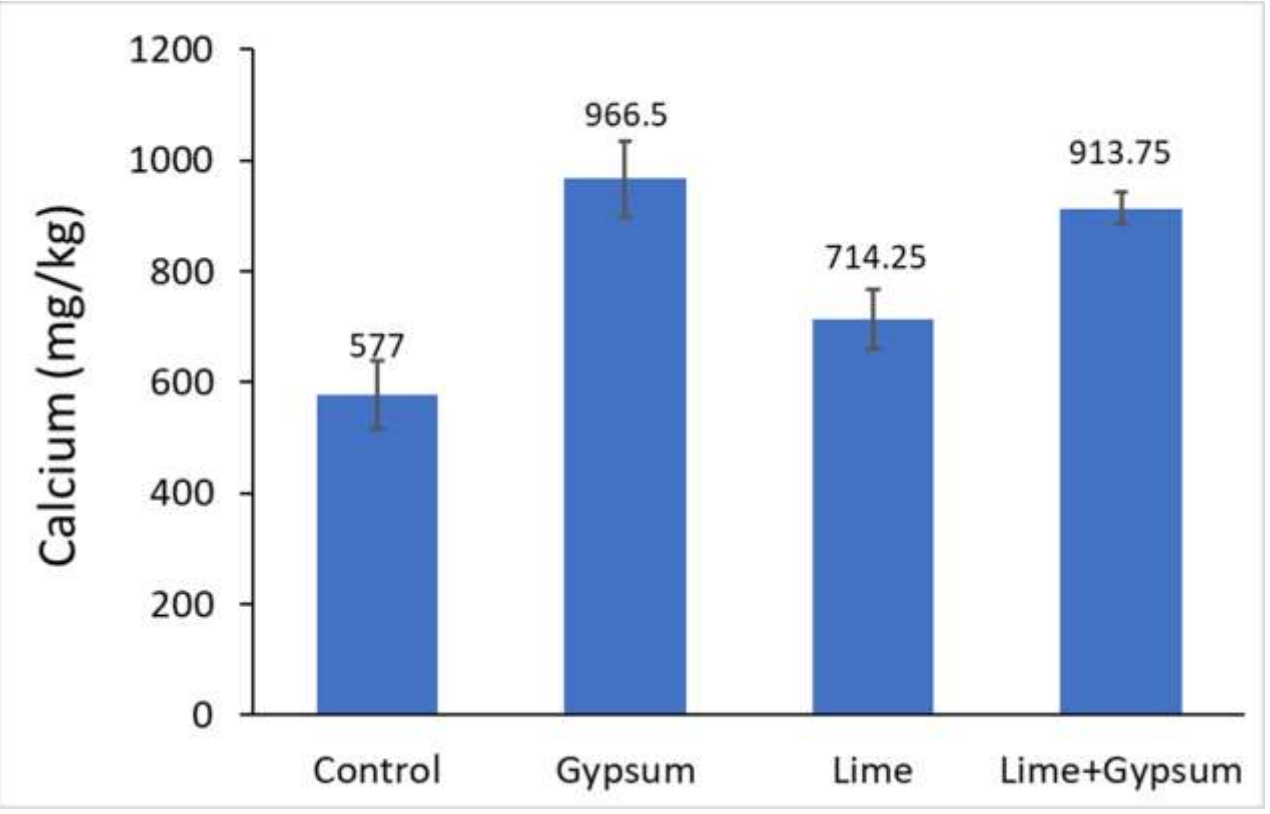
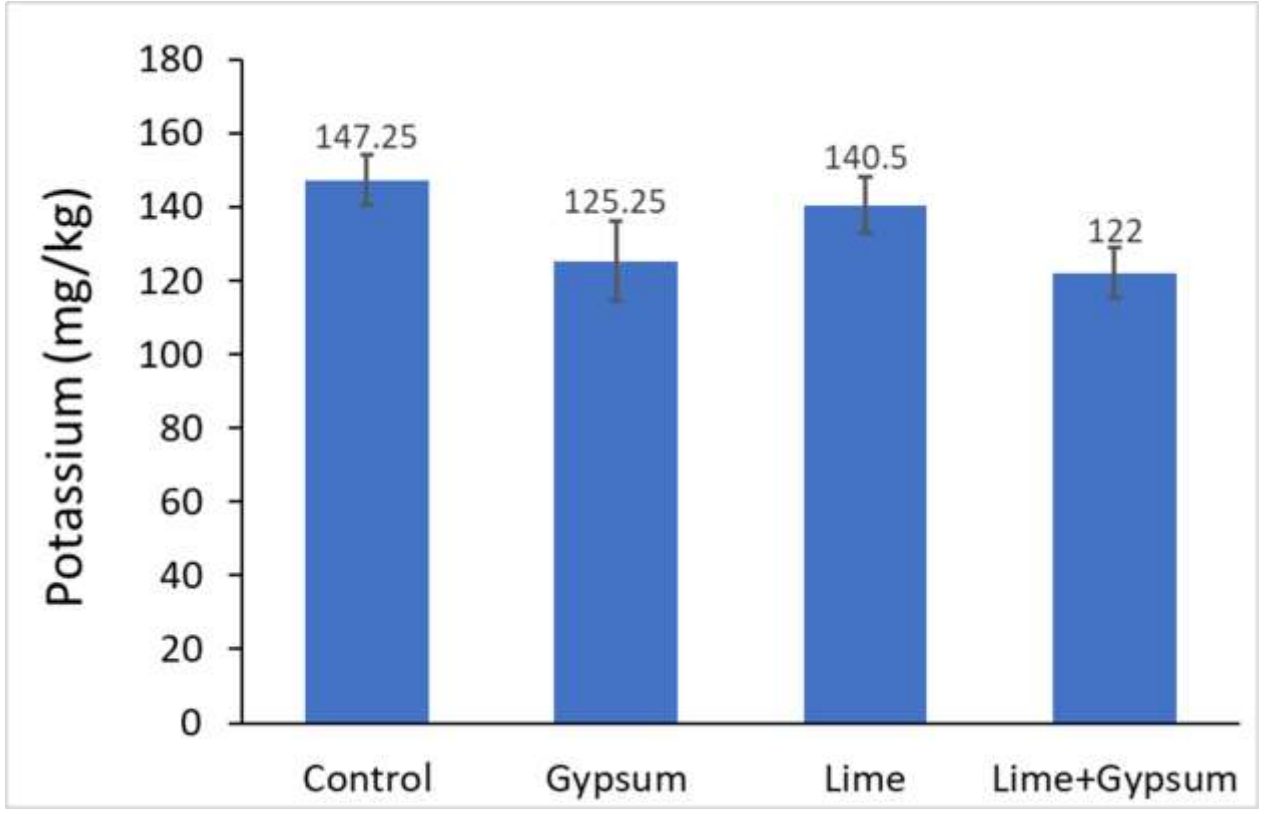
Extractable Soil Ca and K (Mid bloom)





