



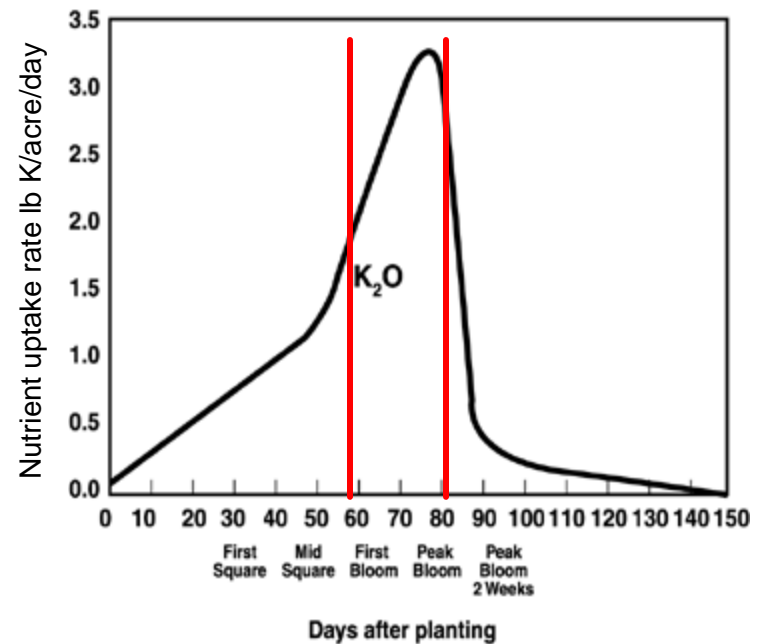
VARIETY AND IRRIGATION EFFECTS ON POTASSIUM RATES IN COTTON

BEATRIX J. HAGGARD, PH.D.



POTASSIUM IN COTTON

- Potassium is needed for:
 - Boll development and filling
 - Fiber elongation
 - Reduced diseases
- Peak uptake occurs between
 - First bloom
 - Peak bloom



Mullins and Burmester, 1990

POTASSIUM UPTAKE

- Potassium deficiency symptoms
 - Upper leaves – Seen Recently
 - Lower leaves
- Ideas for deficiency locations
 - Potassium deficiencies should appear in lower leaves
 - Potassium is mobile in the plant
 - Newer varieties with increased boll load
 - Seen mostly during boll development
 - Increased occurrence of upper leaf deficiencies
- Potassium availability in the soil is directly tied to soil moisture



OBJECTIVES

Variety by Potassium Rate

- Compare yields, leaf potassium content, gin turnout, and fiber quality of cotton under differing potassium rates

