

Potassium Fertilizer Management in Cotton

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Soils of the Southeast

- Sandy
- Acidic
- Low Fertility
- Highly Weathered
- Poorly Buffered
- Low in Organic Matter



Georgia Cotton - #1 Nutrient Problem = Potassium Deficiency



Dodge County, GA

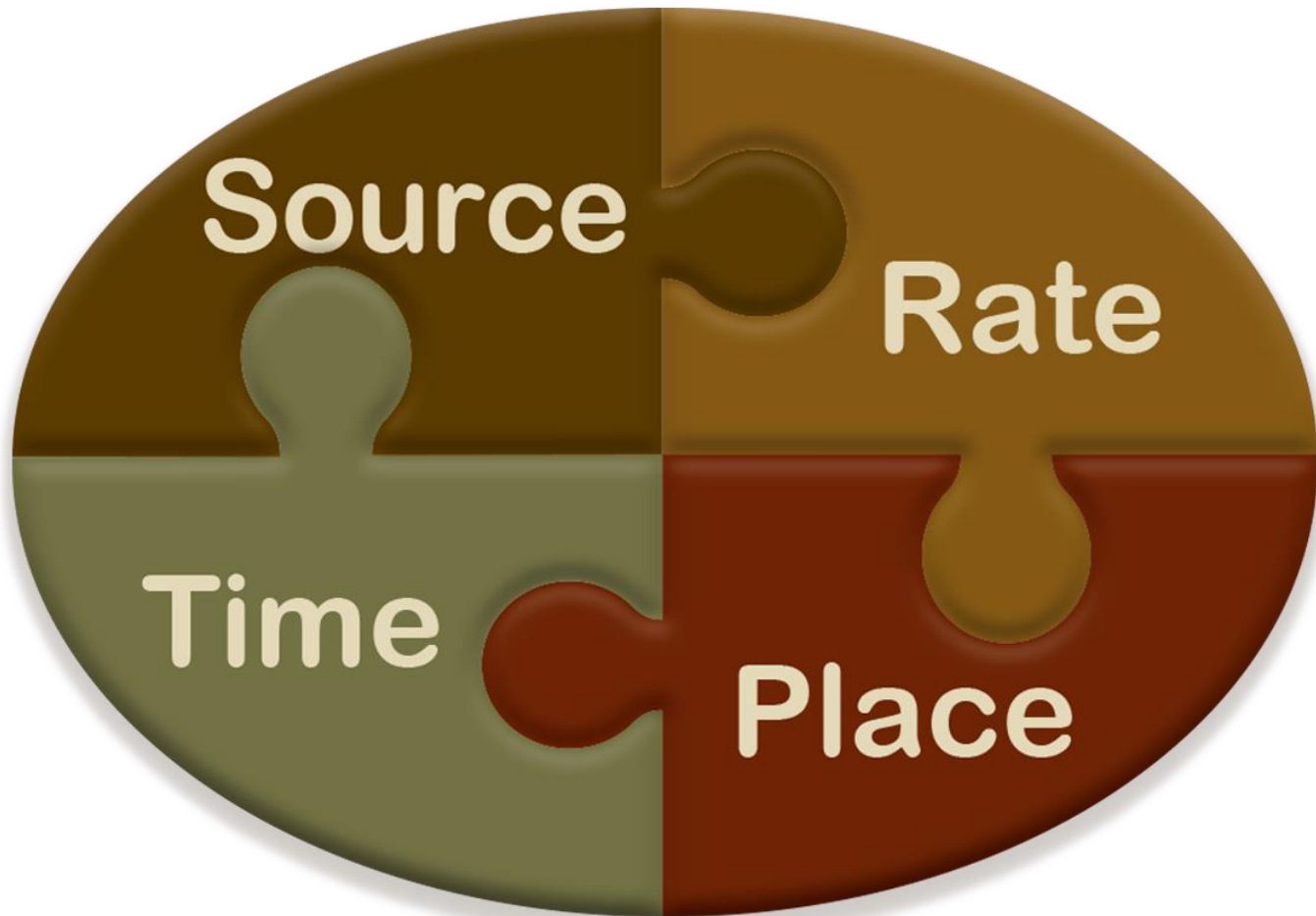
1998

Potassium Deficiency





The 4 “R’s” of Fertilization



2 ton/a + approx. 50 lb N/a sidedress



The Value of Litter

- Pre 2005 Prices

- 60# N x .28 x .6 = 10.08
- 60 # P2O5 x .22 x .8 = 10.56
- 40 # K2O x .12 x .8 = 3.84
- » Total = **\$24.48**

- 2008 Prices

- 60#N x .85 x .6 = 30.60
- 60#P2O5 x .85 x .8 = 40.80
- 40#K2O x .80 x .8 = 25.60
- » Total = **\$97.00**

- » 2020 Prices

- 60#N x .50 x .6 = 18.00
- 60#P2O5 x .40 x .8 = 19.20
- 60#K2O x .35 x .8 = 16.80
- » Total = **\$54.00**



- » Current (Nov 2021)

- 60#N x .95 x .6 = 34.20
- 60#P2O5 x .67 x .8 = 32.16
- 60#K2O x .68 x .8 = 32.64
- » Total = **\$99.00**

How Much Fertilizer Value is Removed in Vines? (Based on 2020 Fertilizer Prices)

50-10-60 (lbs N-P₂O₅-K₂O/a)

50-40-35 (cents N-P₂O₅-K₂O/a)