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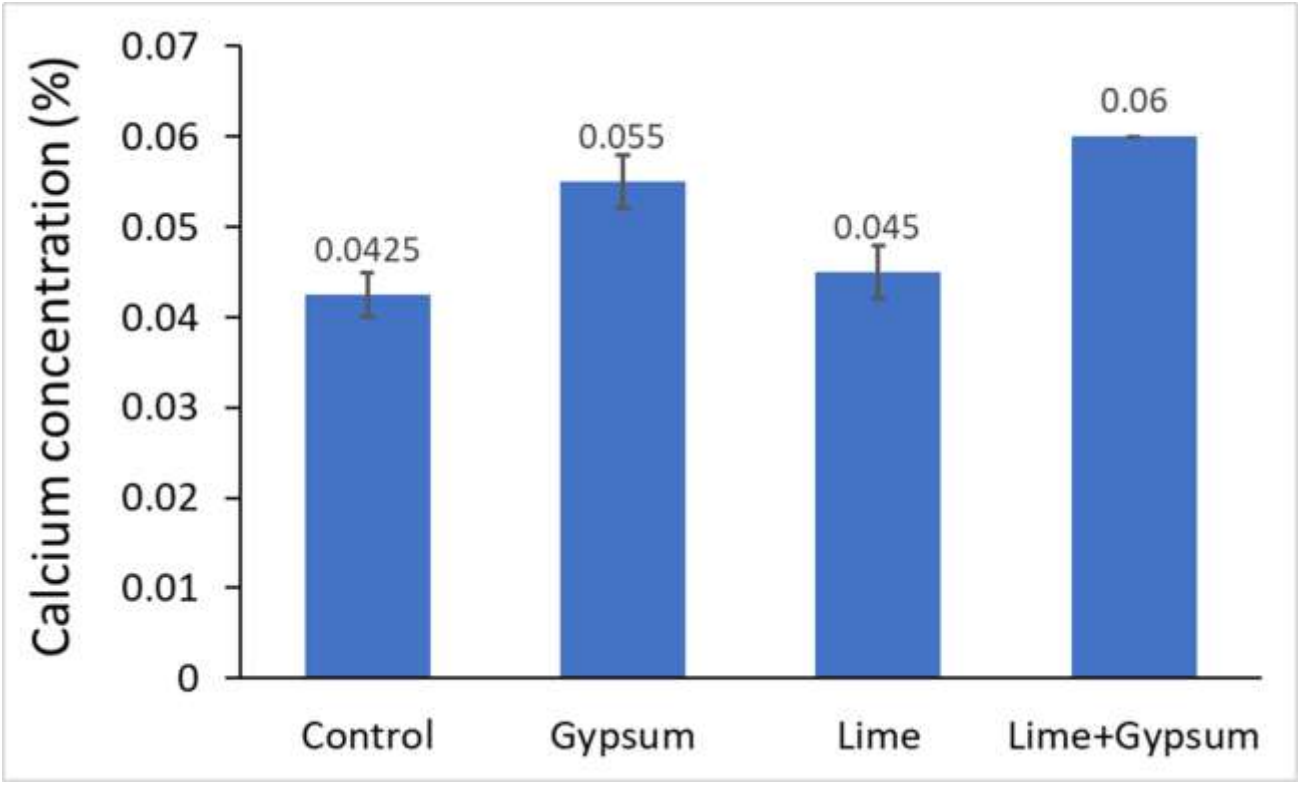
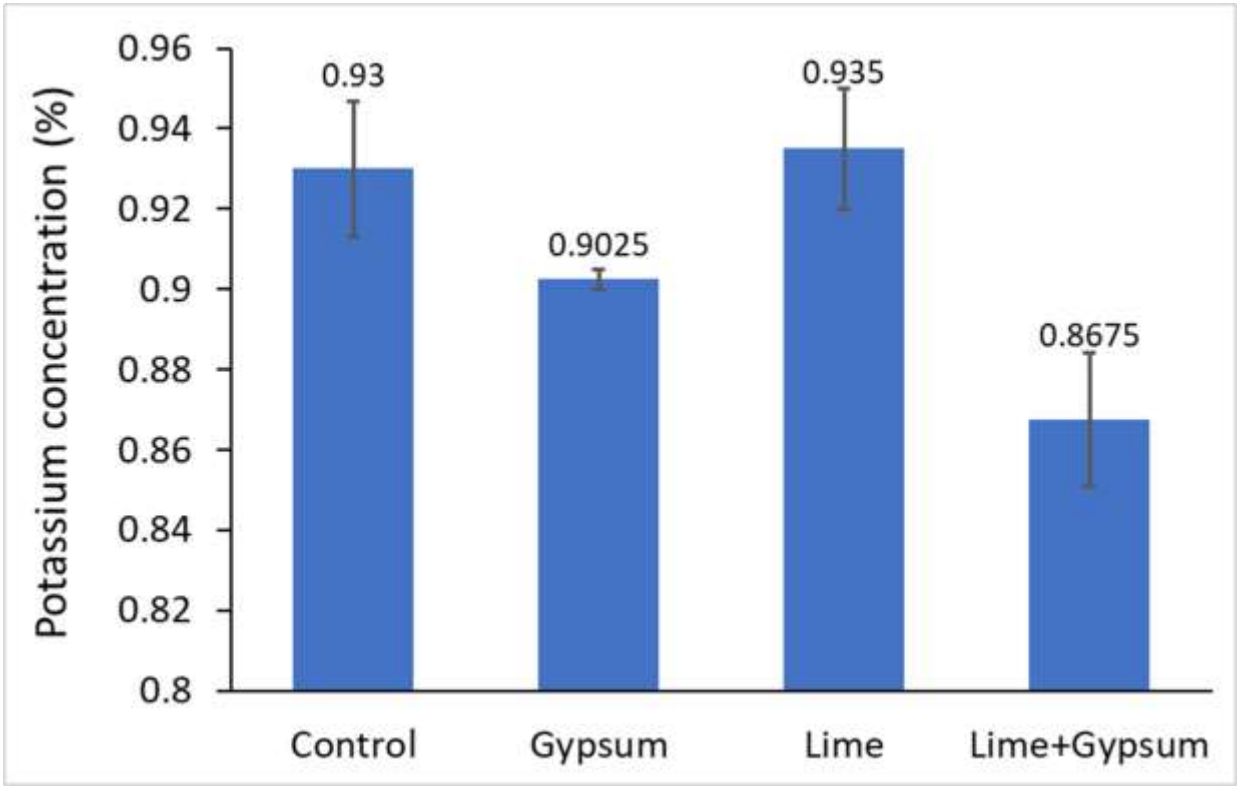
Peanut Seed Calcium and Potassium