Potassium Rate by Irrigation

- Evaluate the effect of irrigation on K deficiency and/or leaf spot incidence

TRIAL SETUP

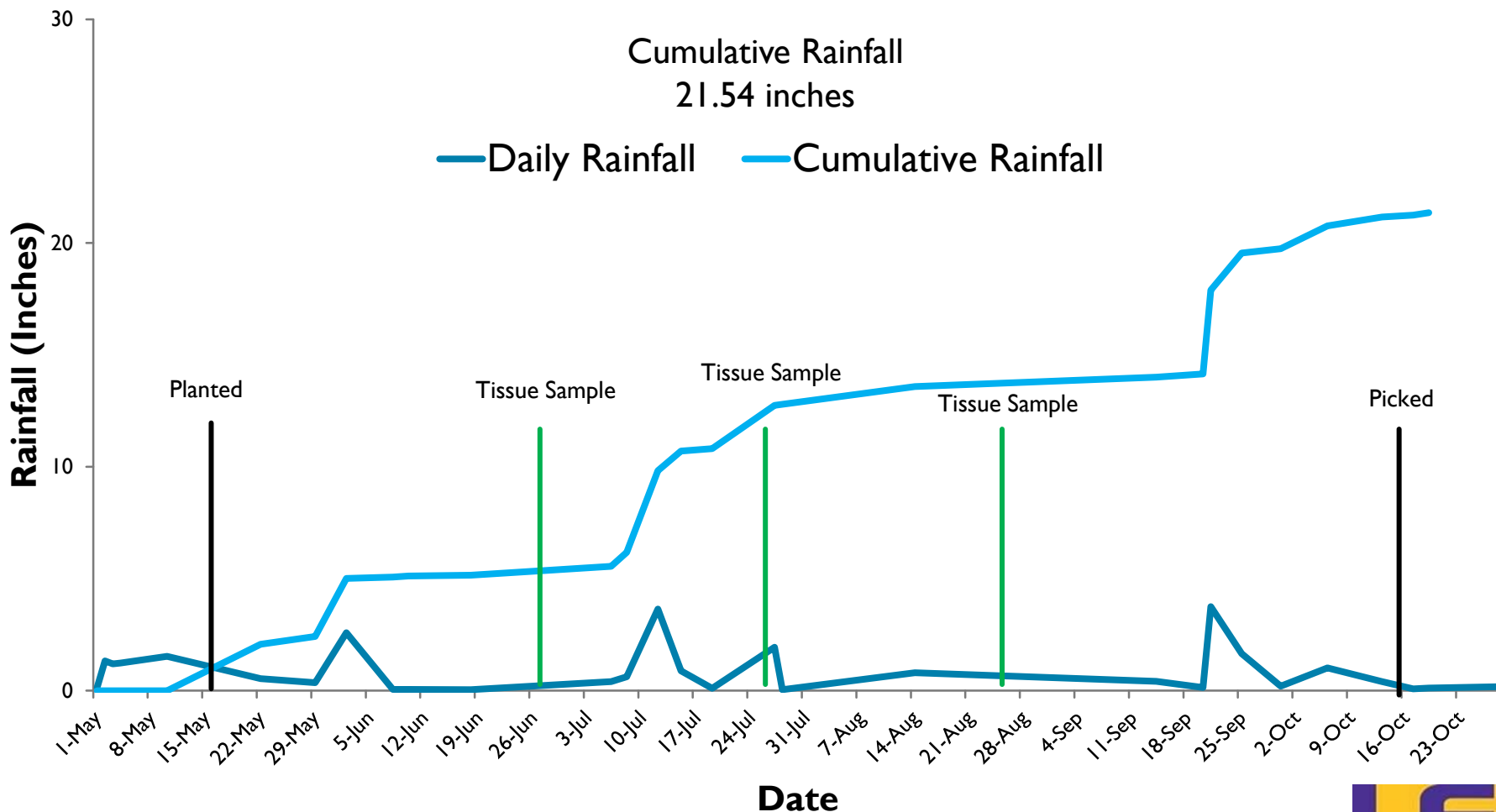
Location

- St. Joseph, Louisiana
- Commerce silt loam (Fine-silty, mixed, superactive, nonacid, thermic Fluvaquentic Endoaquepts)

