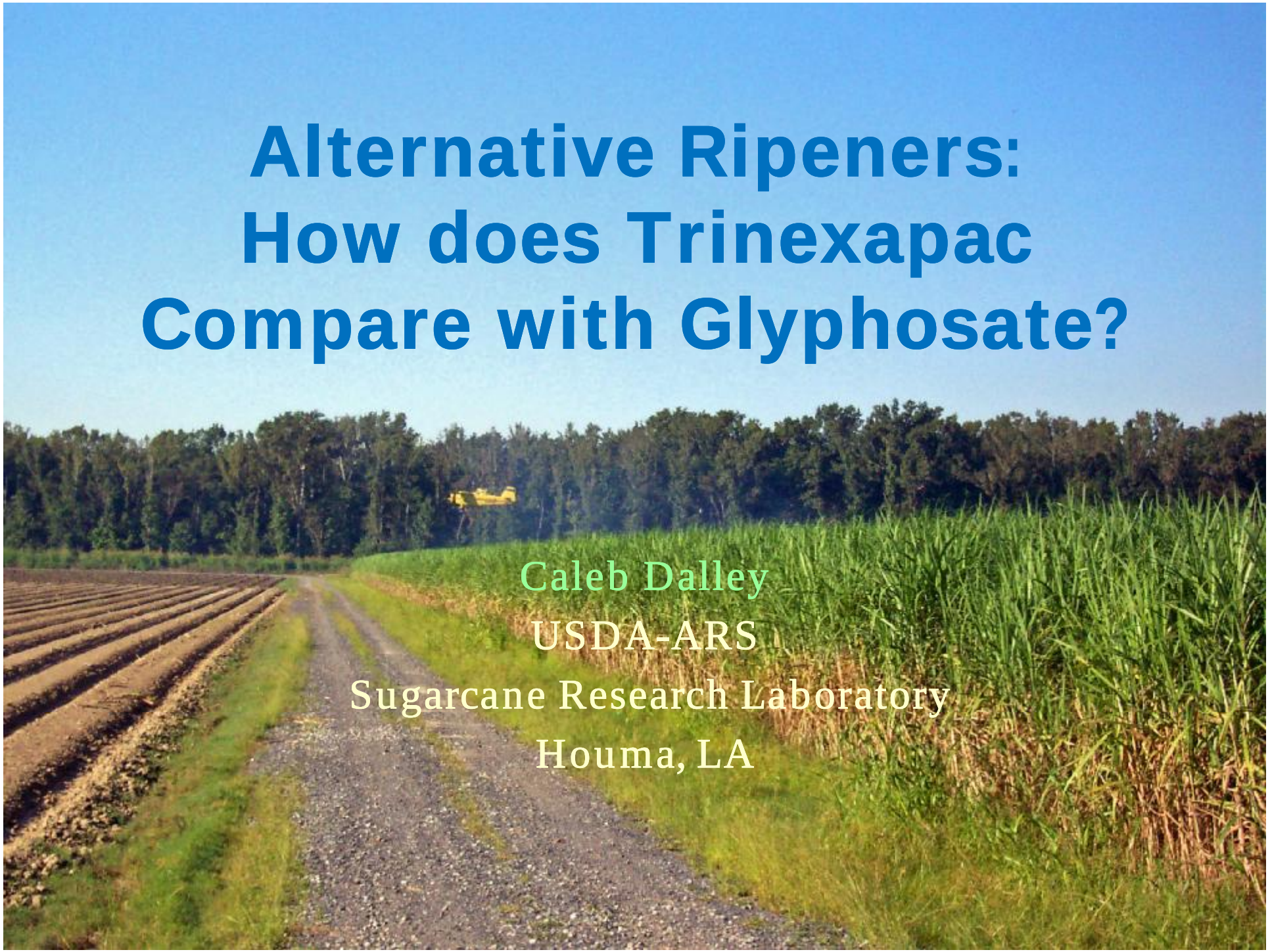
Alternative Ripeners: How does Trinexapac Compare with Glyphosate?