25.00-4.00-21.00 = \$50/a

Nov 2021 = \$95



Jeff Davis County
September 15 '09



**Stemphylium Leafspot
Linked to Potassium Deficiency
Fix with Potassium (Not Fungicide)**

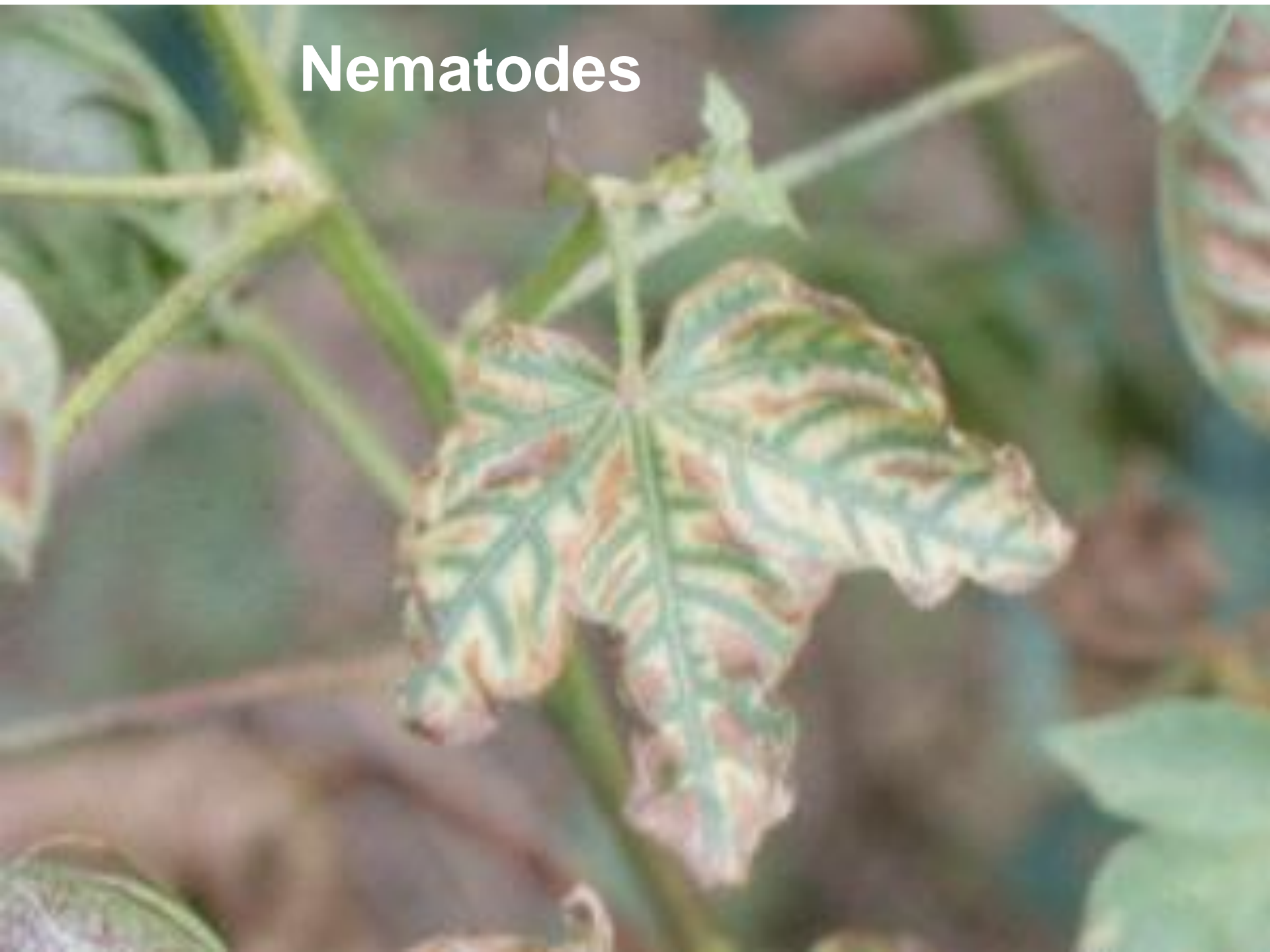


Stemphylium

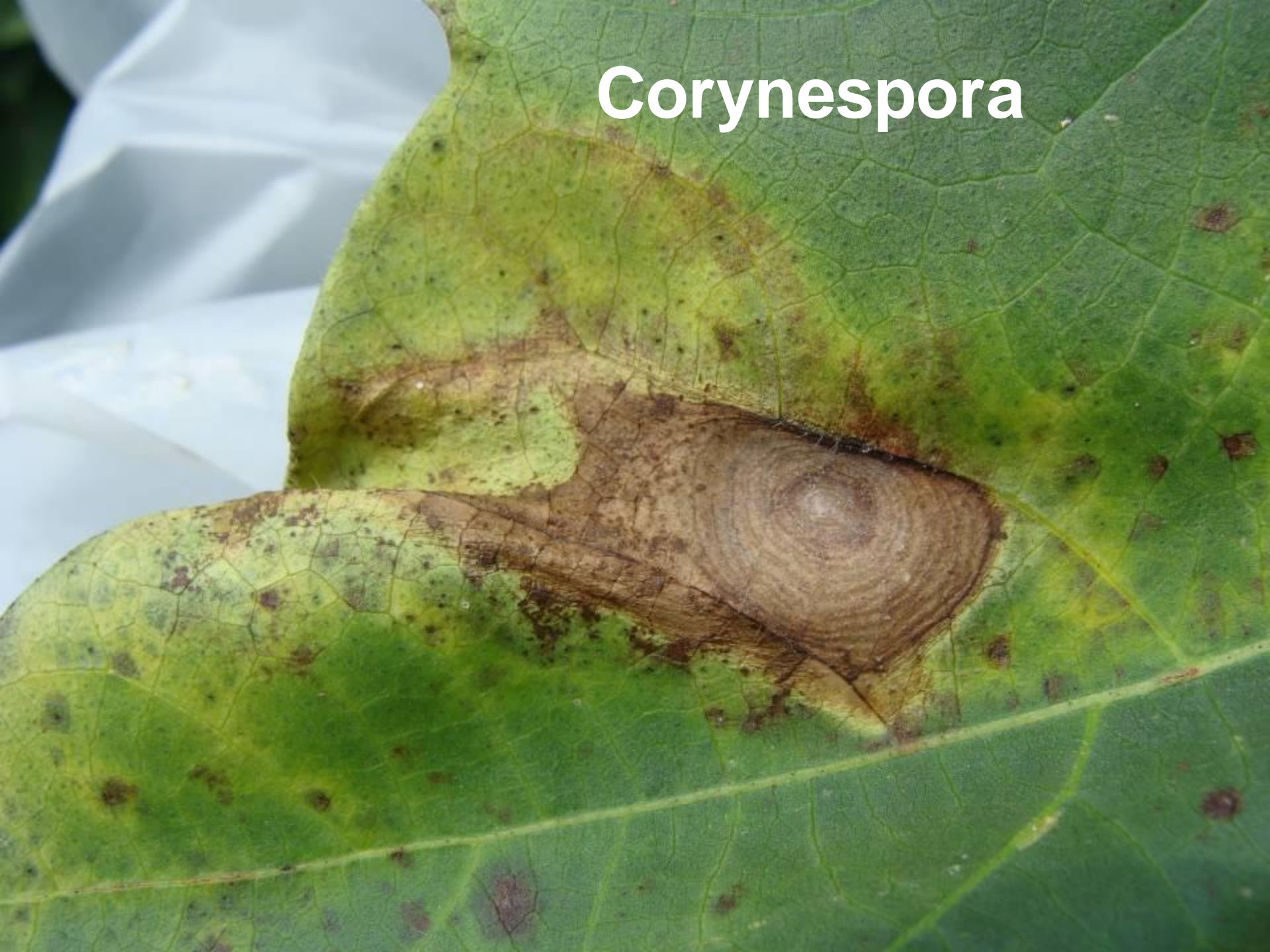


Cercospora
Altenaria

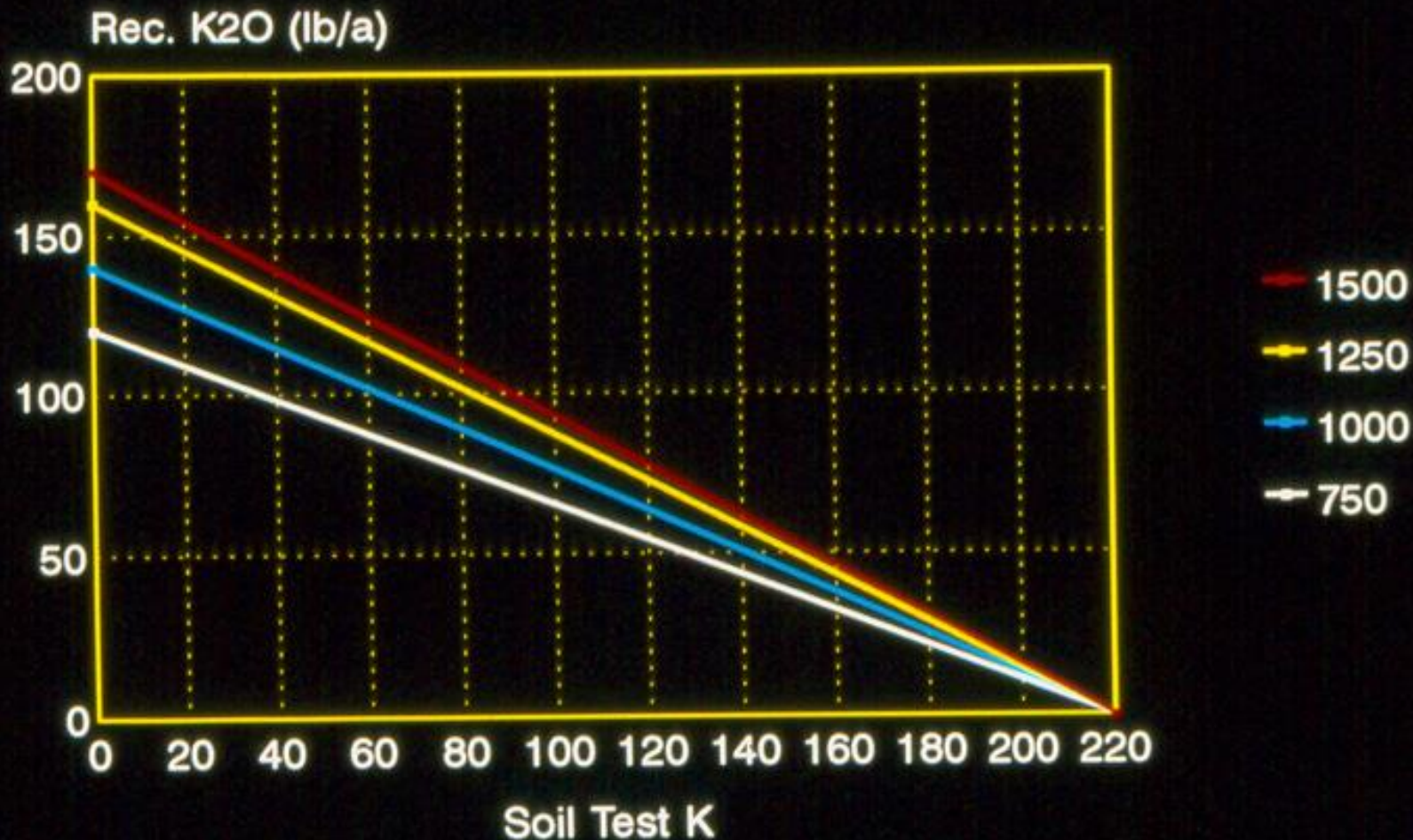
Nematodes



Corynespora



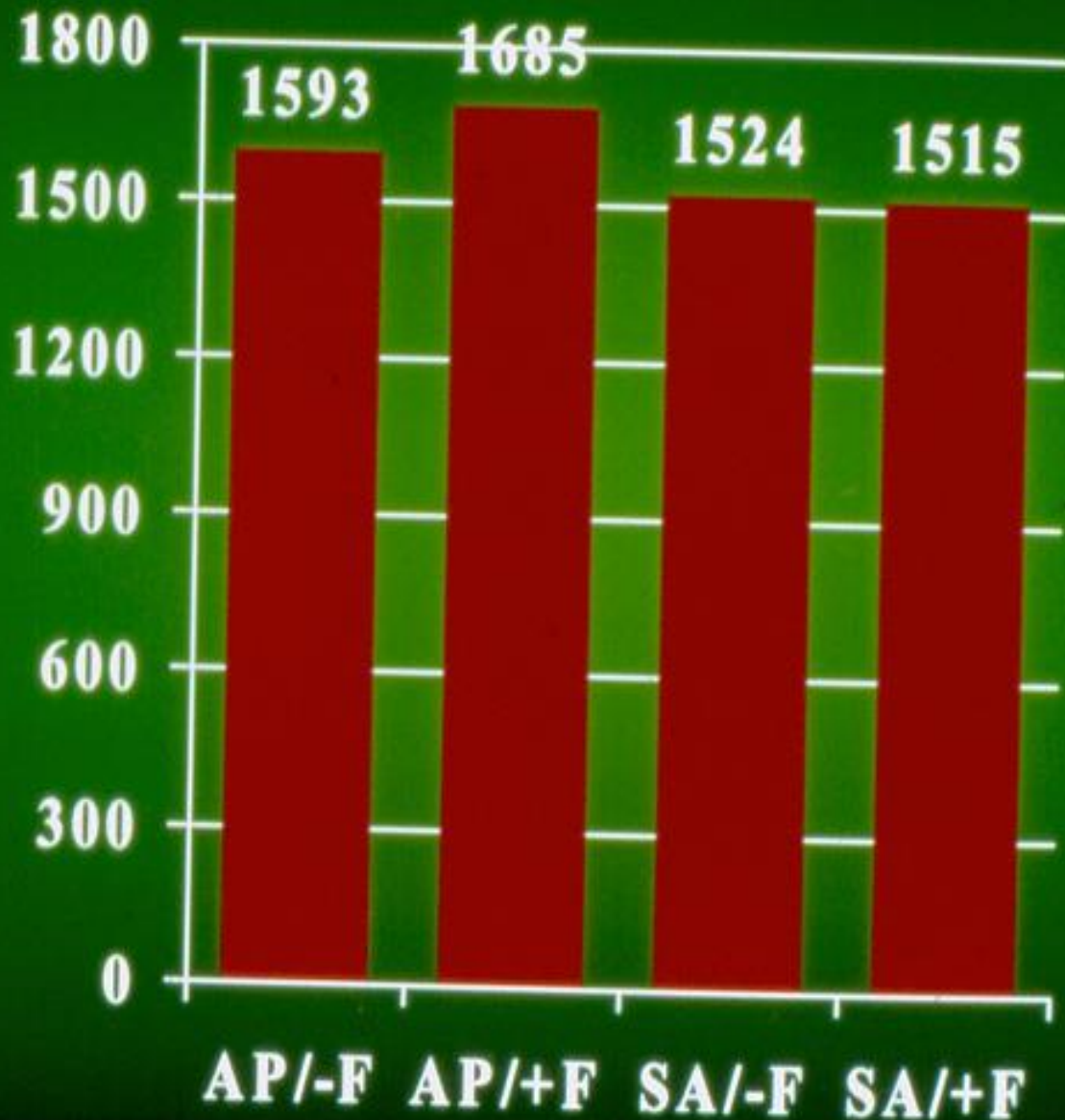