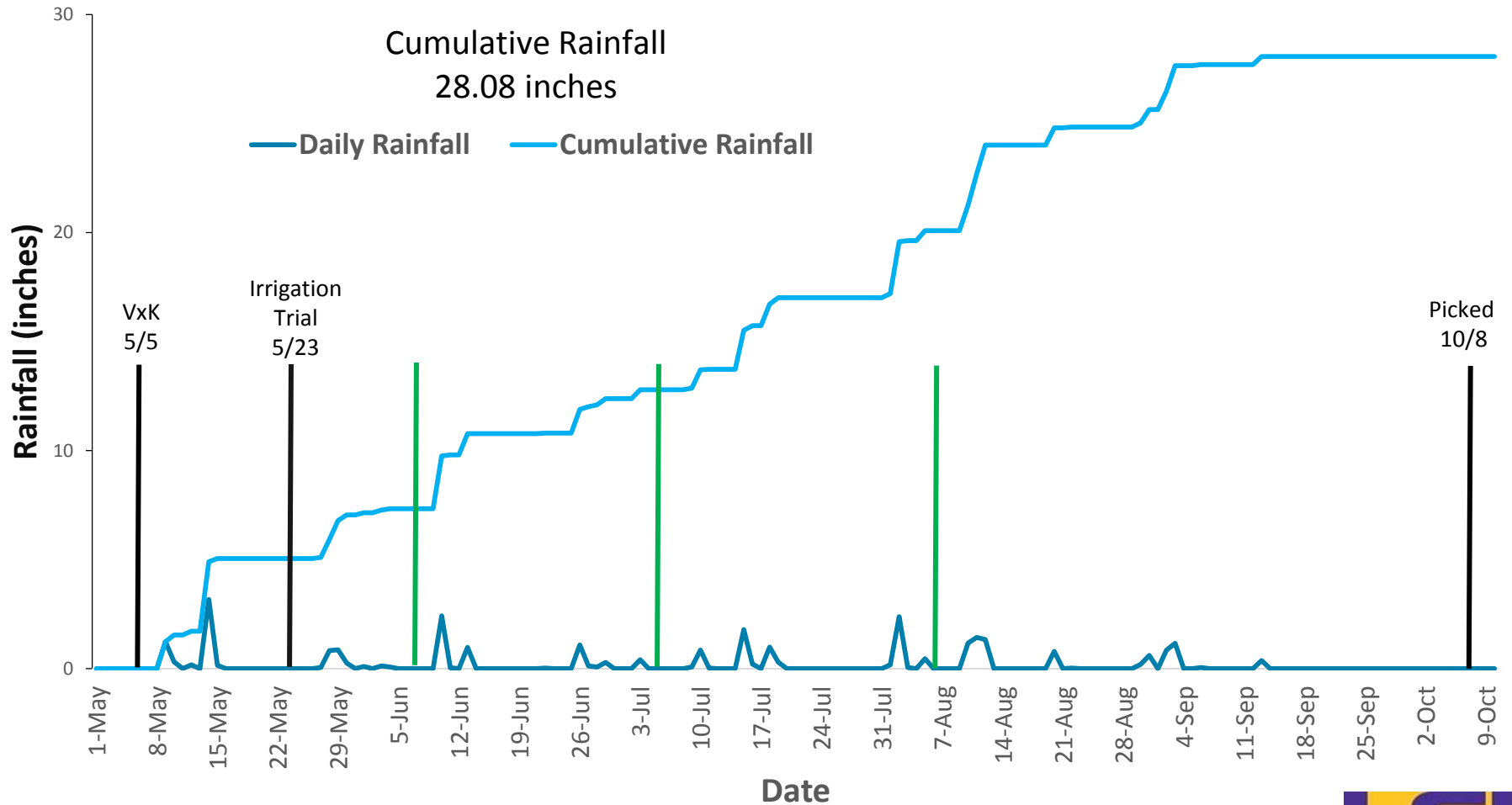
Variety by Potassium

- 5 current varieties were selected
 - Stoneville 5288 B2F
 - Deltapine 0912 B2RF
 - Deltapine 1321 B2RF
 - Phytogen 499 WRF
 - Phytogen 339 WRF
- 3 potassium rates
 - 0 lbs K₂O/acre
 - 60 lbs K₂O/acre
 - 120 lbs K₂O/acre