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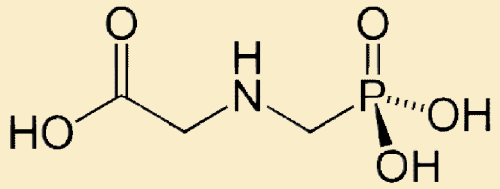
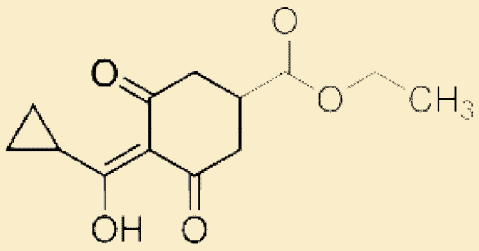
Glyphosate



- Mode of action:
  - Inhibits EPSPS (5-enolpyruvalshikimate-3-phosphate synthase)
  - Needed for production of aromatic amino acids
  - Translocated to meristems of plants (shoot apex)
  - Death of plants is most frequent outcome

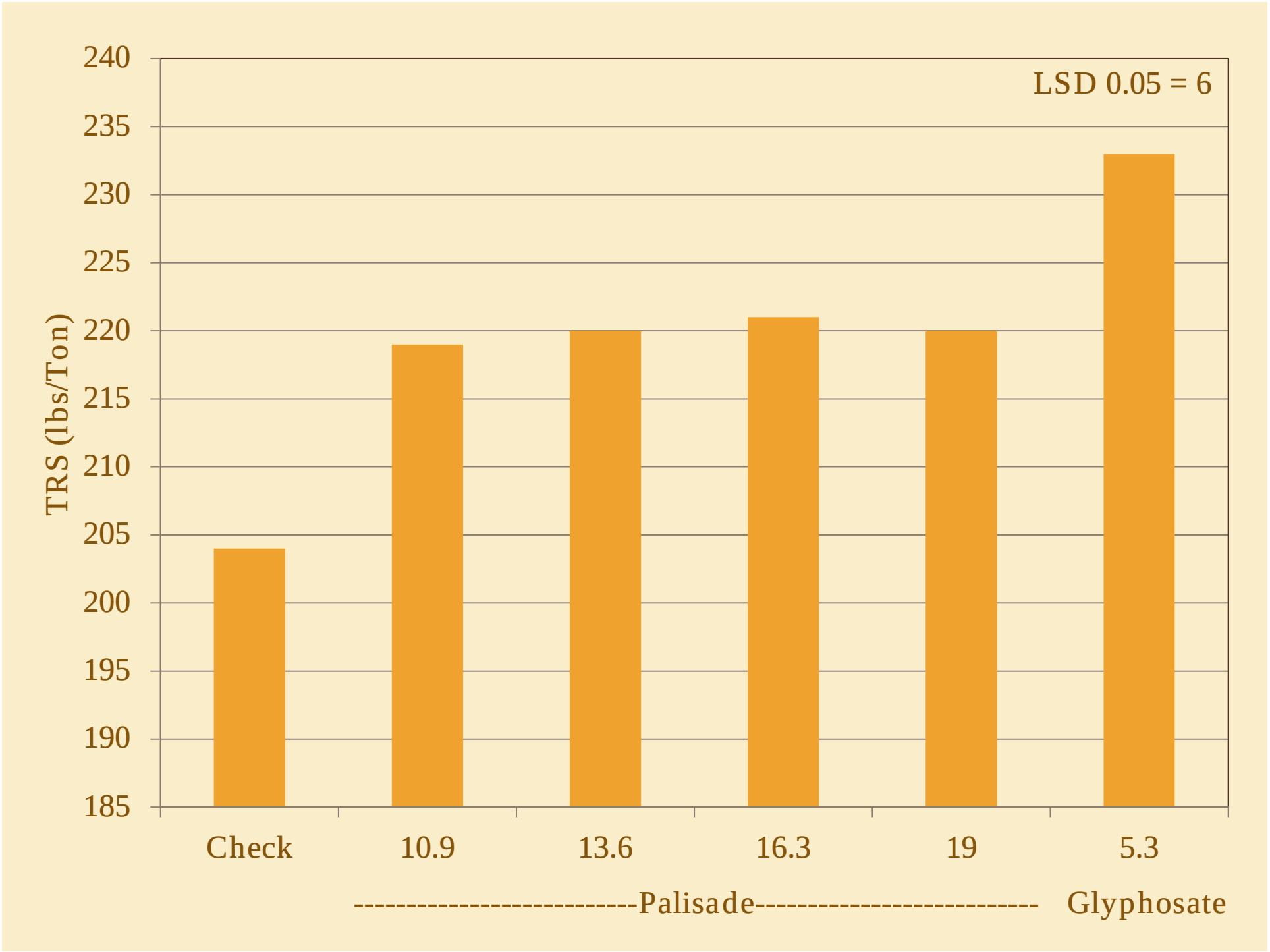
Trinexapac-ethyl



- Mode of action:
  - Late Gibberellic Acid Synthesis Inhibitor
  - Needed for cell elongation
  - Regulation of cell elongation last 4 to 8 weeks
  - No negative long-term effects

