

Sugarcane Fertility Update for 2024

Rich Johnson

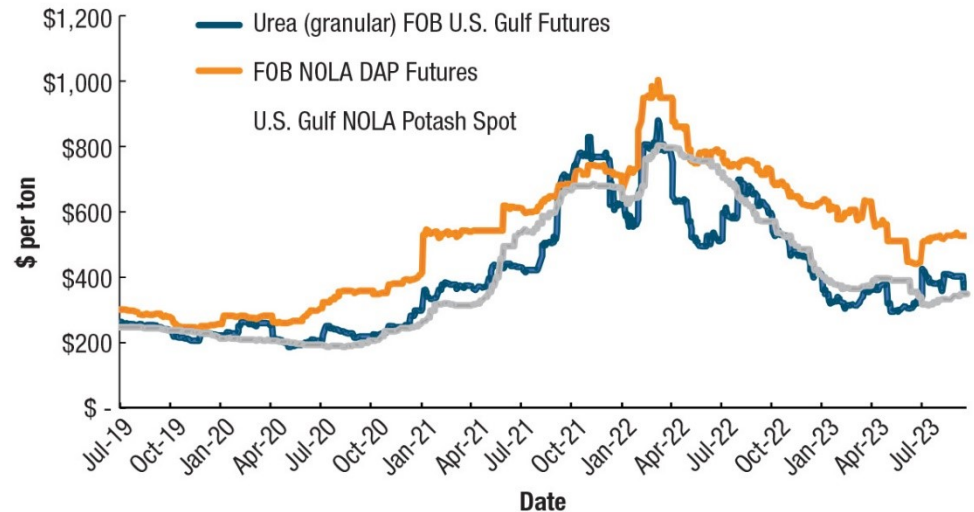
USDA/ARS, SRU



Fertilizer Costs

FIGURE 2

Urea, DAP and potash prices in the U.S., July 2019-October 2023



Source: Urea and DAP prices are from Chicago Board of Trade, and potash price is from Green Markets

Product	Range	Average	Change
Anhydrous Ammonia	\$698-775	\$729.67	+\$11.33
Urea (Dry)	\$476-645	\$559.75	+\$20.42
UAN (32%)	\$350-400	\$372.00	+\$3.67
Potash	\$504-575	\$541.50	-\$21.00

Des Moines, IA Jan 23, 2024, USDA Market News

Soil Fertility priorities for 2024

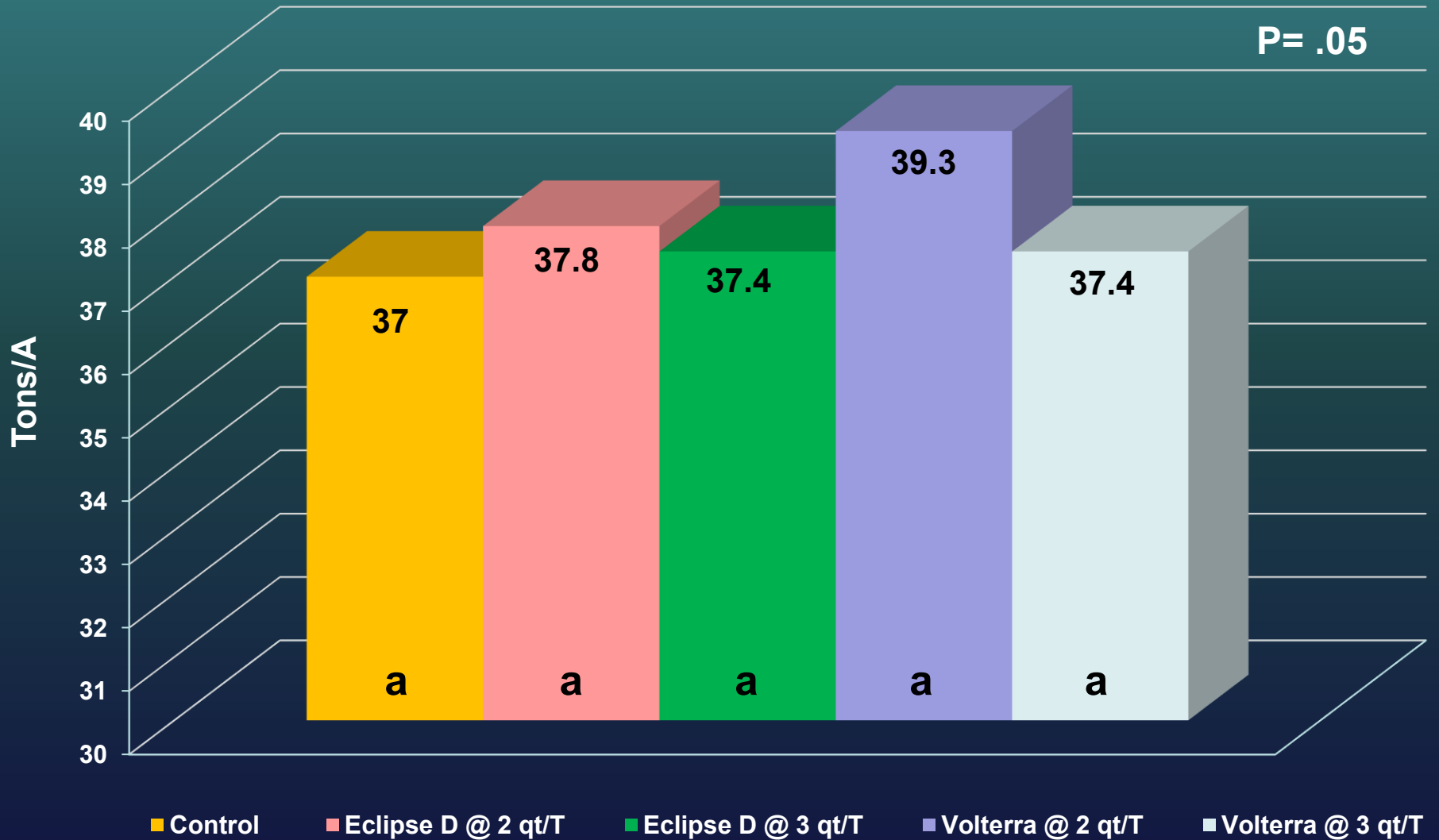
- **Soil pH**
- **Nitrogen**
- **Sulfur**
- **Potassium**
- **Micronutrients (Zn, B)**
- **Phosphorus (at planting?)**

Nitrogen Stabilizers

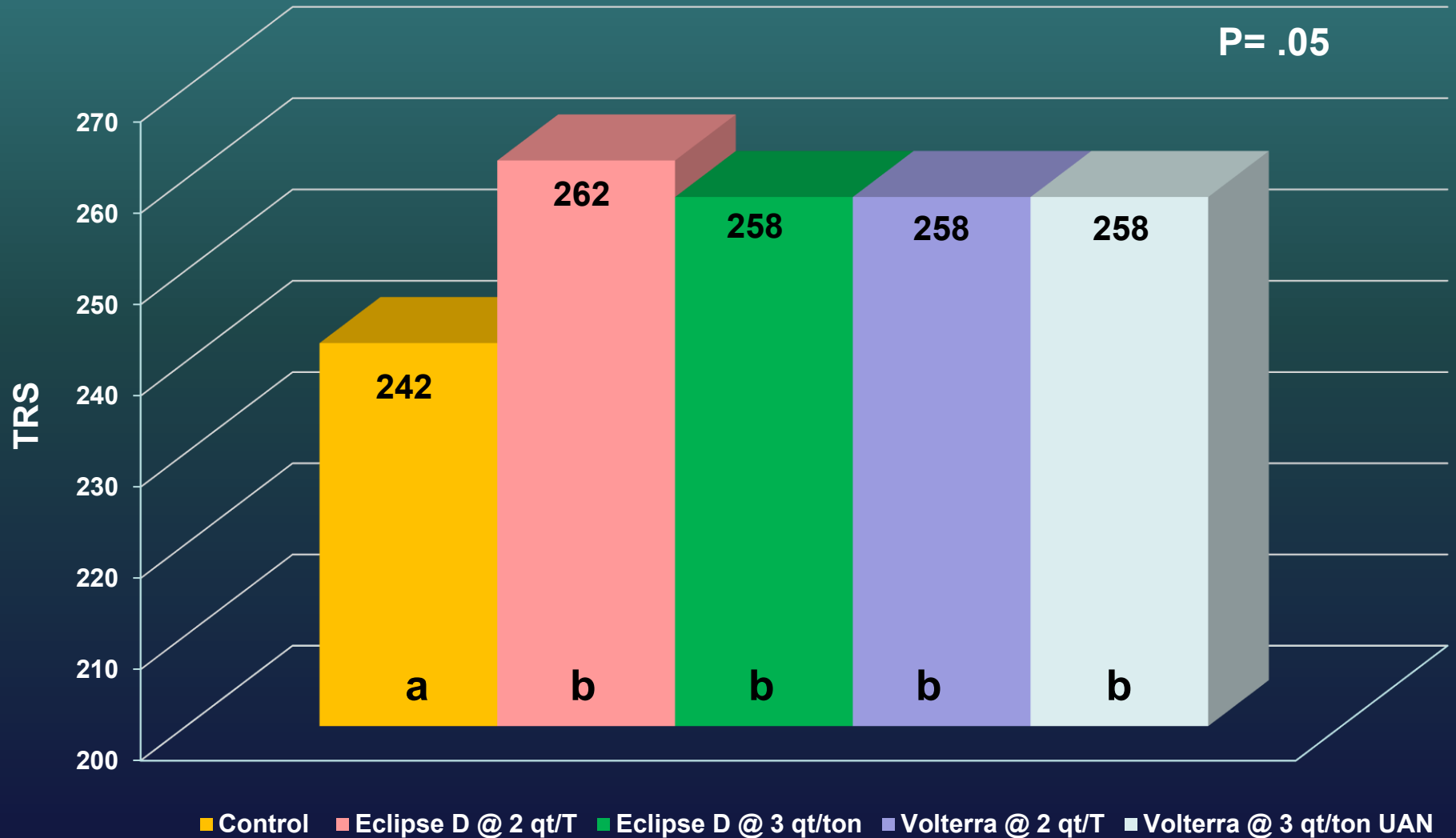
- Urea \longrightarrow urease \longrightarrow NH_4^+
 - Urease inhibitor - N-(n-butyl) thiophosphoric triamide (NBPT)
- NH_4^+ \longrightarrow nitrosomonas, nitrobacter \longrightarrow NO_3^-
 - Nitrification inhibitor – Dicyandiamide (DCD)

Response to Nitrogen Stabilizers

L 01-299, Plant Cane, Tons/A, Gravois, 2023



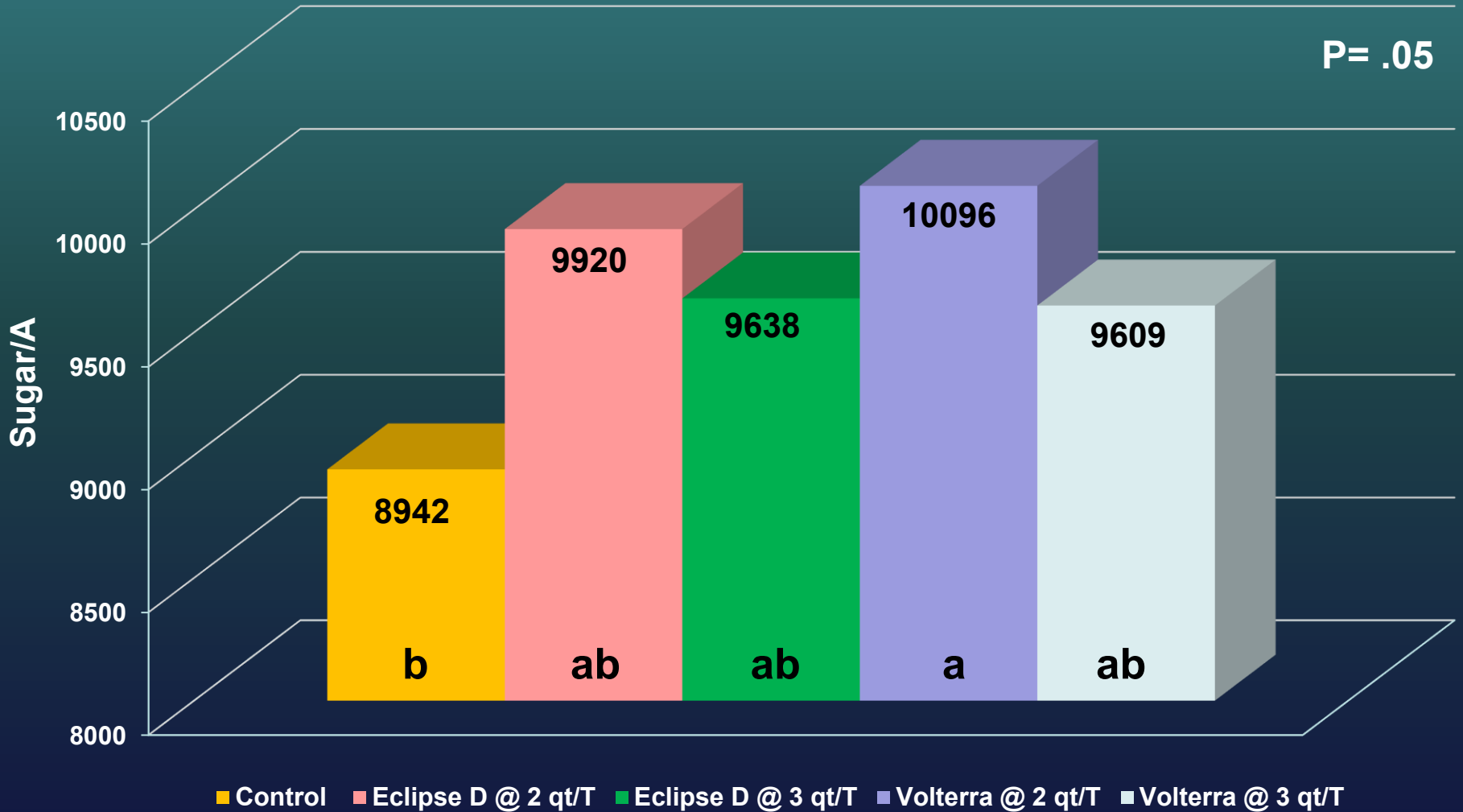
Response to Nitrogen Stabilizers L01-299, PC, TRS, Gravois, 2023



Response to Nitrogen Stabilizers

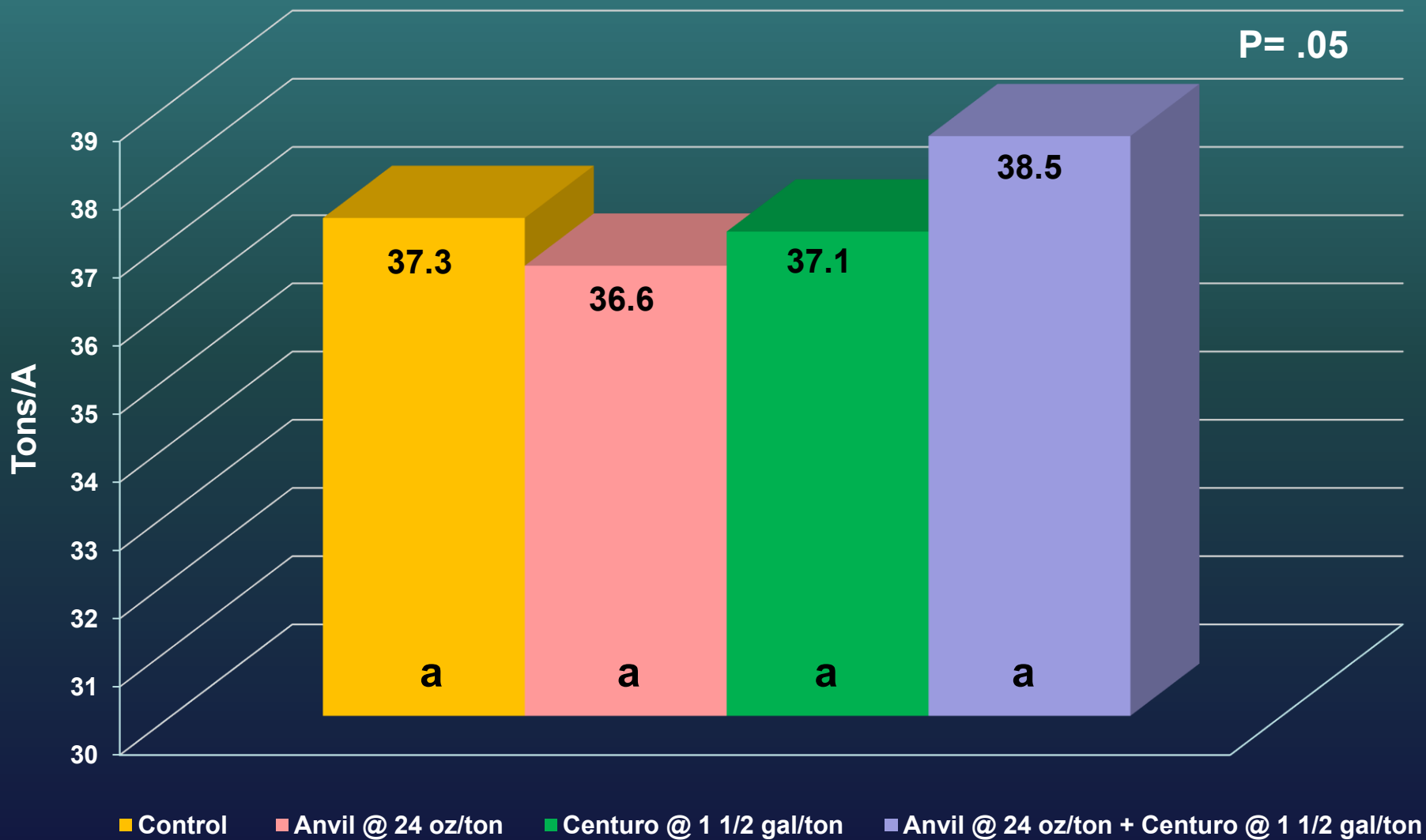
L 01-299, Plant Cane, Sugar/A, Gravois, 2023

