Surviving Another Year of High Fertilizer Prices
(or Dealing with High Fertilizer Prices Two Years in a Row)

Glen Harris – Extension Agronomist : Soils & Fertilizers
University of Georgia – Tifton

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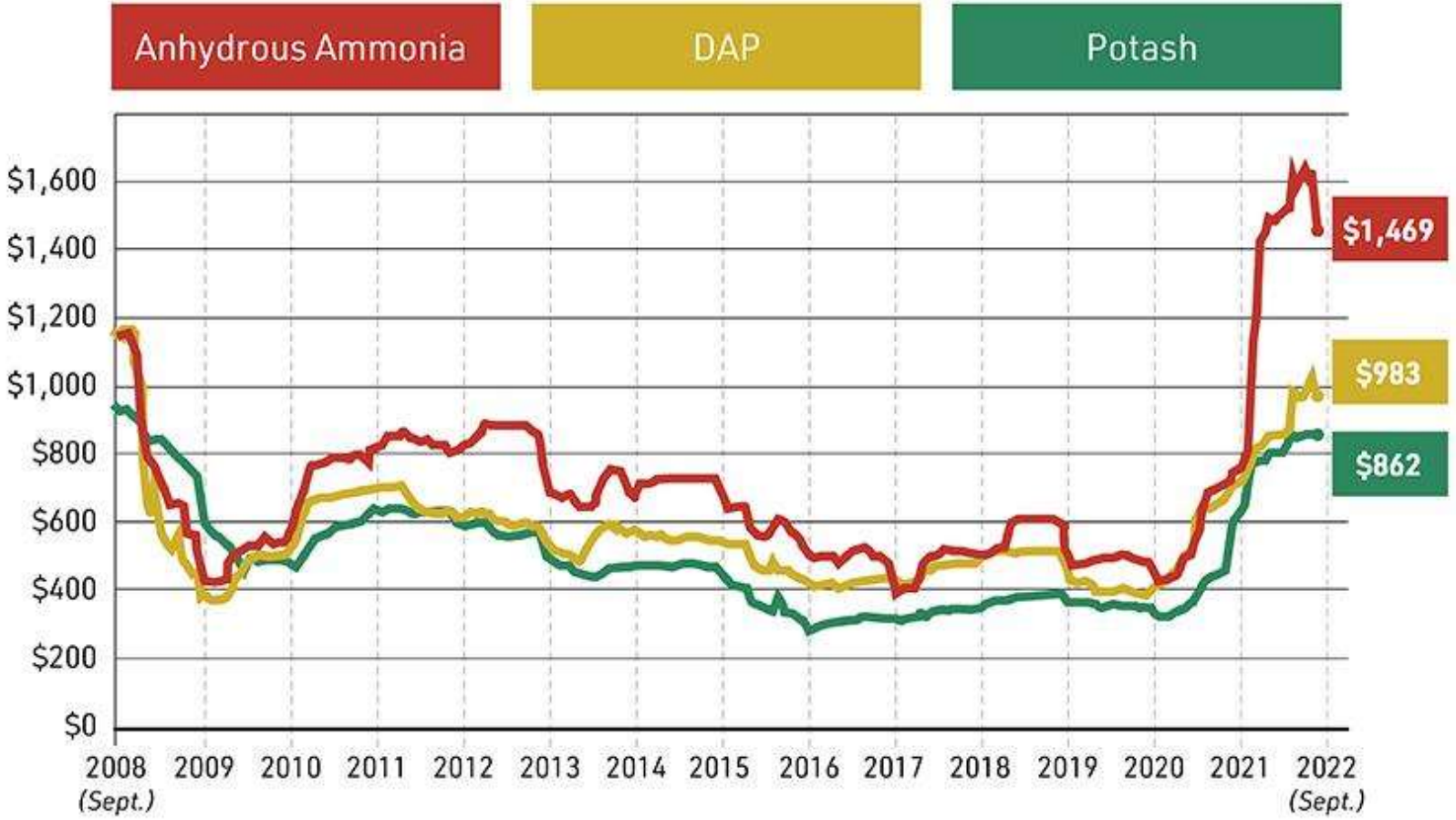
How Rough Are Fertilizer Prices ?

Fertilizer Prices Per Ton in Illinois



SOURCE: USDA, AGRICULTURAL MARKETING SERVICE; ILLUSTRATION: FARM JOURNAL

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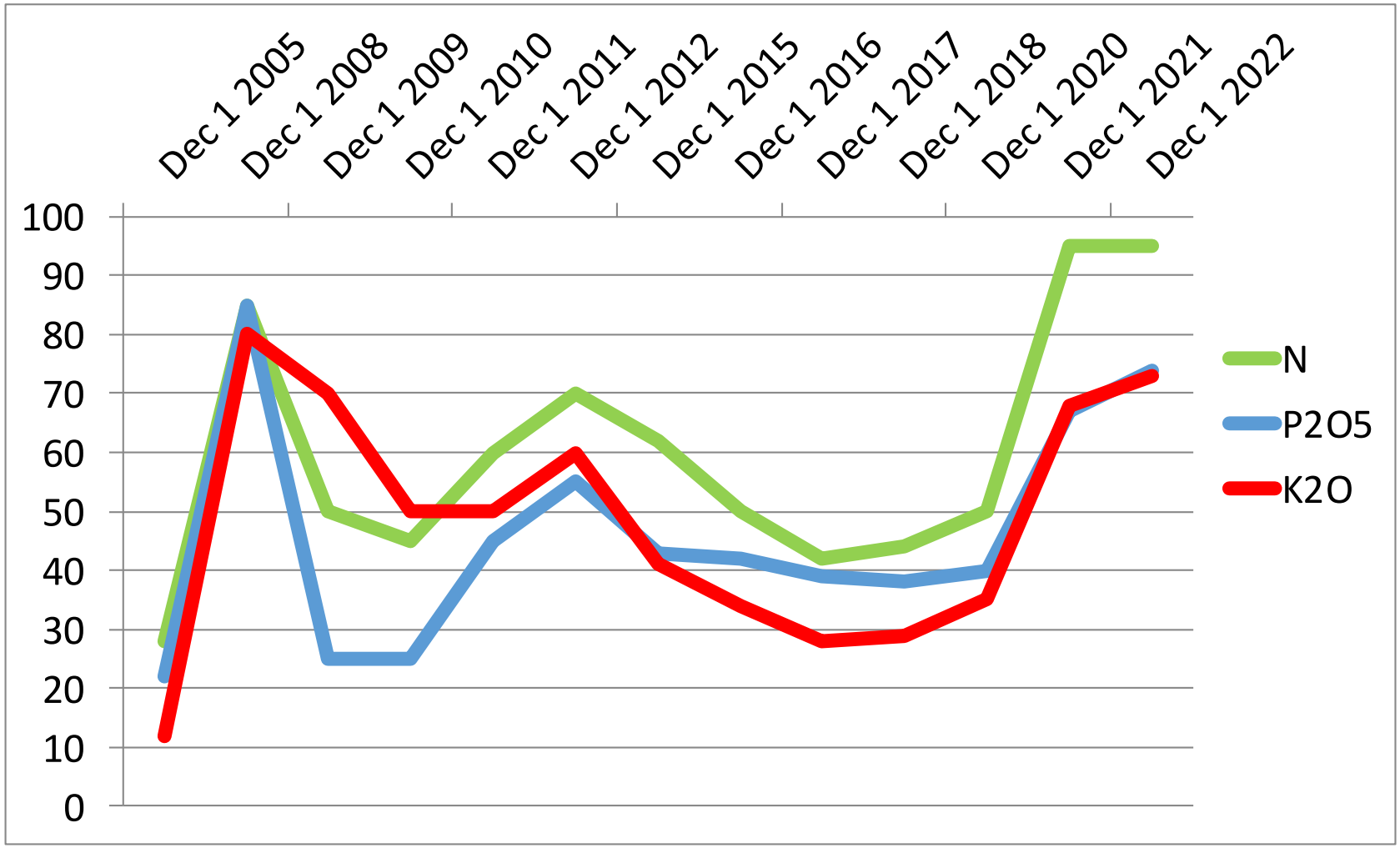
Fertilizer Prices (cents/lb N-P2O5-K2O)



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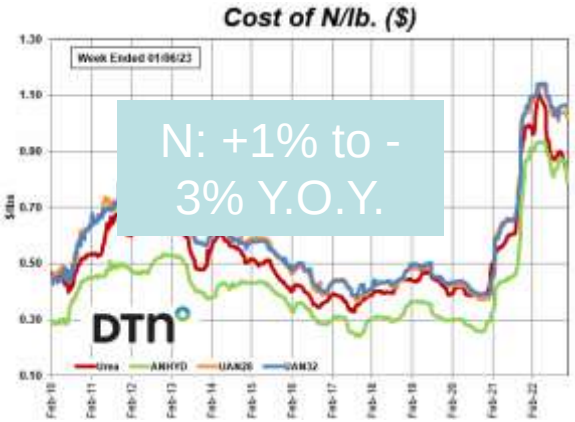
From Dr. Amanda Smith – University of Georgia Economist

Fertilizers

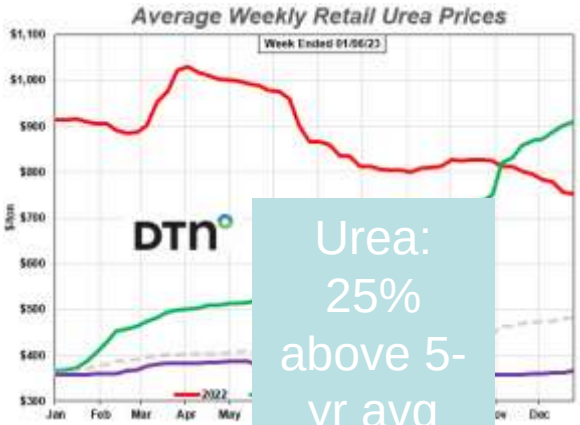
- N demand is more inelastic
- The direction N prices will go depends upon two major questions:
  - Will demand stay high (corn prices)?
  - How much will natural gas prices increase?

- **Prices for most have softened recently**

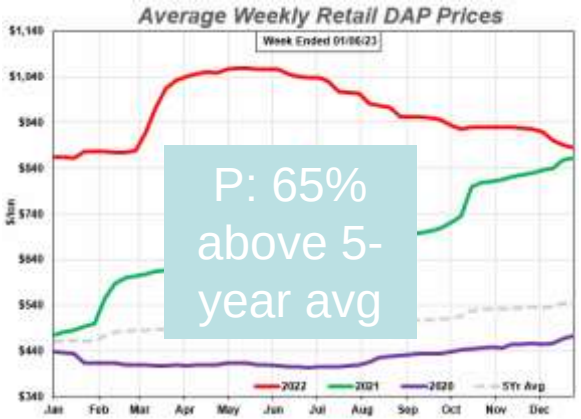
- 2023 Budgets
  - N = $1.10/lb
  - P = $0.80/lb
  - K = $0.75/lb



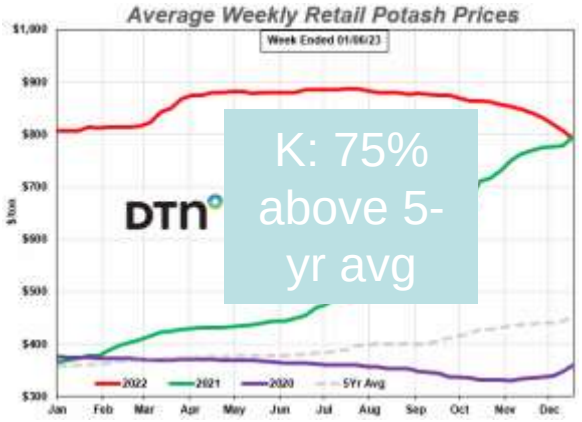
N: +1% to -3% Y.O.Y.