Moddus (trinexapac-ethyl)

- Trials with Palisade 2.1 EC at USDA-ARS
  - Nine trials conducted from 2004-2010
  - Rates evaluated: from 10.9 to 19 oz / A
  - Compared to glyphosate
    - 5.3 oz Roundup PowerMAX or WeatherMAX
    - 6 oz Polado L
    - 5.7 oz Touchdown Total
  - Trials were conducted in HoCP 96-540, LCP 85-384 and L 97-128


LSD 0.05 = 6
TRS (lbs/Ton)
240
235
230
225
220
215
210
205
200
195
190
185
Check
10.9
13.6
16.3
19
5.3
----------Palisade----------
Glyphosate

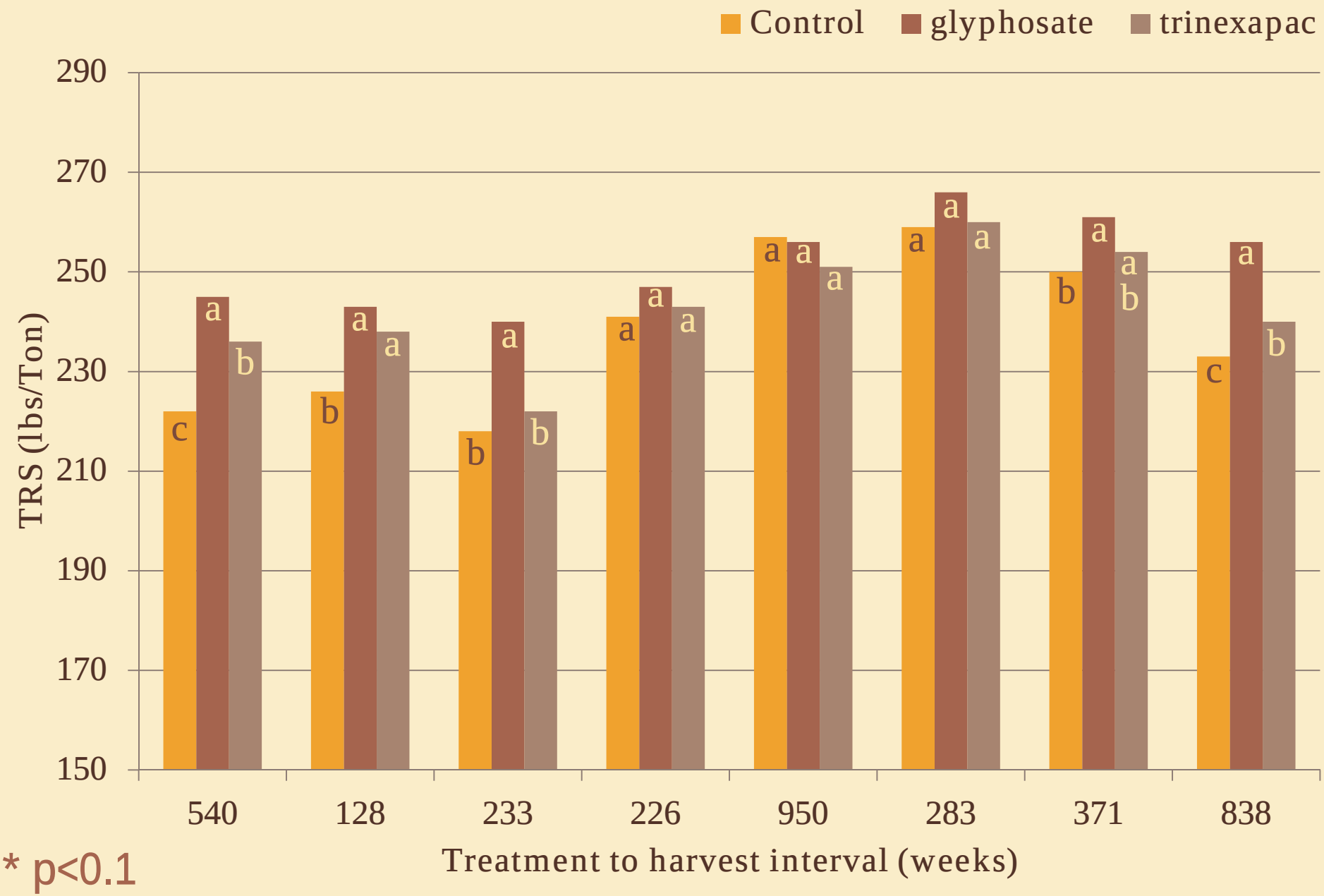
2013 Varietal Ripener Trial

Varietal Response to Ripener Application

- **Study Information:**
  - **Ripeners:**
    - Glyphosate (5.3 oz/A Roundup PowerMax)
    - Trinexapac-ethyl (11 oz/A Palisade)
  - **Reps: 4**
  - **Application Date: Aug 21, 2012**
    - Applied using two-row hand-held spray boom (10 GPA)
  - **Harvest: 10 hand-cut stalks**
    - 4, 5, 6, and 7 weeks after application