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Response to Nitrogen Stabilizers

HoCP 14-885, Plant Cane, Tons/A, Simmoneaux, 2023



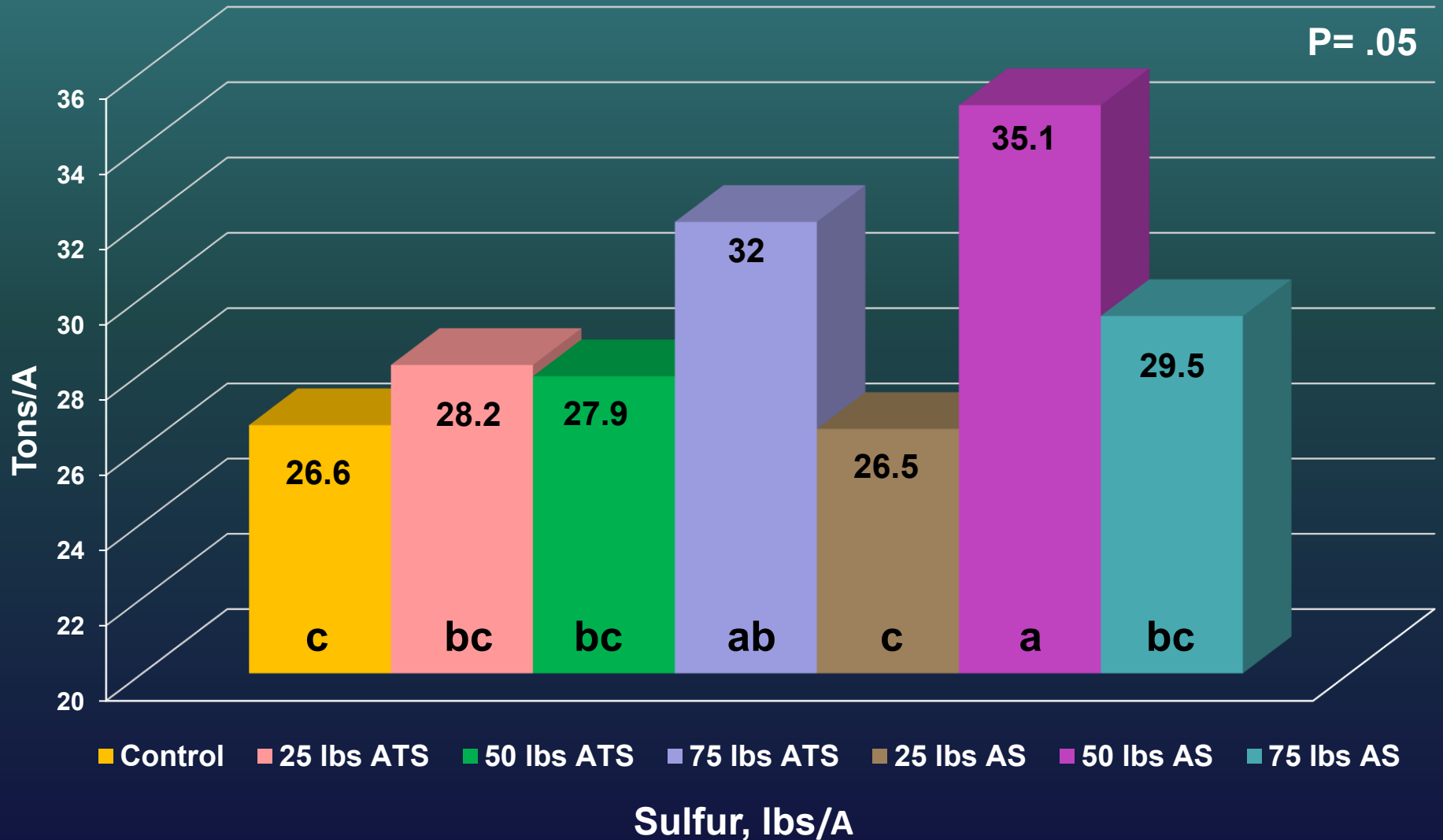
Sulfur (S)

- **Varieties: L01-299, Ho 12-615**
- **Crop Age: PC, 1R, 2R**
- **All soils tested low or medium for, sulfur prior to treatment application.**
- **S rates: 0, 25, 50, 75 lb S/A**
- **Sources: ATS (Liquid), AS (ammonium sulfate)**
- **Reps: 6**

Response to Sulfur Fertilizer

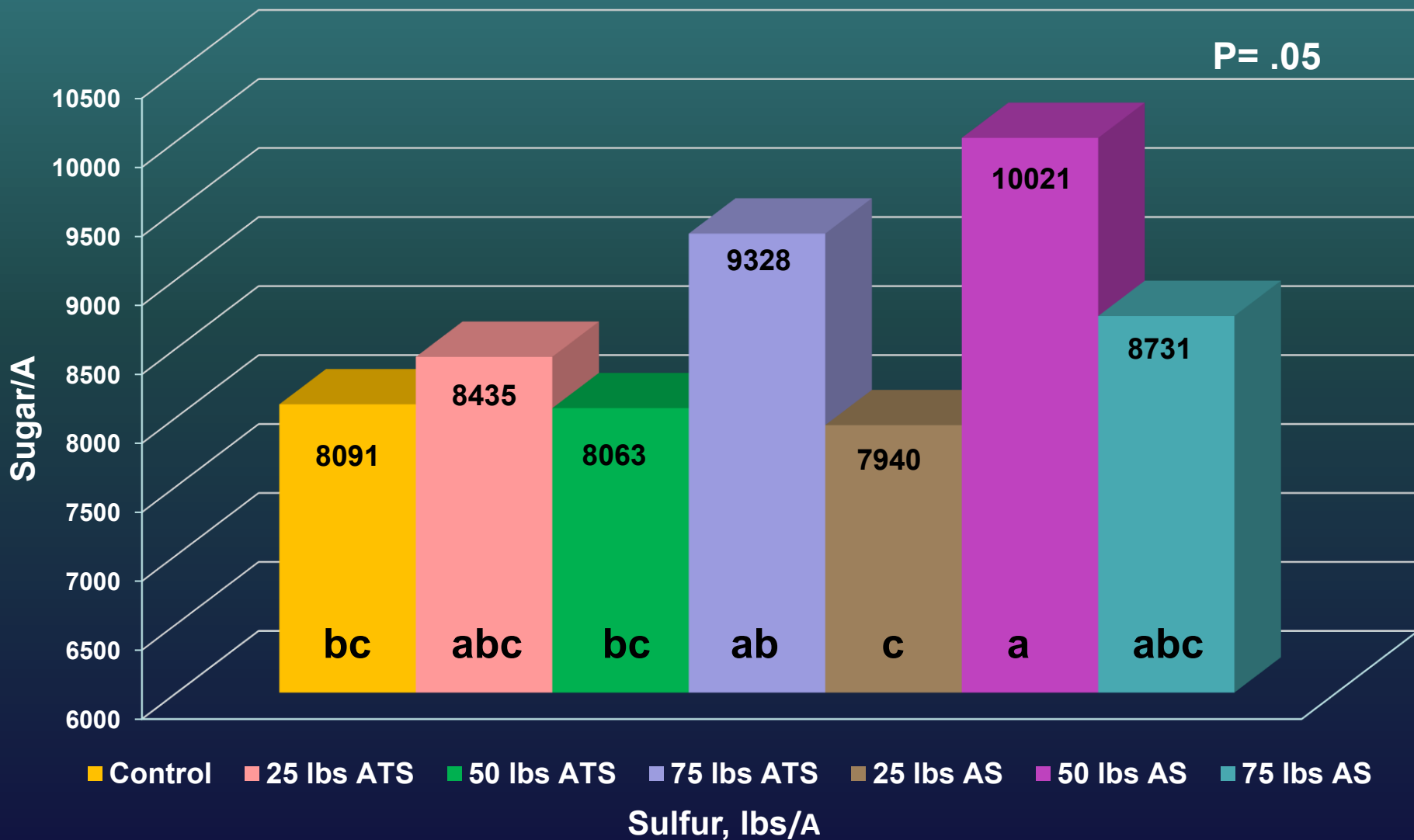
Ho 12-615, 2nd Stubble, Tons/A, Gaubert, 2023

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Response to Sulfur Fertilizer

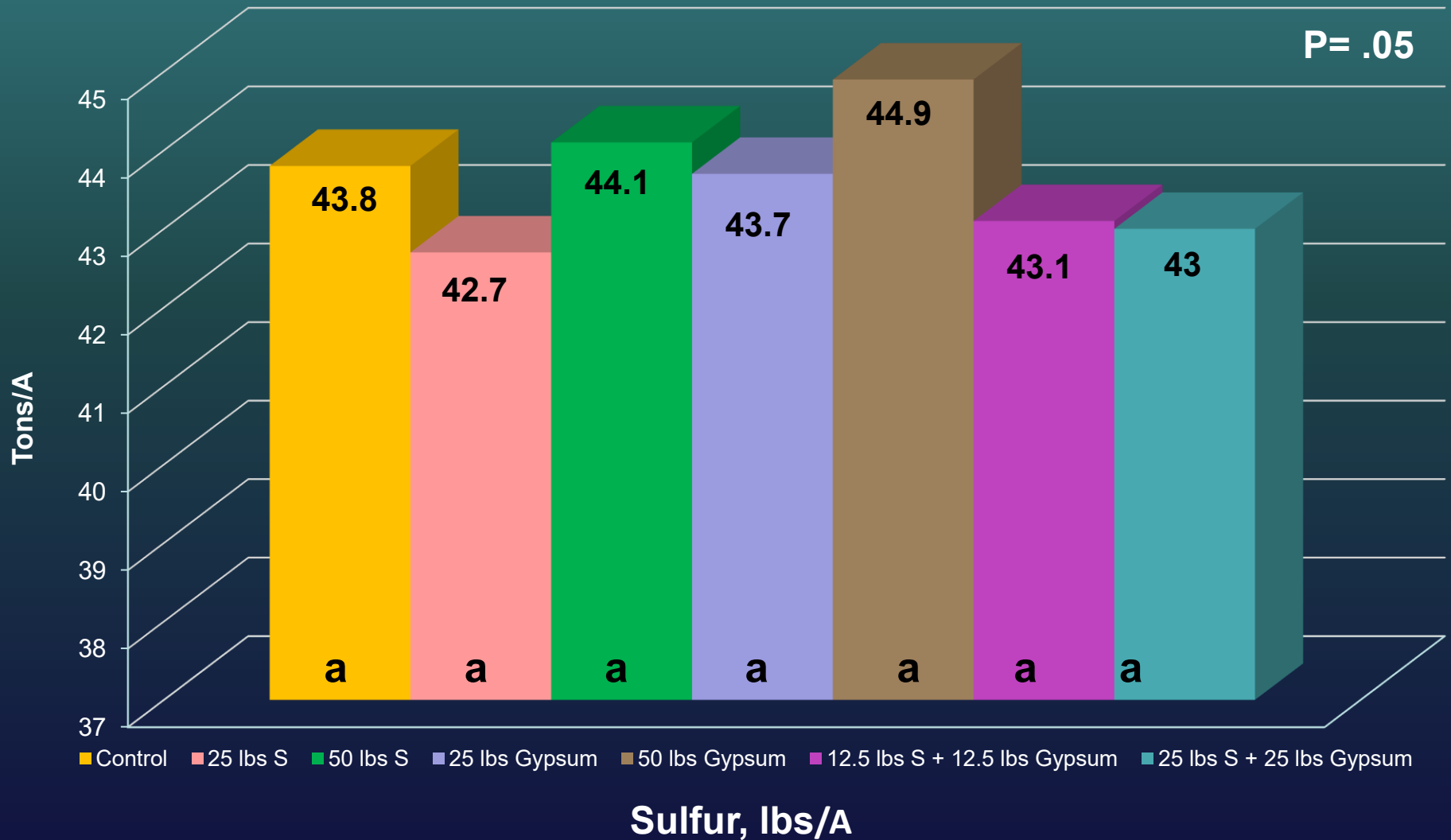
Ho 12-615, 2nd Stubble, Sugar/A, Gaubert, 2023



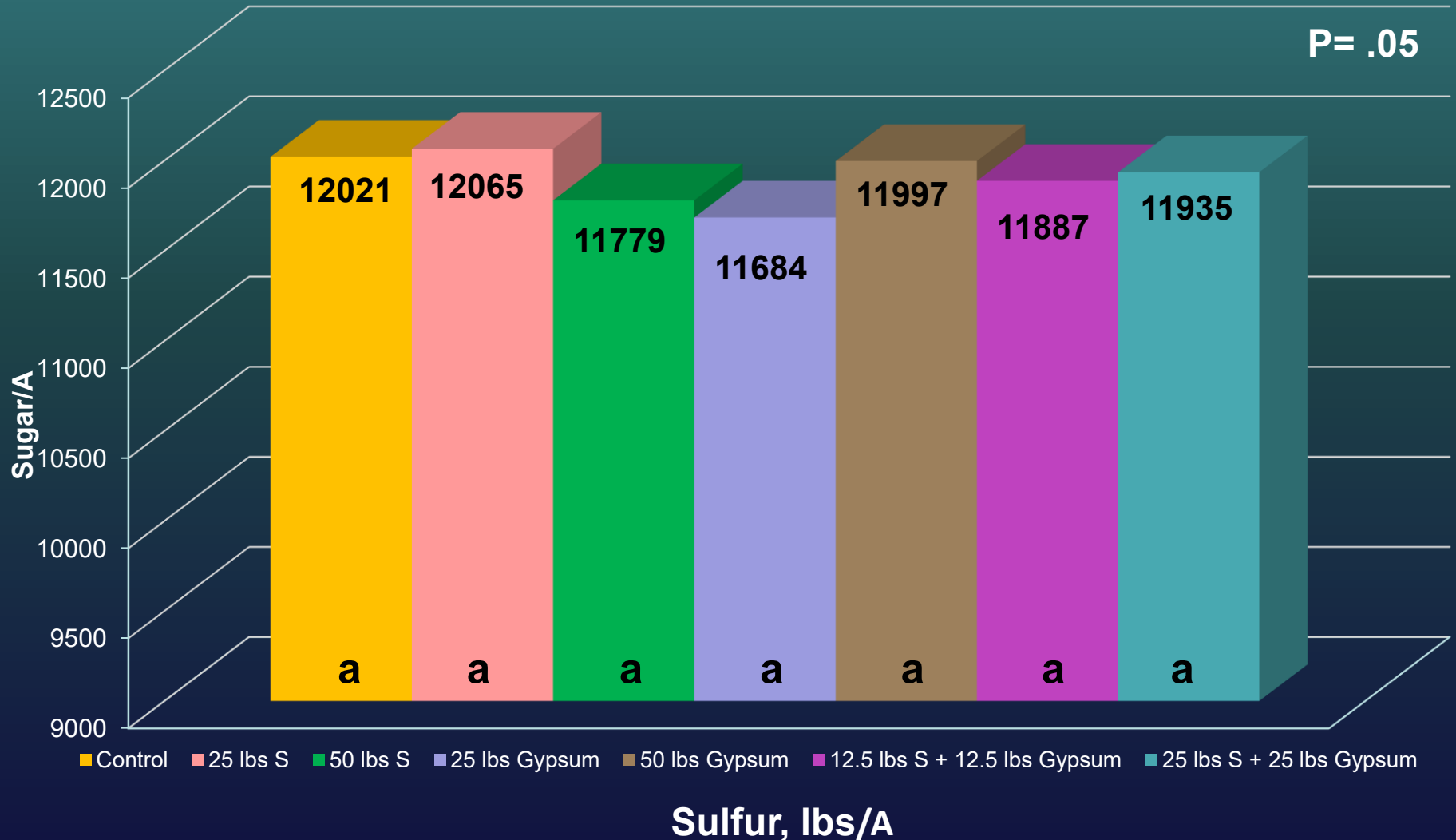
Sulfur (S) Longevity

- **Varieties: L01-299, Ho 12-615**
- **Crop Age: PC, 1R**
- **All soils tested low or medium for, sulfur prior to treatment application.**
- **S rates: 0, 25, 50 lb S/A**
- **Sources: Elemental S, Gypsum**
- **Reps: 6**