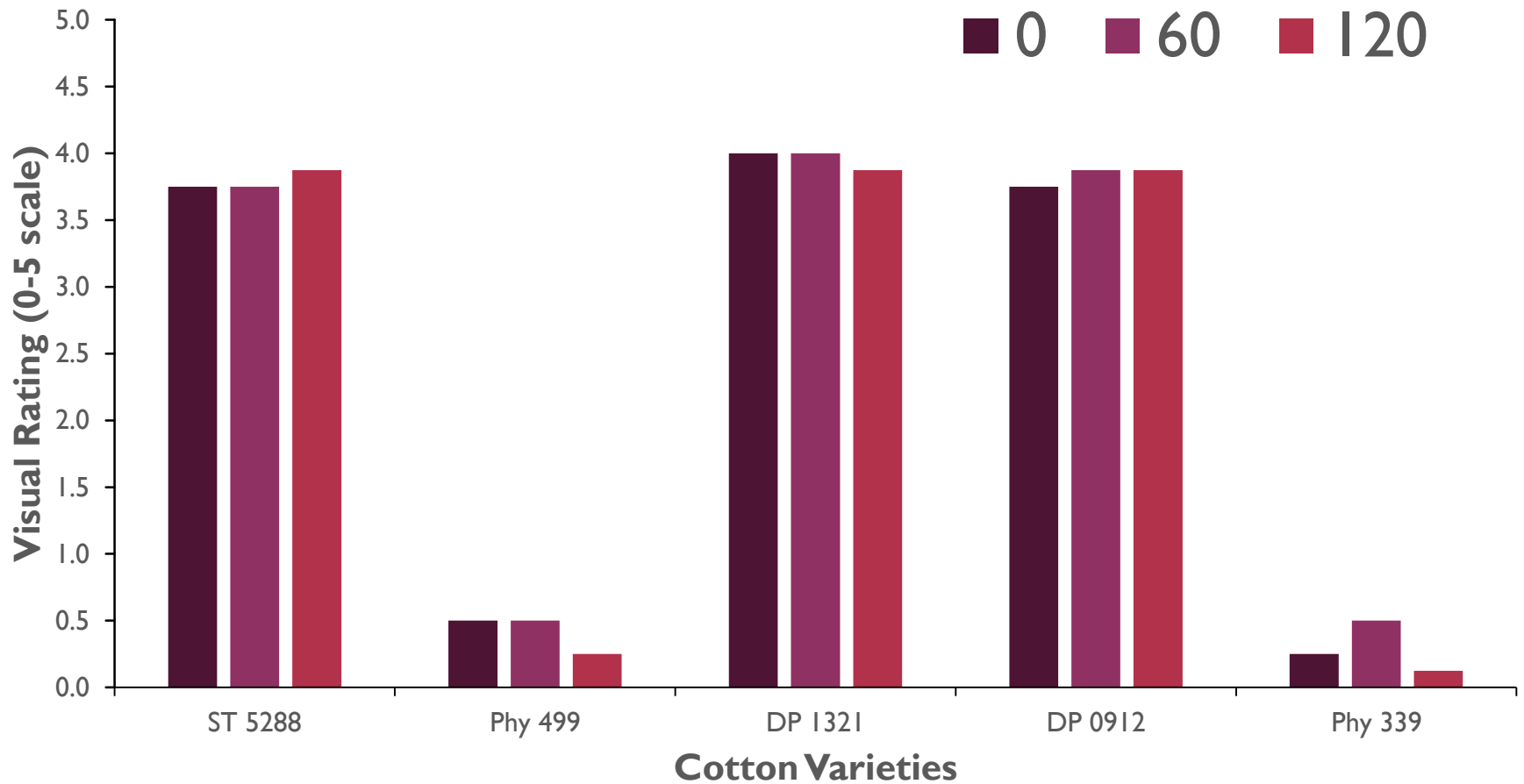
PRECIPITATION DURING 2013 GROWING SEASON



