

# SUGARCANE FERTILITY RESEARCH

## Nitrogen Sensing/VRT System Sulfur

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Louisiana Agricultural Technology and **Management**  
Sugarcane Breakout Session  
February 9, 2023 @ 4:45 -5:10 PM



# LSU AgCenter N Recommendation

- N recommendation based on N response trials

Crop Age	Texture	N Rate, lbs/ac
Plant Cane	Light soils	60-80
	Heavy soils	80-100
Stubble cane	Light soils	80-100
	Heavy soils	100-120

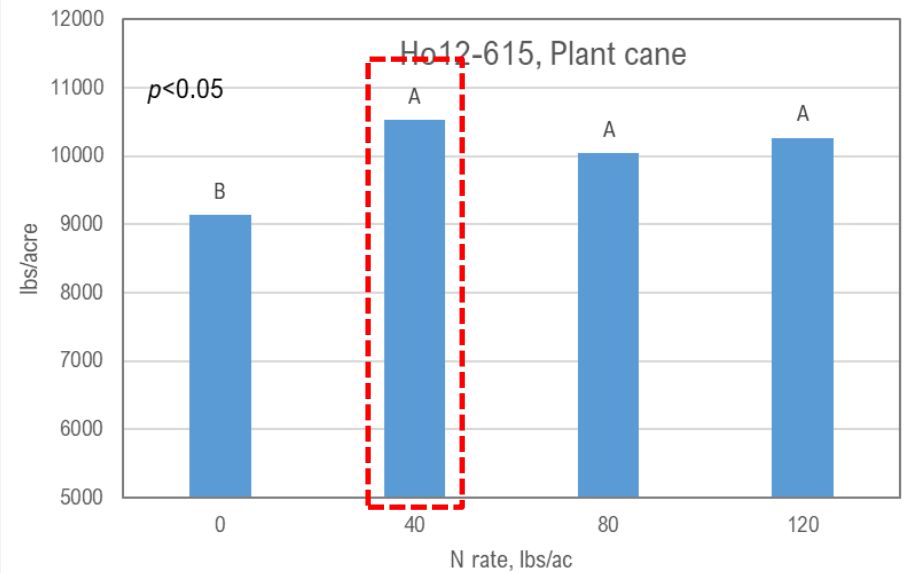
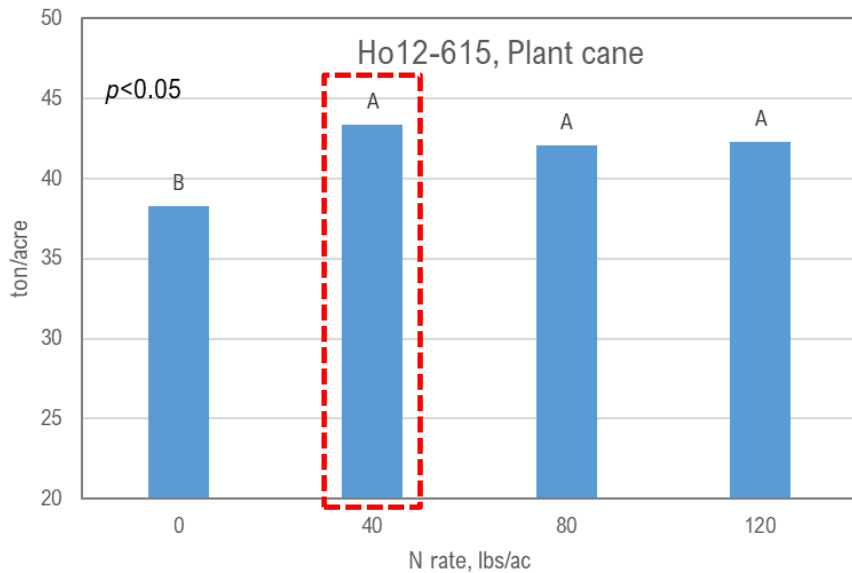
- UNIFORM application