Response to Sulfur Longevity Fertilizer L 01-299, 1st Stubble, Tons/A, Ardoin, 2023

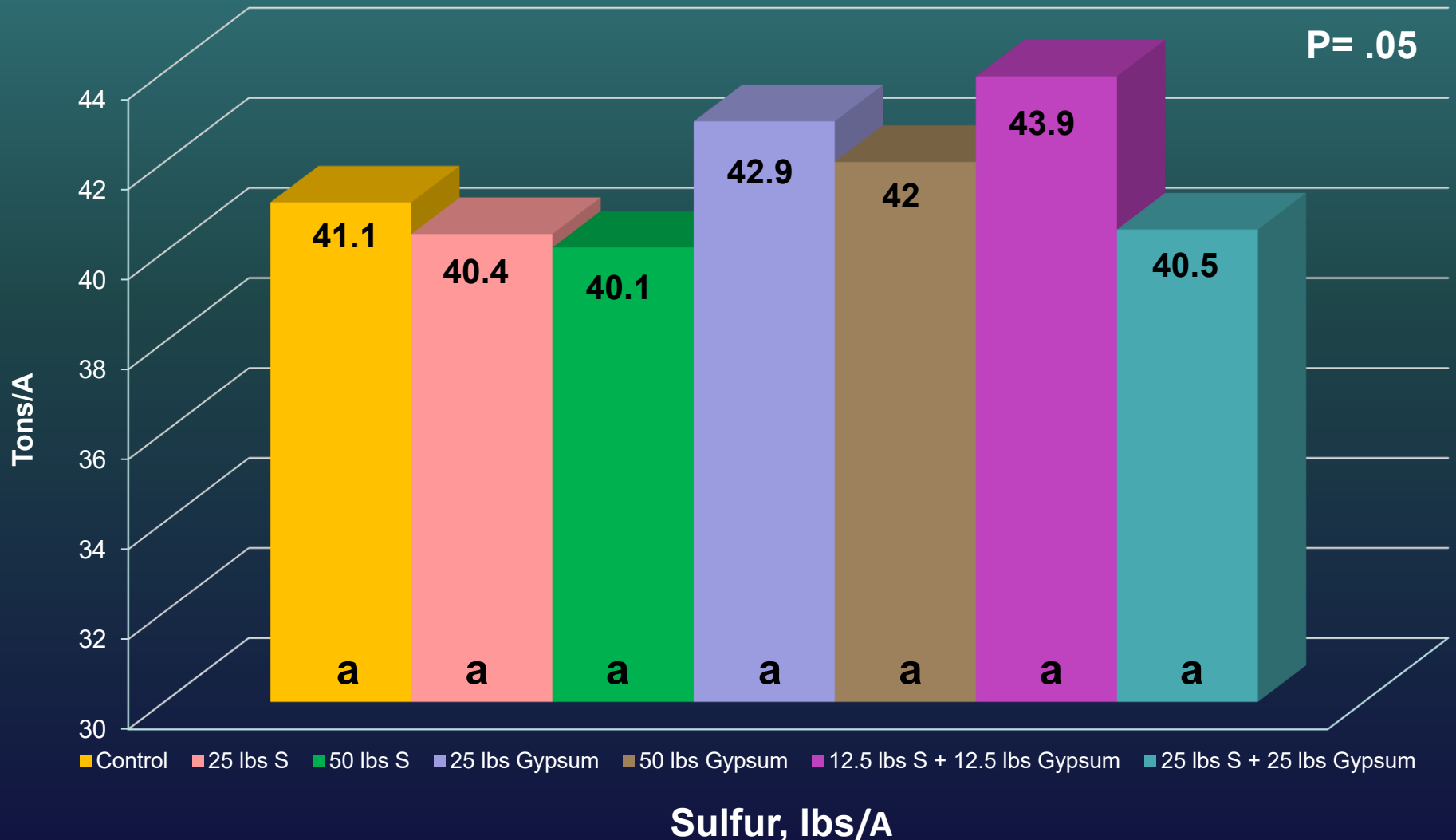


Response to Sulfur Longevity Fertilizer L 01-299, 1st Stubble, Sugar/A, Ardoin, 2023

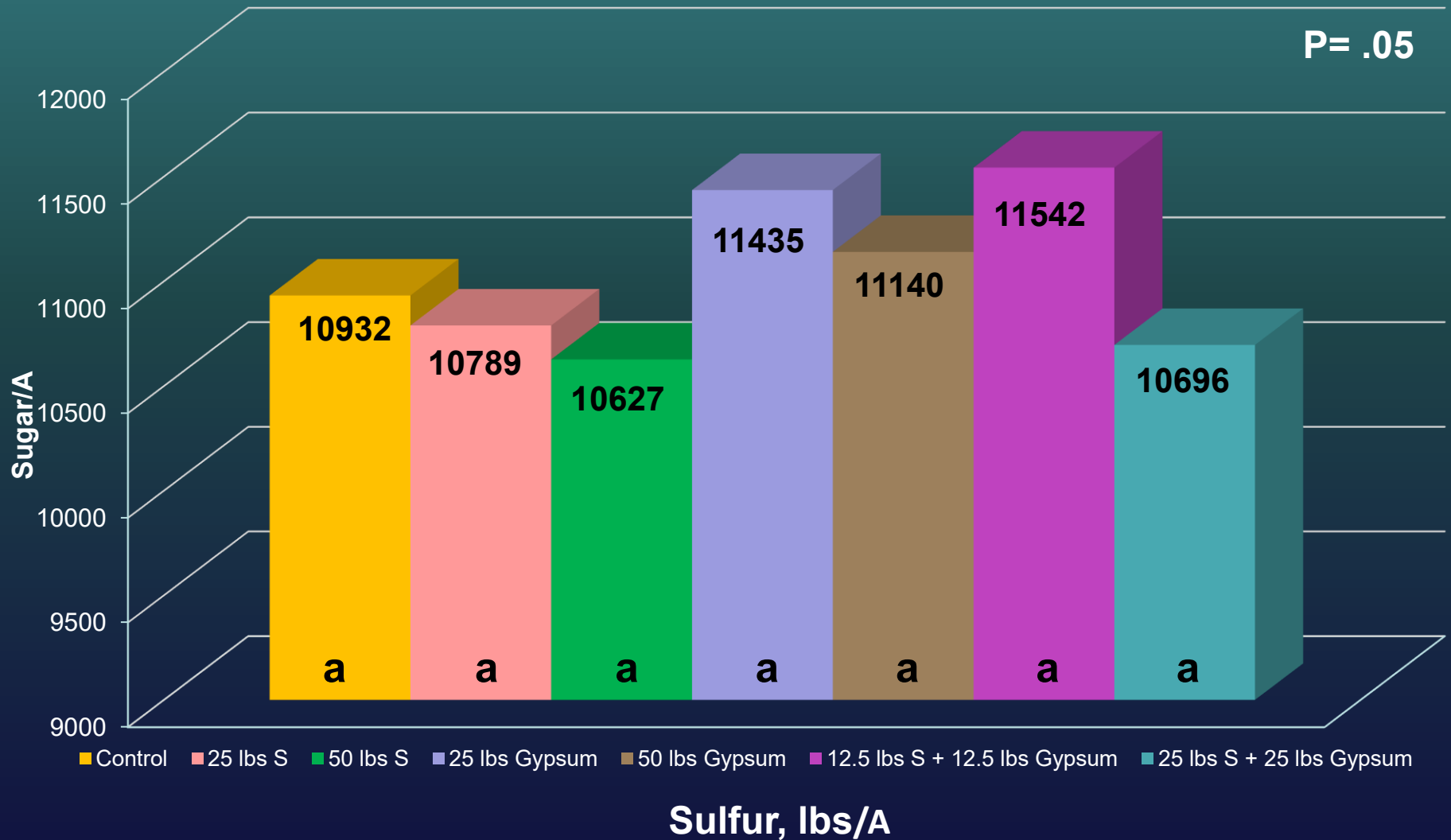


Response to Sulfur Longevity Fertilizer

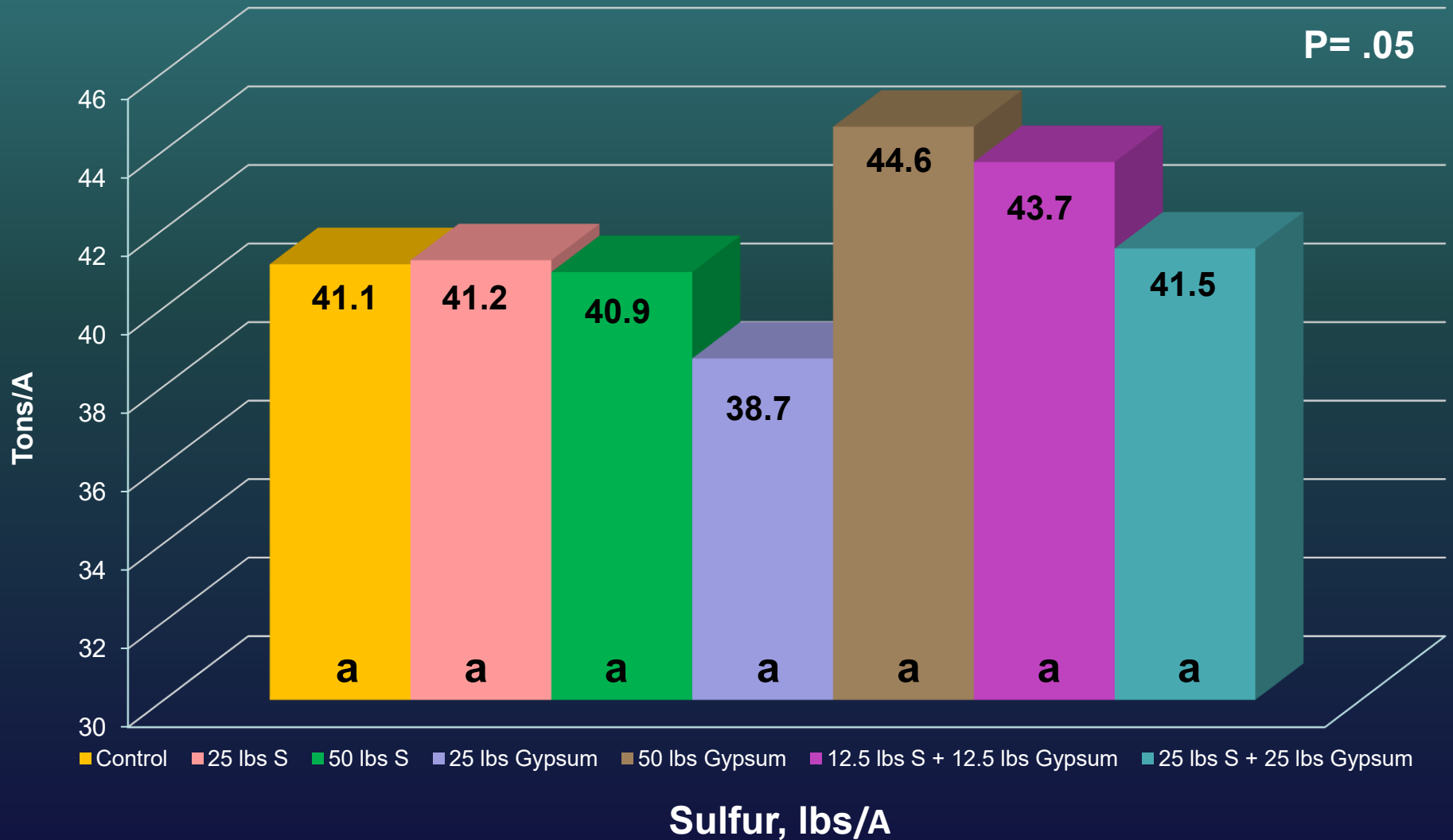
Ho 12-615, 1st Stubble, Tons/A, Ardoin, 2023



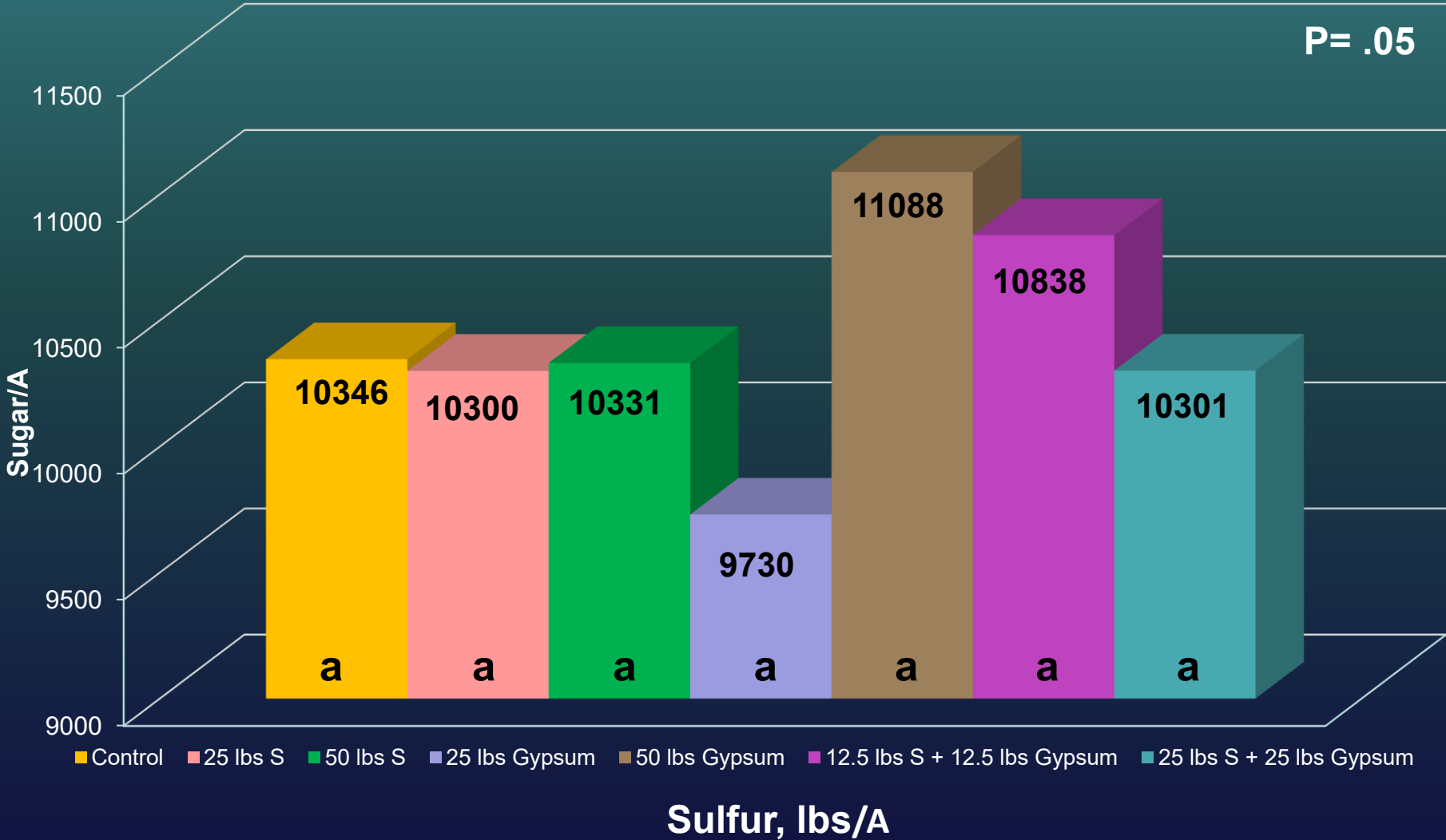
Response to Sulfur Longevity Fertilizer Ho 12-615, 1st Stubble, Sugar/A, Ardoin, 2023