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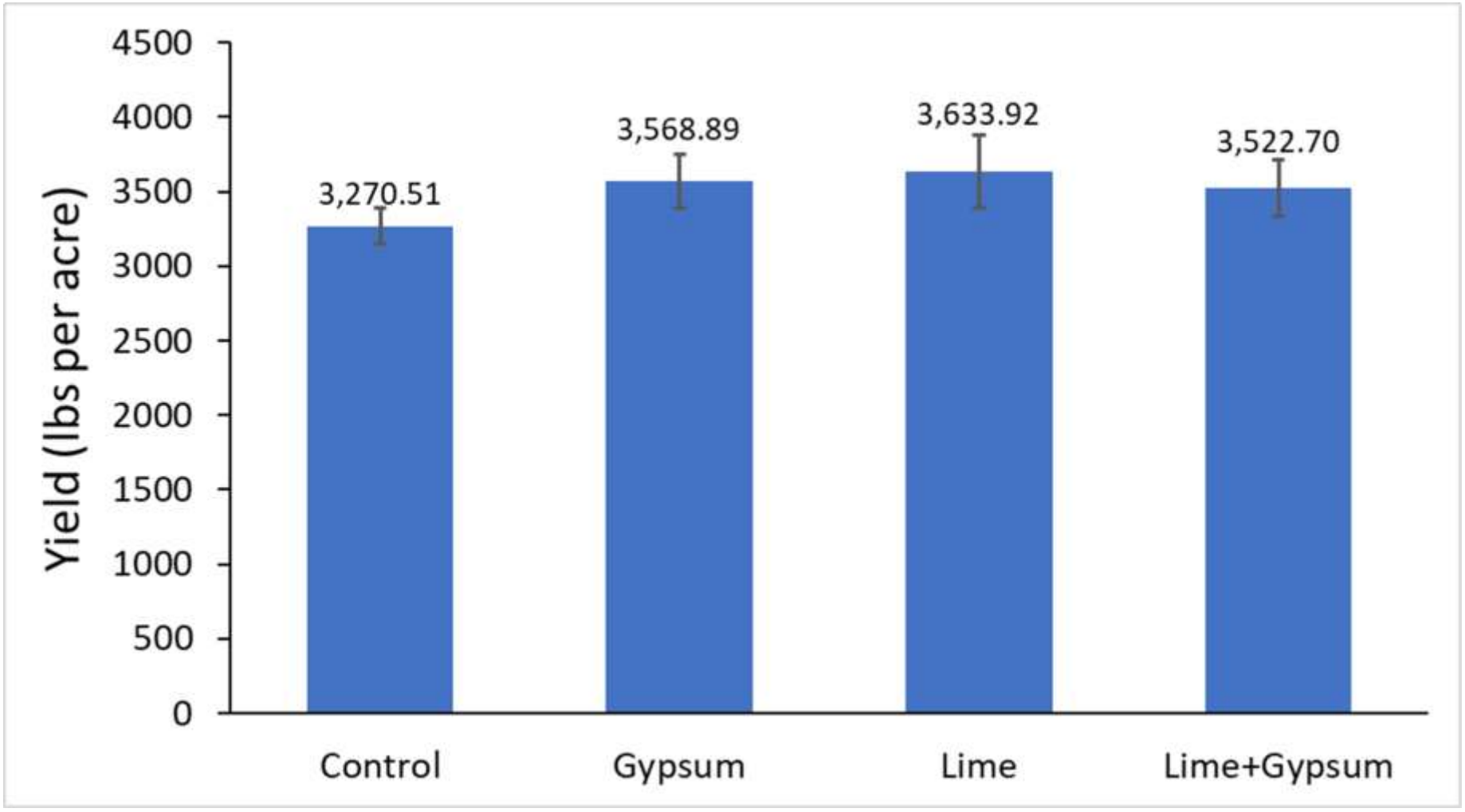
Peanut Yield