Potassium Recommendations for Cotton Based on Yield Goal



Potassium Trial - 1998

◆ Significant Interaction

◆ AP/+F = Best Treatment



DP 555 BR

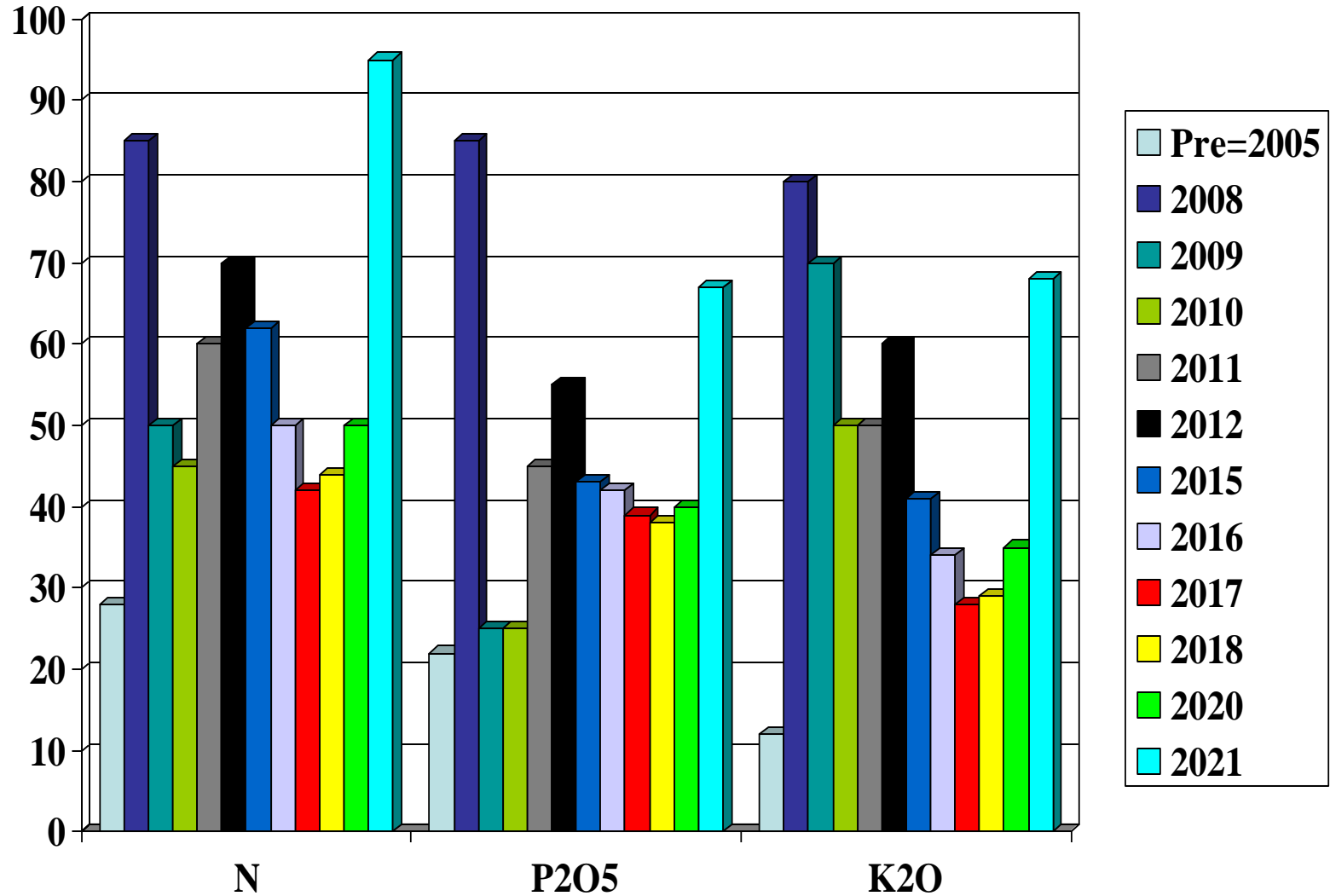
DELTAPINE[®]

Potassium Nutrition for Shorter Season Varieties



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Fertilizer Price for N-P-K (cents/pound)



How Rough Are Fertilizer Prices ?