Variety: Ho12-615, plant cane

Soil type: silty clay loam and silt loam mix

Optimal N application rate: 40 lbs N/acre



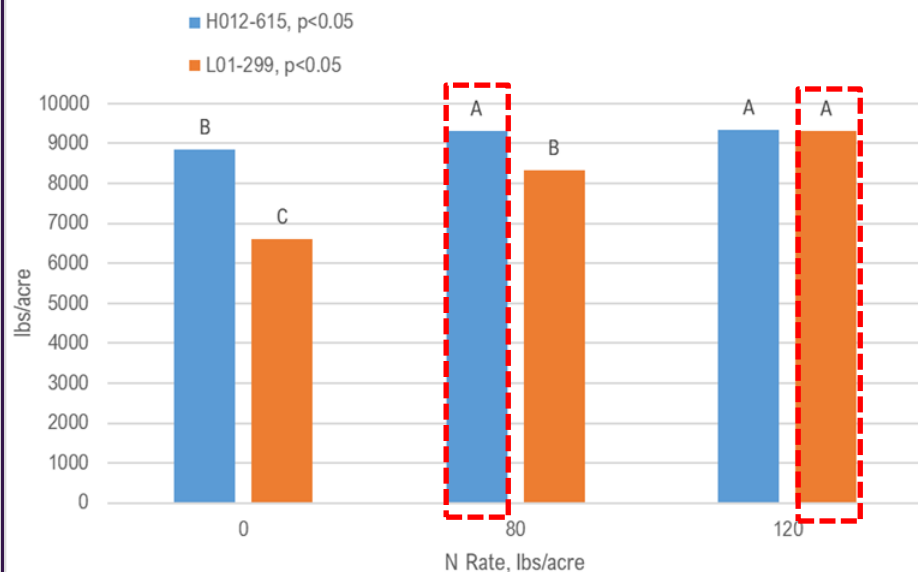
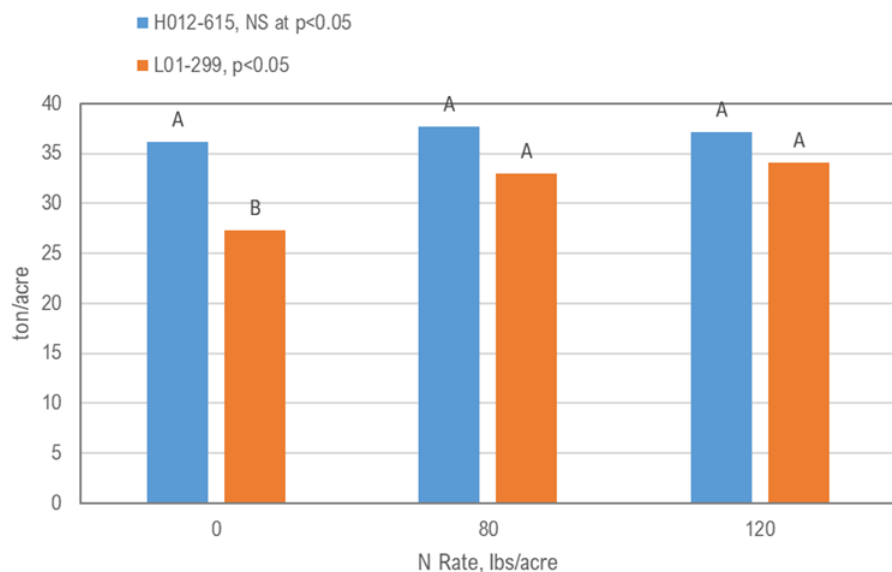
Variety: H012-615, plant cane

Soil type: clay

Optimal N application rate: 80 lbs N/ac\*

(\$ 80 – N)

(\$ 99.44 – increased in sugar yield)



Variety: L01-299, plant cane

Soil type: silt loam

Optimal N application rate: 120 lbs N/ac\*

(\$ 120 – N)

(\$596.60 – increased in sugar yield)