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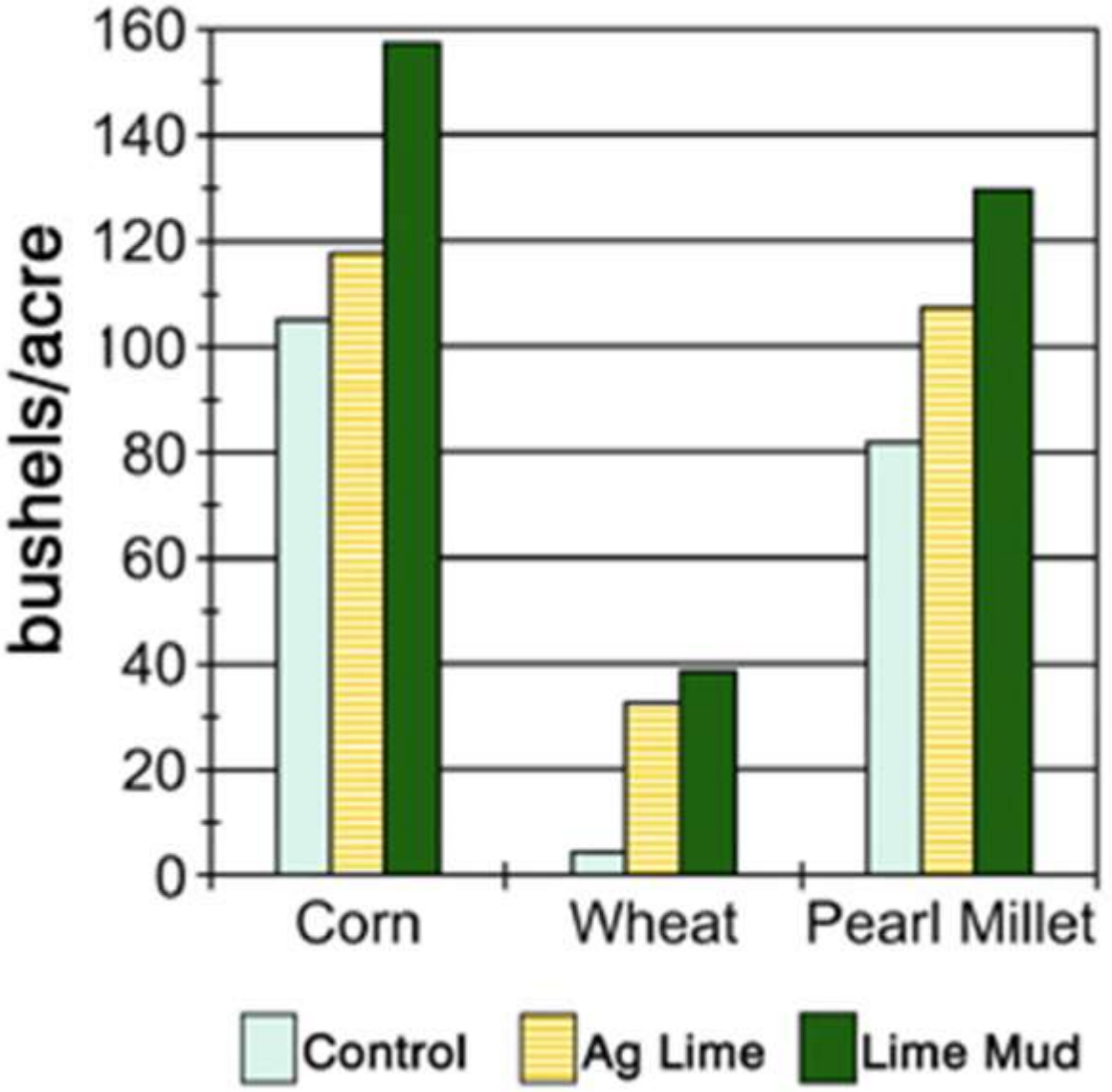
Papermill Lime/ Pulp Mill Lime/Mud Lime