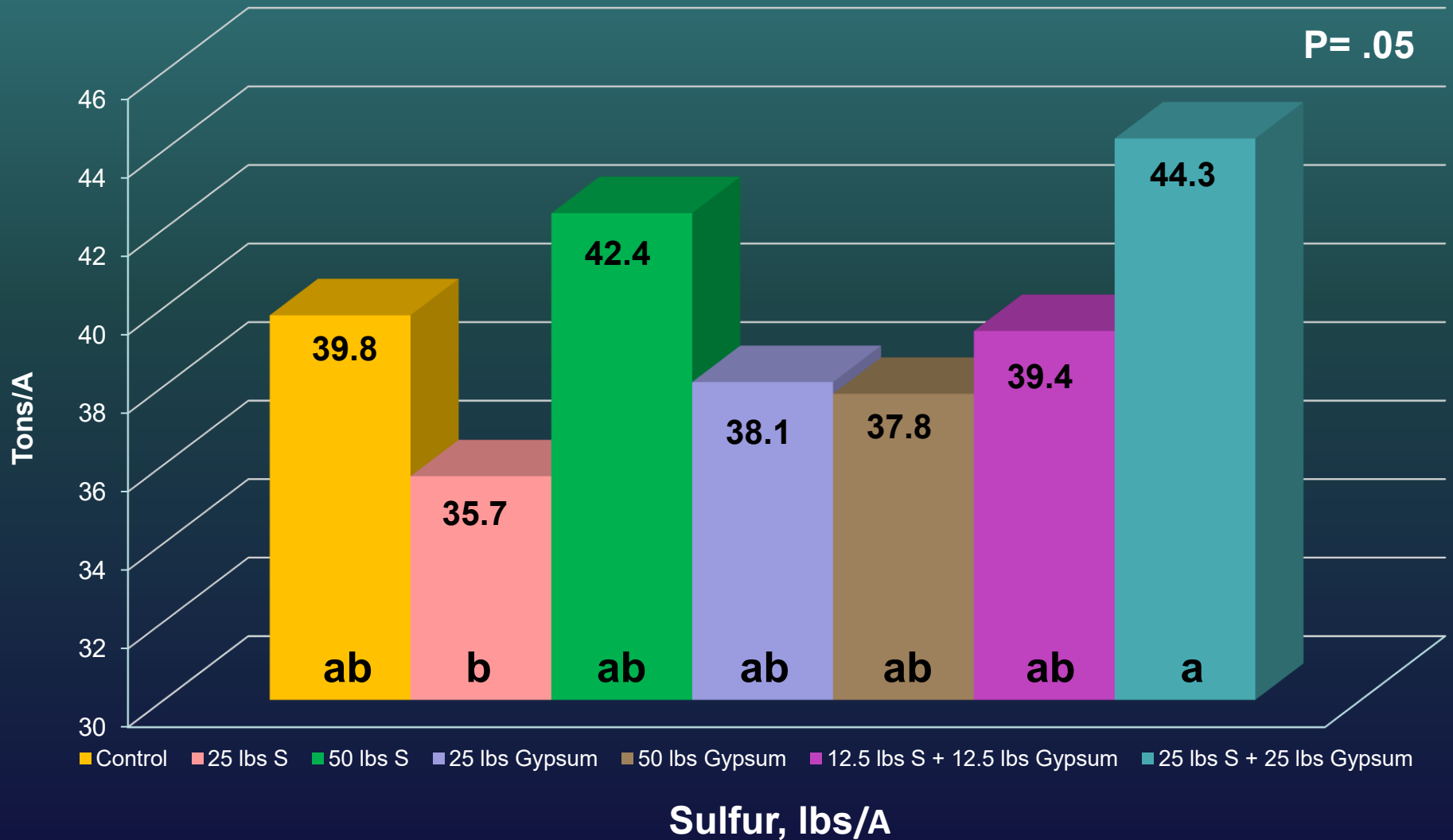
Response to Sulfur Longevity Fertilizer L 01-299, Plant Cane, Tons/A, Robichaux, 2023



Response to Sulfur Longevity Fertilizer L 01-299, Plant Cane, Sugar/A, Robichaux, 2023

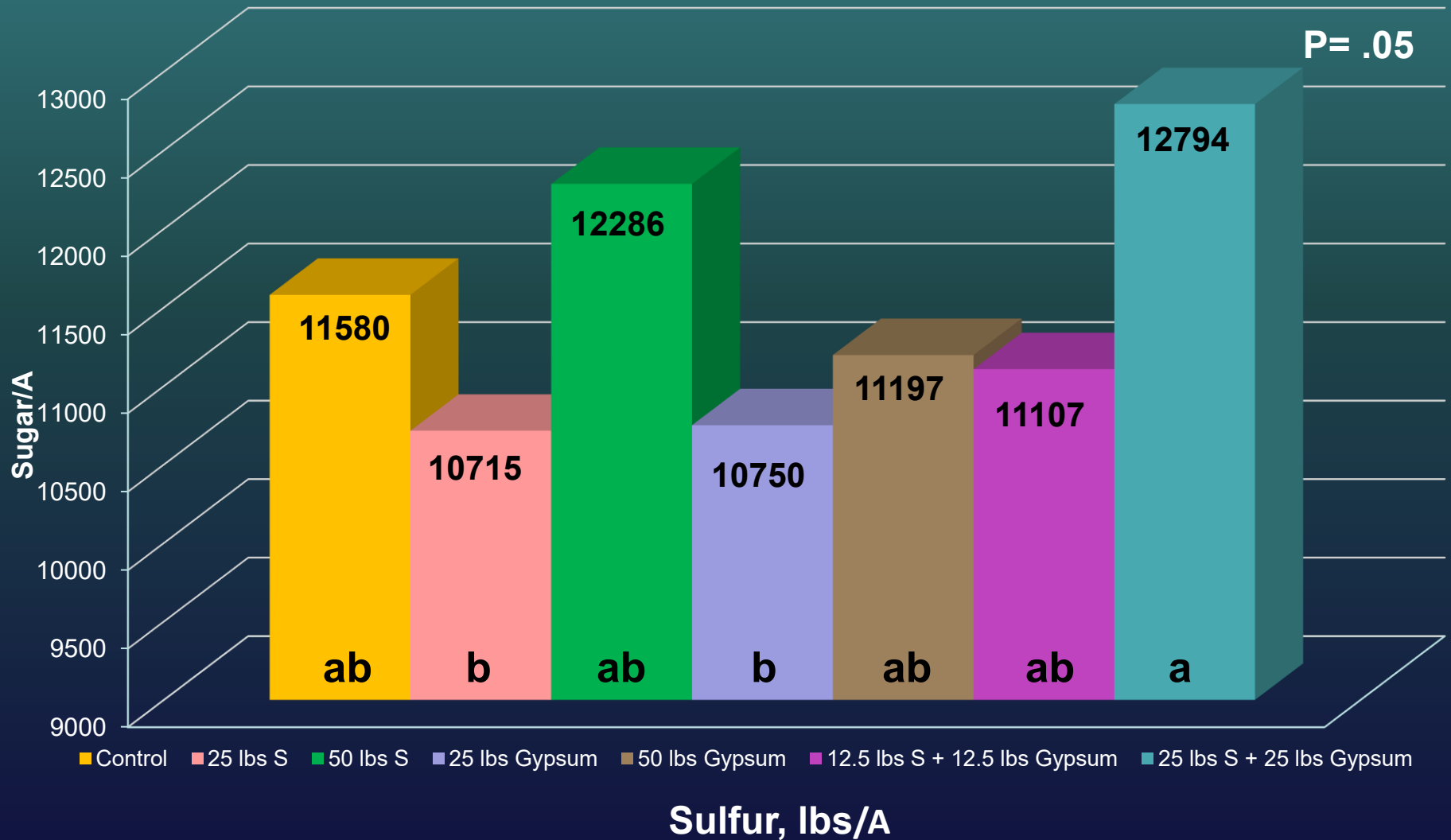


Response to Sulfur Longevity Fertilizer HoCP 14-885, Plant Cane, Tons/A, Robichaux, 2023



Response to Sulfur Longevity Fertilizer

HoCP 14-885, Plant Cane, Sugar/A, Robichaux, 2023



Sulfur (S) Summary

- **Consistent results have demonstrated a benefit to sulfur.**
- **The current recommendation of 24 lb S/A may be too low for optimum response to sulfur.**
- **Results from studies combining elemental S and gypsum also show an advantage to rates greater than 24 lb S.**
- **A new 2-tier Sulfur recommendation will be adopted starting this year.**

< 10 mg S/kg – 40 lbs S/A

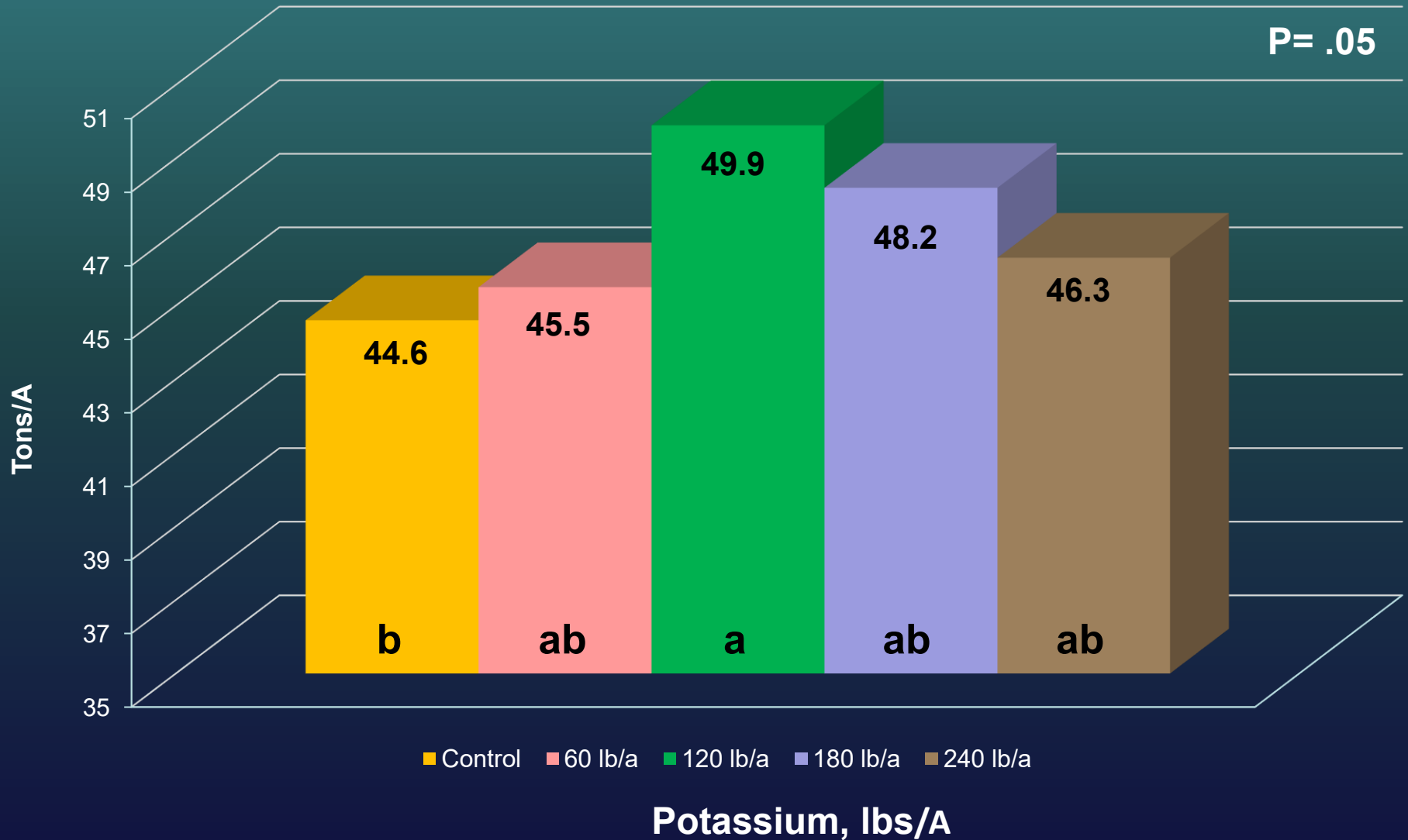
10-20 mg S/kg – 20 lbs S/A

Potassium(K)

- **Variety: L01-299, Light and Heavy soils**
- **Crop Age: PC**
- **All soils tested low**
- **K rates: 0, 60, 120, 180, 240 lb K₂O/A**
- **Sources: Muriate of Potash (KCl)**
- **Reps: 6**