Wood Ash



Good for Raising pH and Providing Potassium

Biosolids



Wheat Straw ? (60 bu/a)

N	34
P2O5	8
K2O	108

(At 60-45-50) 20-4-54 = \$78/a

(At 95-67-68) 32-5-73 = \$110/a

K Rate Studies in 2009

**Location: Sunbelt Expo, Moultrie, GA
Center Pivot Irrigated
Dothan loamy sand**

Three Varieties: DPL 0935, 0949, 555

**Treatments: 0,45,90,135,180 lb K₂O/a as KCl
Also 45/45 and 90/45 “Splits”
And also 90 + Foliar K**

DP 0935
Soil Test K = 46 (low)
Recommended K₂O = 135

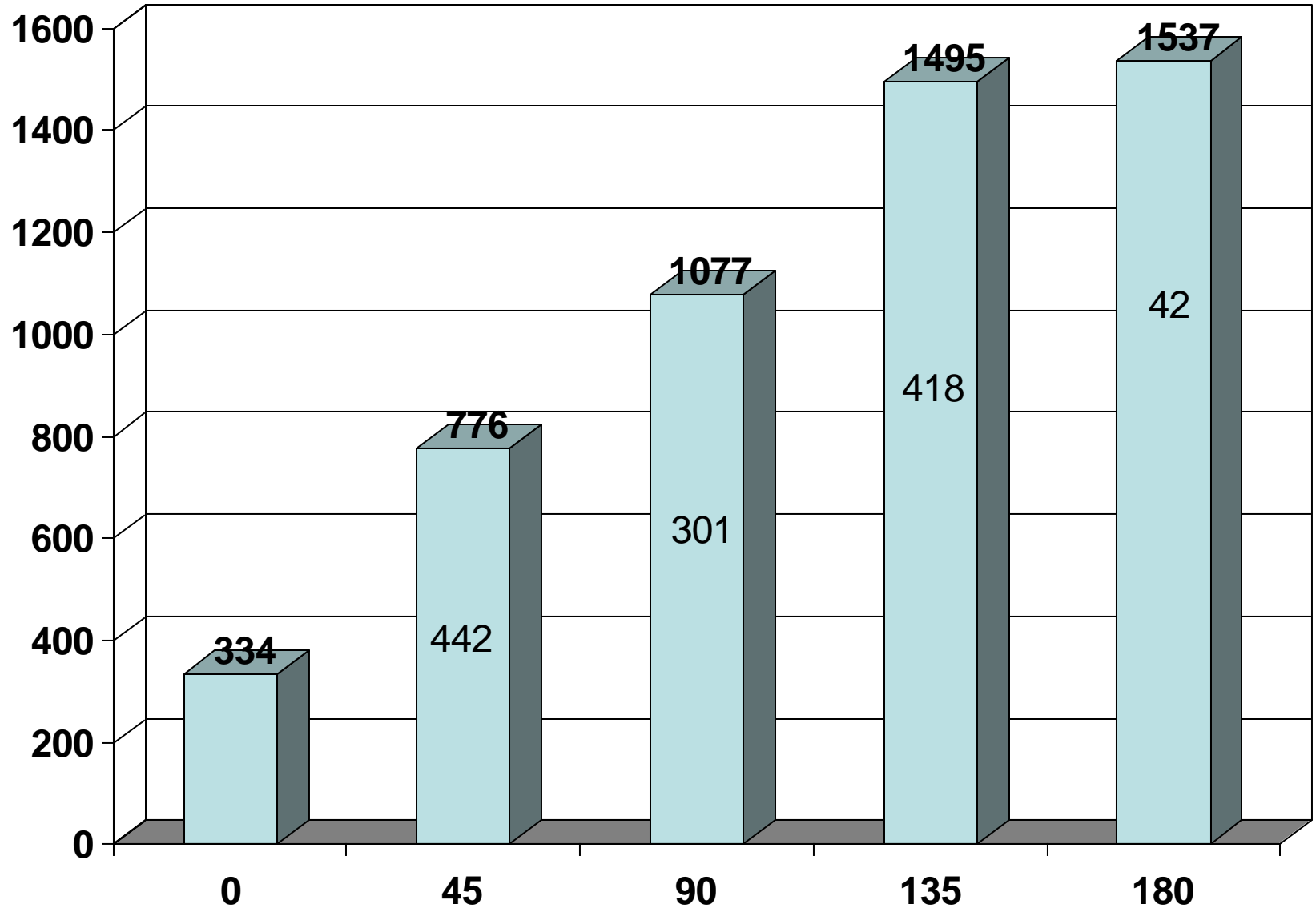
DP 0949
Soil Test K = 46 (low)
Recommended K₂O = 135

DP 555
Soil Test K = 106 (med)
Recommended K₂O = 90



K Rate on Cotton – Sunbelt Expo 2009

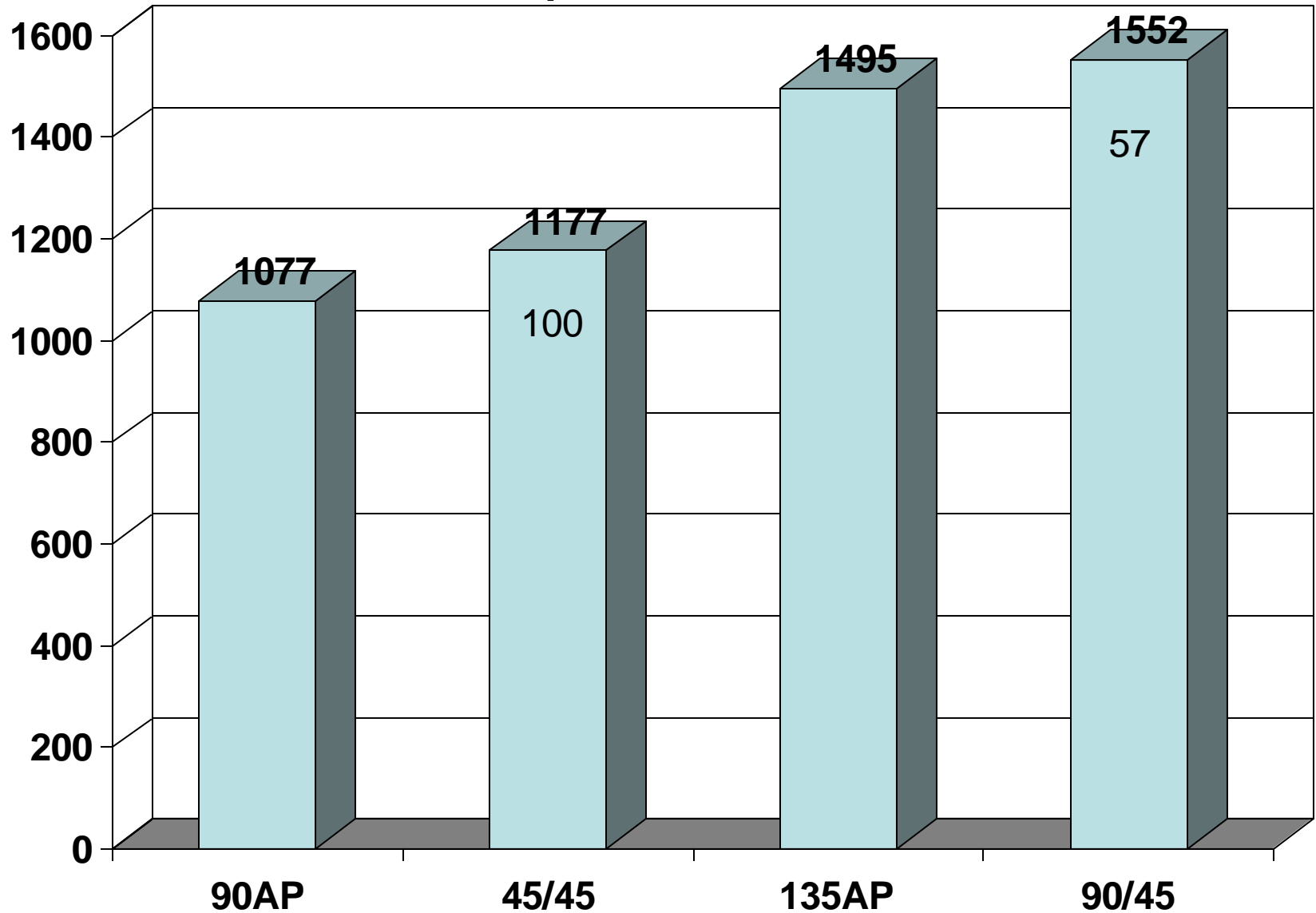
Lbs lint/a **DP 0935** (STK = 46 Rec= 135)