Miner			ne	*
Nitroge				
P_2O_5				
K_2O (				
Calciun				
CCE				
Magnesiu				
Sulfur (				
Boron (				
Copper				
Zinc (p				



*D
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bd

* Data from Morris,
** Data from South
*** Data from Alaba
na - not available

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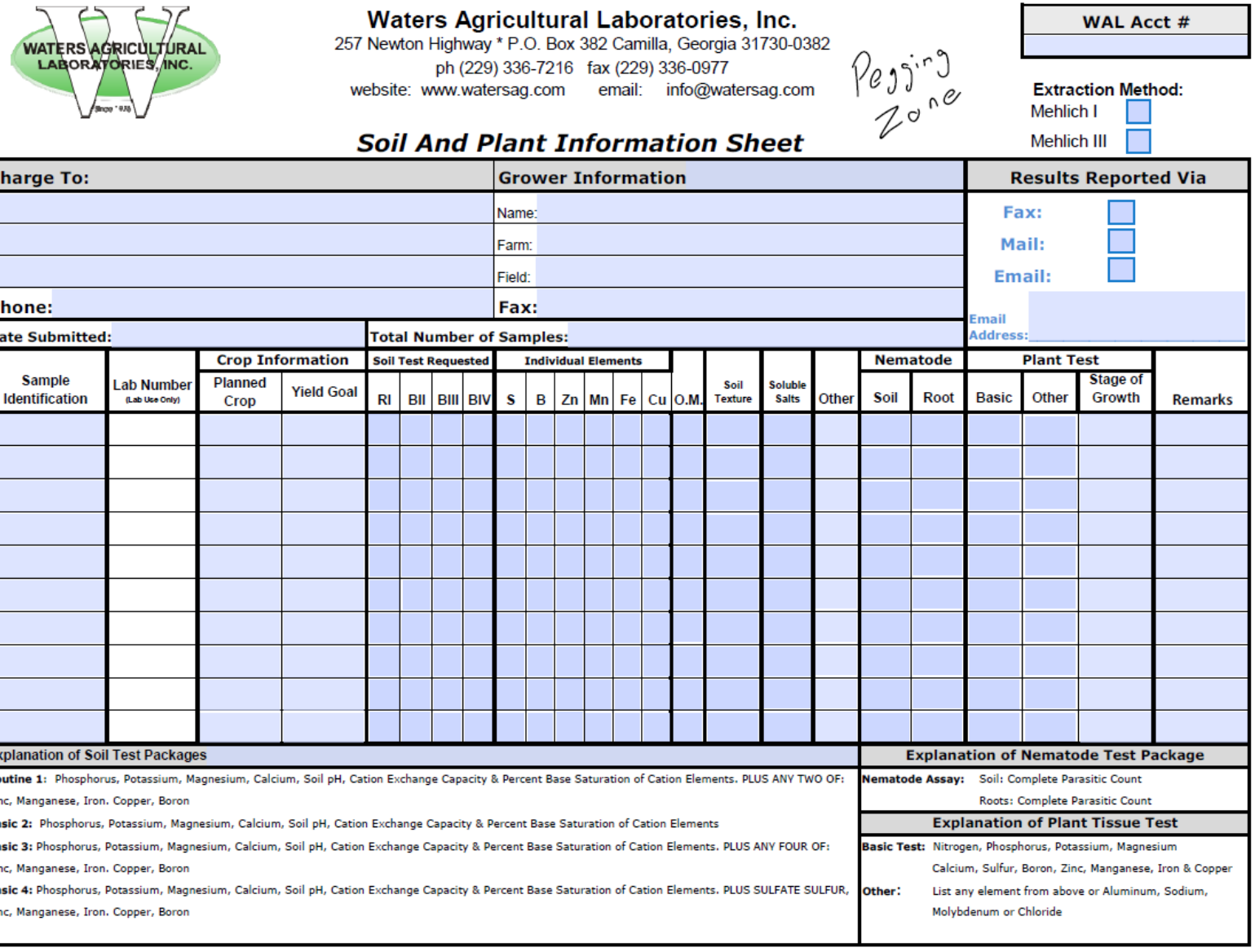
al
t Board

Take Home Message

- Gyp … itions.
- Lim … pla… …re
- Alte … doe… …sum
- Ade … calc… …al



Waters Agricultural Laboratories, Inc.
257 Newton Highway * P.O. Box 382 Camilla, Georgia 31730-0382
ph (229) 336-7216 fax (229) 336-0977
website: www.watersag.com email: info@watersag.com