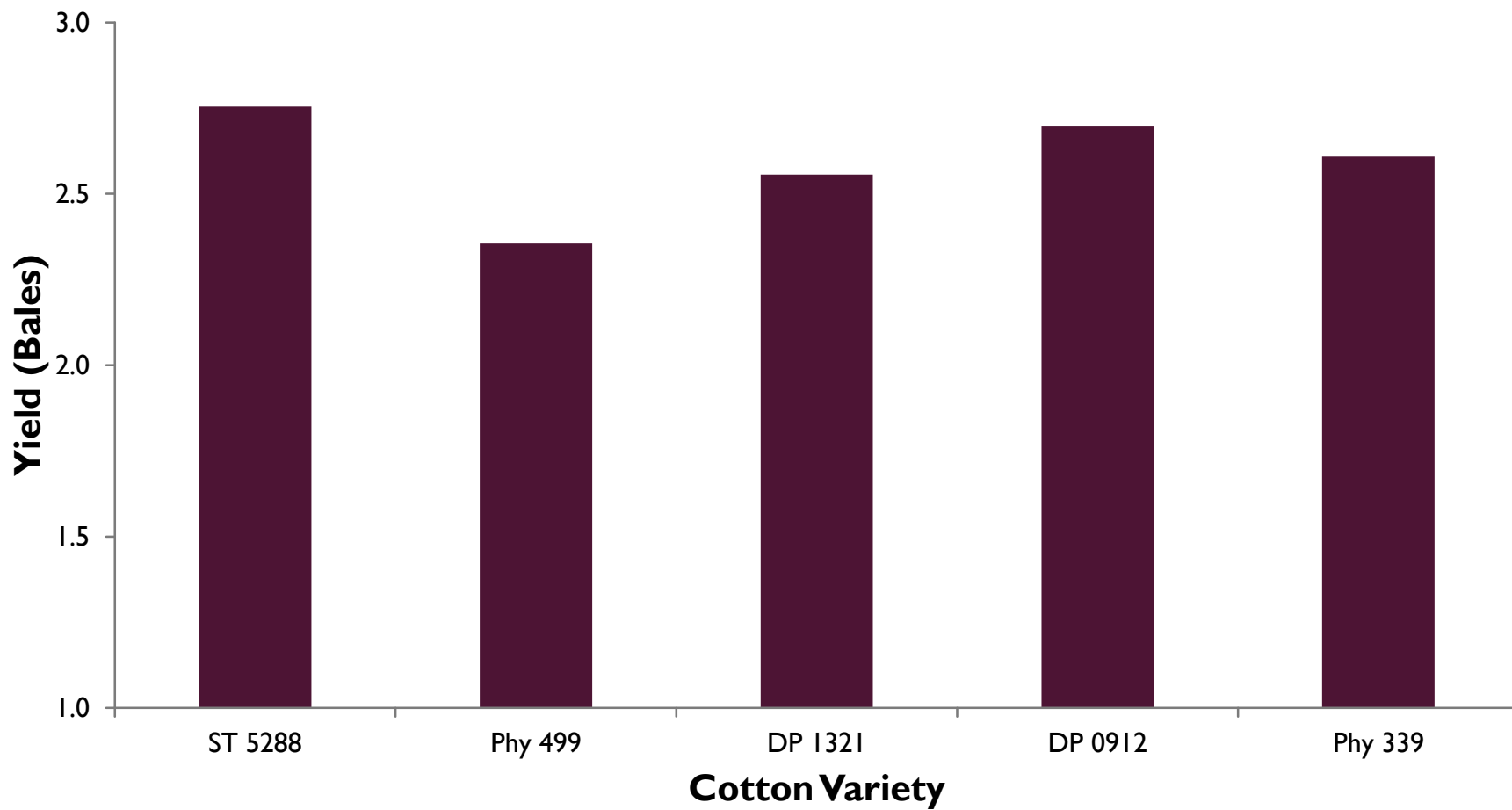
PRECIPITATION DURING 2014 GROWING SEASON



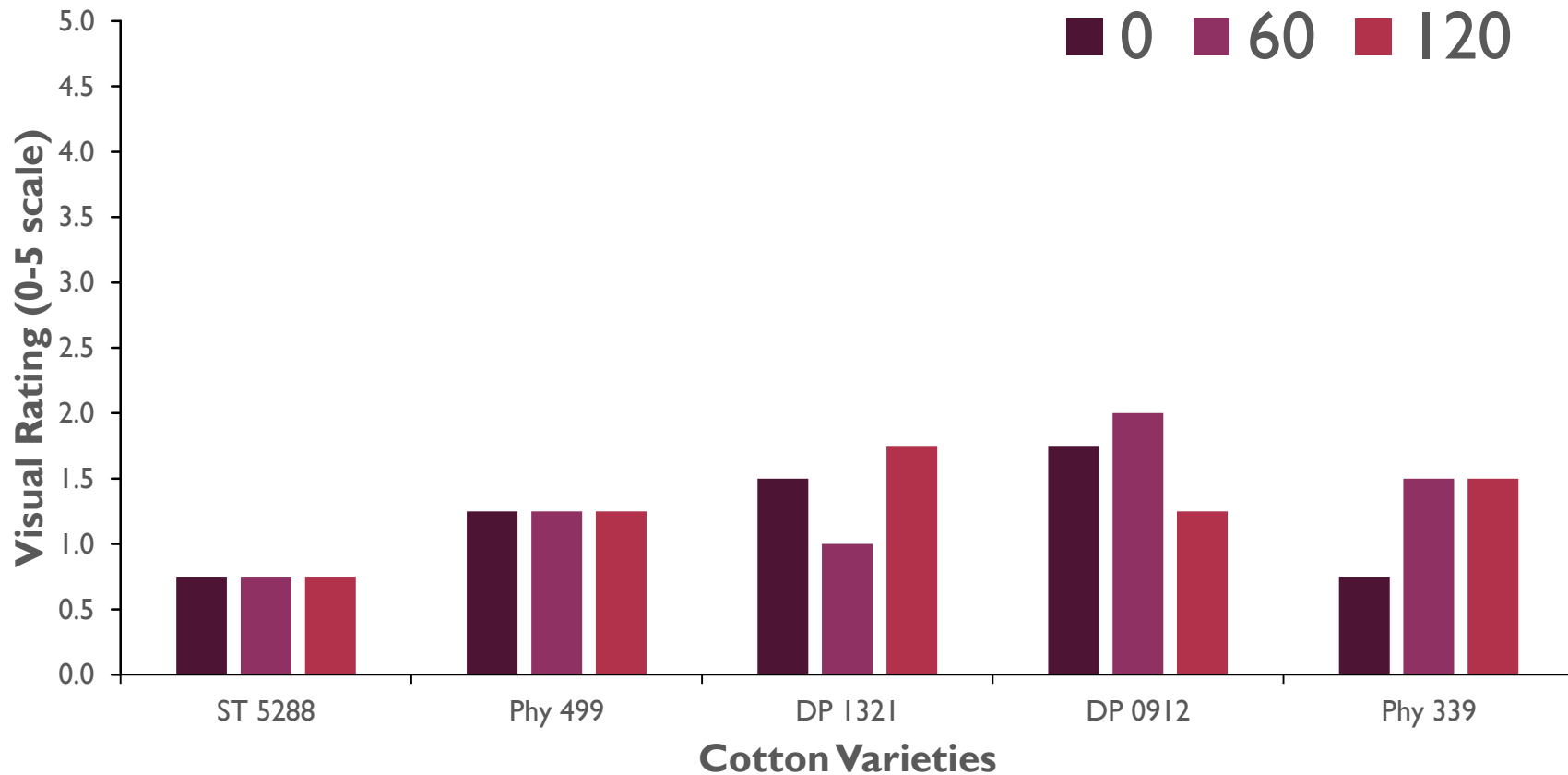
LEAF SPOT VS. COTTON VARIETY AT 3 K RATES 2013