## Remote Sensor/Variable Rate Applicator Systems



## N-Rich Strips



Establish N-Rich Strips three to four weeks before putting out N fertilizer

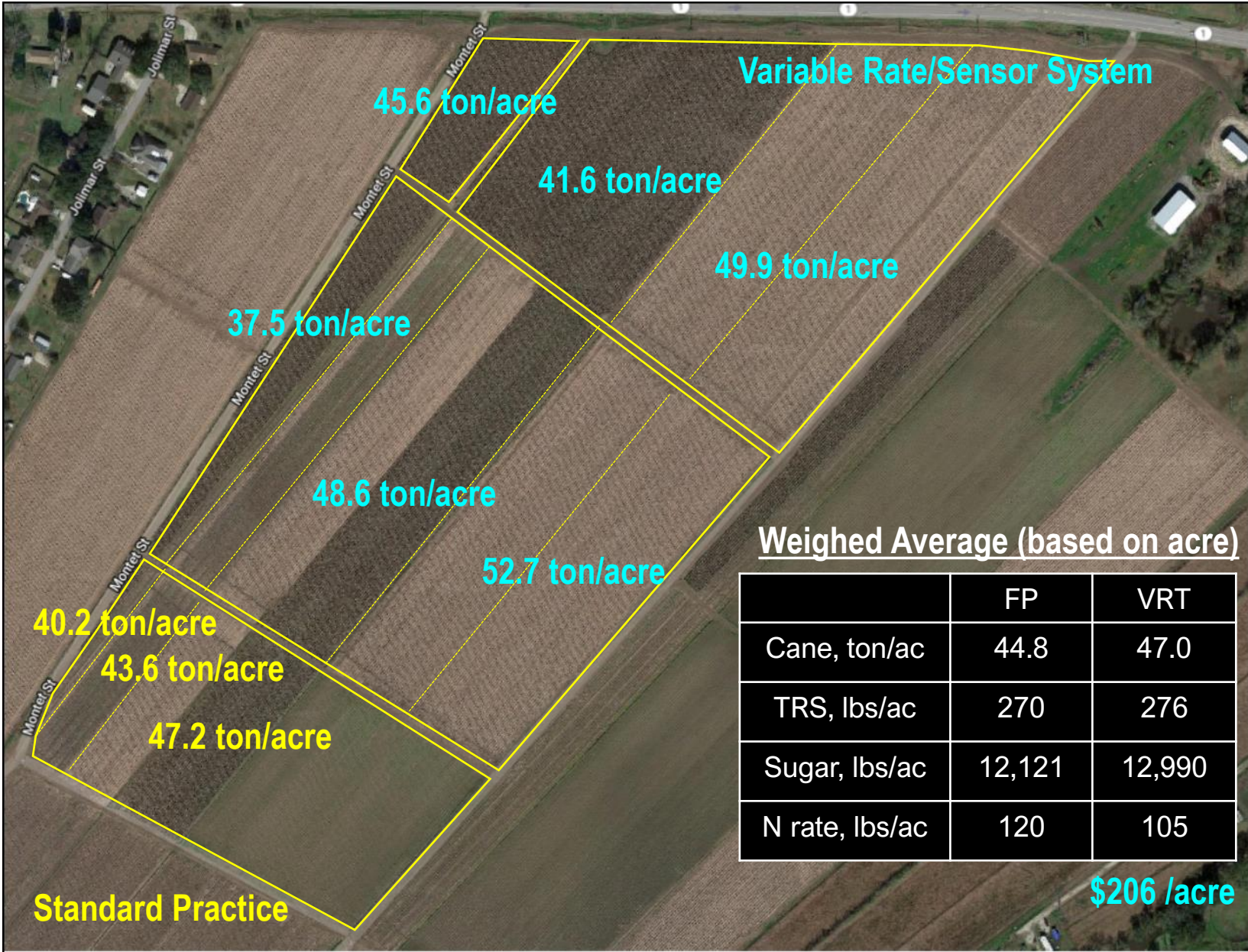
# Sensor-Based N On-The-Go

Captain Joe #116



# Sensor-Based N On-The-Go





**Variable Rate/Sensor System**

45.6 ton/acre

41.6 ton/acre

49.9 ton/acre

37.5 ton/acre

48.6 ton/acre

52.7 ton/acre