K Rate on Cotton – Sunbelt Expo 2009

DP 0935 - “Splits”

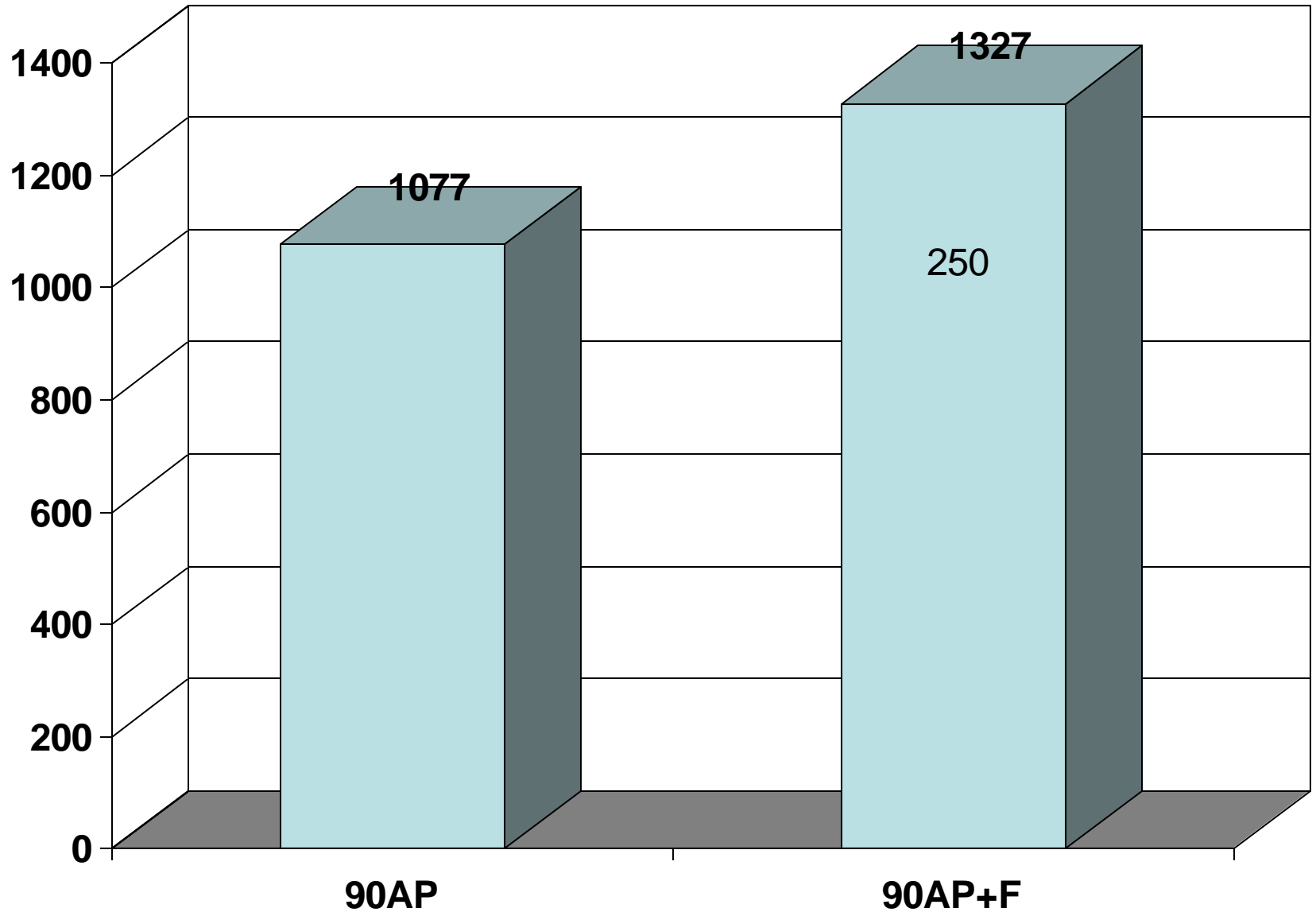
Lbs lint/a



K Rate on Cotton – Sunbelt Expo 2009

Lbs lint/a

DP 0935 - Foliar



Foliar K



July 10 '09



July 10 '09



August 7 '09



August 7 '09



September 2 '09



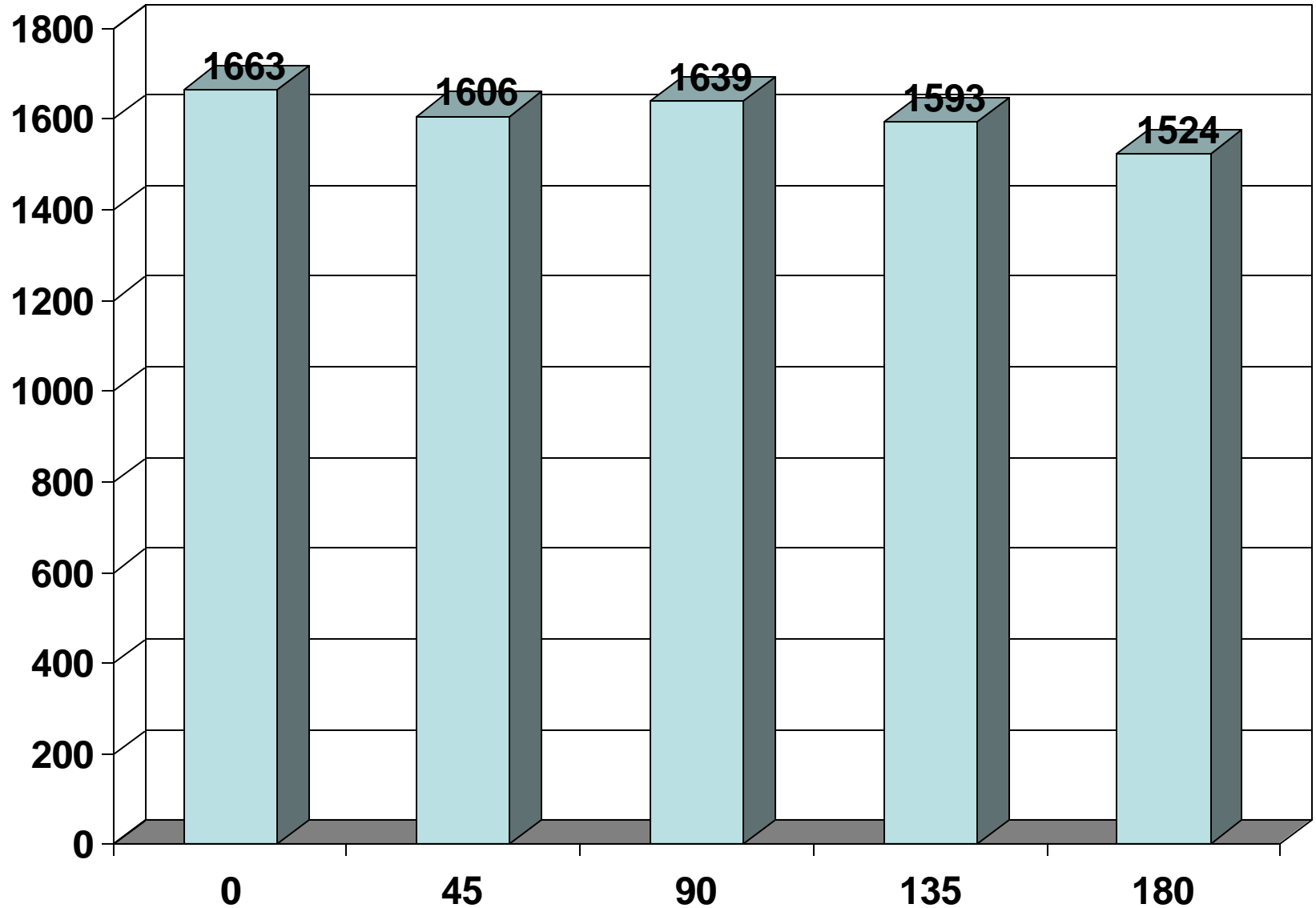
September 2 '09





K Rate on Cotton – Sunbelt Expo 2009

Lbs lint/a DP 555 (STK=106 Rec=90)