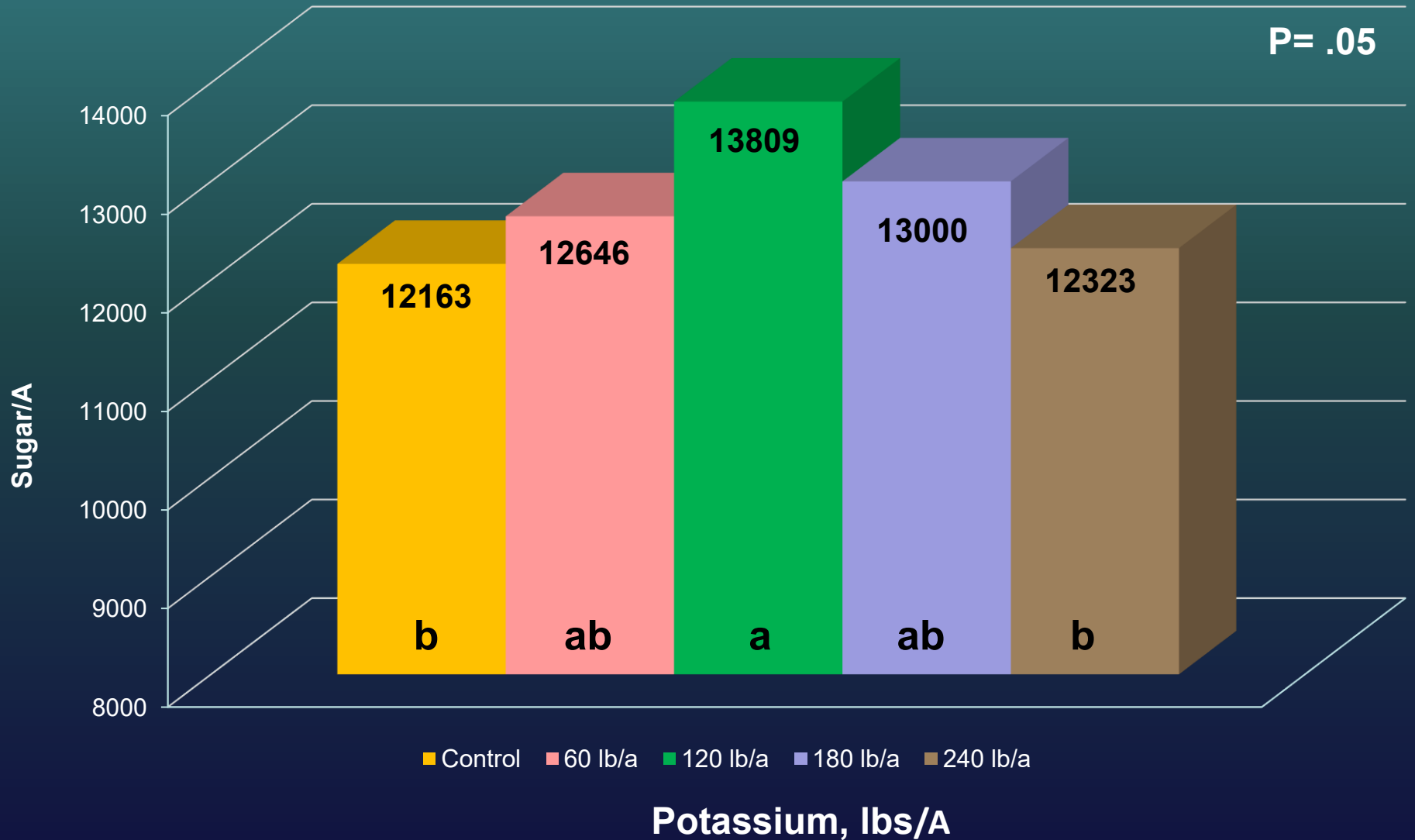
Response to Potassium Fertilizer

L 01-299, Light Soil, Plant Cane, Tons/A, Segura, 2023



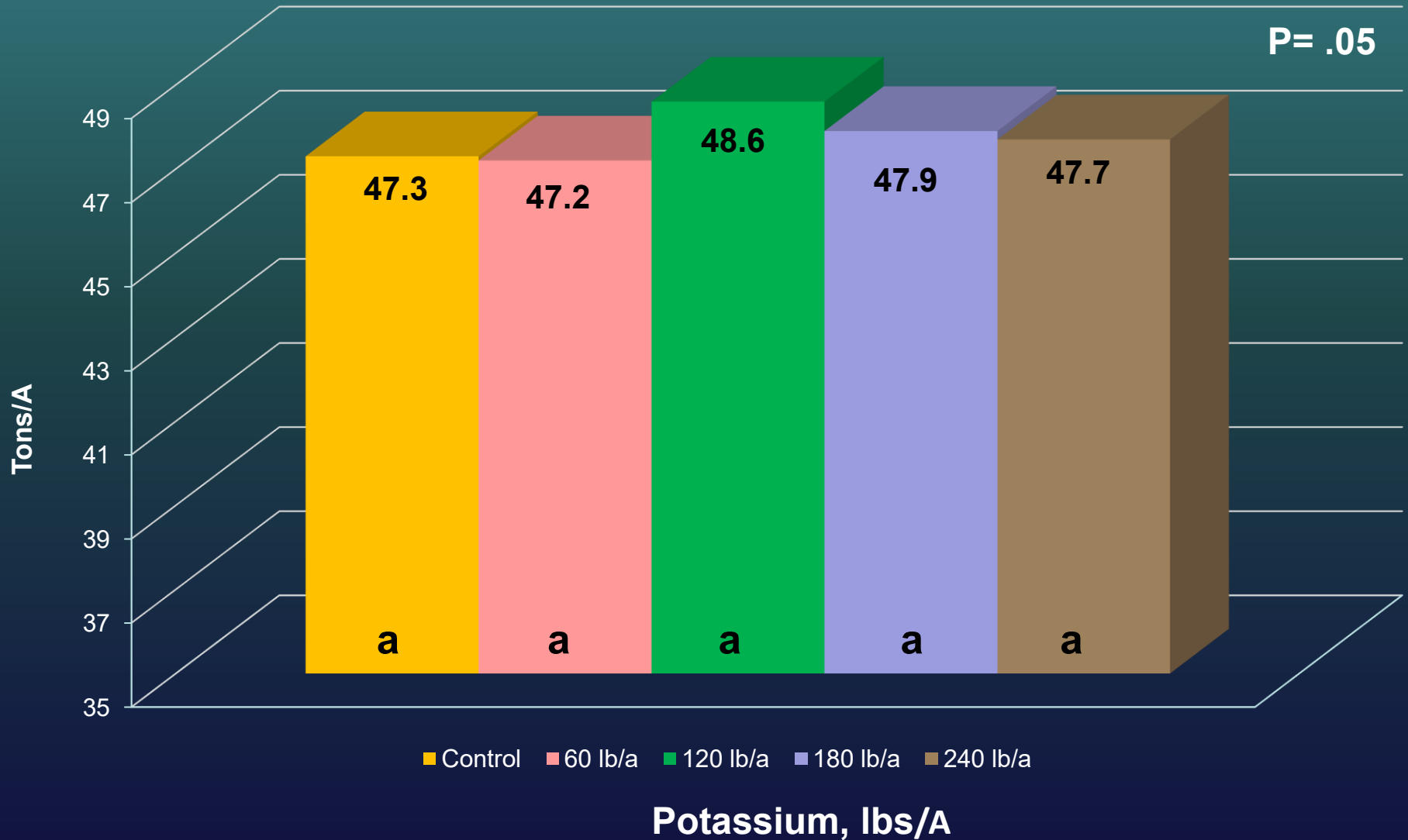
Response to Potassium Fertilizer

L 01-299, Light Soil, Plant Cane, Sugar/A, Segura, 2023



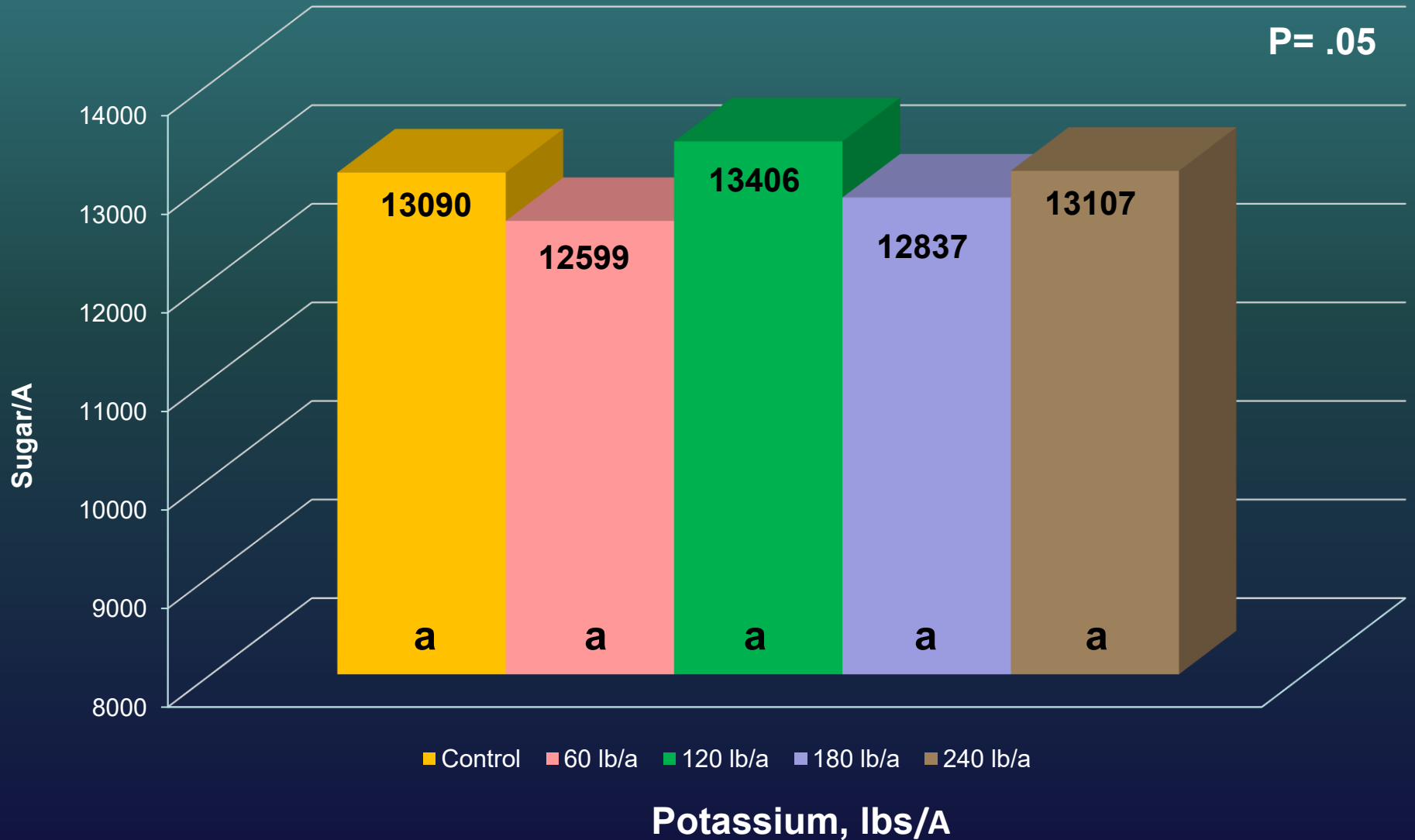
Response to Potassium Fertilizer

L 01-299, Heavy Soil, Plant Cane, Tons/A, Segura, 2023



Response to Potassium Fertilizer

L 01-299, Heavy Soil, Plant Cane, Sugar/A, Segura, 2023

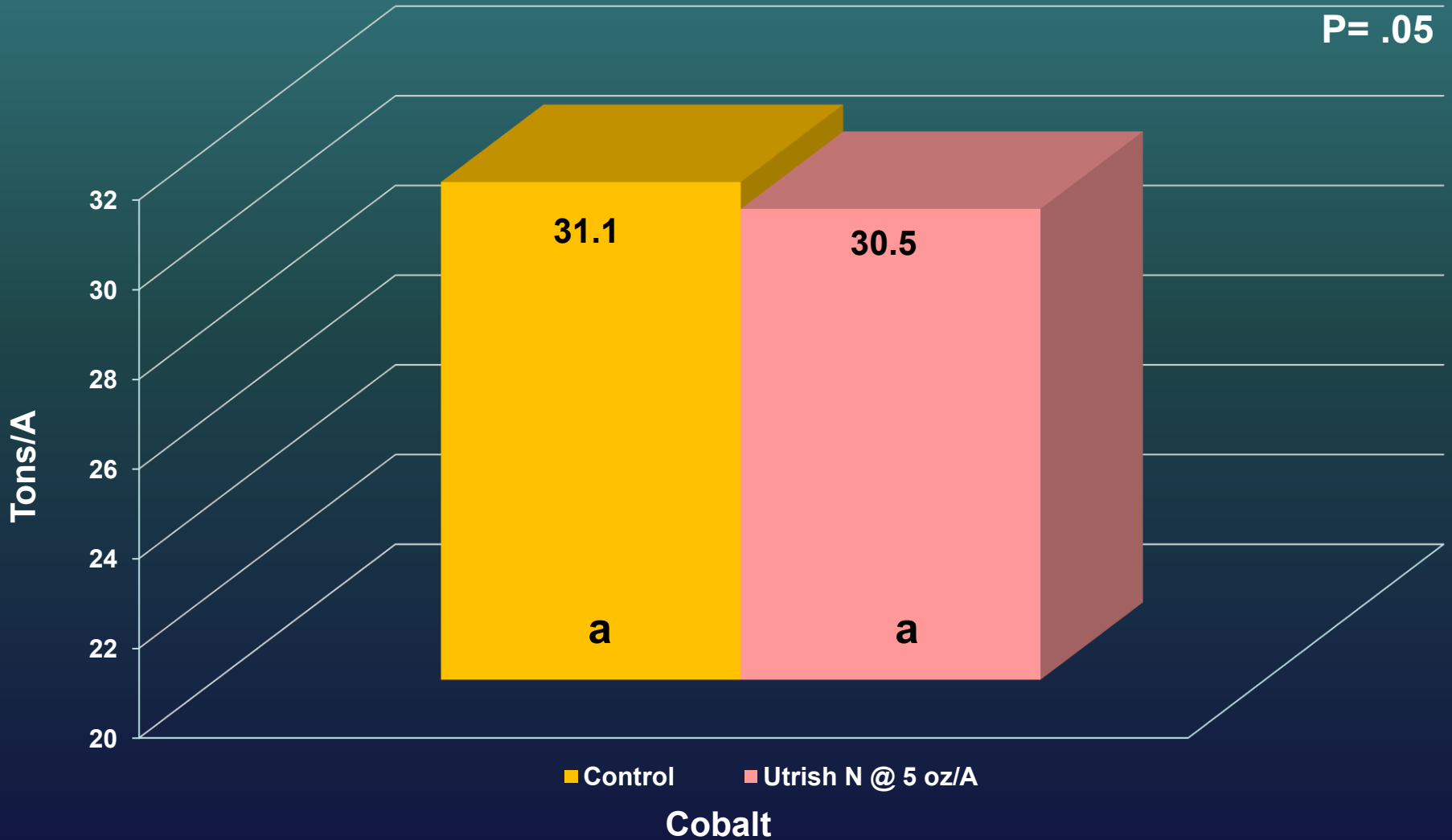


Utrisha N

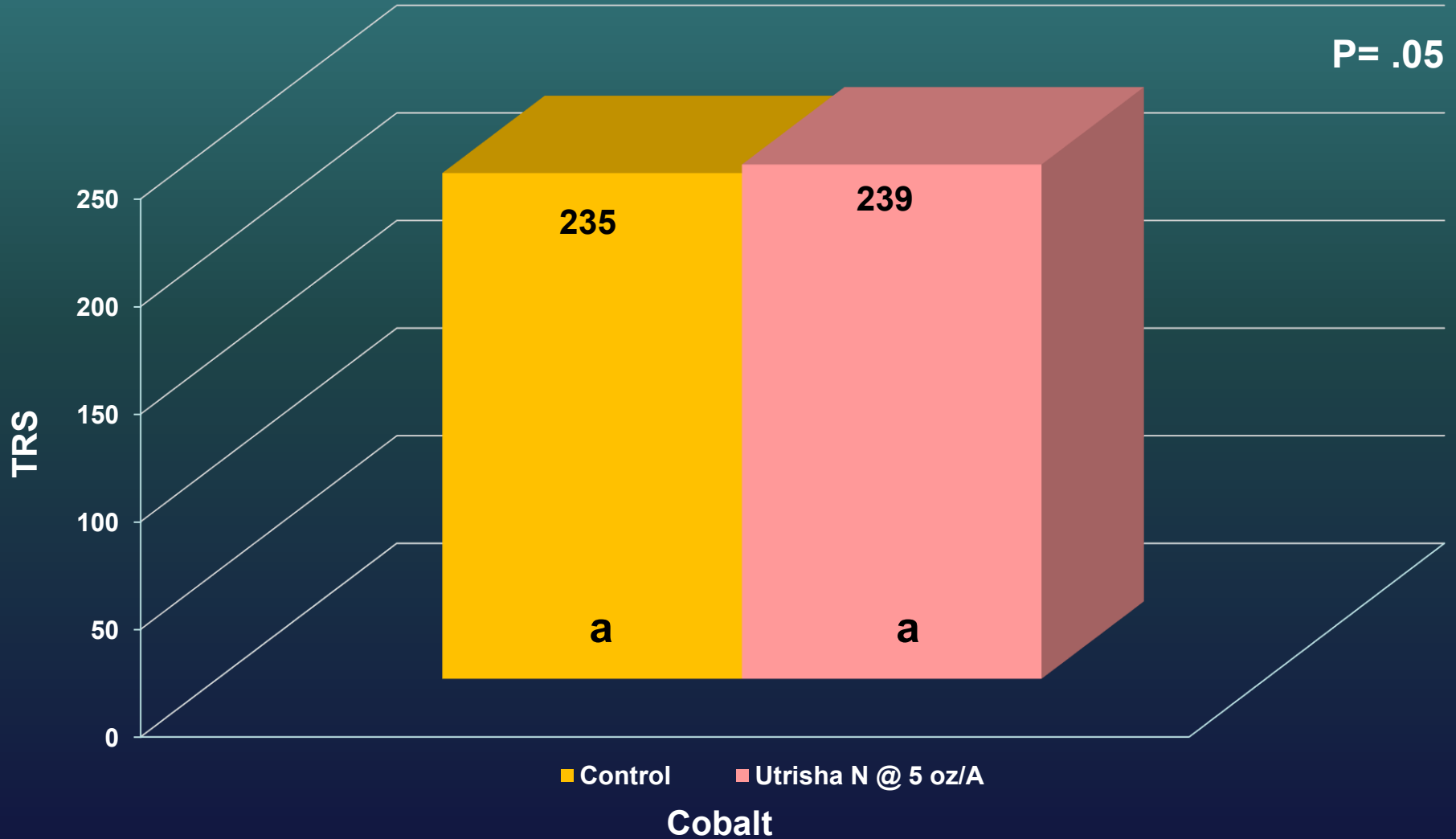
- **Varieties: L01-299**
- **Crop Age: PC**
- **Utrisha rate: 5 oz/A (foliar)**
- **N Rate: 0, 40, 80, 120 lb/A**
- **Reps: 4**
- **Can Utrisha N (Methylobacterium symbioticum) application stimulate sugarcane to fix-atmospheric nitrogen?**