40.2 ton/acre

43.6 ton/acre

47.2 ton/acre

**Standard Practice**

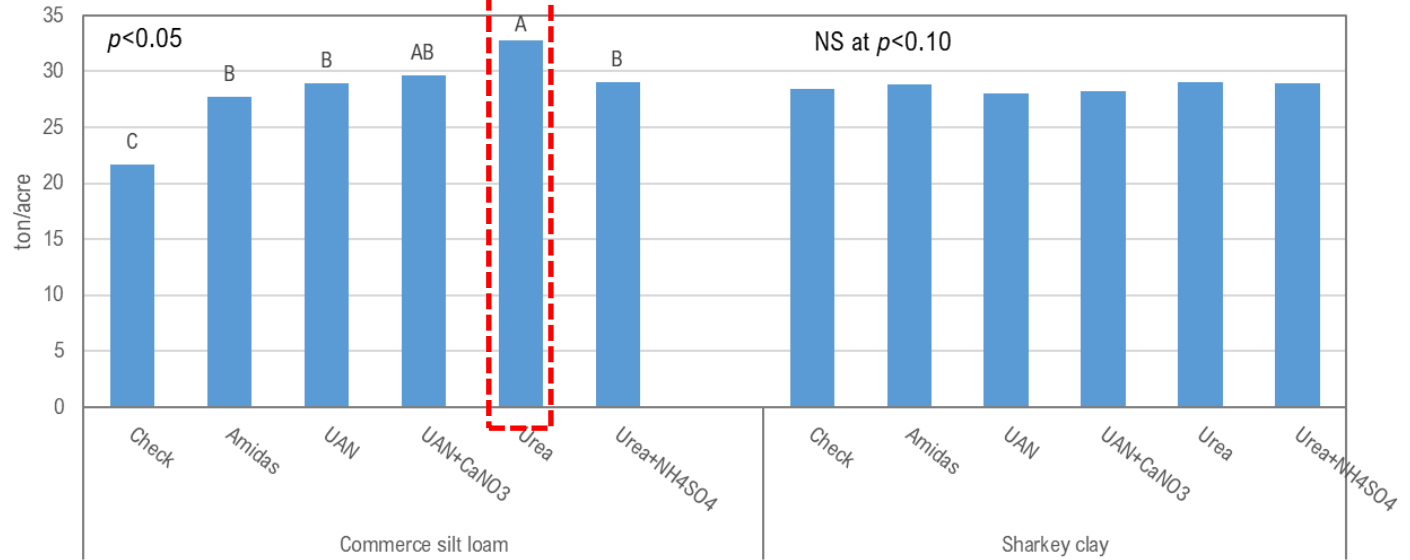
**Weighed Average (based on acre)**

	FP	VRT
Cane, ton/ac	44.8	47.0
TRS, lbs/ac	270	276
Sugar, lbs/ac	12,121	12,990
N rate, lbs/ac	120	105

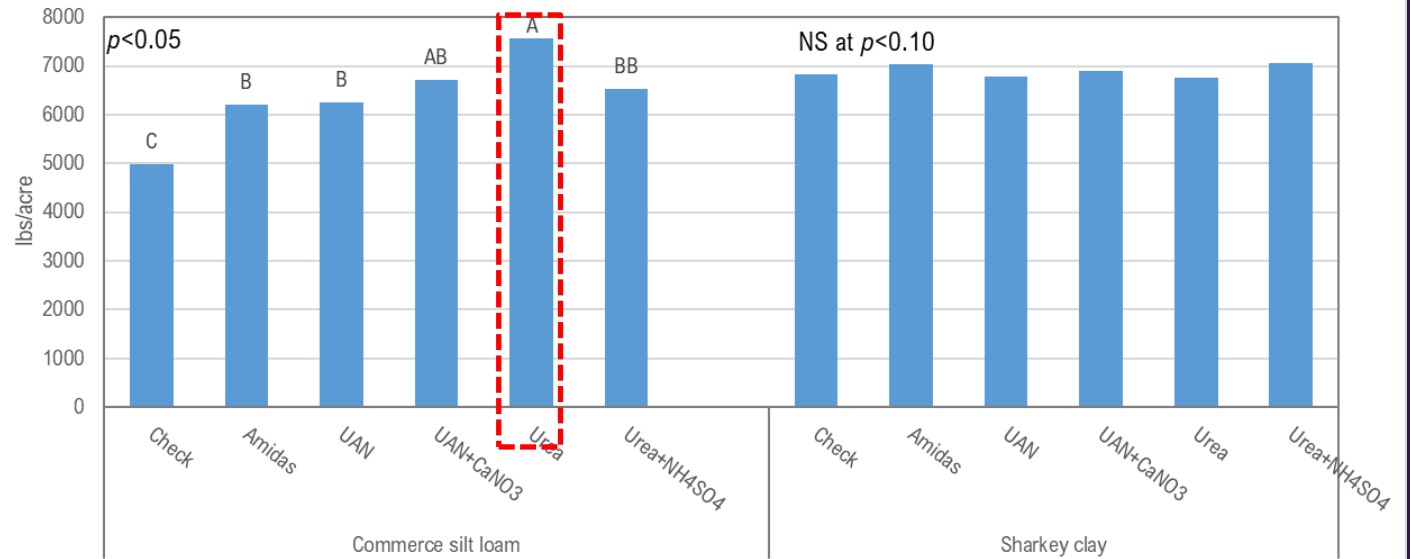
**\$206 /acre**



Effect of Nitrogen Source on Tonnage of Cane  
(Commerce silt loam and Sharkey clay)