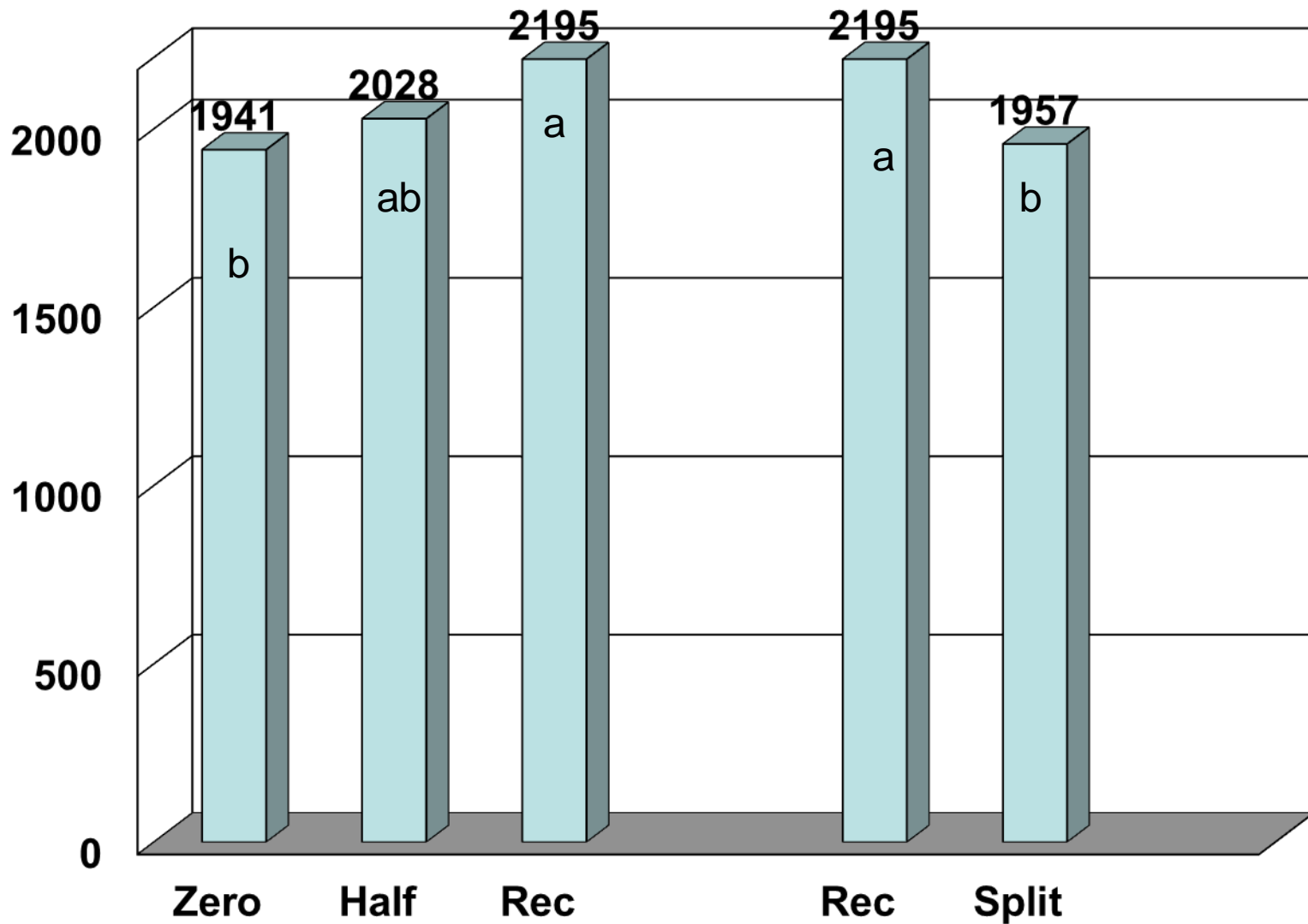
Effectiveness of Split Applications and Foliar Potassium on Eight Different Cotton Varieties – 2011-12



Glen Harris
University of Georgia-Tifton

Cotton Yield (lb lint/a)

Variety = PHY 499

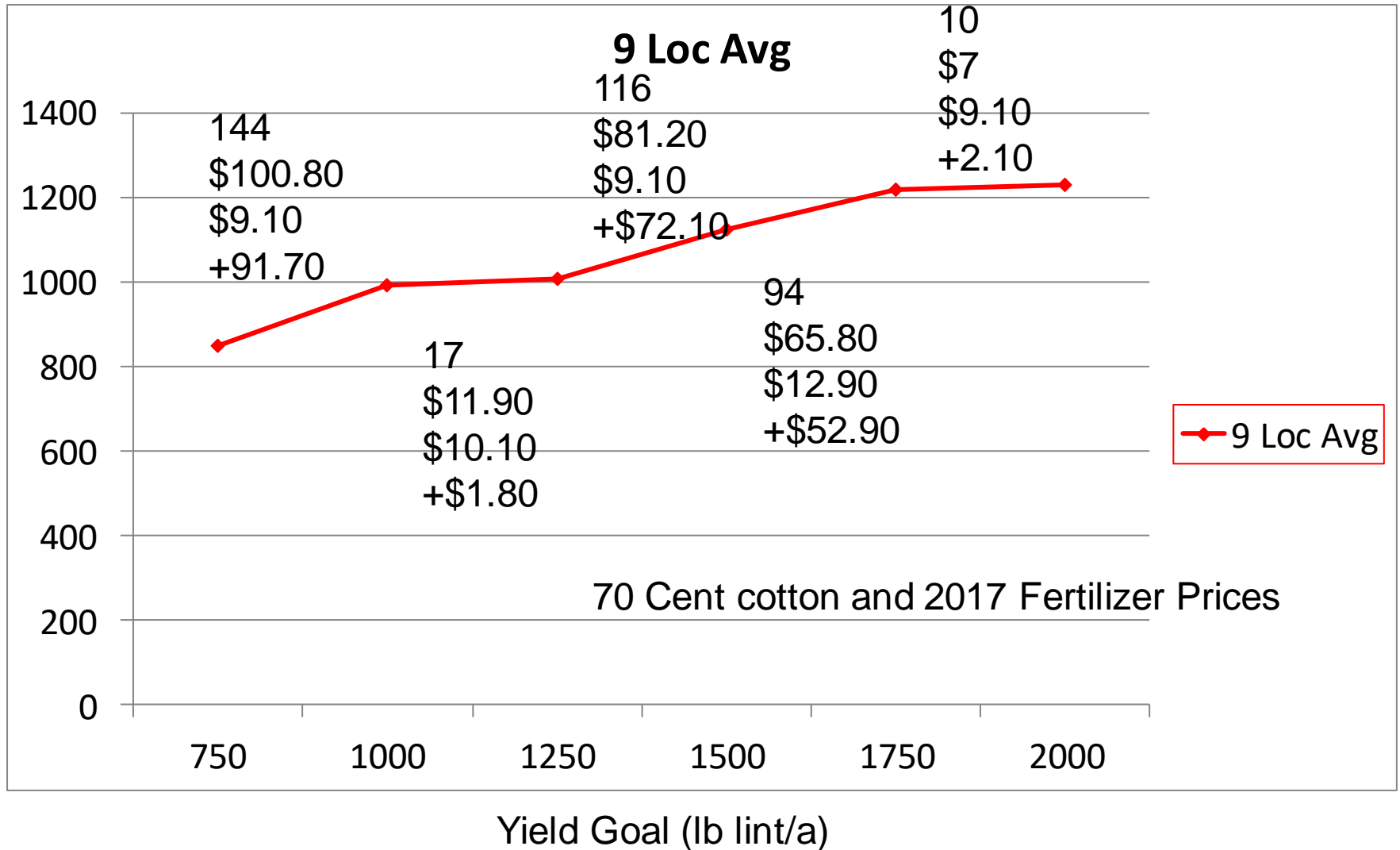


(Prob=0.1076, Coefficient of Variation = 6 %, Turnout = 39 %)