Urea: 25% above 5-yr avg



P: 65% above 5-year avg



K: 75% above 5-yr avg

Source: DTN/The Progressive Farmer, Jan 2023

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Basic Strategy for Dealing with High Fertilizer Prices

Soil Test
Maintain Proper Soil pH
Fertilize by Yield or Production Goals
Reduce Fertilizer Rates (?)
Band N, P and K to Increase Efficiency (?)
Give N Credits to Manure and Legume Cover Crops

In-Season Adjustments
Split Applications (Esp. N)

Alternative/By-Product
Fertilizer Sources (?)

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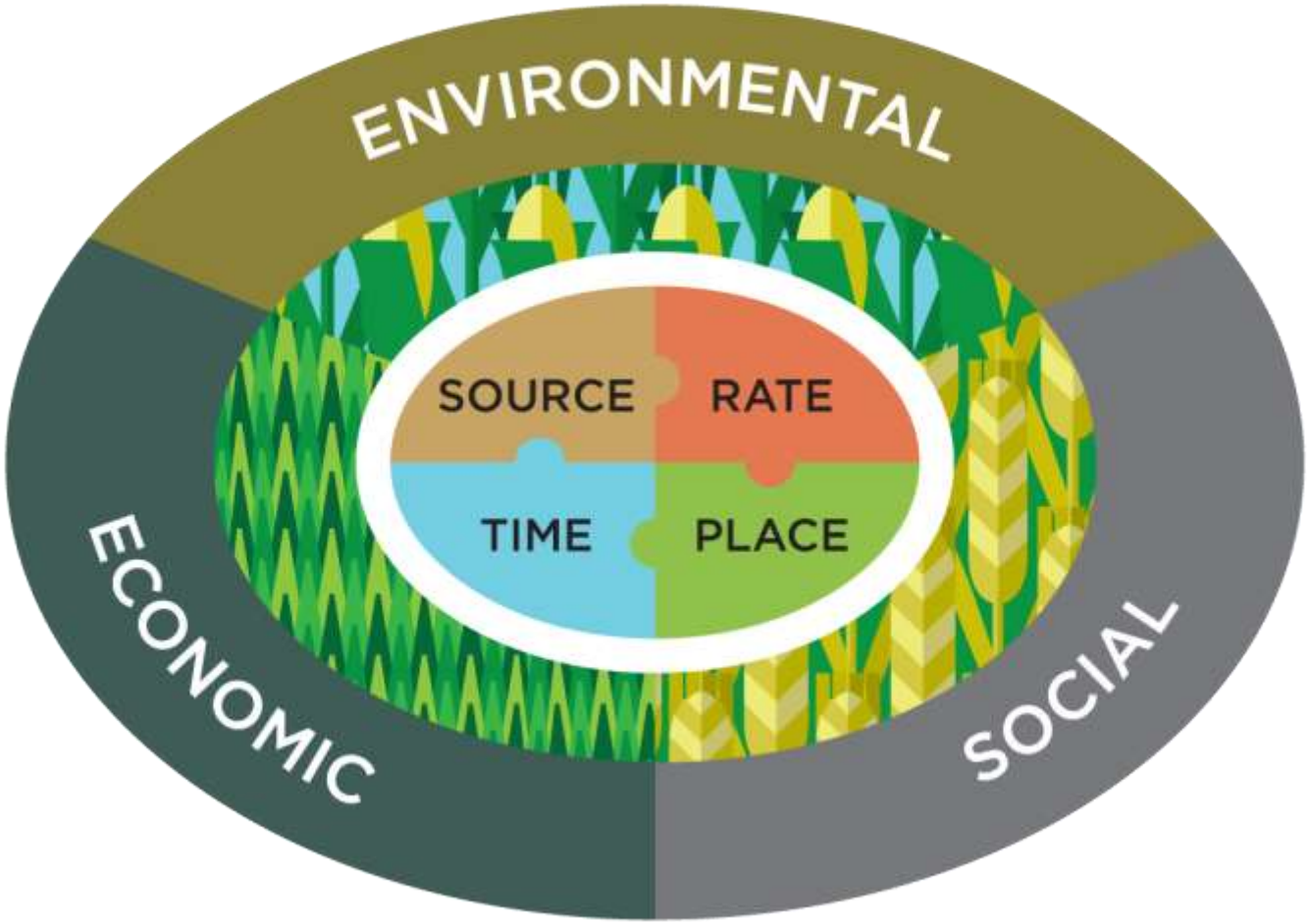
The “4 R’s” Of Fertilization



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Source: The Fertilizer Institute (TFI)

Basic Strategy for Dealing with High Fertilizer Prices

Soil Test - R
Maintain Proper Soil pH - R
Fertilize by Yield or Production Goals - R
Reduce Fertilizer Rates (?) - R
Band N, P and K to Increase Efficiency (?) - P
Give N Credits to Manure and Legume Cover Crops - S

In-Season Adjustments
Split Applications - T

Alternative/By-Product
Fertilizer Sources (?) – S

Grid Sampling/VR – R x P

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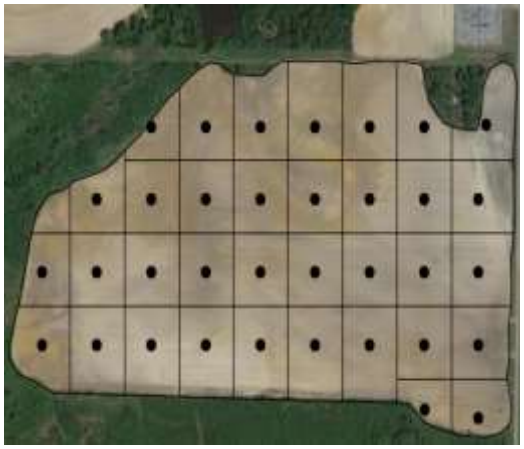
From Dr. Simer Virk – UGA Ag Engineer
Optimal Grid Size for Soil Sampling?

1.0 ac



2.5 ac

5.0 ac

7.5 ac

10.0 ac

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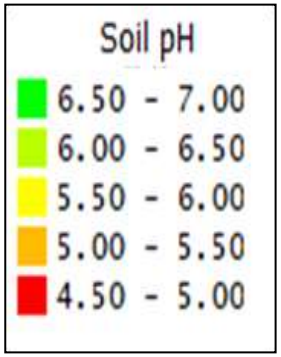
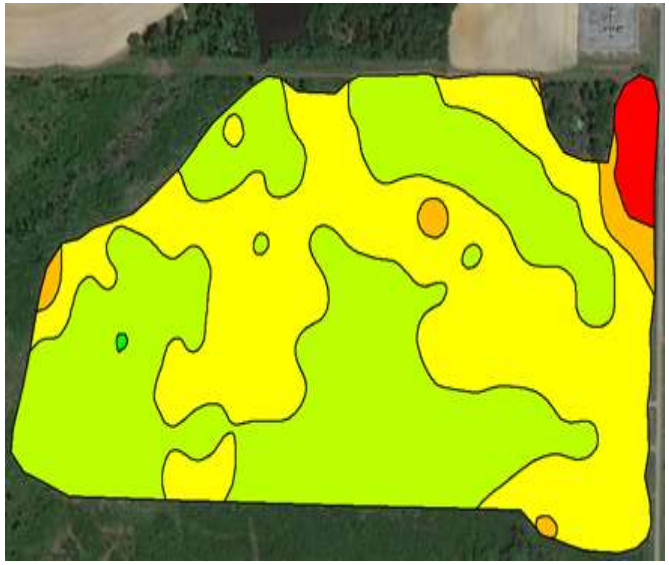
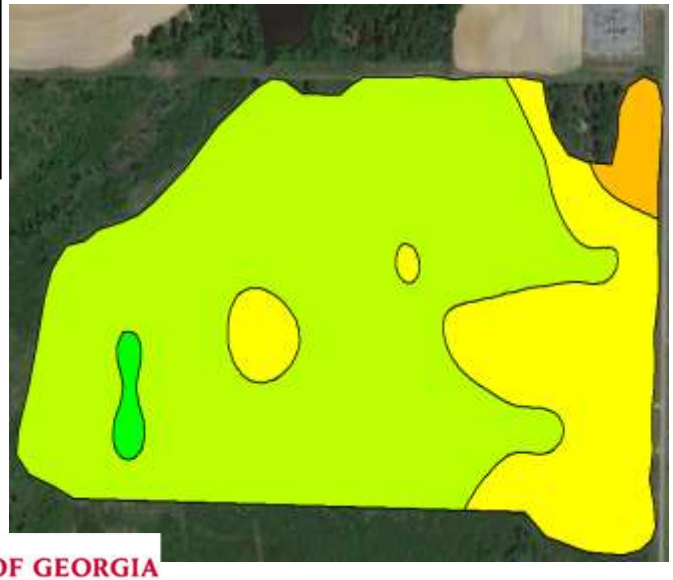
Actual Soil pH Variability (163 Samples)





1 ac (92 samples)

2.5 ac (35 samples)



5 ac (17 samples)

Nitrogen Recommendations for Cotton
Based on Yield Goals

Yield Goal (lbs lint/a)	N Rate (lb/a)
750	60
1000	75
1250	90
1500	105

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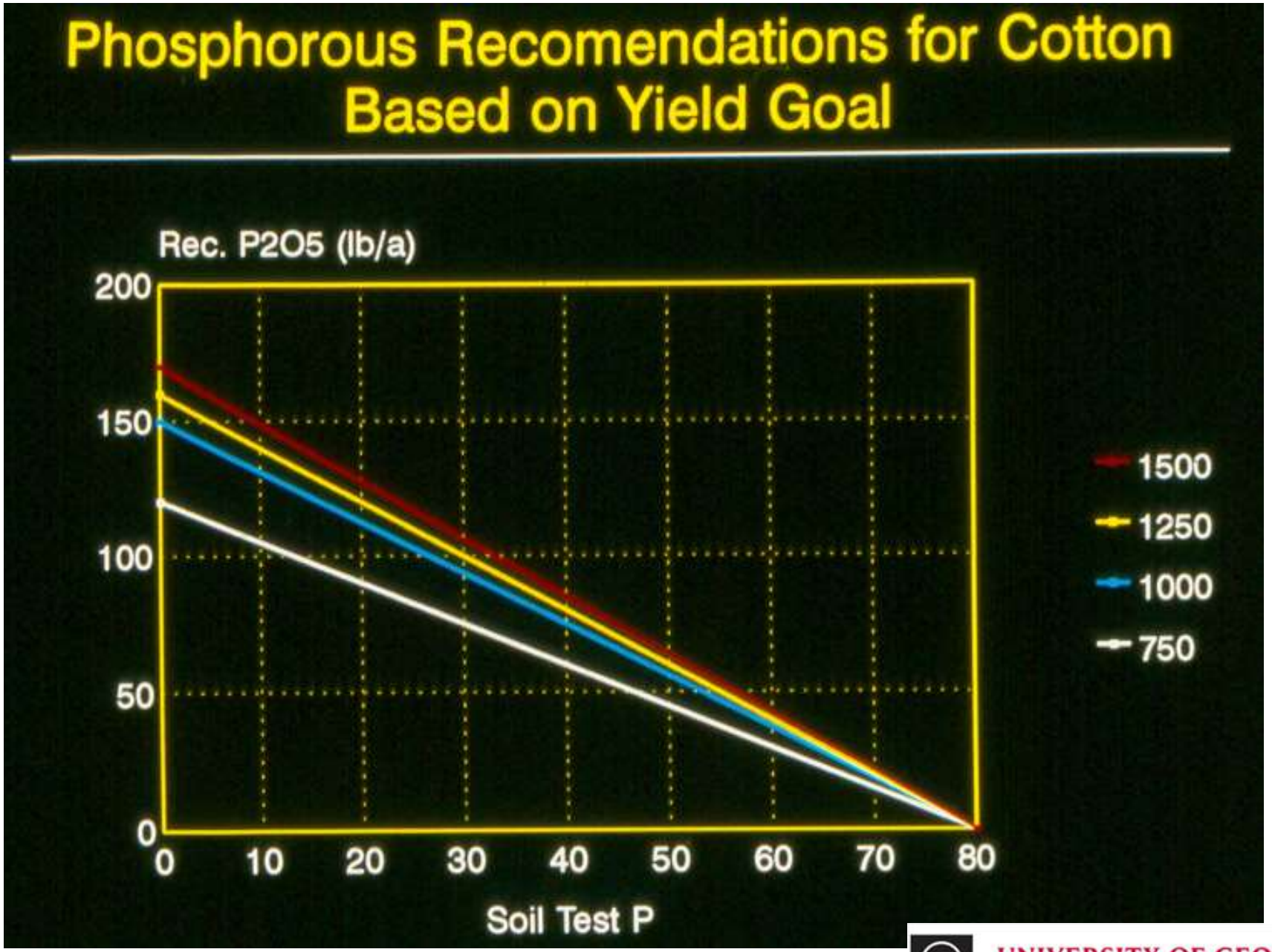
Phosphorous Recomendations for Cotton Based on Yield Goal