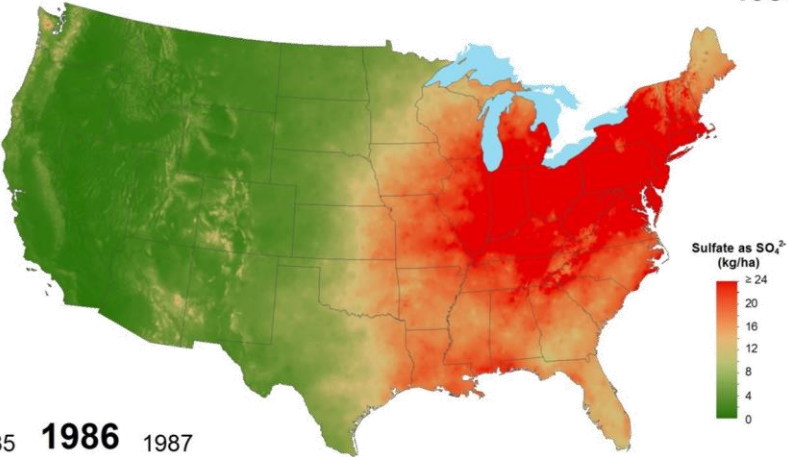
Effect of Nitrogen Source on Tonnage of Cane  
(Commerce silt loam and Sharkey clay)



# Increasing Cases of Sulfur Deficiency

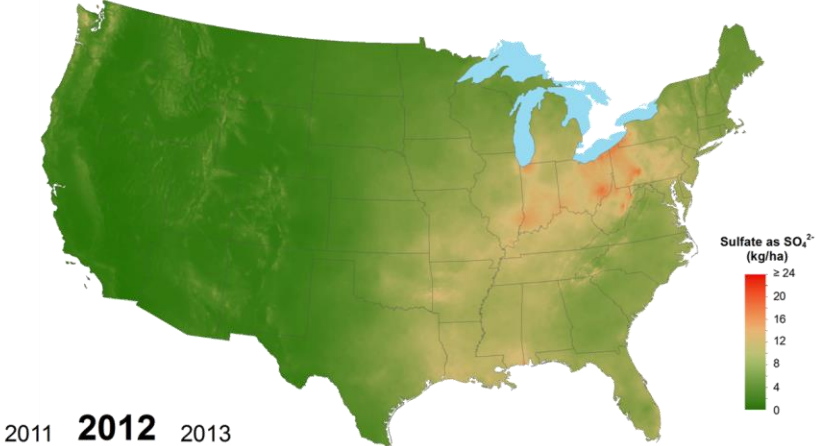
One year after the implementation of Clean Air Act 1985

Sulfate ion wet deposition  
1986



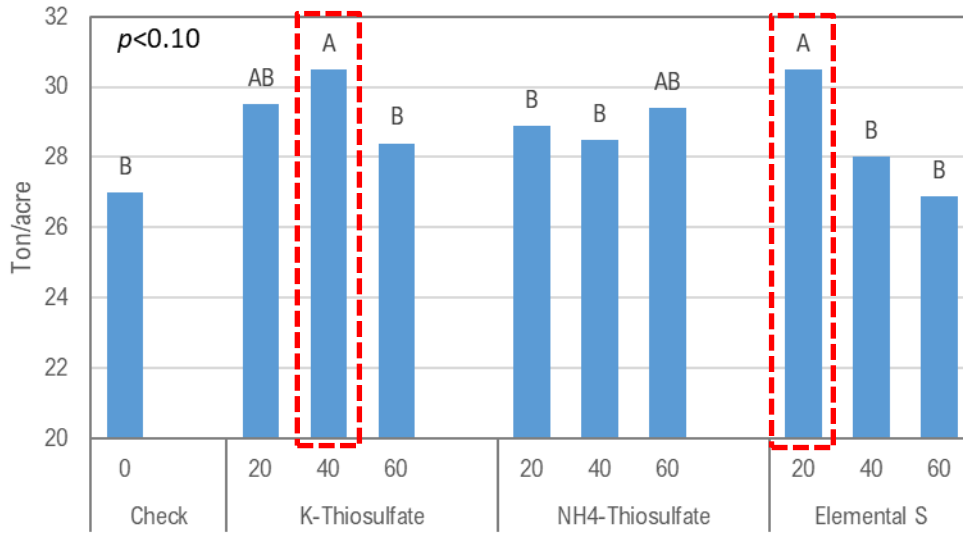
National Atmospheric Deposition Program/National Trends Network  
<http://nadp.isws.illinois.edu>