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

Actual Yield (lb lint/a)

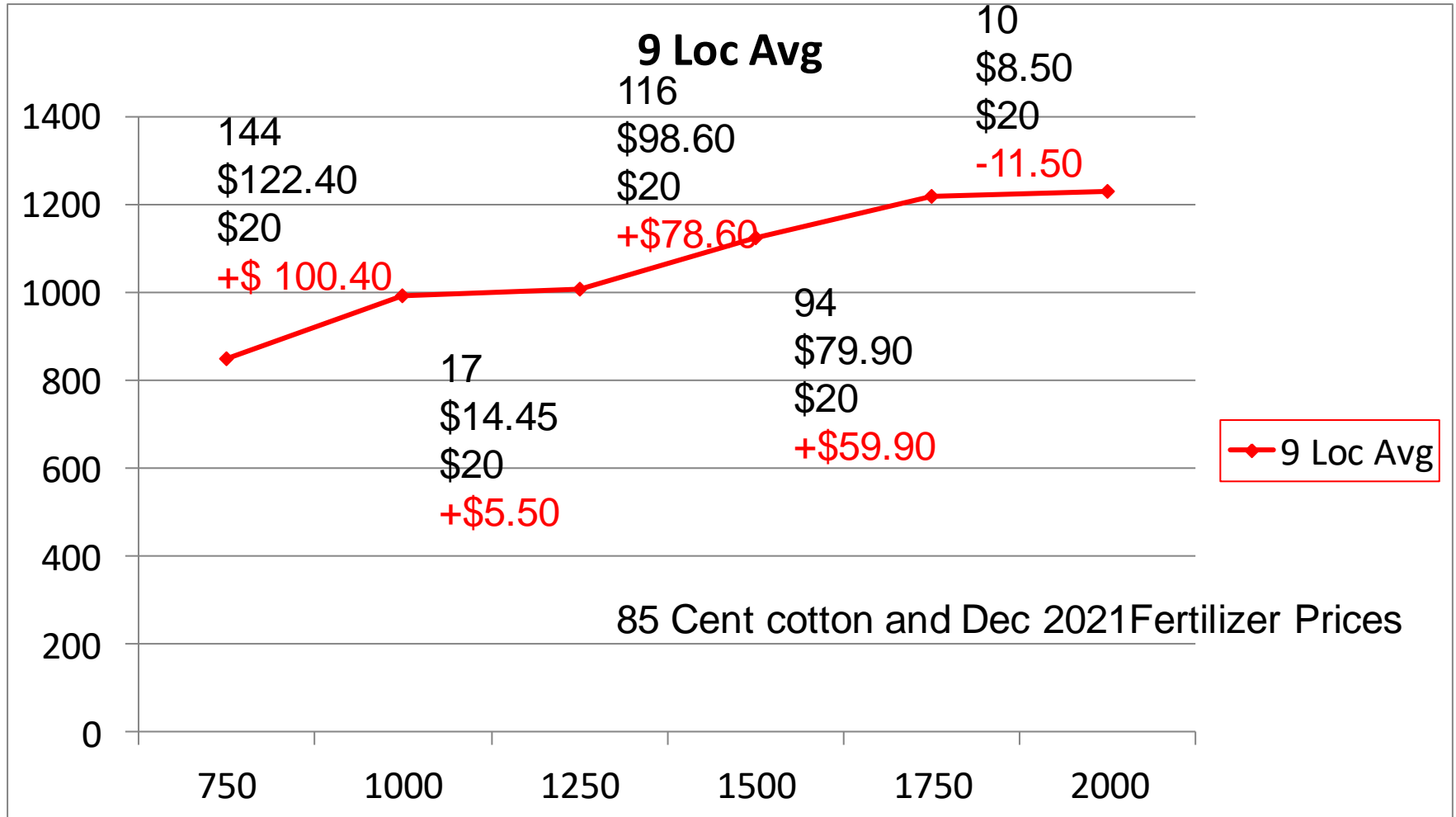
Variety = DP 1646



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

Actual Yield (lb lint/a)

Variety = DP 1646



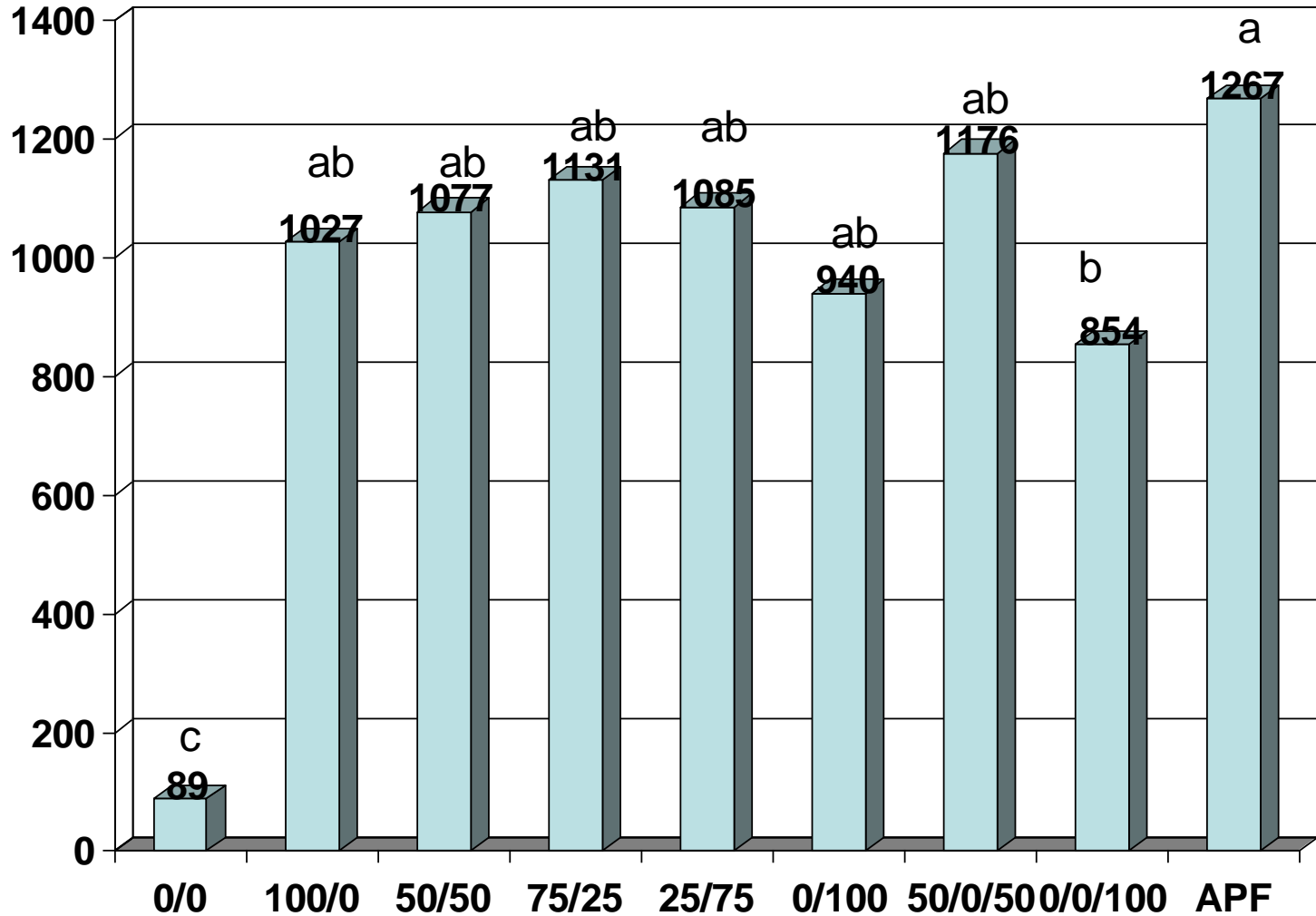
85 Cent cotton and Dec 2021 Fertilizer Prices

Yield Goal (lb lint/a)