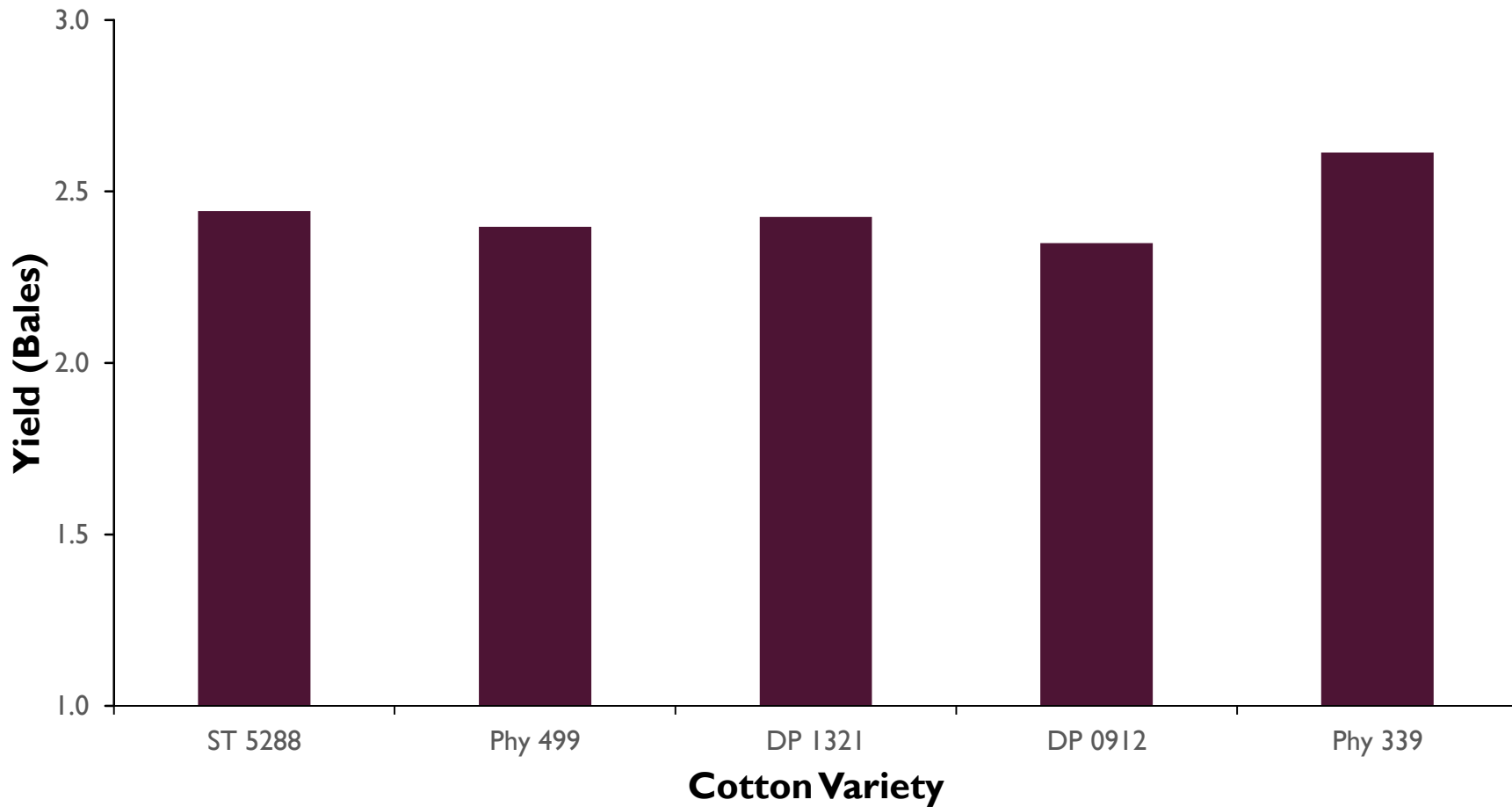
RESULTS 2013



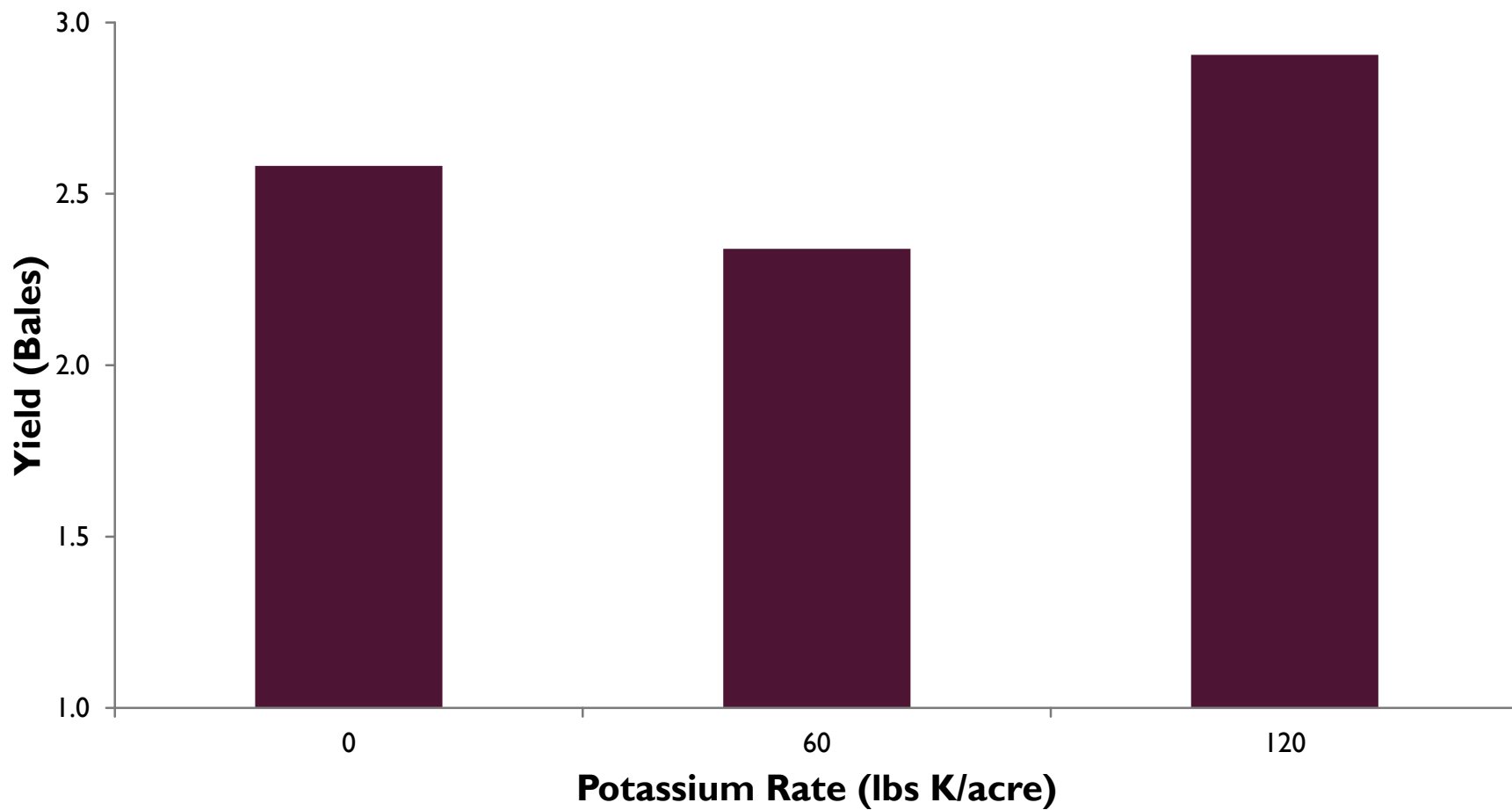
LEAF SPOT VS. COTTON VARIETY AT 3 K RATES 2014