Sulfate ion wet deposition  
2012



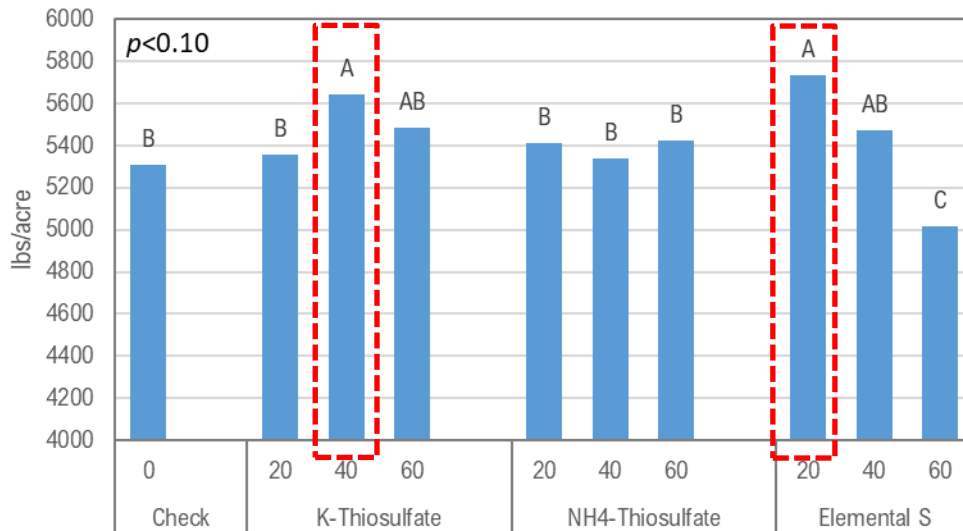
National Atmospheric Deposition Program/National Trends Network  
<http://nadp.isws.illinois.edu>

Effect of S Source and Rate on Cane Tonnage



- L01-299, 2<sup>nd</sup> ratoon
- N and K were adjusted to have uniform rates across the treatments.
- Soil type: mix of Commerce silt loam and Sharkey clay

Effect of S Source and Rate on Sugar Yield



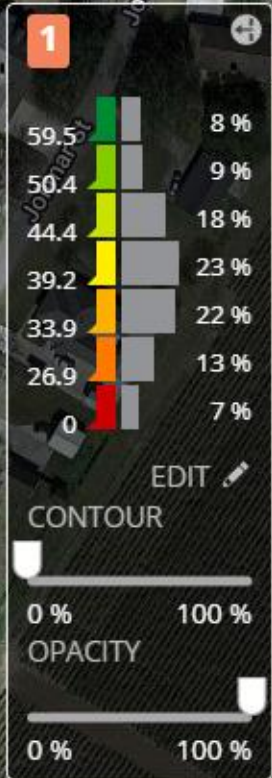


2022 Sugarcane: Harvest

Yield

Compare

Overview



**Verify!!!  
+ 30 lbs N**



**47 tons/acre**

**42 tons/acre**

**13,500 lbs sugar/acre**

**11,400 lbs sugar/acre**

**Leaf S: 0.15%**

**Leaf S: 0.27%**

**Leaf S: 0.18%**

**Leaf N: 1.9%**

**Leaf N: 1.5%**

**Leaf N: 1.9%**

# Take Home Notes

- Current LSU AgCenter N recommendation – valid
- Variable Rate Technology/Remote Sensing – improve N fertilizer use efficiency
- Urea – N source option to UAN solution (light textured soil)
- 20-40 lbs S/ac application rate, depending on S source

# THANK YOU!