Preliminary K Timing on Cotton

Bowen 2021 DPL 1646

Lb lint/a



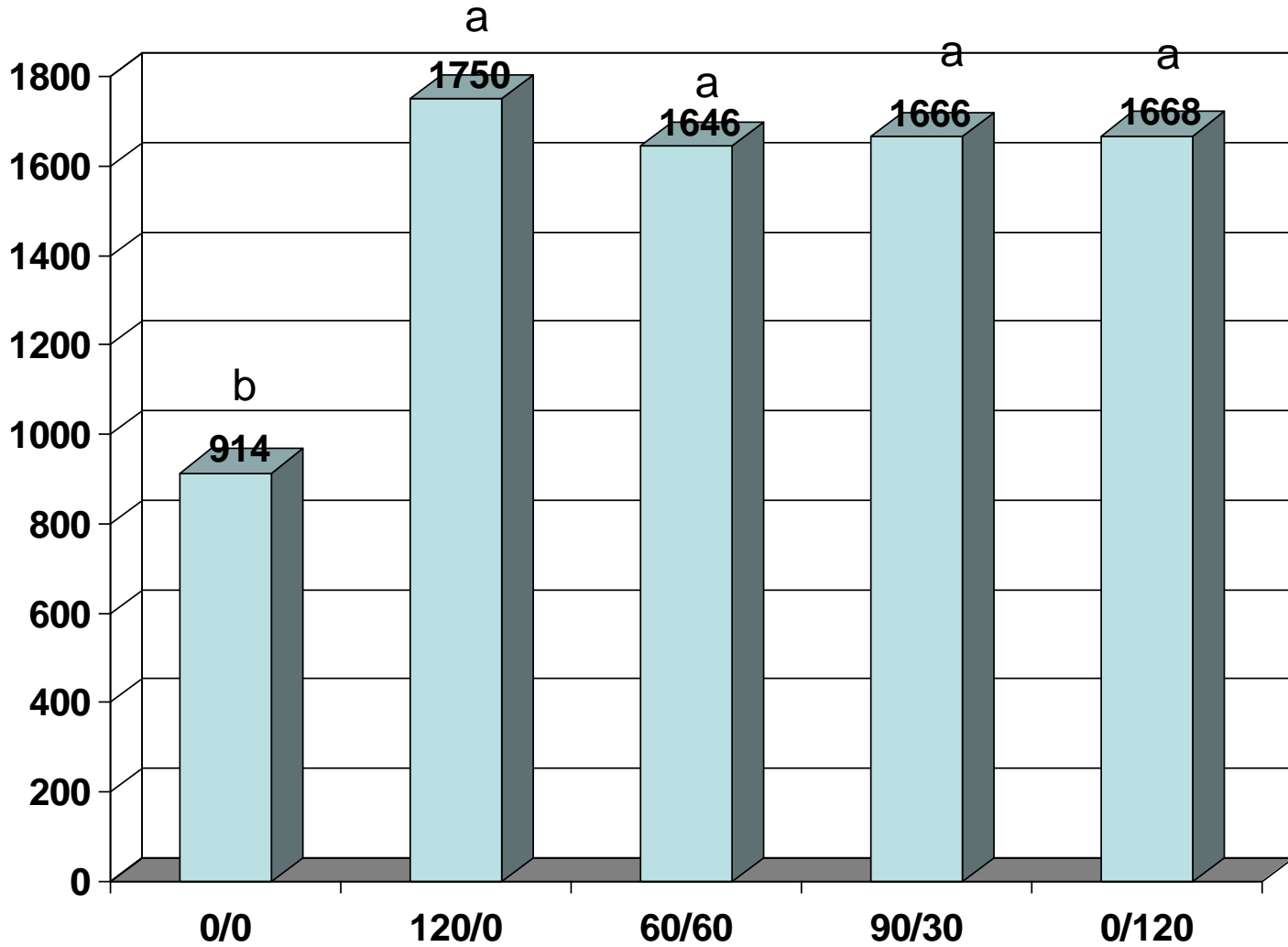
AP/SD/FB

CV=16 P=0.0001

K Timing on Cotton

Midville 2021 DPL 1646

Lb lint/a



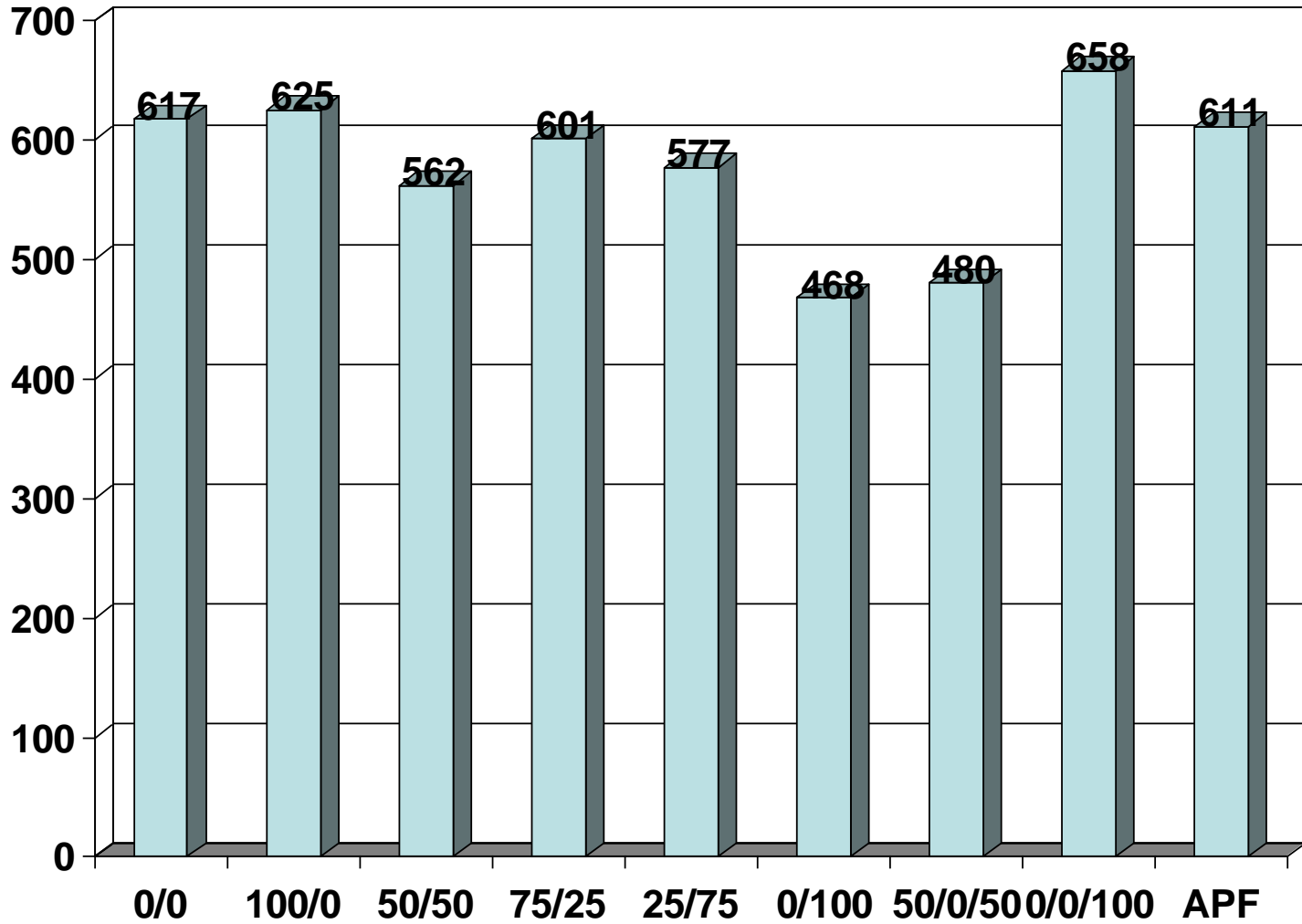
AP/SD

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

Preliminary K Timing on Cotton

Sunbelt Expo 2021 DPL 1646

Lb lint/a



AP/SD/FB

CV=26 P=0.6813 so "NS"





Thanks to:

Georgia Cotton Commission

Georgia Plant Food Ed Soc

UGA Cotton Team

Sunbelt Expo

UGA Microgin



The University of Georgia

Cotton Team