Response to Utrisha N L 01-299, PC, Tons/A, Gravois, 2023

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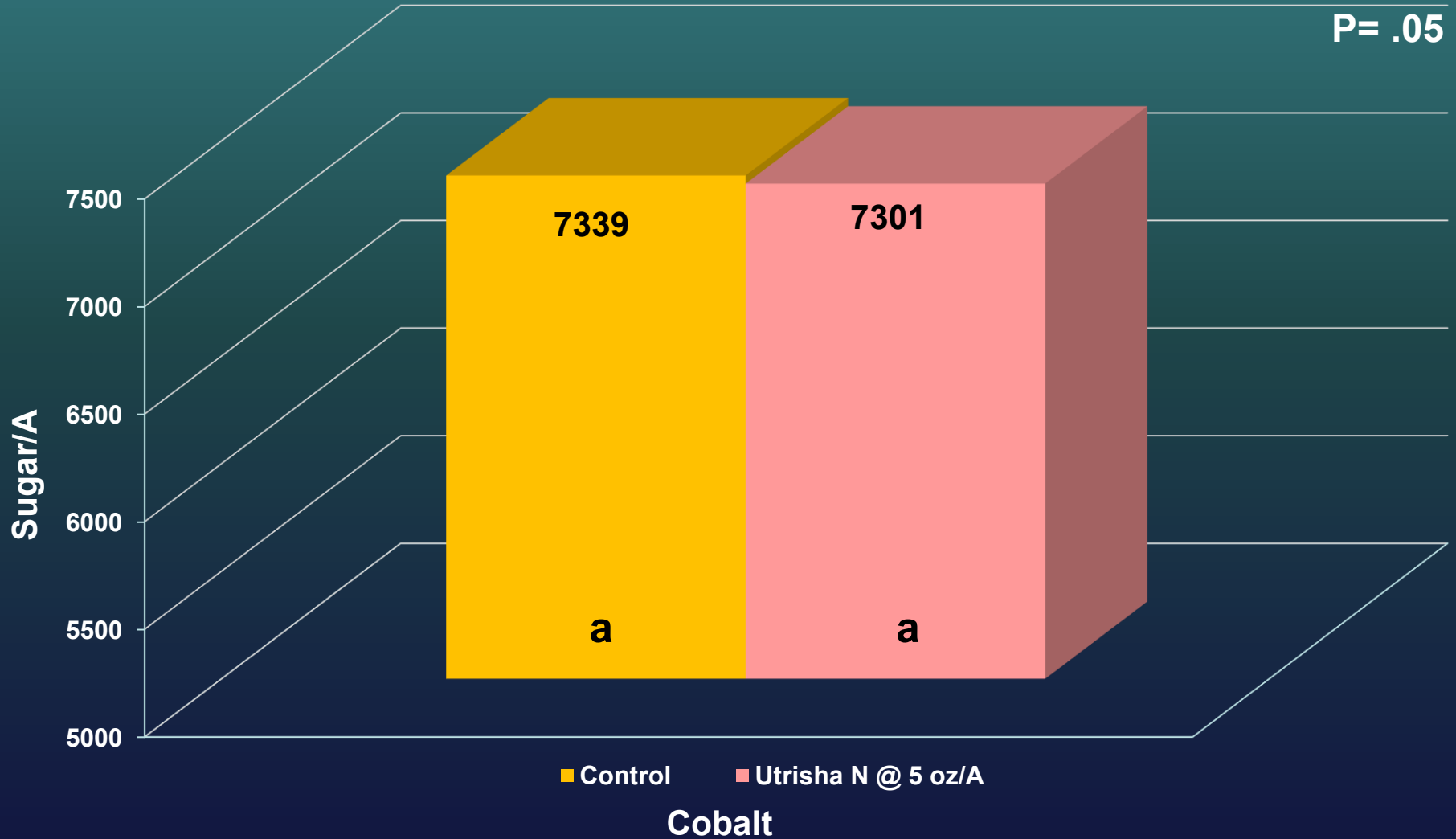


Response to Utrisha N L 01-299, PC, TRS, Gravois, 2023

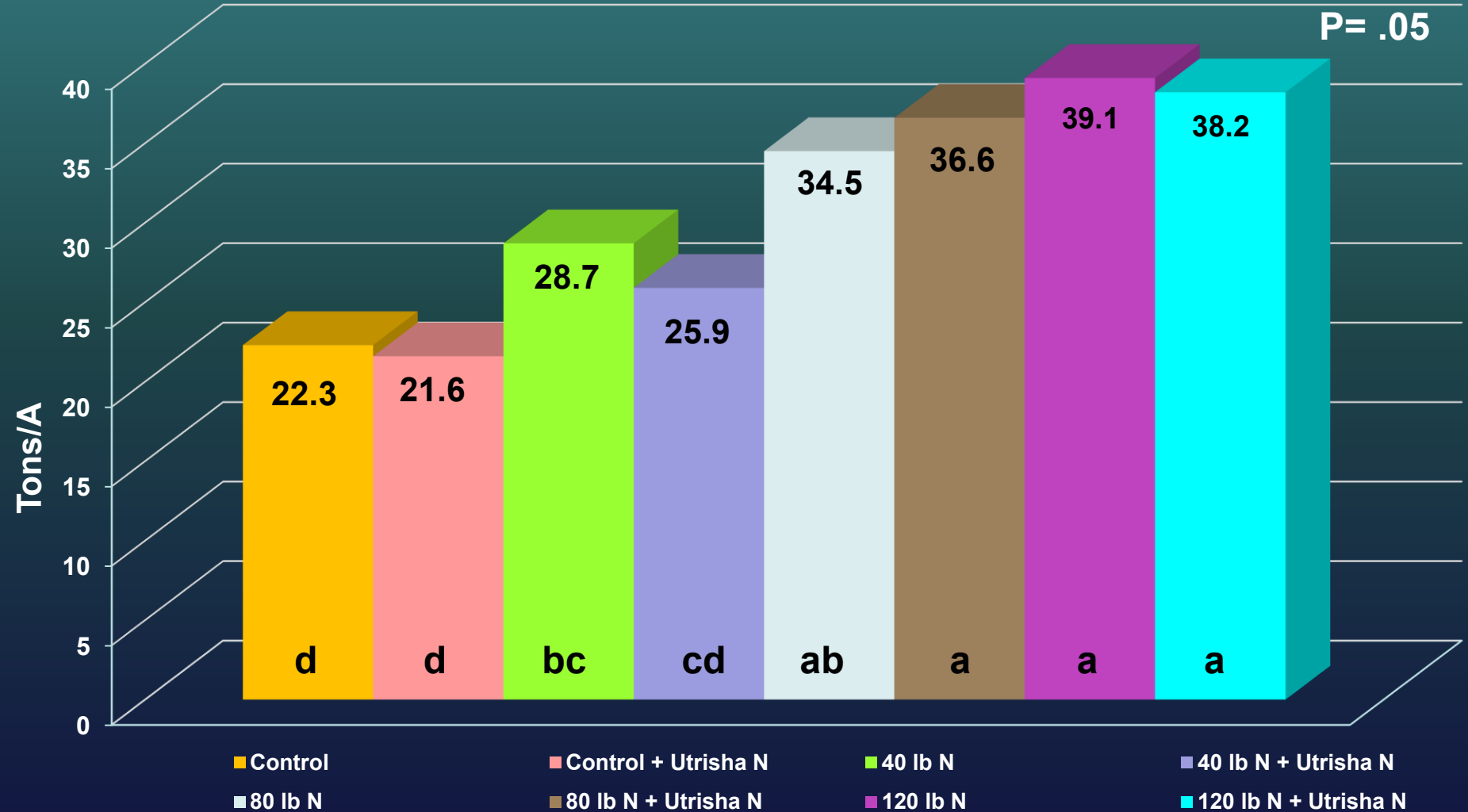


Response to Utrisha N L 01-299, PC, Sugar/A, Gravois, 2023

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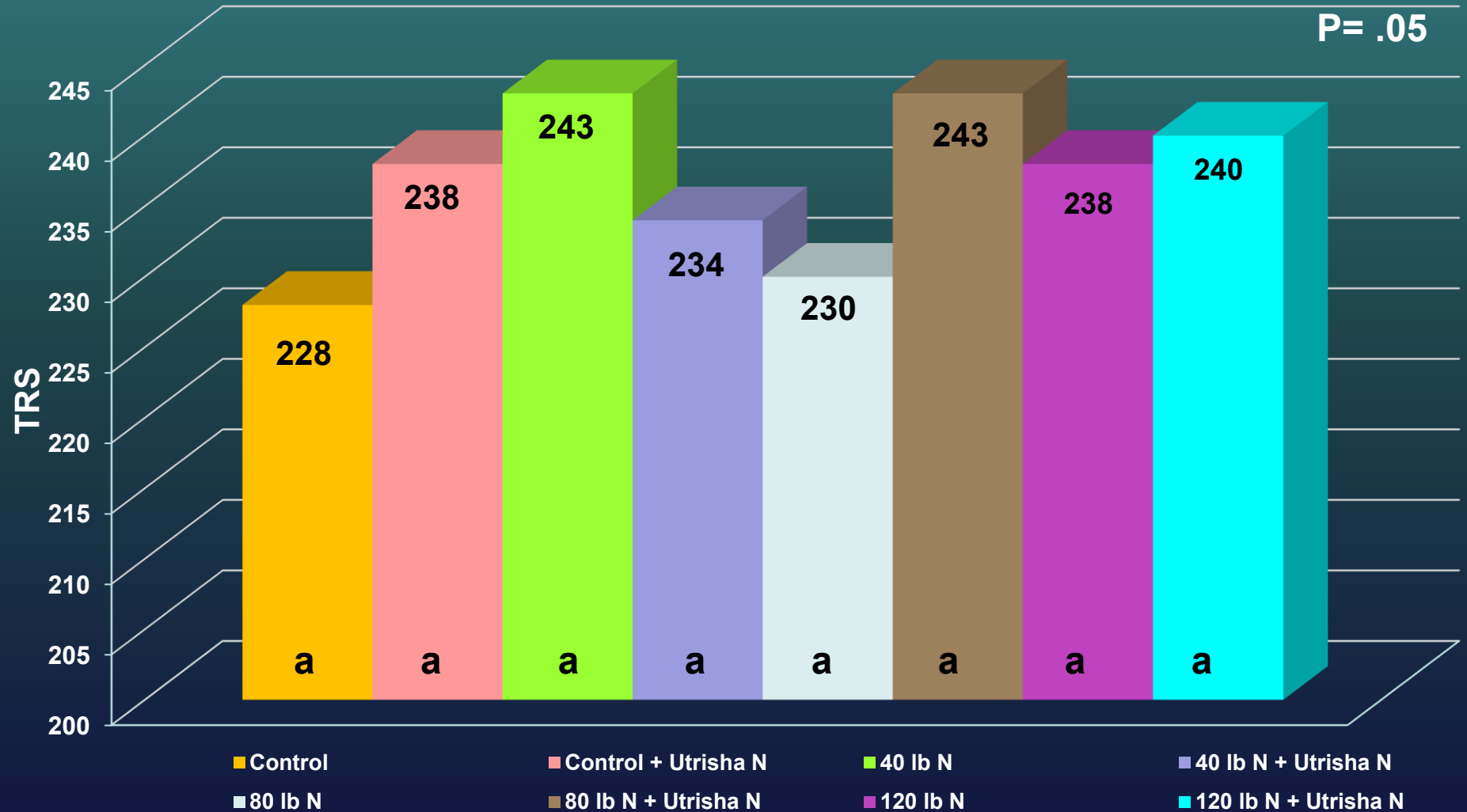


Response to Utrisha N x Nitrogen L 01-299, PC, Tons/A, Gravois 2023



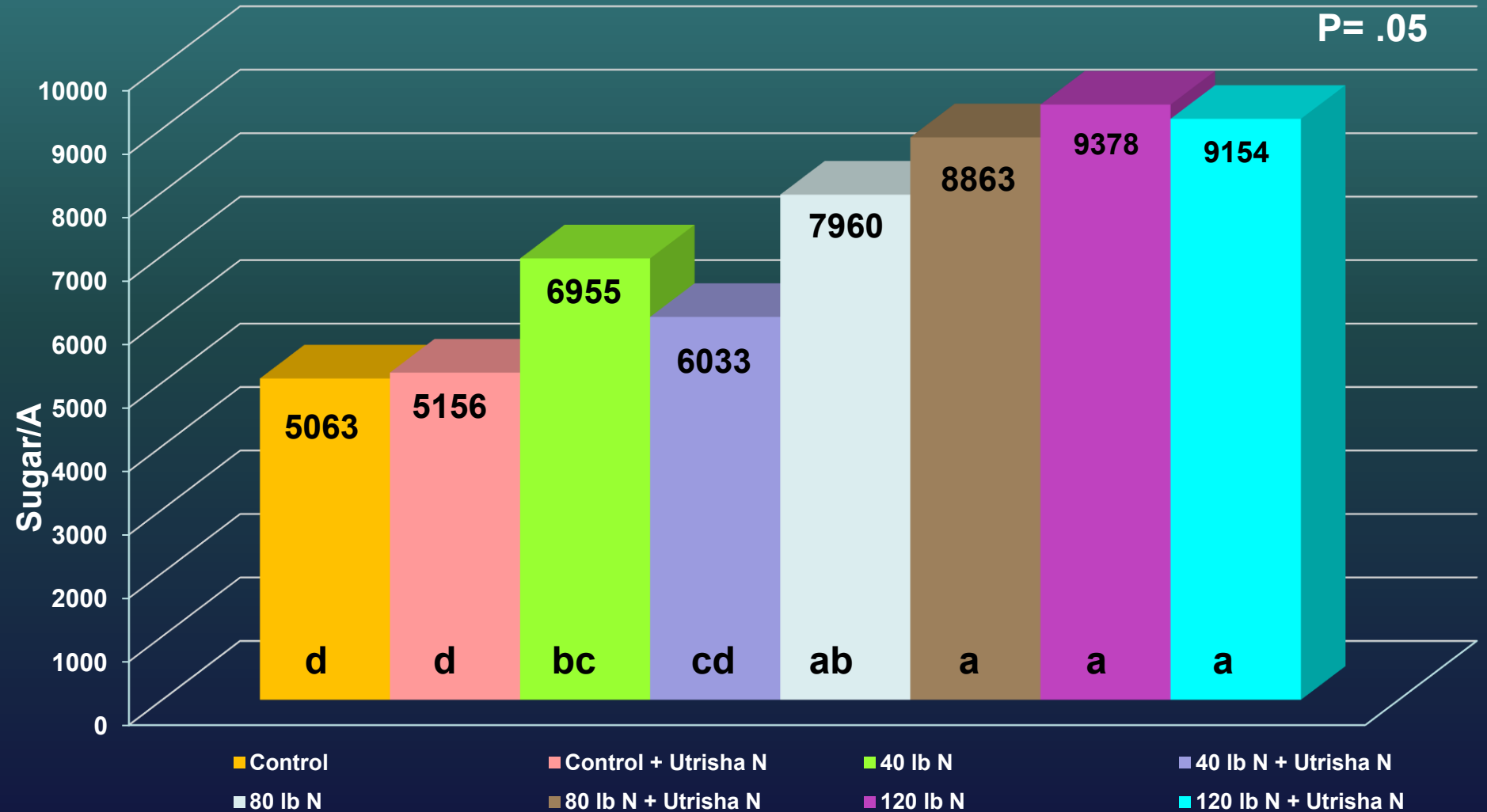
Response to Utrisha N x Nitrogen L 01-299, PC, TRS, Gravois 2023

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Response to Utrisha N x Nitrogen L 01-299, PC, TRS, Gravois 2023