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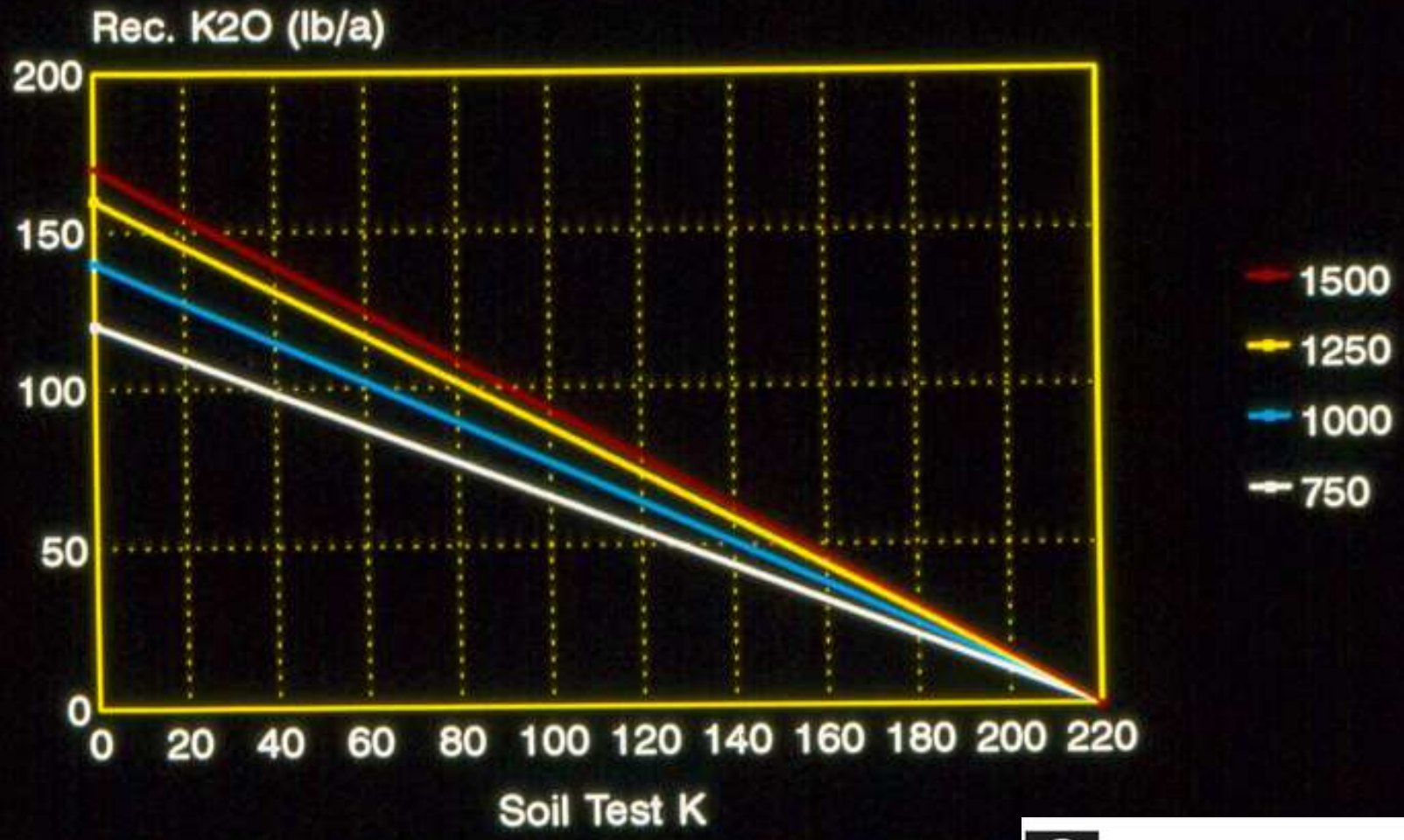
Potassium Recomendations for Cotton Based on Yield Goal



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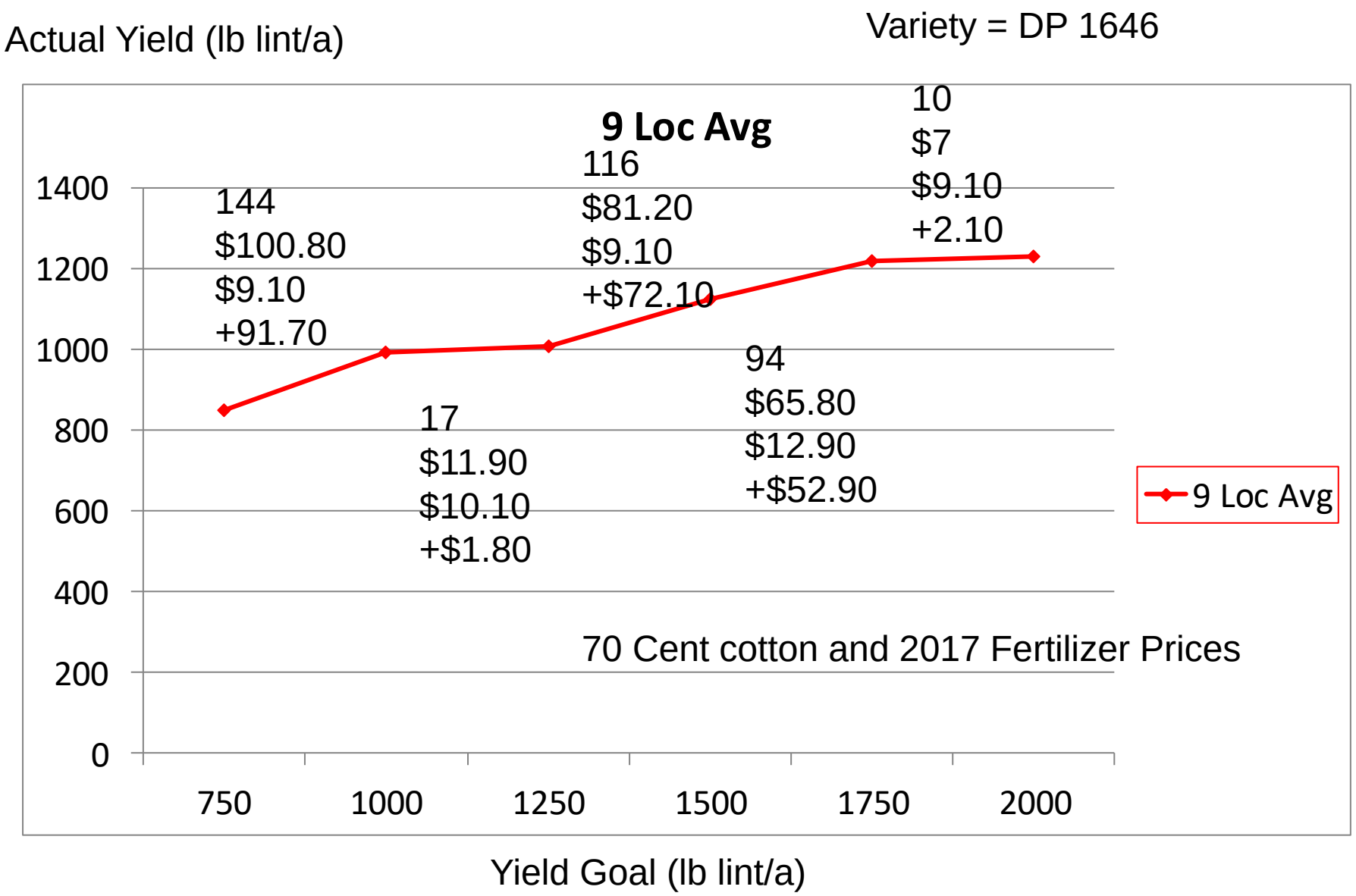
Fertilizing Cotton (N-P-K) By Yield Goal – 2017+2018



N-P-K Rates by Yield Goal

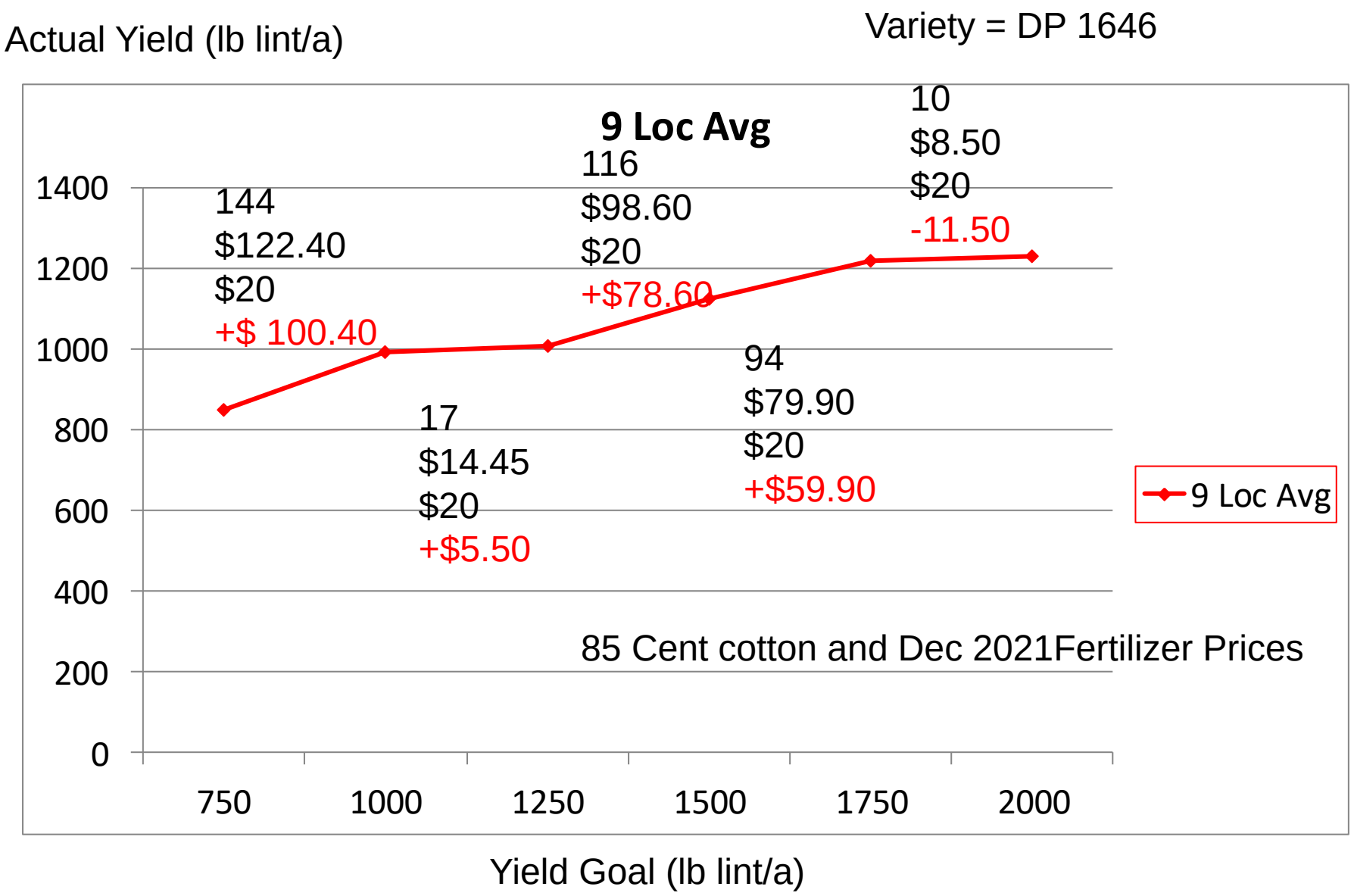
Yield Goal	N-P-K Applied	Increase	Cost*
750	30-50-80	-----	------
1000	45-50-90	15-0-10	$ 9.10
1250	60-60-90	15-10-0	$10.10
1500	75-60-100	15-0-10	$ 9.10
1750	90-70-110	15-10-10	$12.90
2000	105-70-120	15-0-10	$ 9.10