Pegging Zone

WAL Acct #

Extraction Method:
Mehlich I ☐
Mehlich III ☐

Soil And Plant Information Sheet

Charge To:	Grower Information	Results Reported Via
	Name:	Fax: ☐
	Farm:	Mail: ☐
	Field:	Email: ☐
Phone:	Fax:	Email Address:
Date Submitted:	Total Number of Samples:	

Sample Identification	Lab Number (Lab Use Only)	Crop Information: Planned Crop	Crop Information: Yield Goal	Soil Test Requested: RI	BII	BIII	BIV	Individual Elements: S	B	Zn	Mn	Fe	Cu	O.M.	Soil Texture	Soluble Salts	Other	Nematode: Soil	Nematode: Root	Plant Test: Basic	Plant Test: Other	Plant Test: Stage of Growth	Remarks

Explanation of Soil Test Packages

Routine 1: Phosphorus, Potassium, Magnesium, Calcium, Soil pH, Cation Exchange Capacity & Percent Base Saturation of Cation Elements. PLUS ANY TWO OF: Zinc, Manganese, Iron. Copper, Boron

Basic 2: Phosphorus, Potassium, Magnesium, Calcium, Soil pH, Cation Exchange Capacity & Percent Base Saturation of Cation Elements

Basic 3: Phosphorus, Potassium, Magnesium, Calcium, Soil pH, Cation Exchange Capacity & Percent Base Saturation of Cation Elements. PLUS ANY FOUR OF: Zinc, Manganese, Iron. Copper, Boron

Basic 4: Phosphorus, Potassium, Magnesium, Calcium, Soil pH, Cation Exchange Capacity & Percent Base Saturation of Cation Elements. PLUS SULFATE SULFUR, Zinc, Manganese, Iron. Copper, Boron

Explanation of Nematode Test Package

Nematode Assay: Soil: Complete Parasitic Count
Roots: Complete Parasitic Count

Explanation of Plant Tissue Test

Basic Test: Nitrogen, Phosphorus, Potassium, Magnesium Calcium, Sulfur, Boron, Zinc, Manganese, Iron & Copper

Other: List any element from above or Aluminum, Sodium, Molybdenum or Chloride

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Variety Testing

Corn Varieties

- **19 Varieties**
- **Yield- 172-222 bu/acre**
  - CP B5497 vt 2p 114
  - **CP B5760 tre 117**
  - DK B68-35 vt 2p 118
  - DK B70-45 ribvt 2p 120
  - PN 1847 VYHR 118

Cotton Varieties

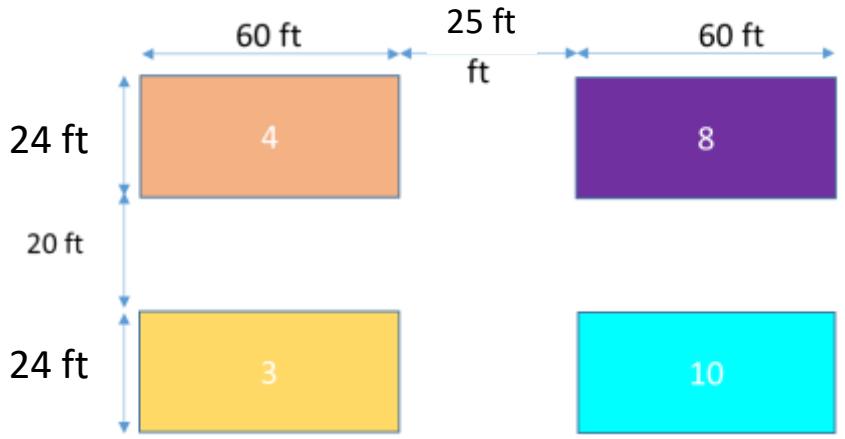
- **18 Varieties**
- **Yield- 0.83-1.39 bales/acre**
  - NG4190B3XF
  - DP2115B3FX
  - DP2012B3FX
  - DP2127B3FX
  - **ST5091B3FX**