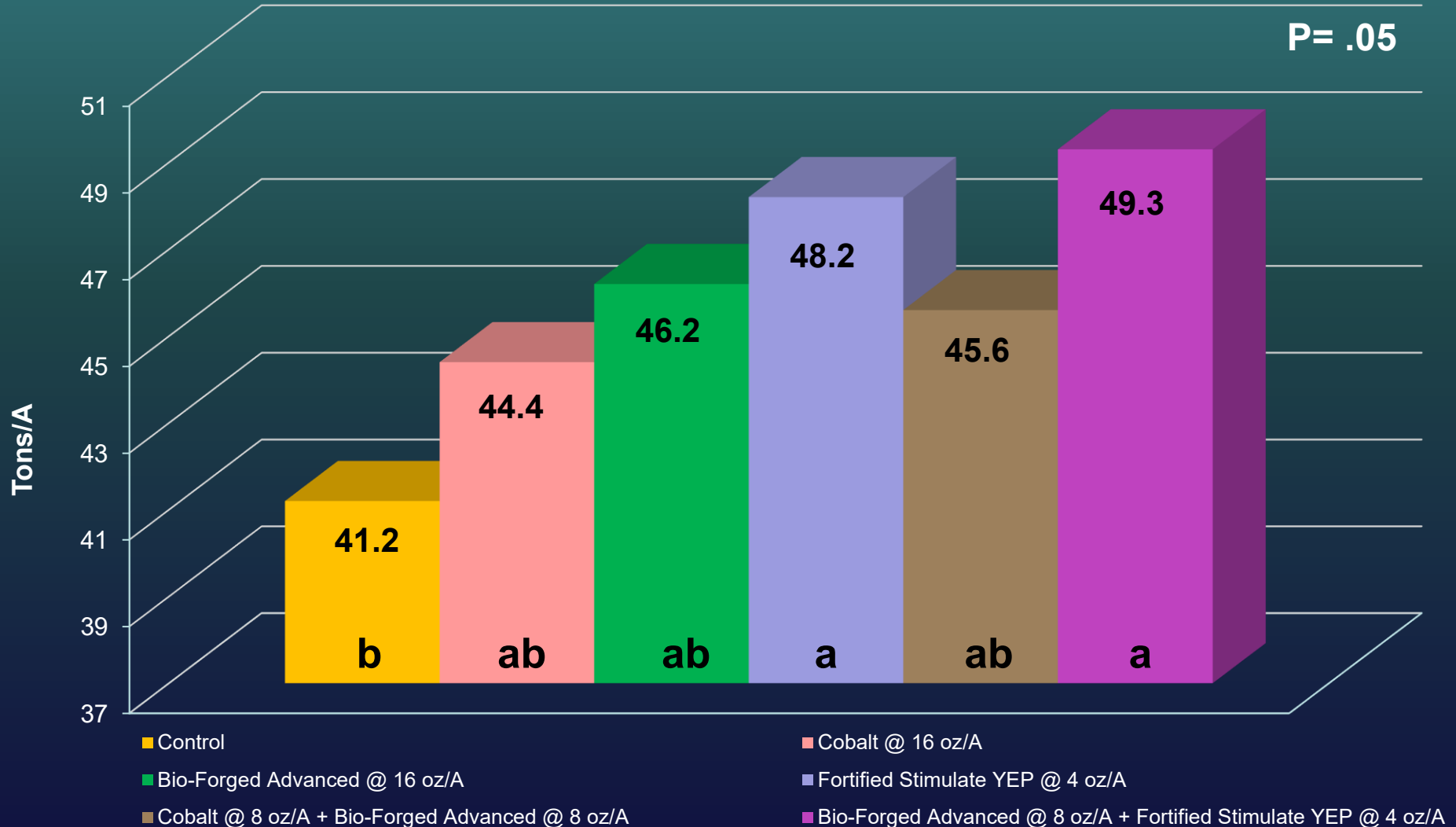
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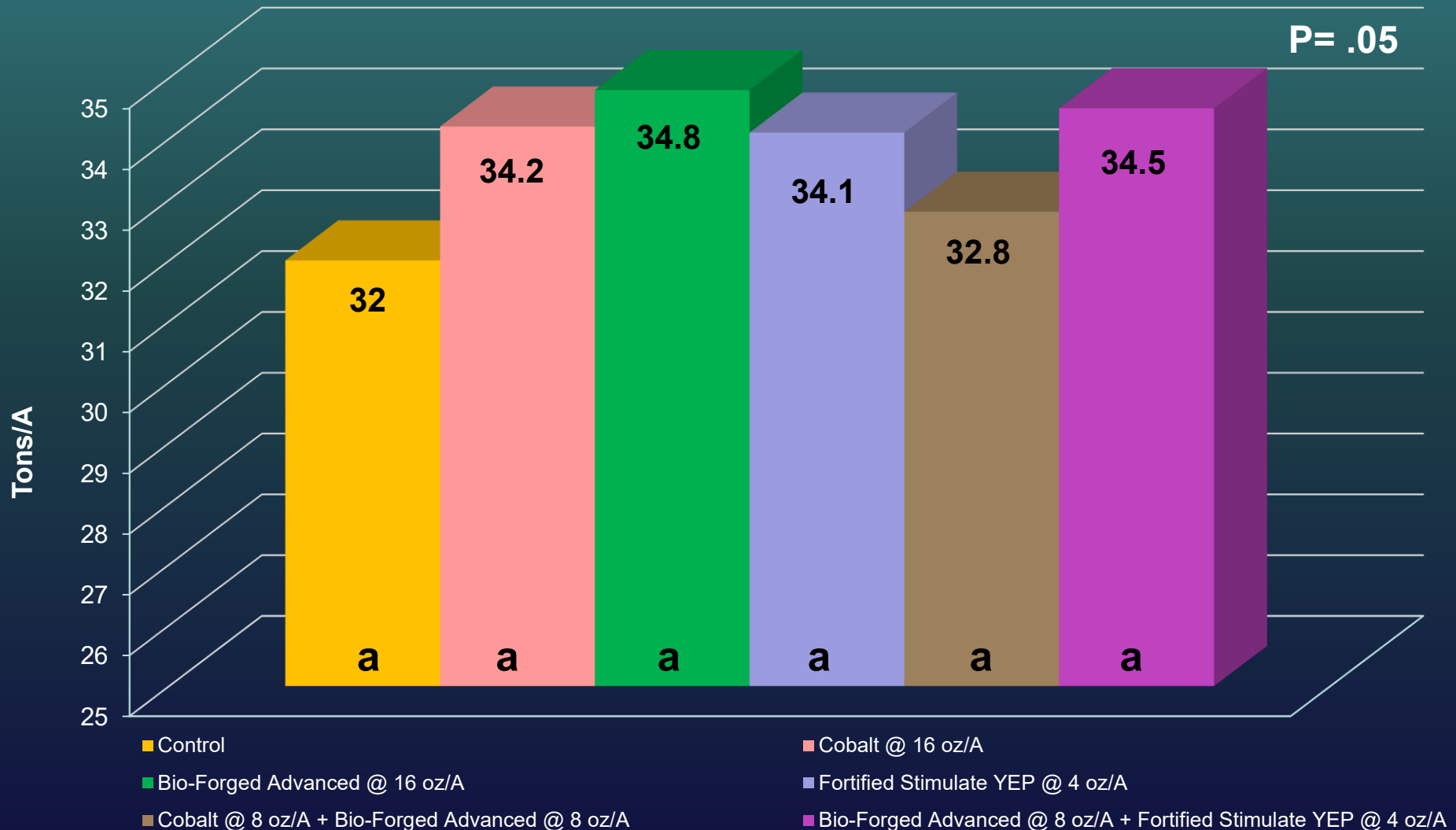
Adjuvants for Billet Planted Cane

- **Varieties: L01-299**
- **Crop Age: PC, 1R**
- **Treatments:**
 - **Control**
 - **Bioforge Advanced @ 1 pt/A (N, K, Co, Mo)**
 - **Cobalt @ 1 pt/A**
 - **Fortified Stimulate YEP @ 4 oz/A (Kinetin, GA, IBA, IAA)**
 - **Cobalt @ 8 oz/A + Bioforge @ 8 oz/A**
 - **Bioforge @ 8 oz/A + Fortified Stimulate @ 4 oz/A**
- **All treatments applied after billets planted with spray tractor @ 20 gal/A**
- **Reps: 4**

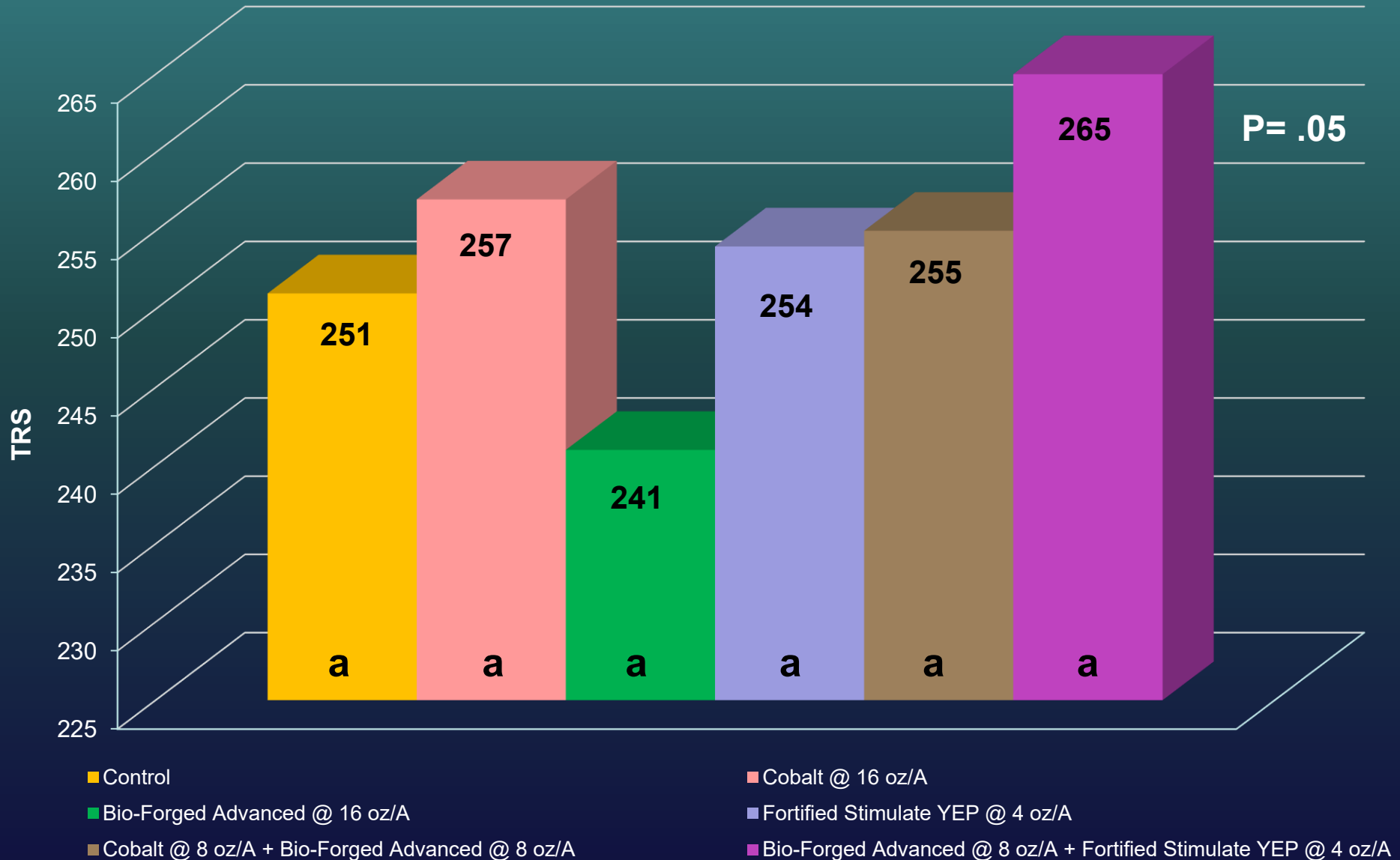
Response to Billet Treatments at Planting L 01-299, Plant Cane, Tons/A, Gravois, 2022



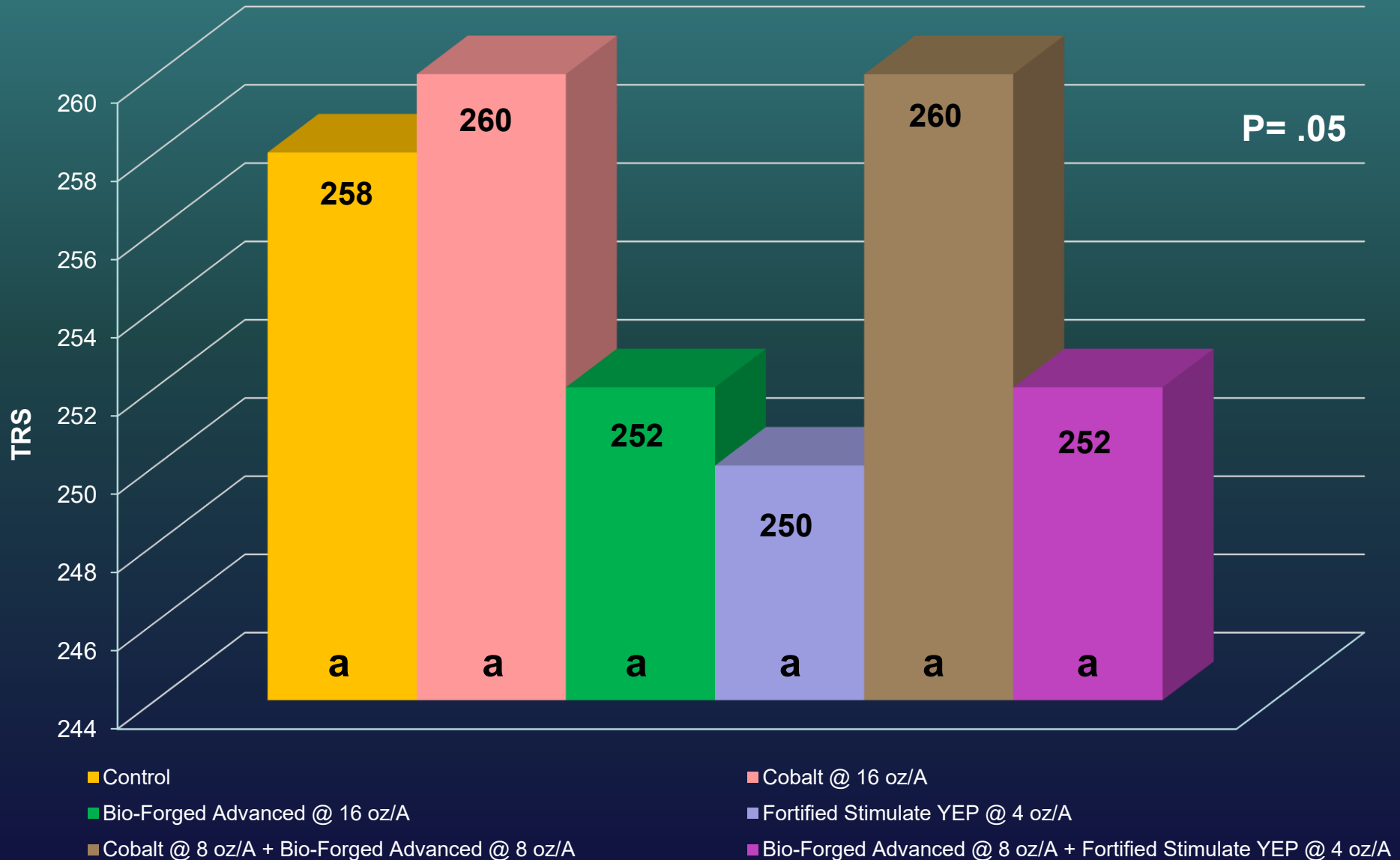
Response to Billet Treatments at Planting L 01-299, 1st stubble, Tons/A, Gravois, 2023