All sites = “Medium” P & K

Used 5-10-15 with minors as a base, then adjusted P with 0-46-0 and K with 0-0-60
N Side dressed with “Amidas” 40-0-0 5.5(S)

* 2017 Fertilizer prices – 42-38-28 (cents/lb N-P2O5-K2O)

Fertilizing Cotton (N-P-K) By Yield Goal – 2017+2018

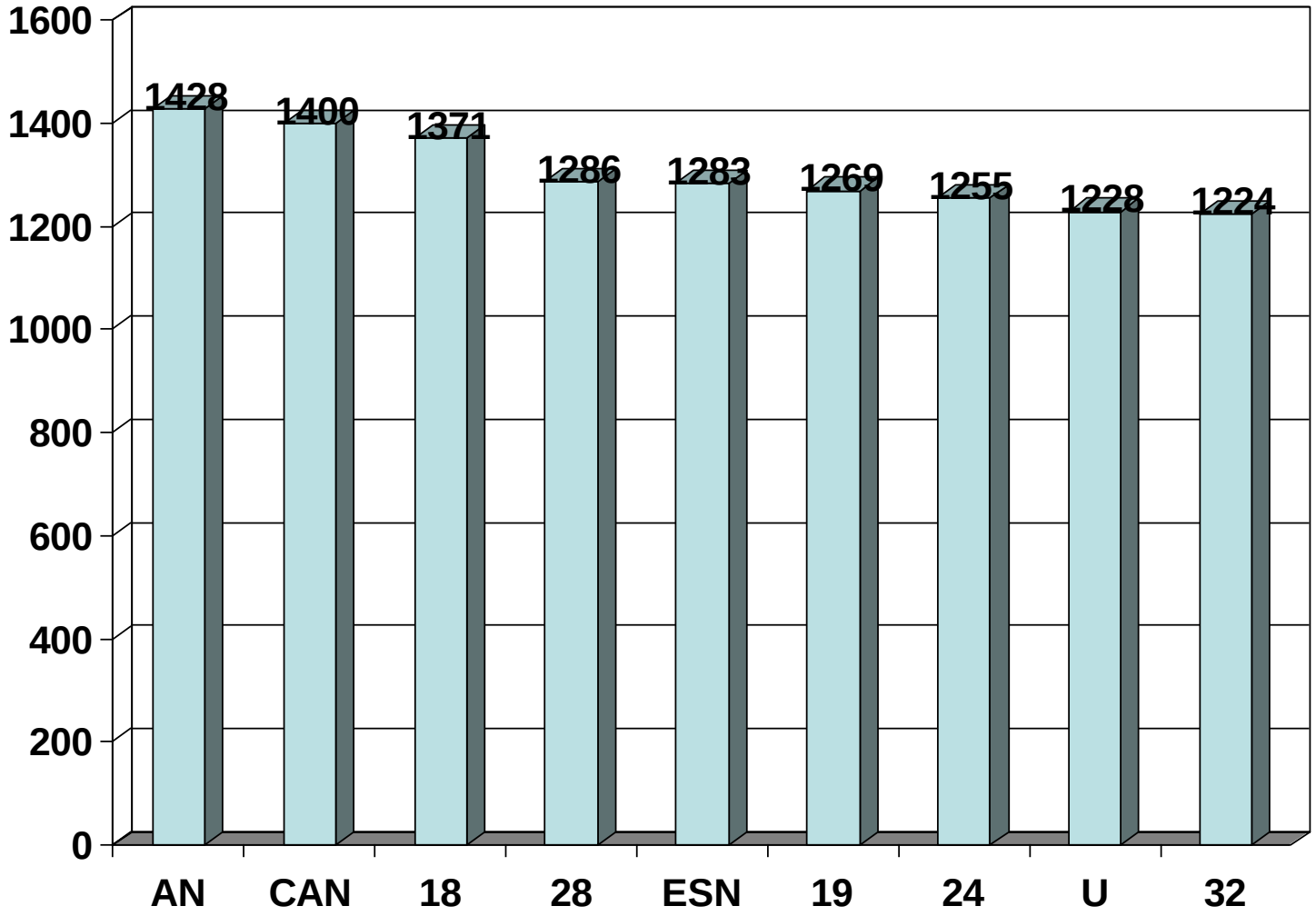



Nitrogen Sidedress “Sources”

Sidedress N Source Comparison

RDC+EXPO – 2013+2014 AVG

Cotton Yield (lbs lint/a)



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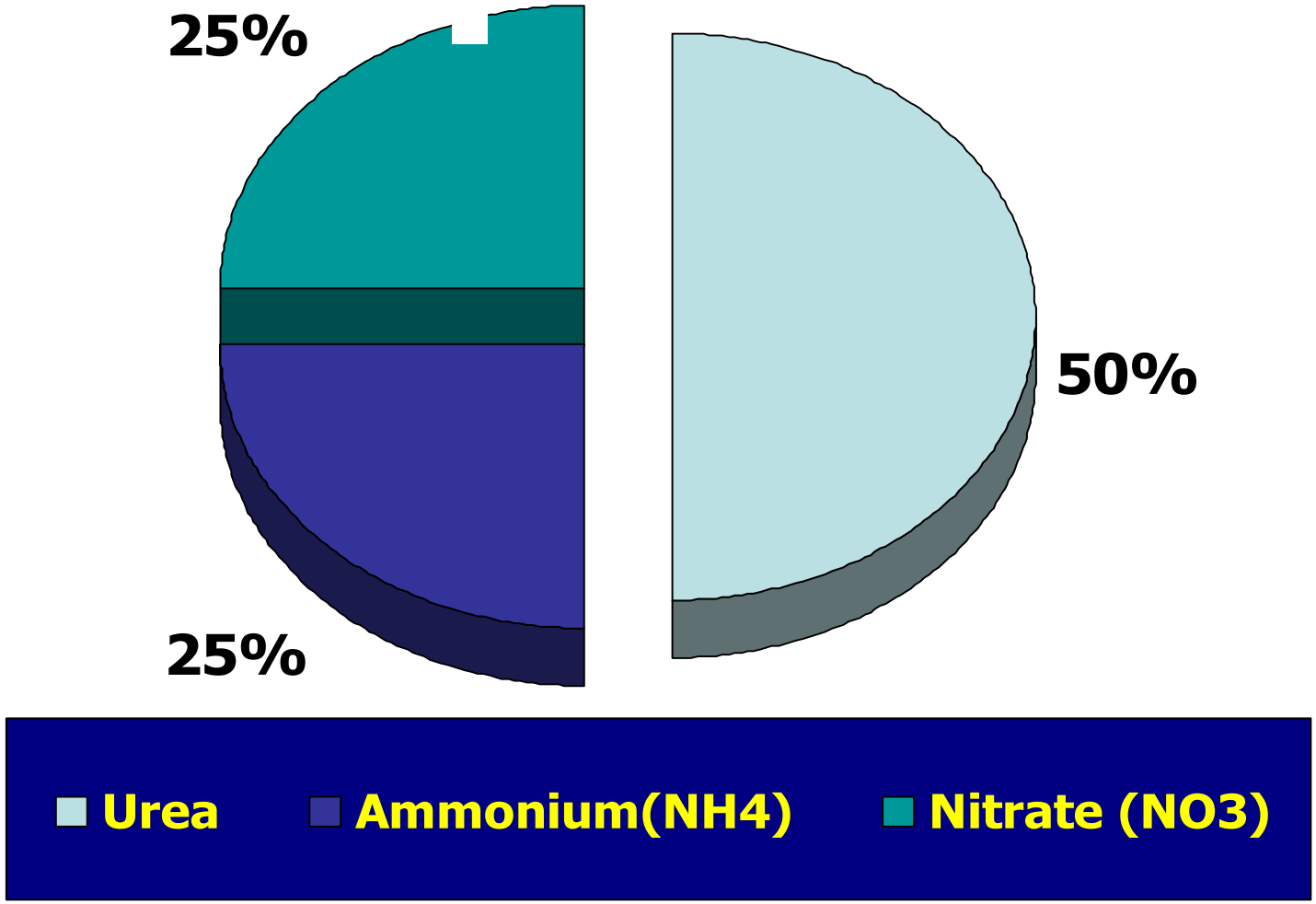
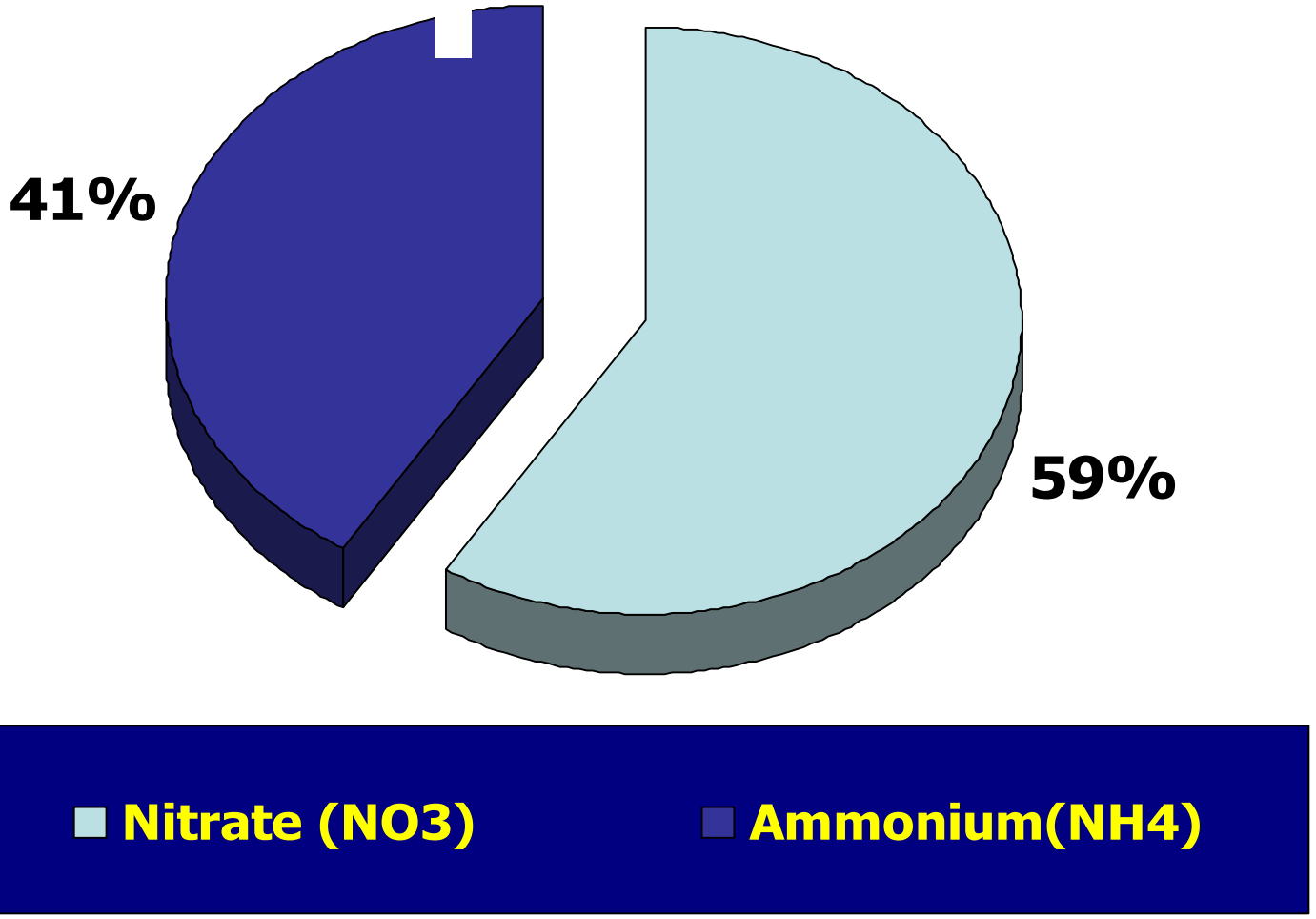
Composition of UAN (32% N)
(urea + ammonium nitrate)