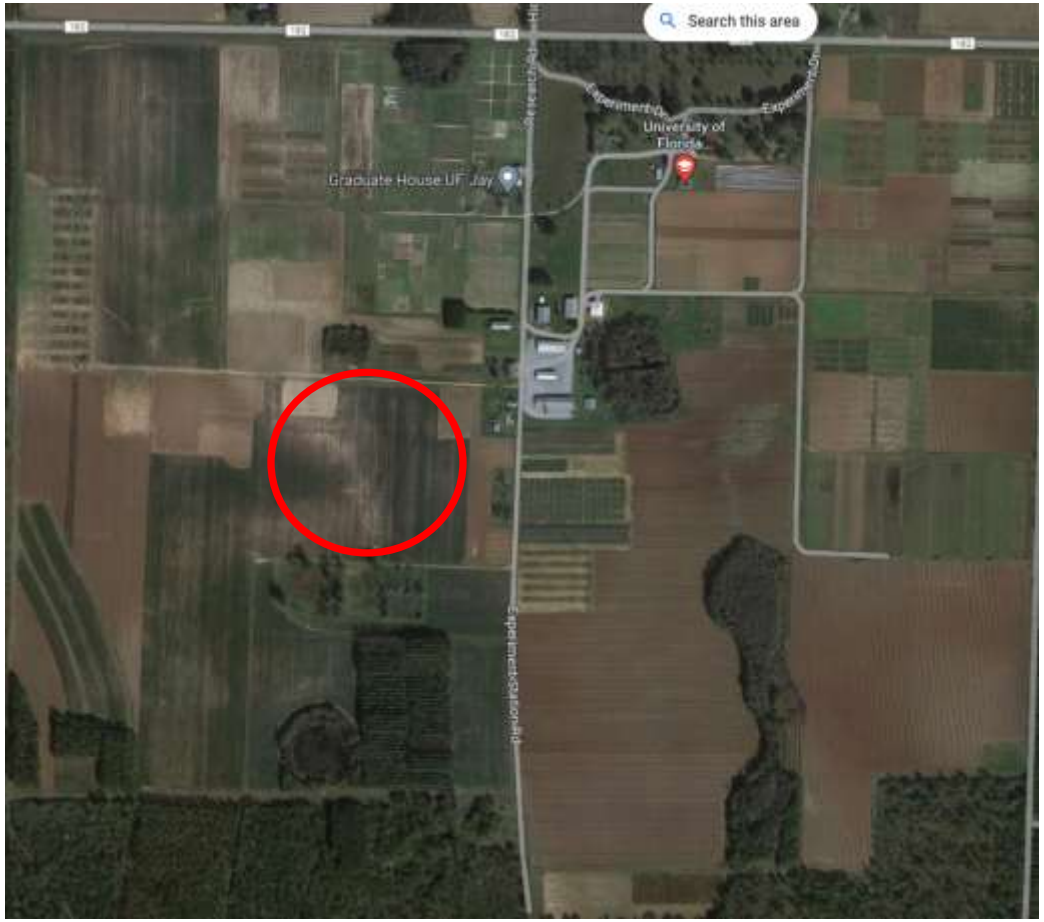
Soybean Varieties

- **7 Varieties**
- **Yield- 14-29.5 bu/acre**
  - 62-D60 (Armor)
  - **NK69-Q4XF (Syngenta)**
  - AG71XF2 (Asgrow)

Florida STEP Cotton Contest 2024

- West Florida Research and Educational Center (WFREC), Jay FL
- Variable Rate Irrigation System
- Four randomized plots
- Each farm on paper includes 1000 harvest acres for the purposes of making decisions but is imposed on plots at WFREC.





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Florida STEP Cotton Contest 2024

- **Management Decisions for Cotton Contest**
  - Cotton hybrid,
  - Seeding rate,
  - Irrigation management,
  - Nitrogen management,
  - Growth Regulator
  - Insurance selection, and
  - Cotton marketing.

- The project team at the station will manage all plots.
- These decisions will be made in real-time using a secure STEP website (https://step.ifas.ufl.edu/) provided to participating teams at the start of the competition.
- Other Management decision remain same for all teams.

Florida STEP Cotton Contest 2024

Recruiting Teams	Kickoff Meeting	Conduct Competition	Award Banquet
Now-April	Early April	May-November	January 2025

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On-Farm No Till Planter Demonstration

Acknowledgements












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West Florida Research and Education Center

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES EST. 1868

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National Peanut Board

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Thank You

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