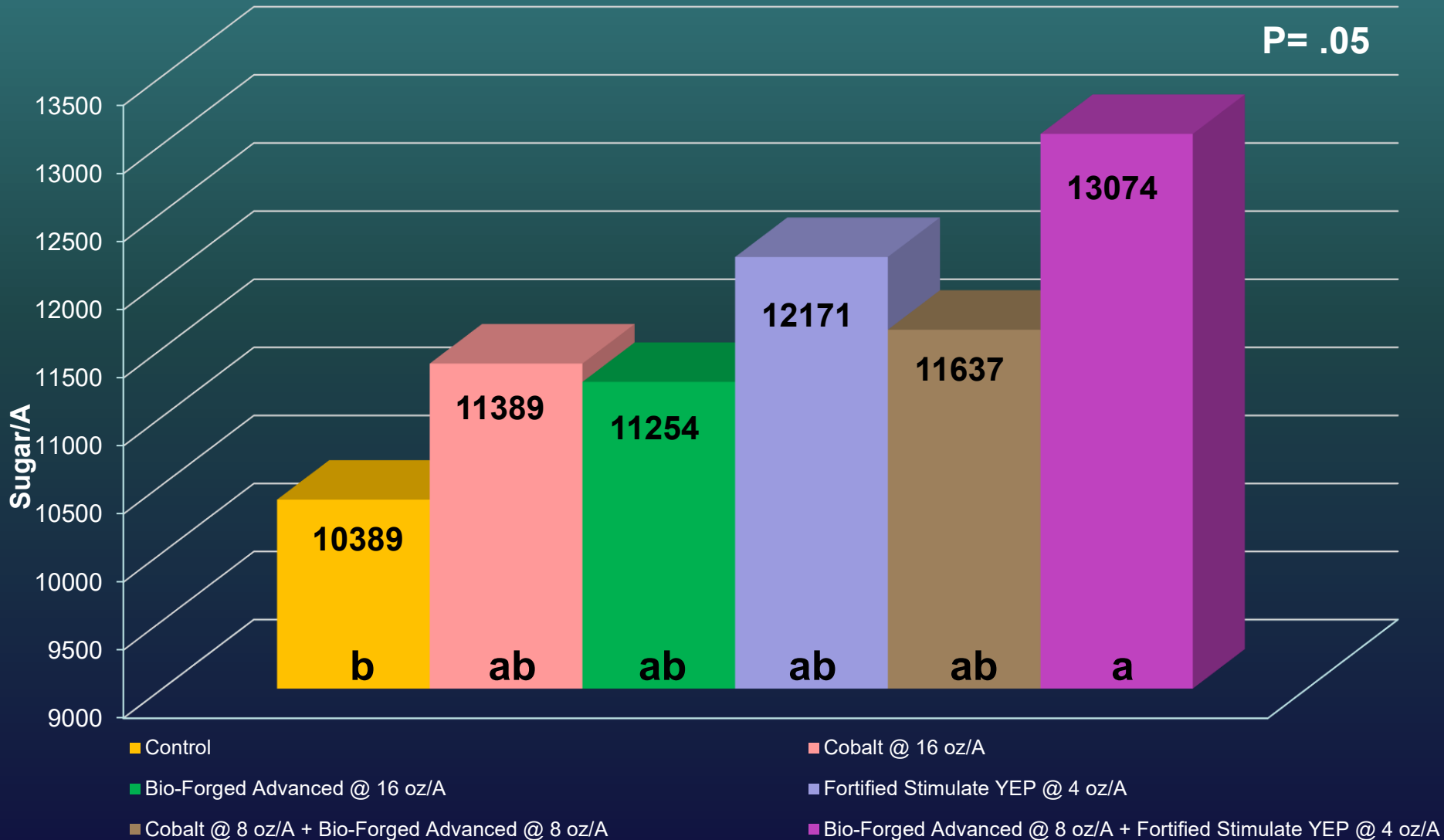
Response to Billet Treatments at Planting L 01-299, Plant Cane, TRS, Gravois, 2022



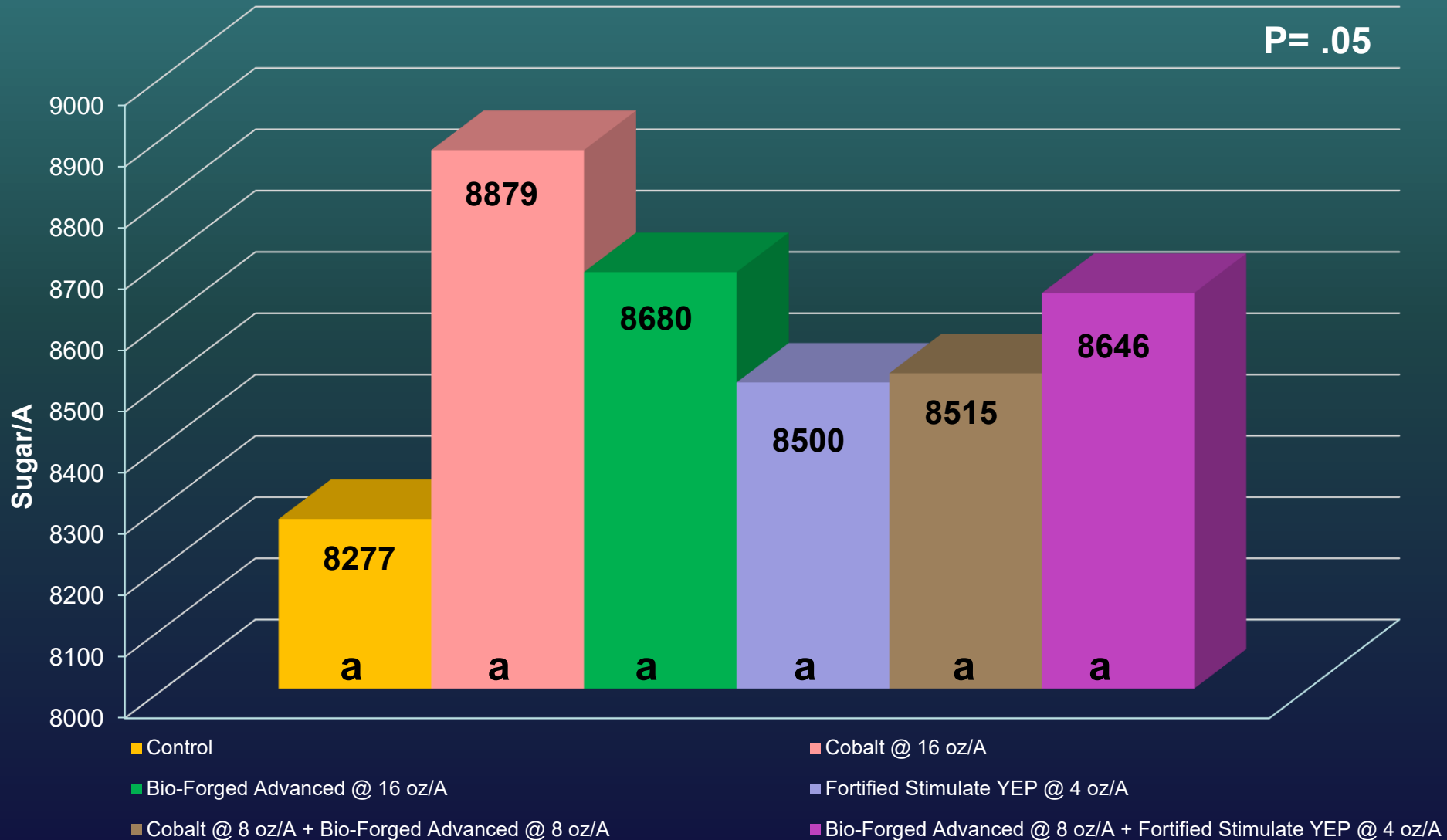
Response to Billet Treatments at Planting L 01-299, 1st stubble, TRS, Gravois, 2023



Response to Billet Treatments at Planting L 01-299, Plant Cane, Sugar/A, Gravois, 2022



Response to Billet Treatments at Planting L 01-299, 1st stubble, Sugar/A, Gravois, 2023

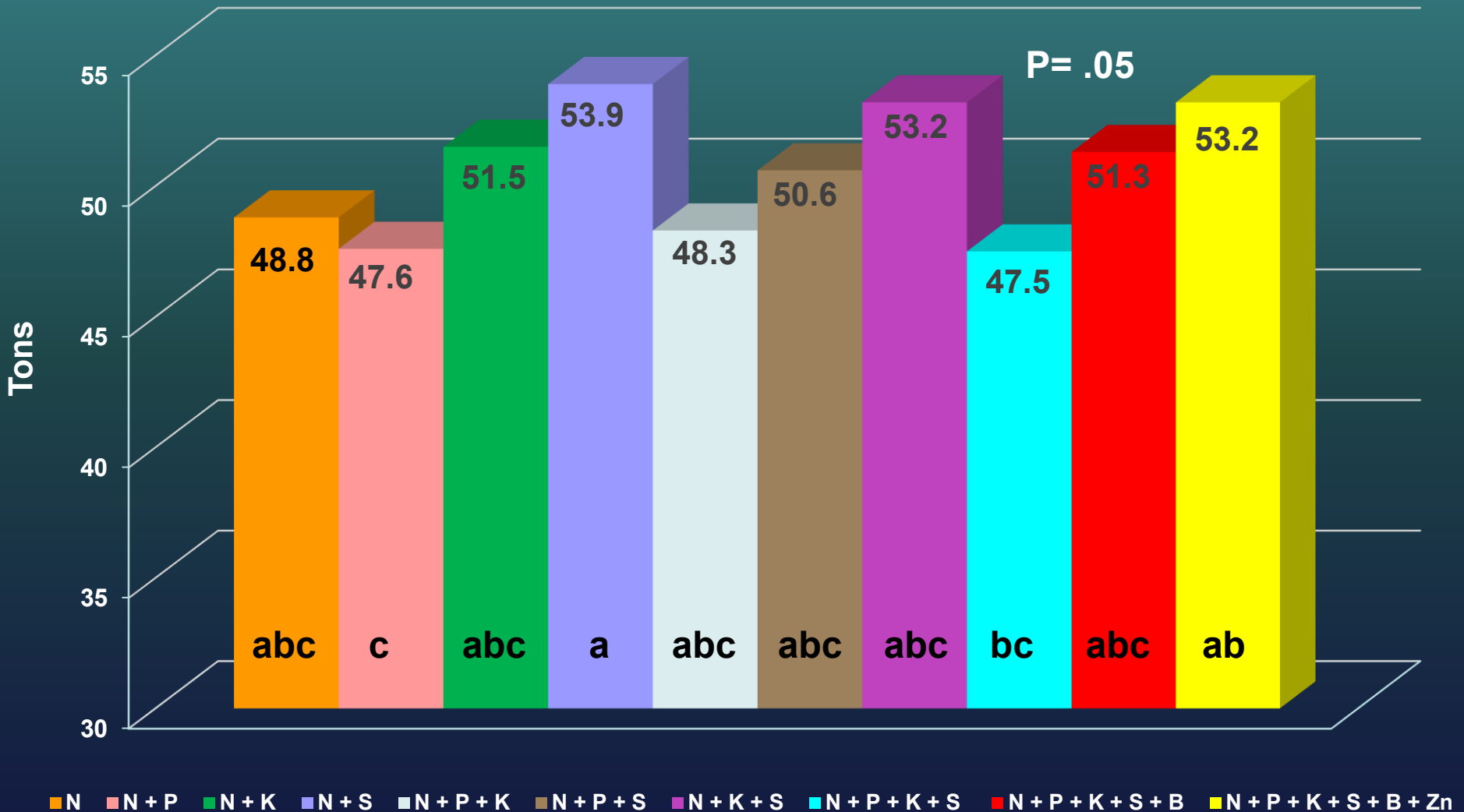


Sugarcane Fertility Component Experiment

- Variety: L01-299, PC
- Treatments:
 - N @ 100 lb/A
 - N @ 100 lb/A + P @ 45 lb/A
 - N @ 100 lb/A + K @ 120 lb/A
 - N @ 100 lb/A + S @ 50 lb/A
 - N @ 100 lb/A + P @ 45 lb/A + K @ 120 lb/A
 - N @ 100 lb/A + P @ 45 lb/A + S @ 50 lb/A
 - N @ 100 lb/A + K @ 120 lb/A + S @ 50 lb/A
 - N @ 100 lb/A + P @ 45 lb/A + K @ 120 lb/A + S @ 50 lb/A
 - N @ 100 lb/A + P @ 45 lb/A + K @ 120 lb/A + S @ 50 lb/A + B @ 2 lb/A
 - N @ 100 lb/A + P @ 45 lb/A + K @ 120 lb/A + S @ 50 lb/A + B @ 2 lb/A + Zn @ 4 lb/A
- Reps – 4

Response to Fertilizer Components

L 01-299, PC, Tons/A, Gravois, 2023



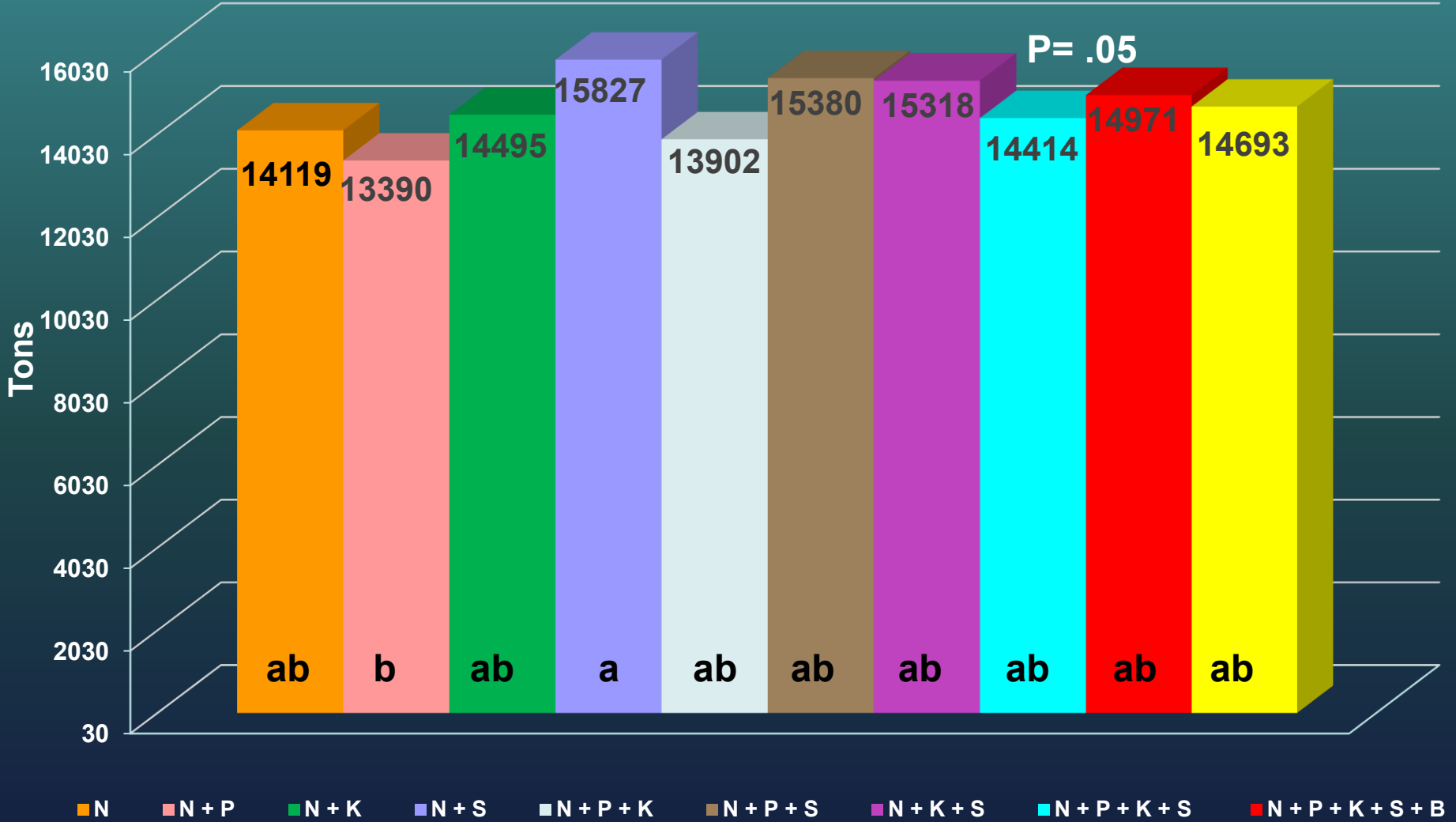
Response to Fertilizer Components

L 01-299, PC, TRS, Gravois, 2023



Response to Fertilizer Components

L 01-299, PC, Tons/A, Gravois, 2023



Acknowledgements

- American Sugar Cane League
- Cultural Practices Staff: Katie Richard, Ellie Richard, Brenda King, Paul Lirette (Dawson Dufrene, Randy Richard)
- All cooperating growers

A dramatic sunset over a field. The sky is filled with vibrant orange, red, and yellow clouds, with the sun low on the horizon. In the foreground, there is a field of dry grass, and in the background, a row of tall corn plants is silhouetted against the bright sky.

Questions?

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