*** Add ATS to make 28-0-0-5(S)**

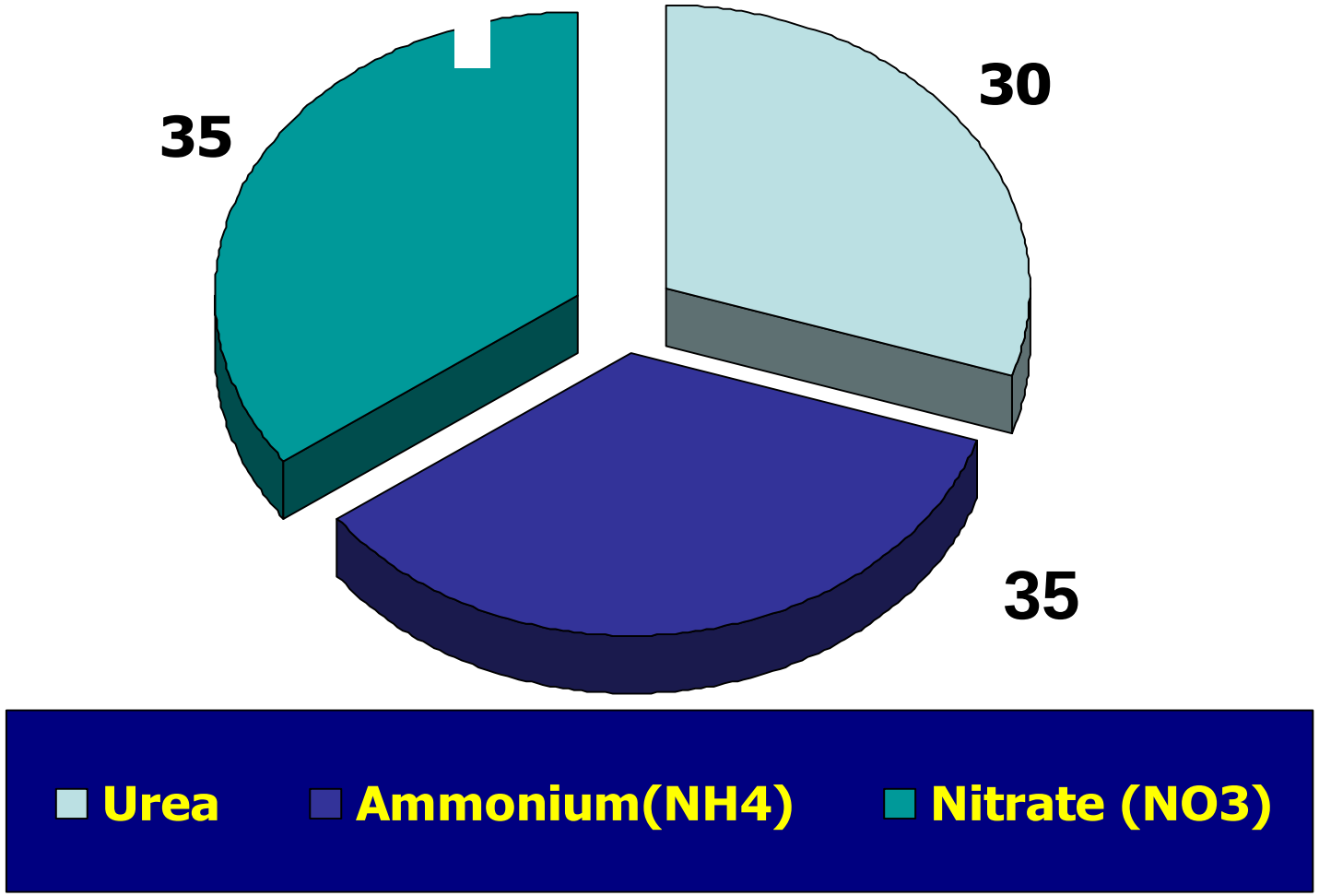
Composition of “19-E” (19%N)
(ammonium nitrate + sodium nitrate)



*** Add ATS to make 18-0-0-3(S)**

Composition of “24% N”

(urea + ammonium nitrate + sodium nitrate)



*** Add ATS to make 24-0-0-3(S)**

Agricultural, Municipal and Industrial By-Products

Chicken Litter
"Poultash"
Gin Trash

Biosolids
Symtrex
Sus-Terra

FGD Gypsum
Wood Ash
Wallboard
RecycLime

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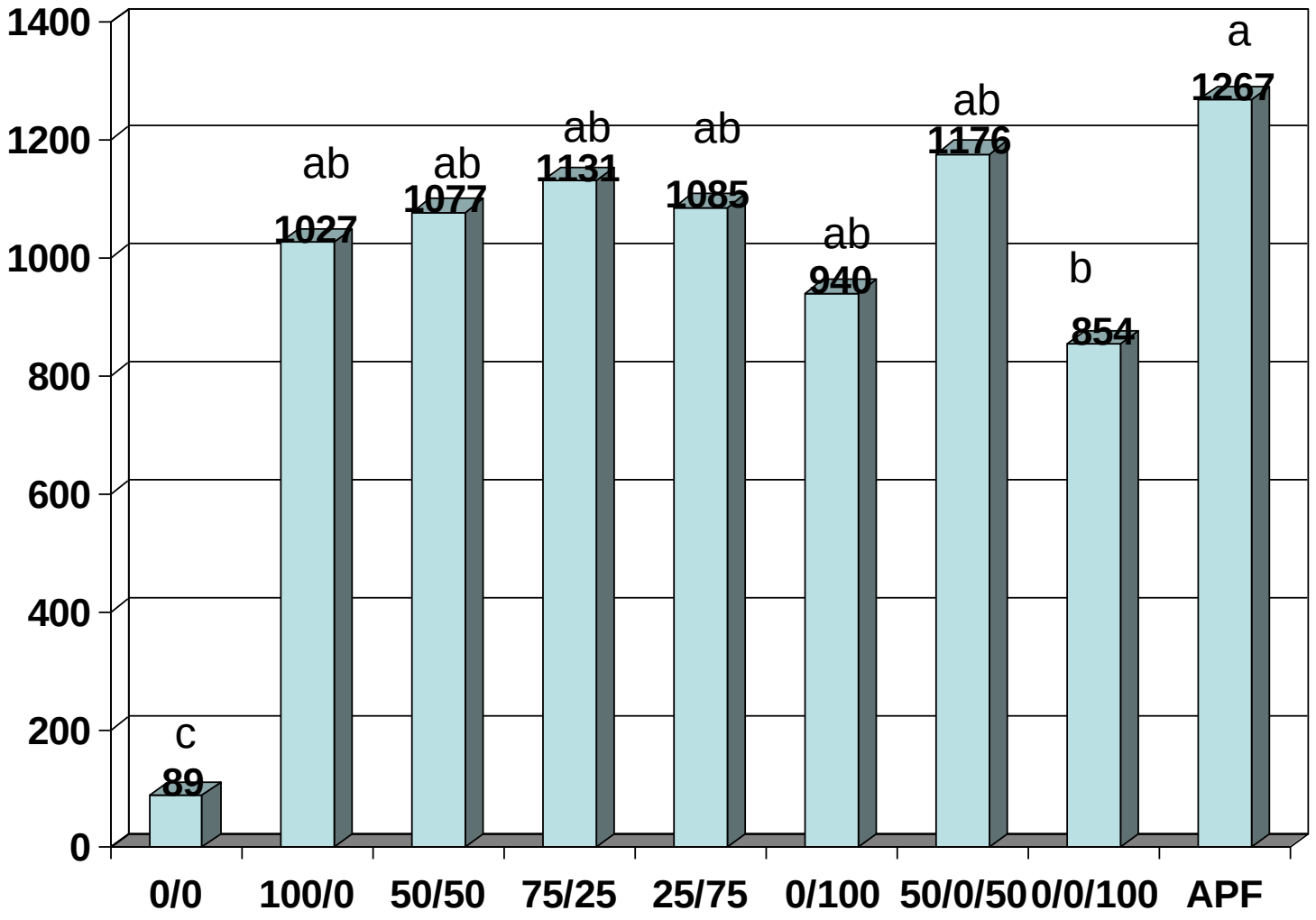
Leafspot and K Deficiency