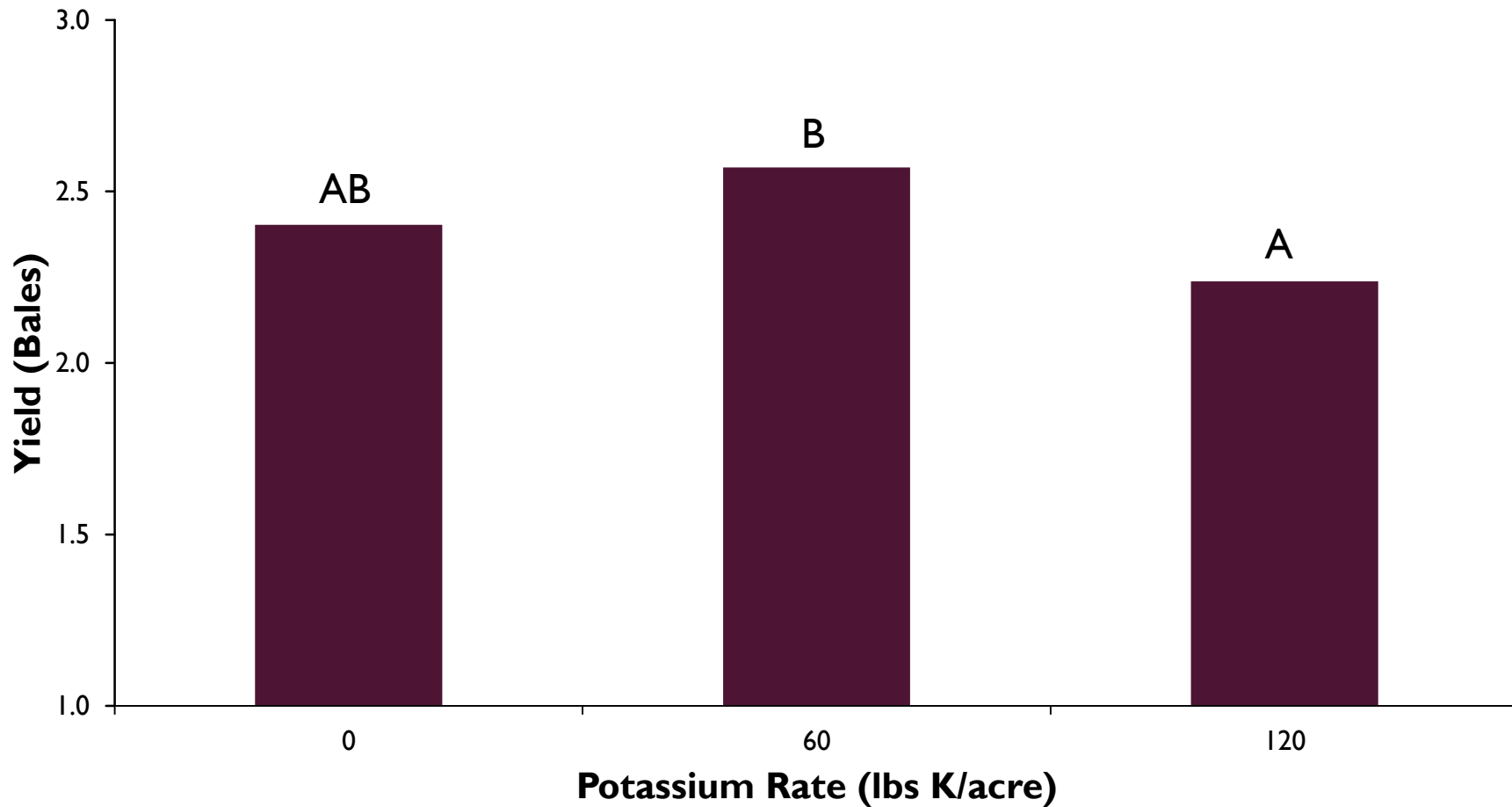
RESULTS 2014



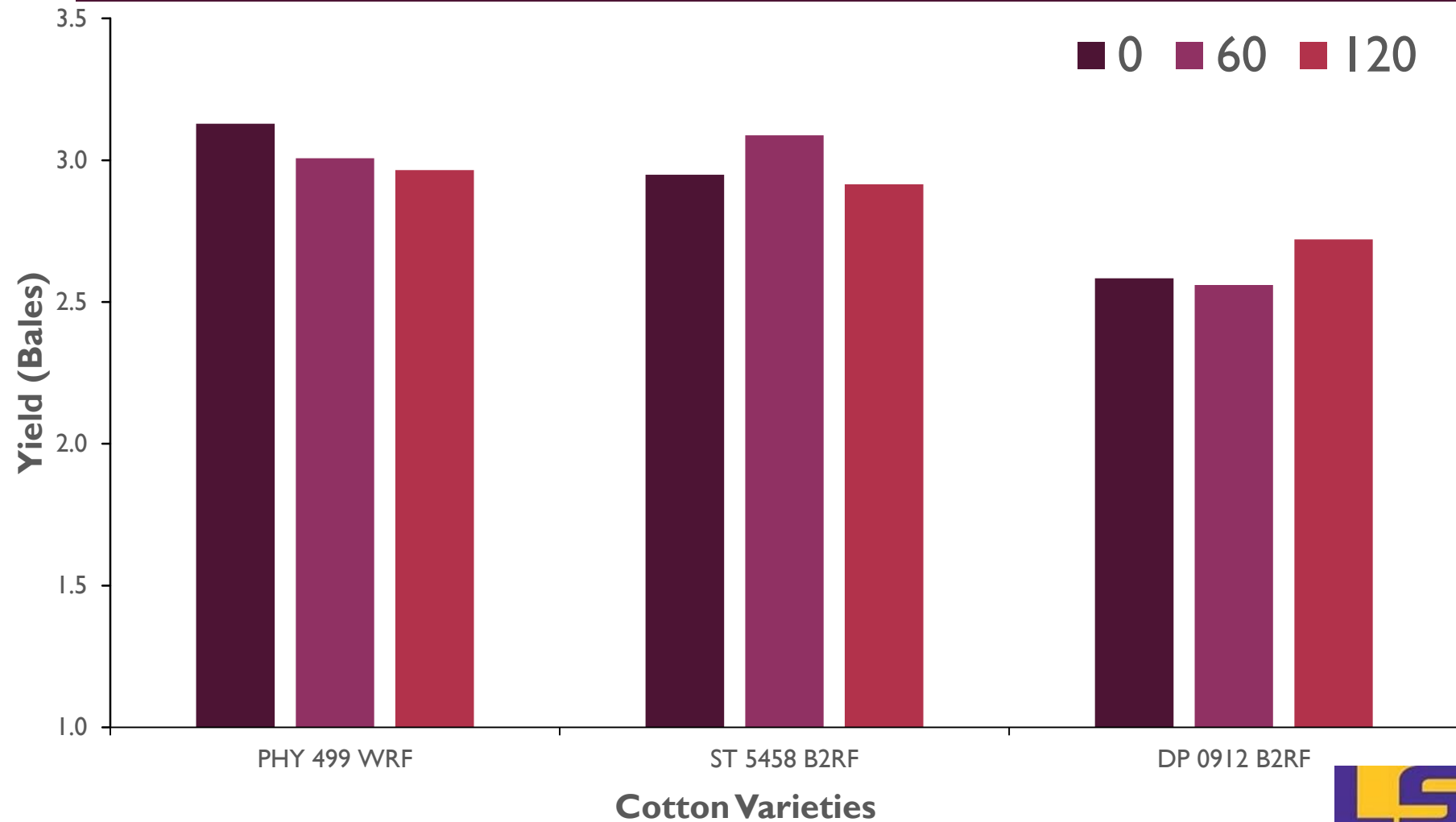
RESULTS 2013



RESULTS 2014



2012 POTASSIUM TRIAL - JOHN KRUSE



IRRIGATED VS. NON-IRRIGATED

- K is transported through soil water
 - Even with K present, K deficiencies can exist if the plant is not able to access the K
 - Due to the inconsistencies that had been seen with the previous data, it was decided to evaluate K with and without irrigation