K Timing on Cotton

Bowen 2021 DPL 1646

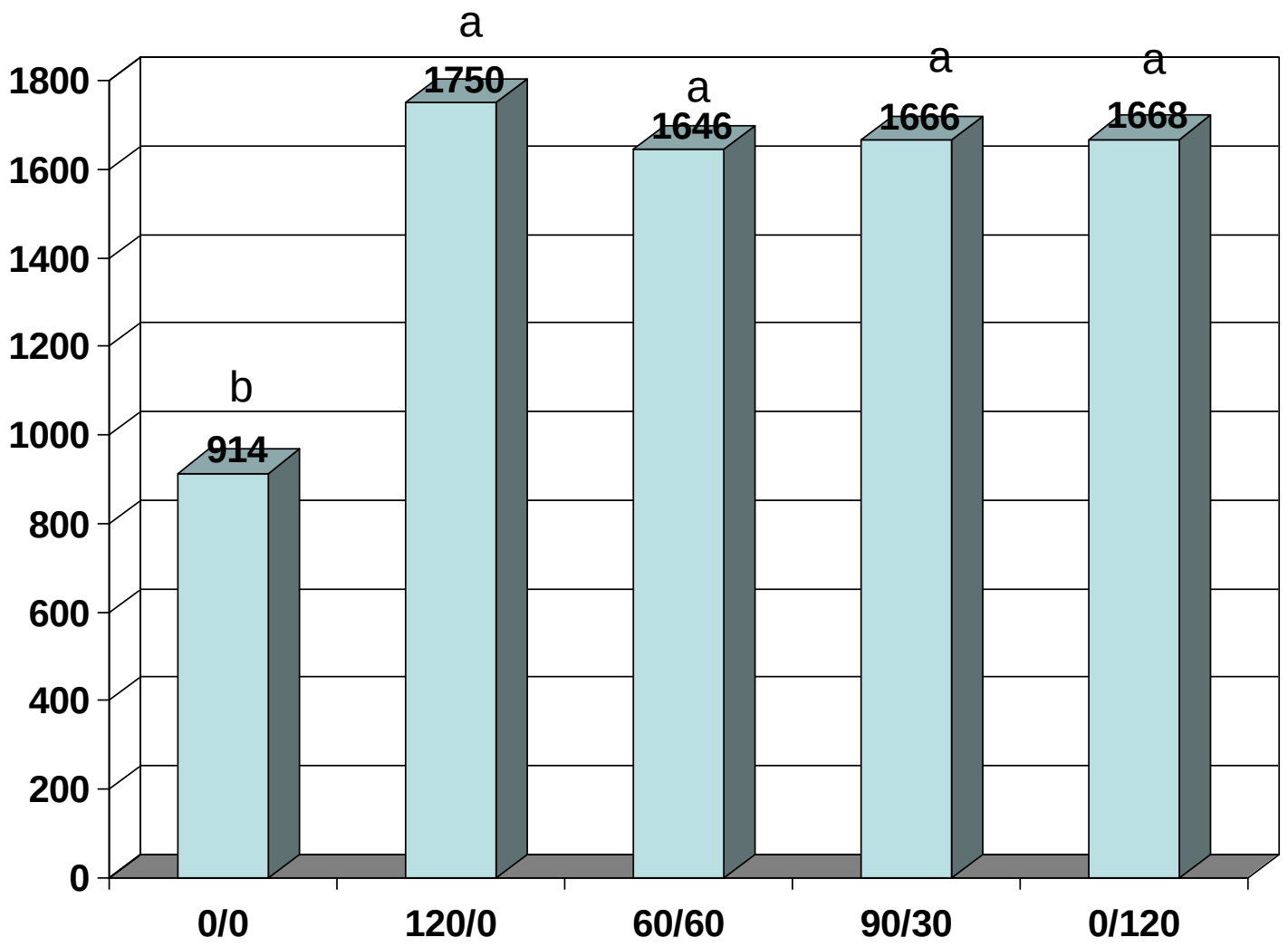
Lb lint/a



AP/SD/FB CV=16 P=0.0001

K Timing on Cotton

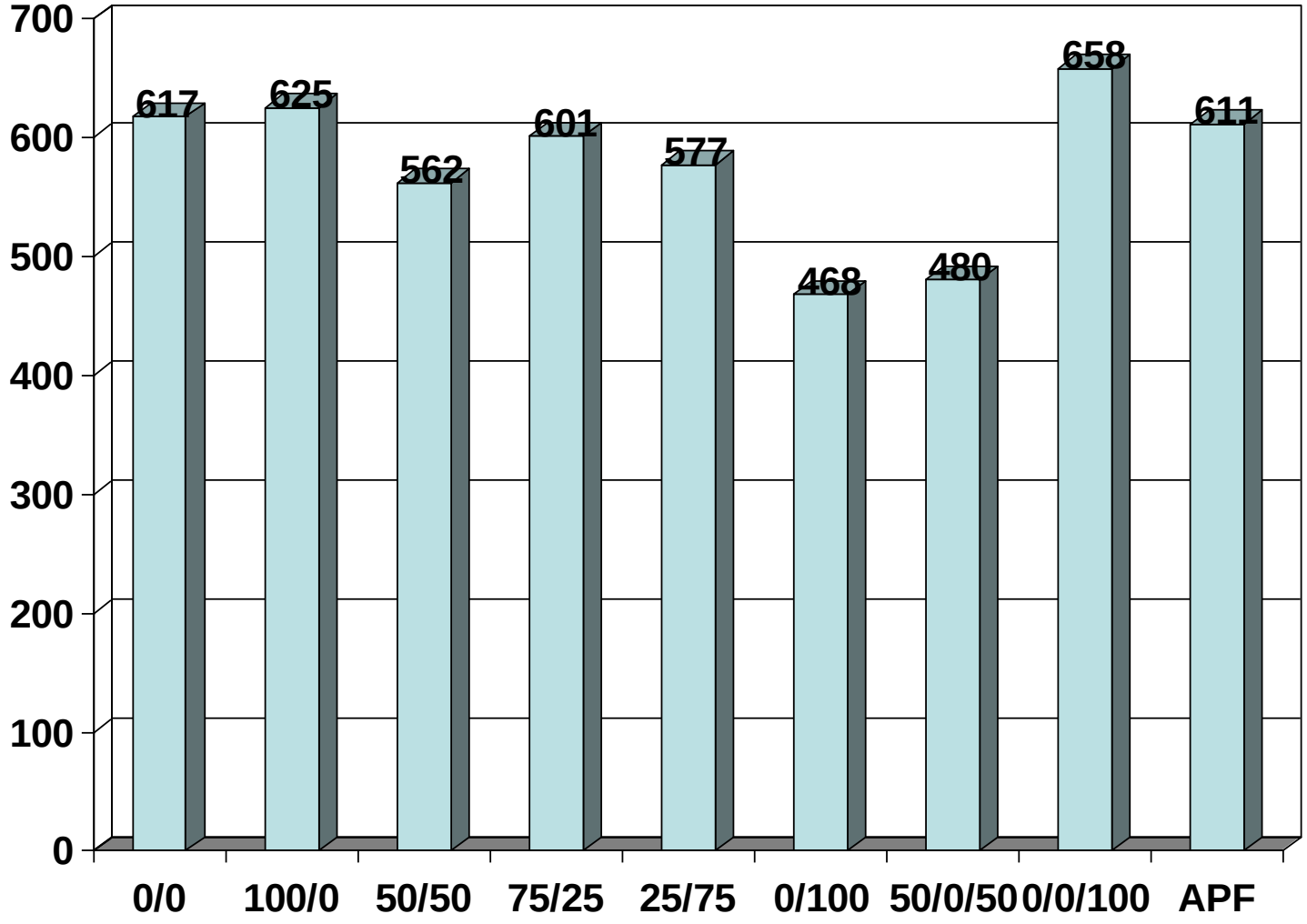
Midville 2021 DPL 1646



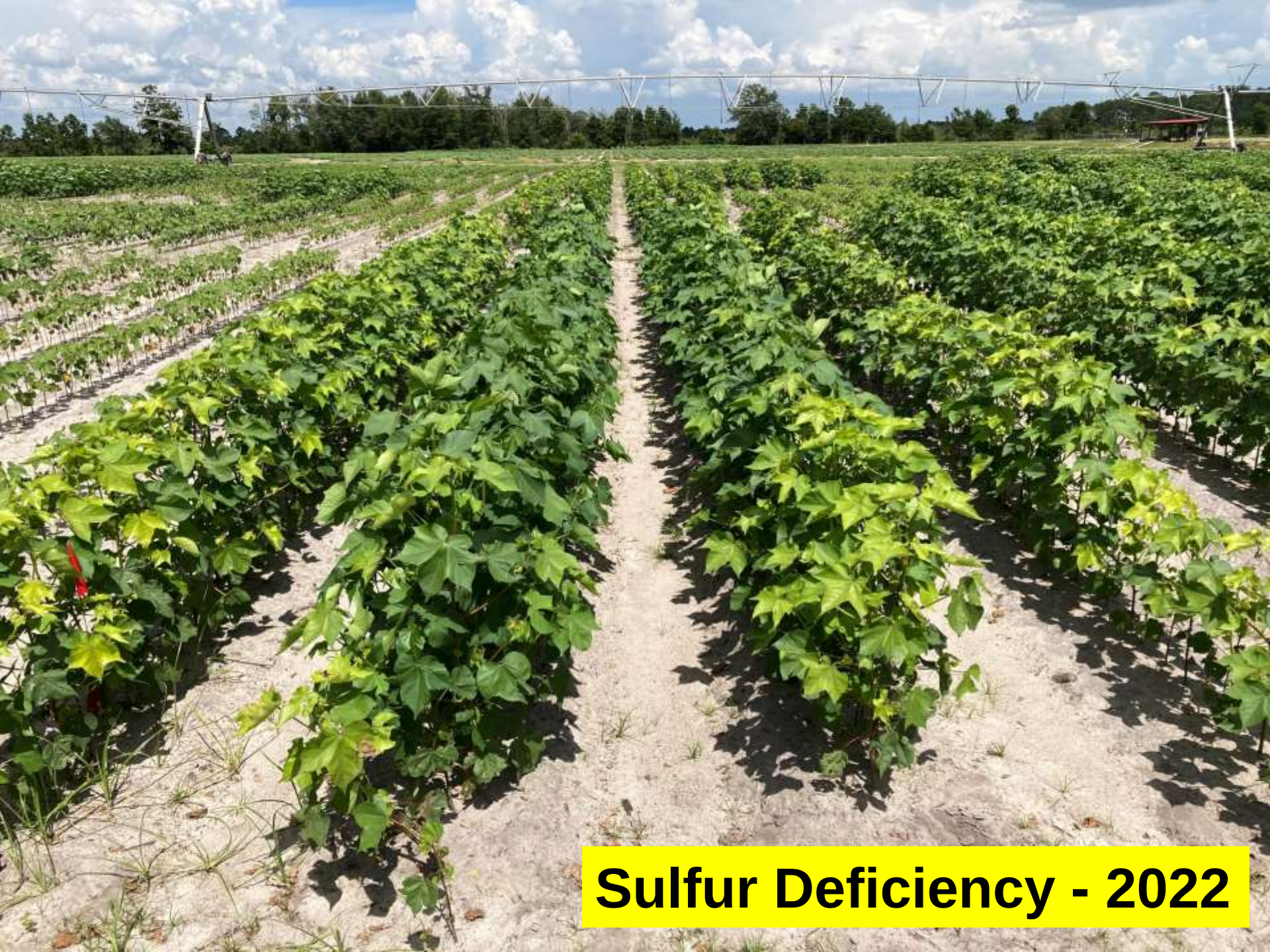
AP/SD Assume 40 % TO for all plots (CV=9 P=.0001)

K Timing on Cotton

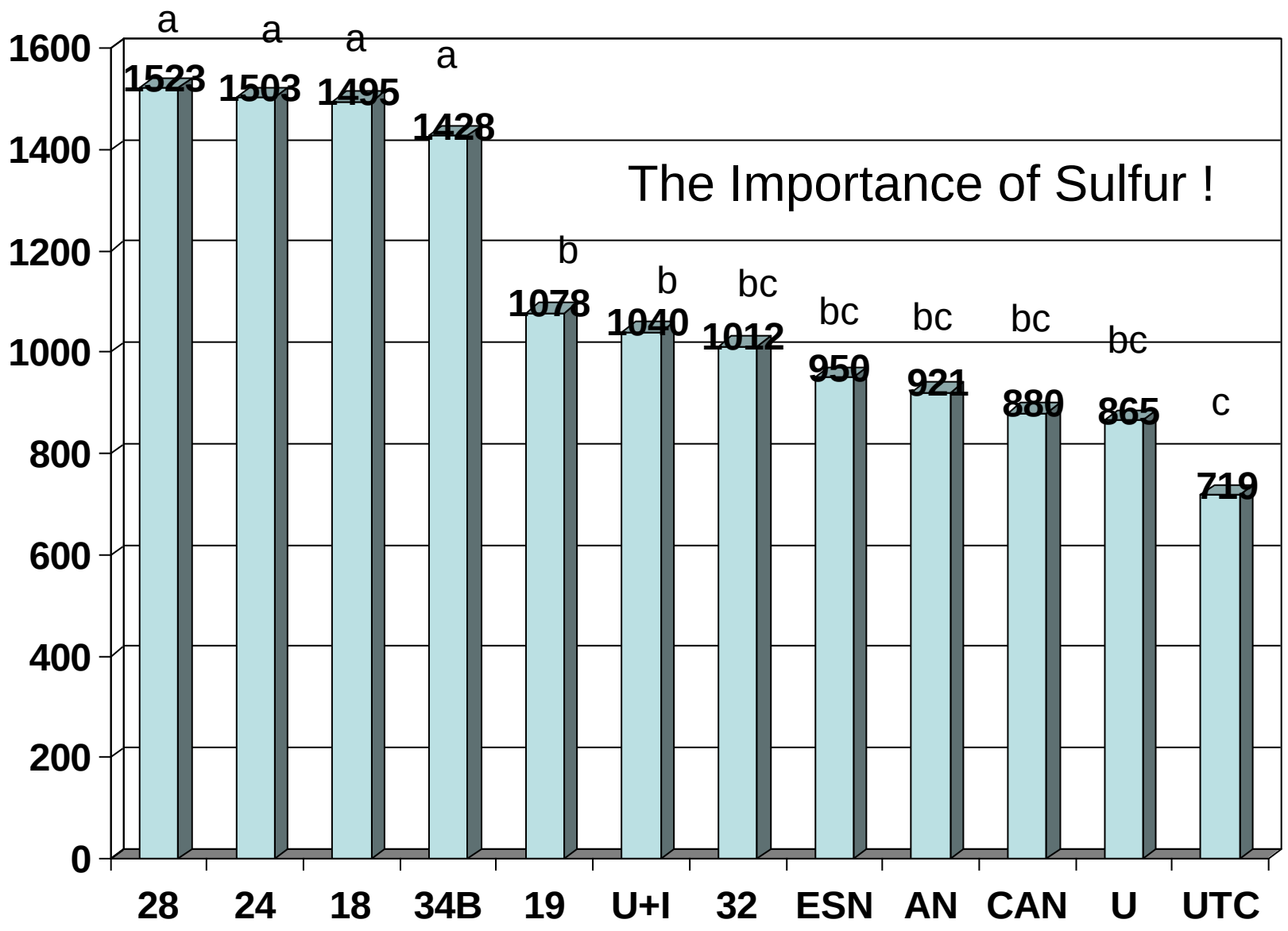
Sunbelt Expo 2021 DPL 1646



AP/SD/FB CV=26 P=0.6813 so “NS”


Sulfur Deficiency - 2022

Cotton Yield (lbs lint/a) **Stripling N Source Study - 2014**



There are no…

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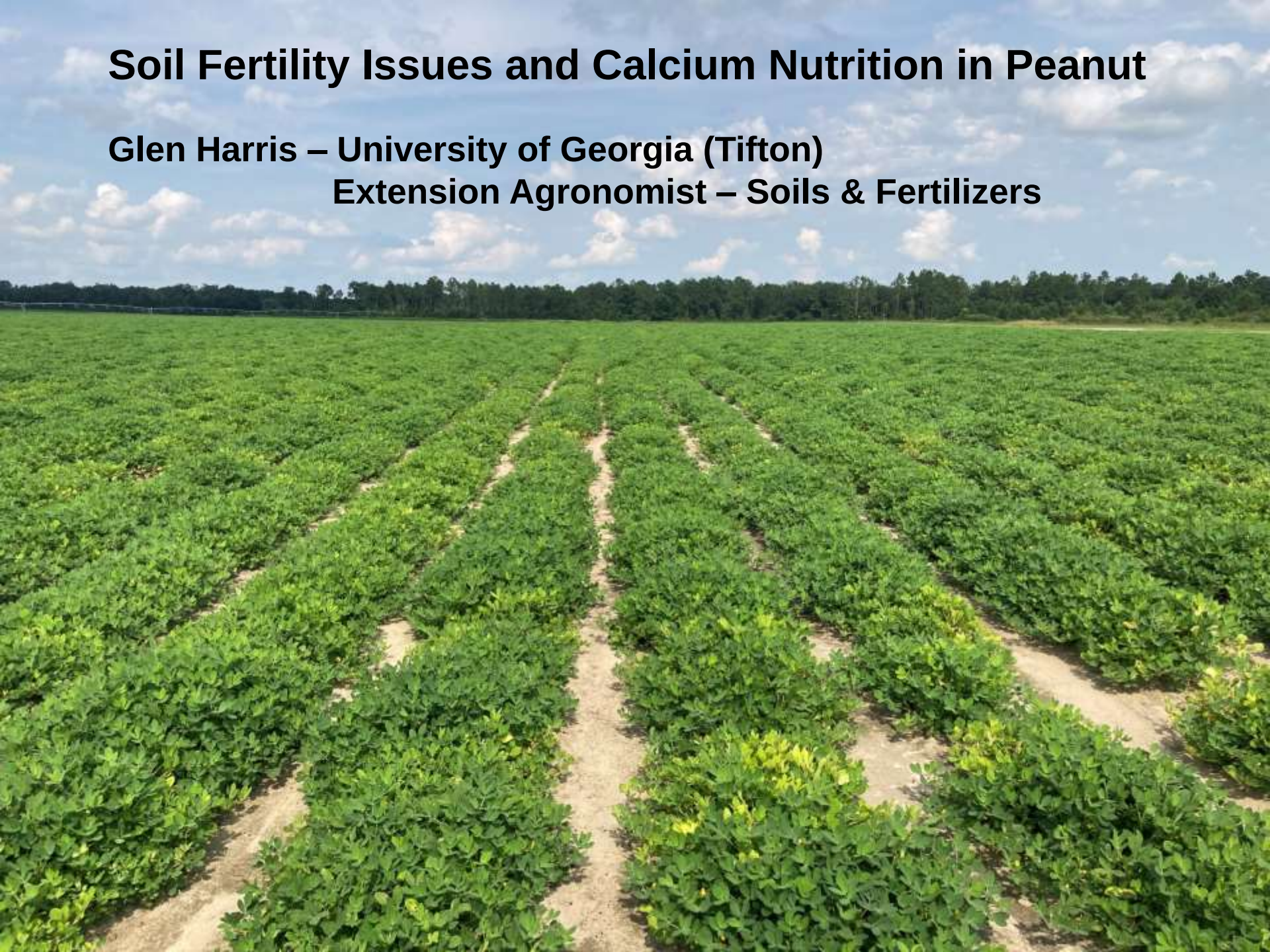
Cotton Fertilization “Strategy”

1. Soil Test – (Grid?)
2. Lime to pH of 6.0-6.5
3. Apply P, K at Planting
4. Adjust N-P-K for Yield Goal
5. Apply N in Split Applications
6. Apply 10 to 20 lb Sulfur/a
7. Foliar Feed 0.5 lb Boron/a
8. Troubleshoot/Tissue Sample (Earlier the Better)
9. Foliar Feed ?

Soil Fertility Issues and Calcium Nutrition in Peanut

Glen Harris – University of Georgia (Tifton)
Extension Agronomist – Soils & Fertilizers

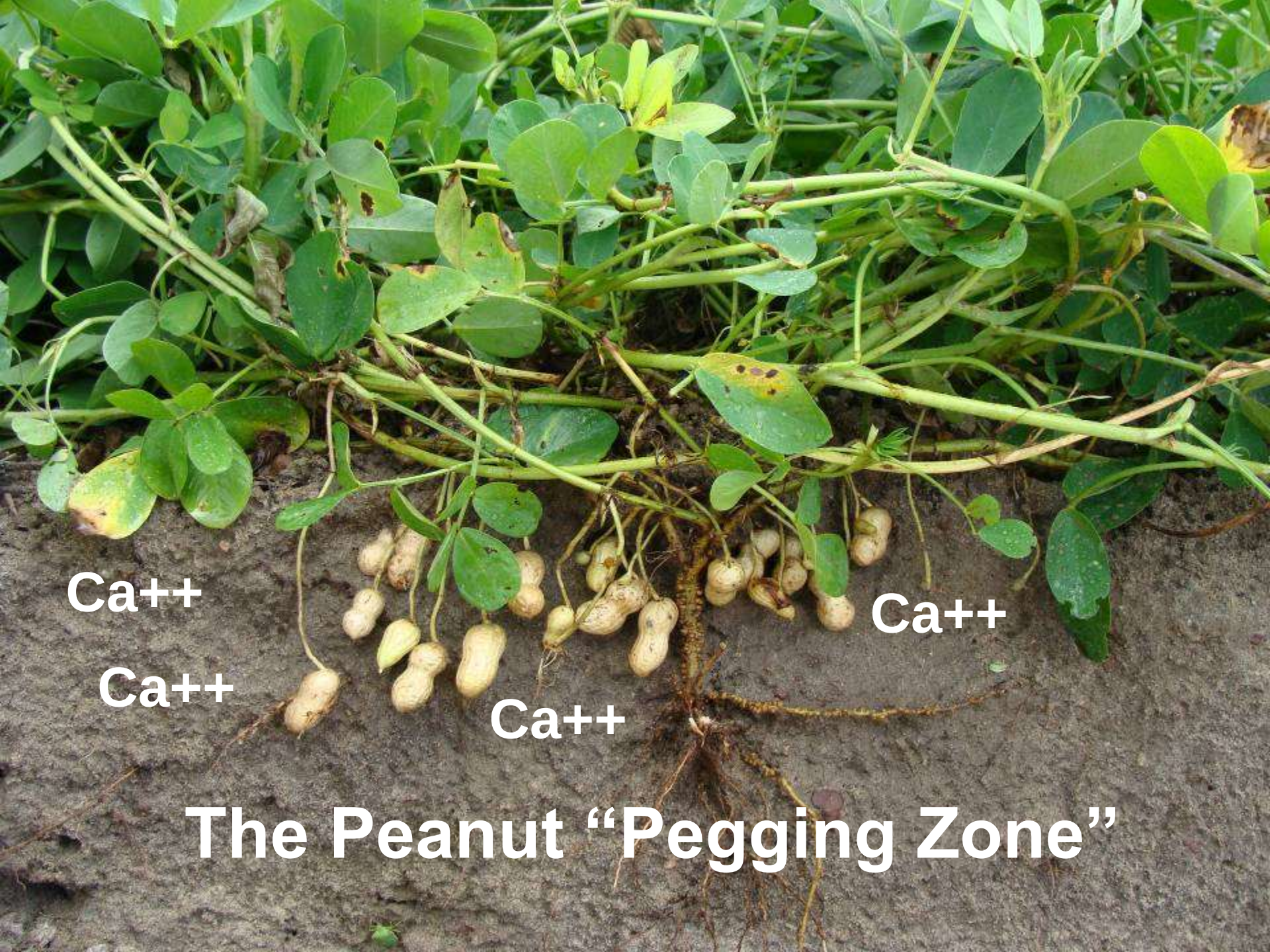


Which Crop Needs the Most Fertilizer ?

(If “Medium” Soil Test P and K)

Corn (300-120-190)
Cotton (90-50-50)
Soybeans (0-40-80)
Peanuts (0-0-0)

Wheat (100-40-40)
Wheat – Soybean (100-80-120)
Hay (400-60-200)


Ca++
Ca++
Ca++
Ca++
The Peanut “Pegging Zone”

Calcium Deficiency

Symptoms

- ✓ “Pops”
- ✓ Pod Rot
- ✓ Black Heart
- ✓ Poor Germination

Current UGA Recommendations

Runner: Need 500 lb Ca/a and Ca:K of 3:1
If either not met, then 1000 lb/a gypsum at EB

Peanuts Saved for Seed:
Automatic 1000 lb/a gypsum at EB

(Virginias: Automatic – 2000 lb/a gypsum)

“New” Way to Recommend Gypsum on Peanut ??

Pegging Zone Samples

Soil Level	Ca:K	Ratios	Ca:Mg		Rec	lb Ca/a	lb gypsum/a
ABOVE 800	6:1	both above	4:1		0	0	
800-	3:1	either or both below	2:1		60	300	
600-800	6:1	both above	4:1		100	500	
600-800	6:1	either below	4:1		120	600	
600-800	6:1	both below	4:1		140	700	
500-600	6:1	both above	4:1		160	800	
500-600	6:1	either or both below	4:1		180	900	
500-600	6:1	both below	4:1		200	1000	
BELOW 500		regardless of ratio			250	1250	

Pegging Zone Samples

Soil Level	Ca:K	Ratios	Ca:Mg		Rec
ABOVE 800	6:1	both above	4:1		0
800-	3:1	either or both below	2:1		60
600-800	6:1	both above	4:1		100
600-800	6:1	either below	4:1		120
600-800	6:1	both below	4:1		140
500-600	6:1	both above	4:1		160
500-600	6:1	either or both below	4:1		180
500-600	6:1	both below	4:1		200
BELOW 500		regardless of ratio			250

0
300
500
600
700
800
900
1000
1250

Gypsum Recommendation by Private Lab (lb/a)

Location	2021	2022
Ponder Farm	0	NA
RDC Pivot	500	0
ABAC	800	500
Midville	900	1250
Lang Farm	1250	1250