Non-Irrigated – 120 lbs K/ac



Irrigated – 120 lbs K/ac

TRIAL SETUP

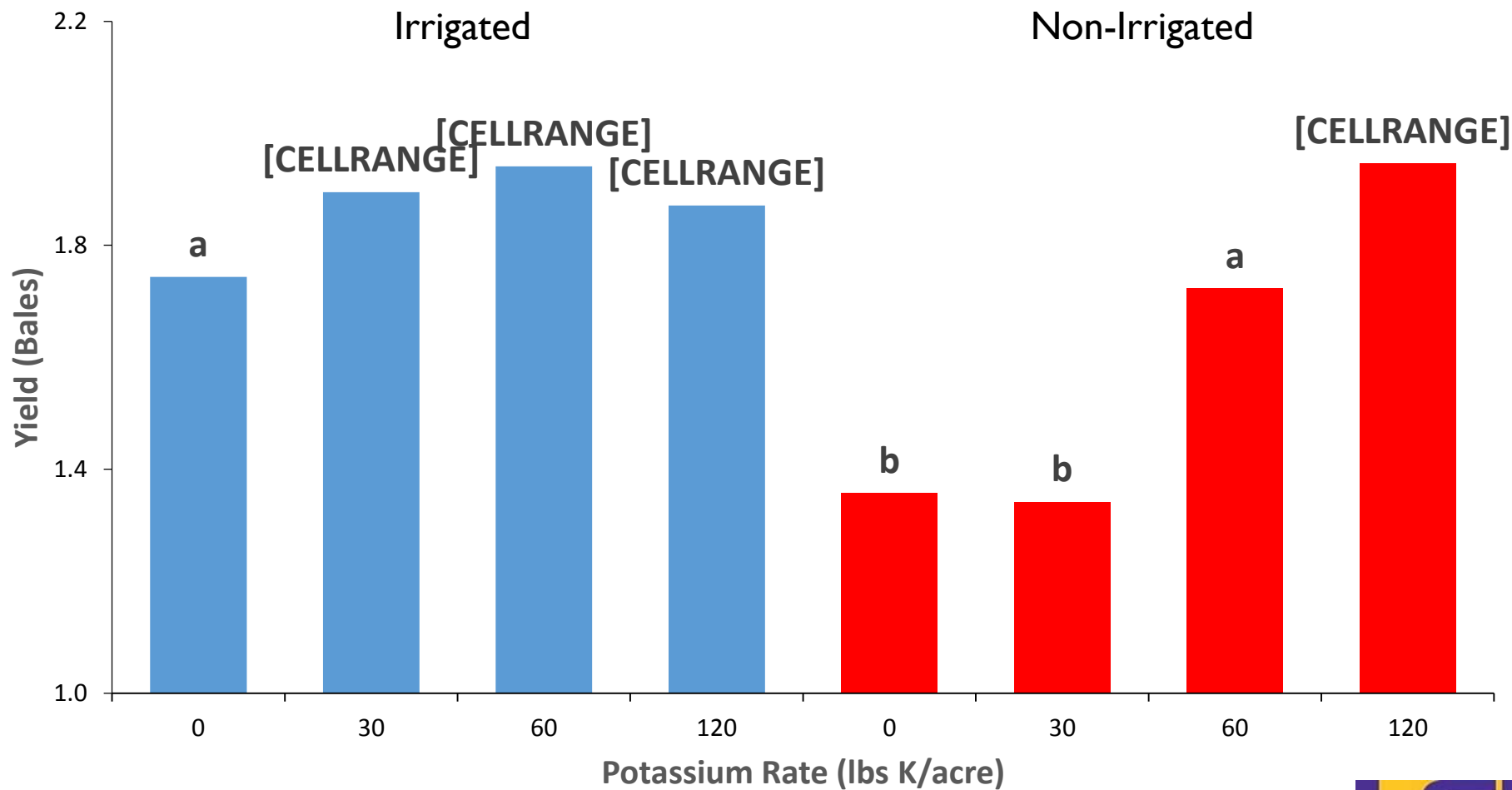
Location

- St. Joseph, Louisiana
- Commerce silt loam (Fine-silty, mixed, superactive, nonacid, thermic Fluvaquentic Endoaquepts)

Irrigated vs Non-Irrigated

- Variety planted
 - Deltapine 0912 B2RF
- 5 potassium rates
 - 0, 30, 60, 90, and 120 lbs K_2O /acre

IRRIGATED VS. NON-IRRIGATED



OVERALL FINDINGS

- Water is the primary factor controlling K availability
- For the 5 varieties of cotton
 - No significant yield differences were observed across K rates
 - Very beneficial, so we do not have to recommend differing rates according to variety
 - Yield inconsistencies were seen on a Commerce silt loam
 - This is going to be evaluated in a greenhouse to determine if there are any nutrient ratios that could be causing this to occur
 - Mg/K or Ca/K
 - No differences were seen in 2013 for Mic values

OVERALL FINDINGS

- Water is the primary factor controlling K availability
- For the Irrigated vs Non-Irrigated
 - Additional K that was applied to the plots did not influence the yield as much as the irrigation
 - For a non-irrigated system, 120 lbs of K/acre was needed to achieve similar yields to that found in an irrigated system even under lower K rates

2014 SUMMER AGRONOMY/SOILS CREW