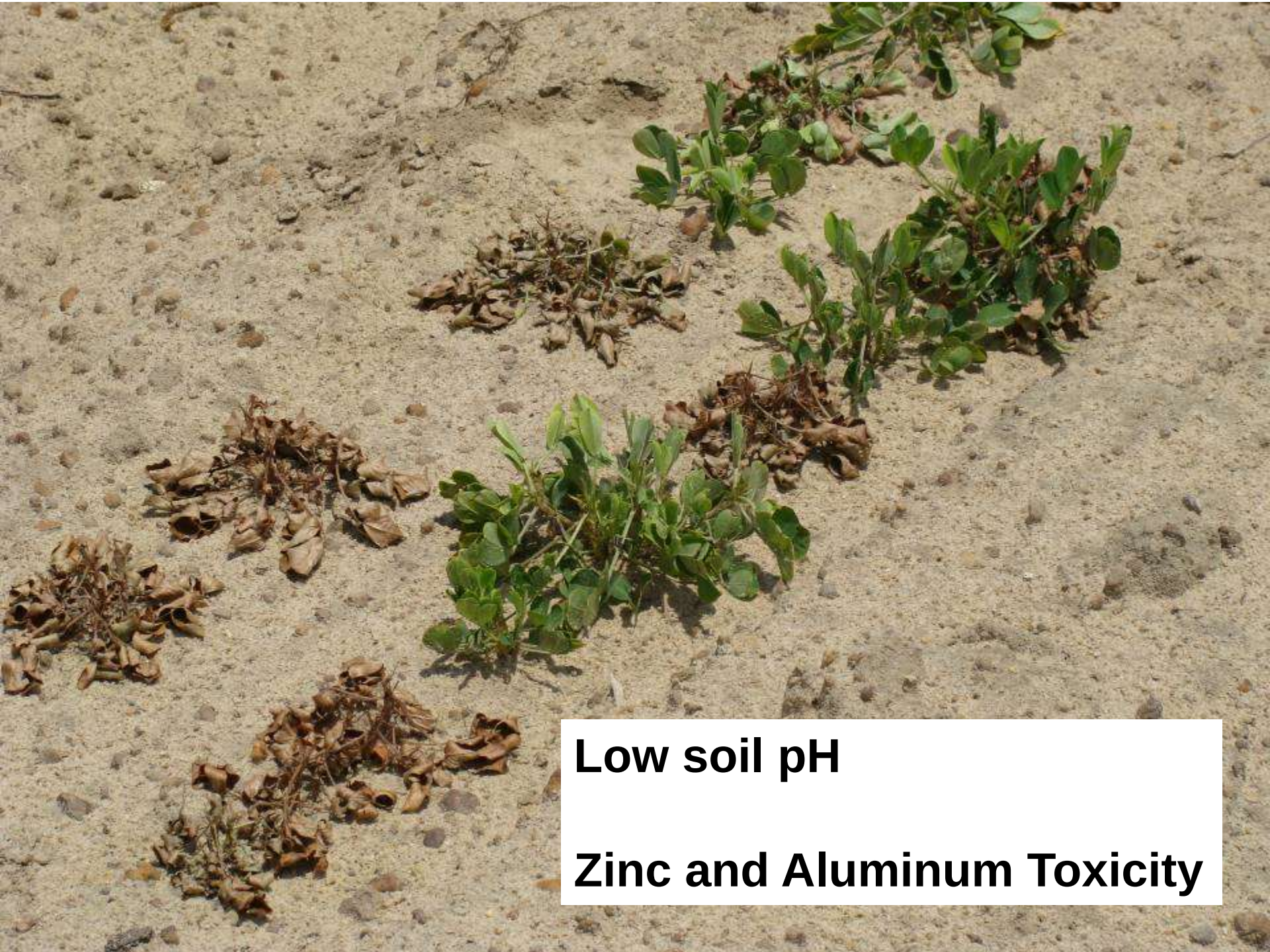
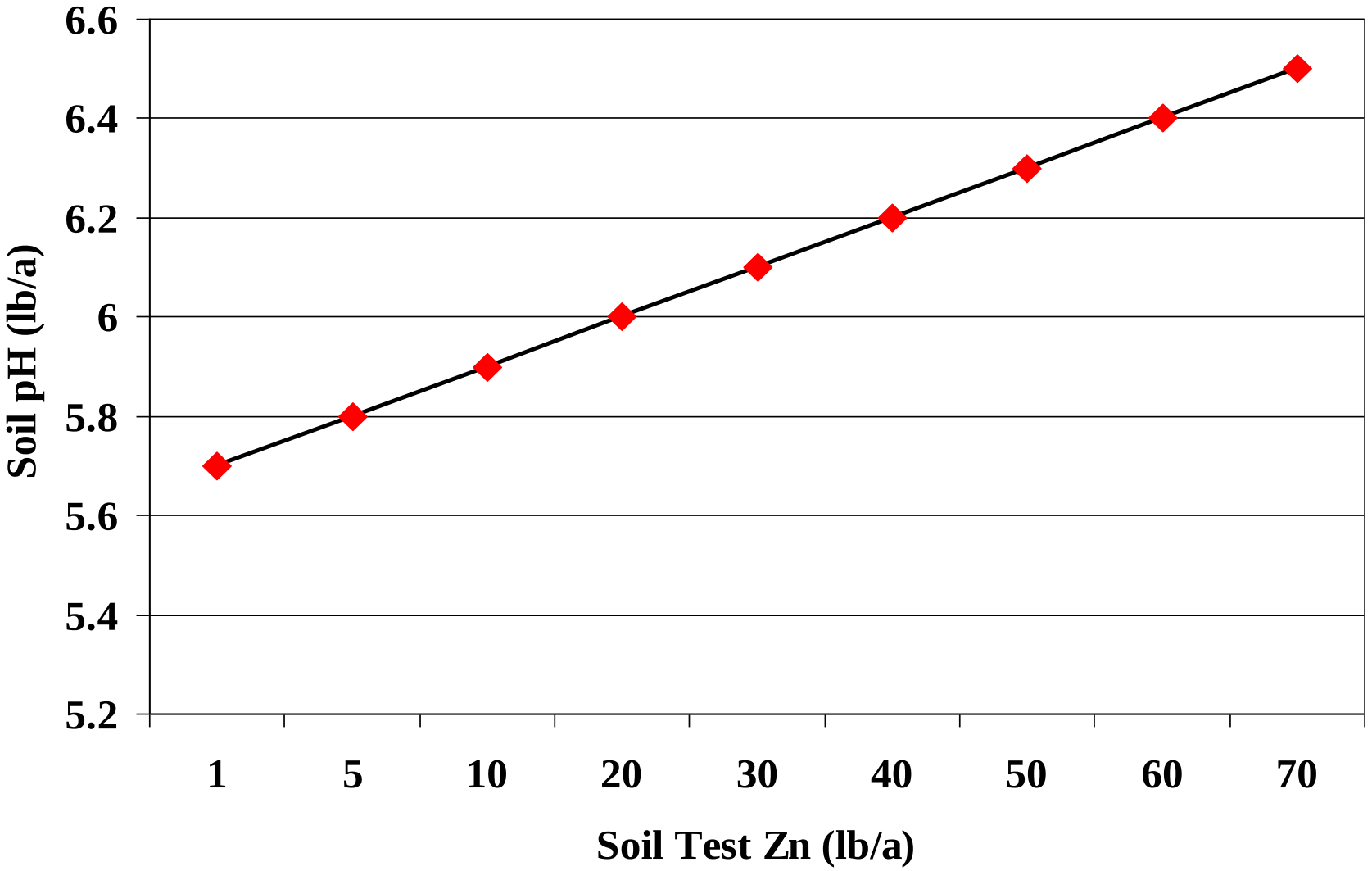
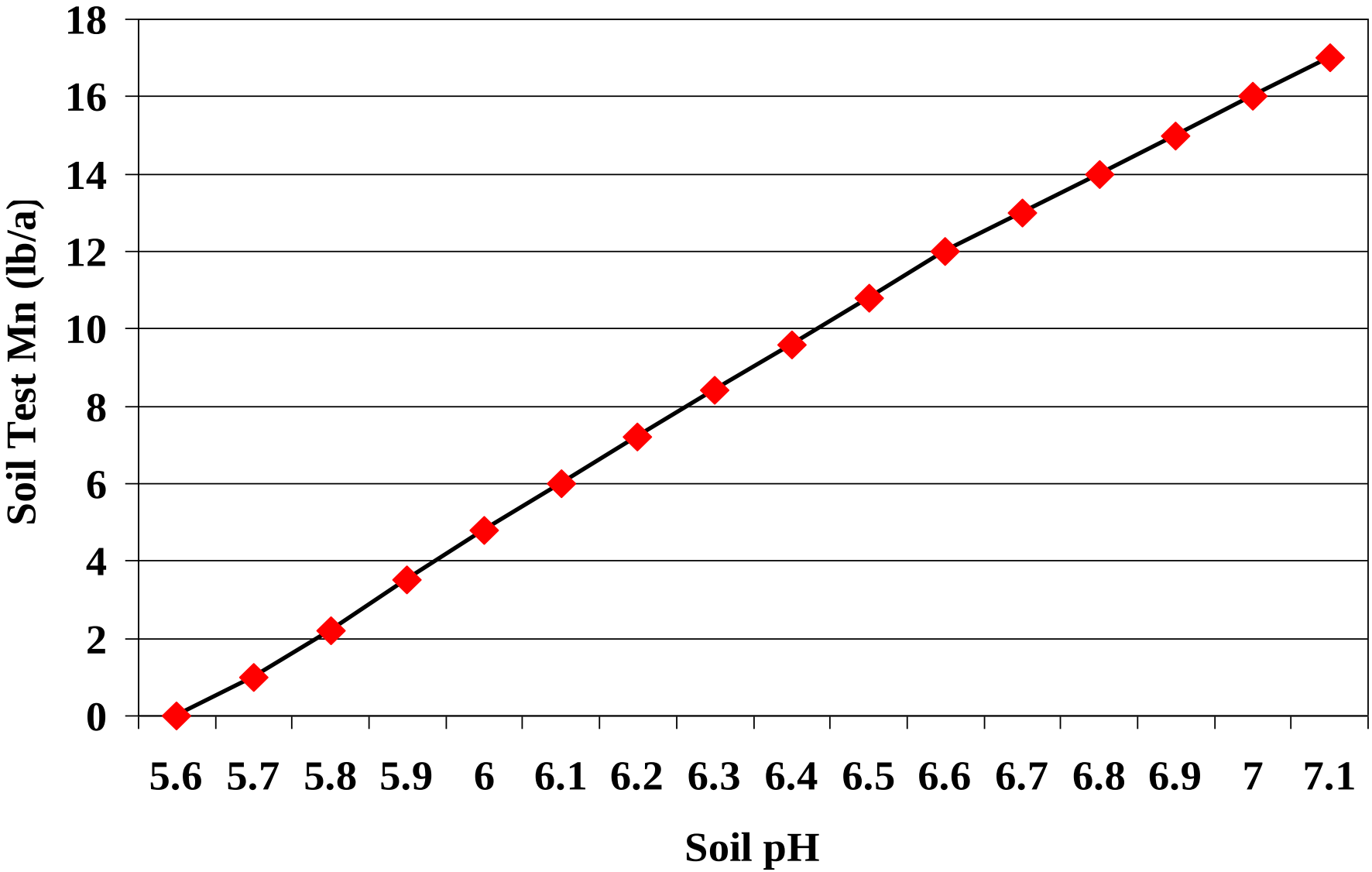

Low soil pH
Zinc and Aluminum Toxicity

Figure 2. Relationship between pH and zinc availability. Maintain soil pH levels above the line to help avoid zinc toxicity.
Source: Davis-Carter, J. et al. 1991 Peanut Research Extension report




High pH
Manganese Deficiency

Figure 1. Relationship between pH and manganese availability. Maintain soil test manganese levels above the line to help avoid manganese deficiency. Source: Soil Test Handbook for Georgia



Estimate of N-P-K Value Removed in Vines

(Based on September 2022 Fertilizer Prices and No availability factor on N)

50-10-60 (lbs N-P2O5-K2O/a)
95-74-73 (cents N-P2O5-K2O/a)
47.50-7.04-43.80 = $98.34/a

Thank You, Questions?

Thanks to:

Georgia Cotton Commission
National Peanut Board
Georgia Plant Food Ed Soc
Waters Laboratory

The University of Georgia

Cotton Team