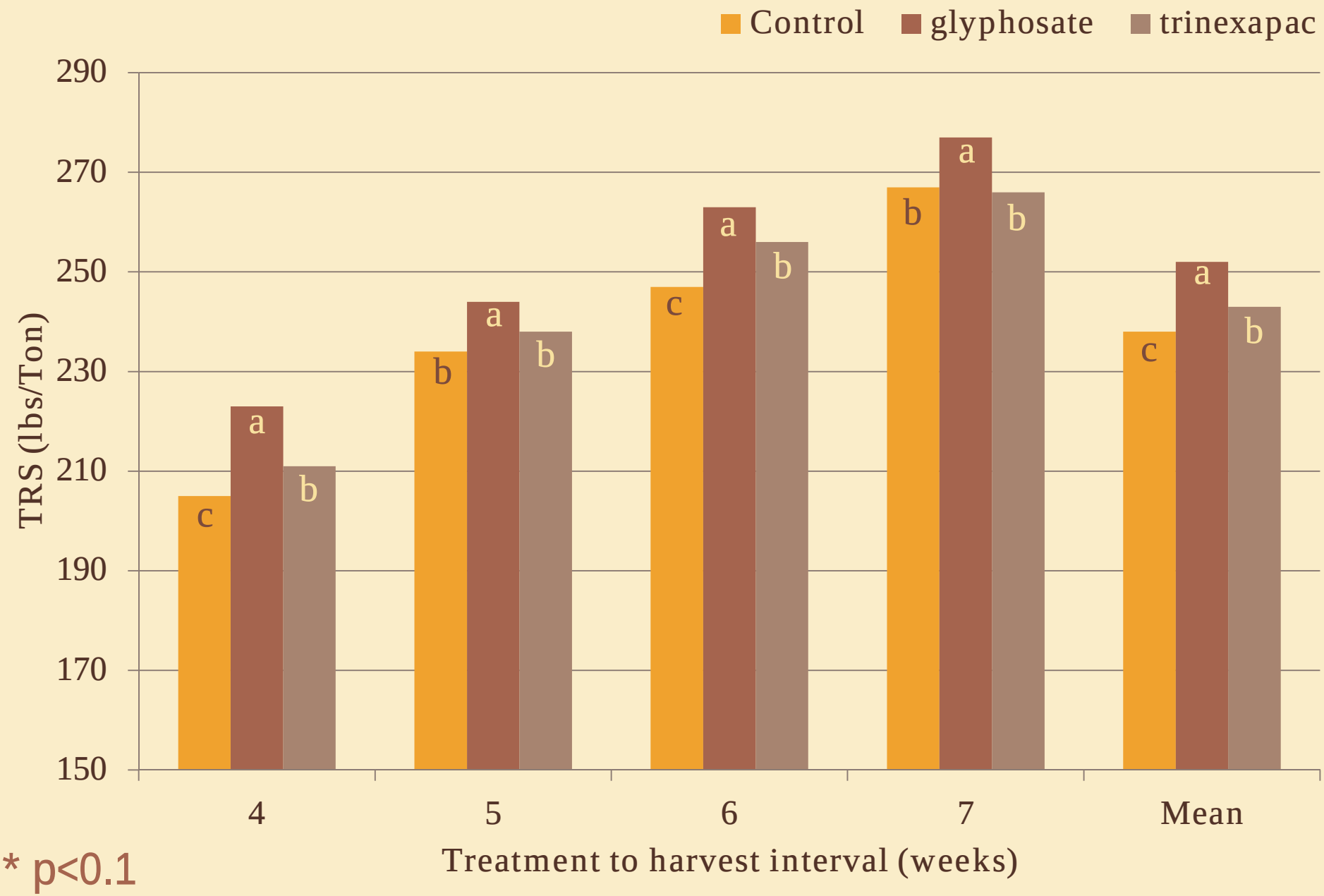
- **Varieties Tested:**
  - HoCP 96-540
  - L 97-128
  - L99-226
  - L 99-233
  - Ho 00-950
  - L 01-283
  - L03-371
  - L04-838

Average of four harvest dates



* p<0.1

Average of eight varieties



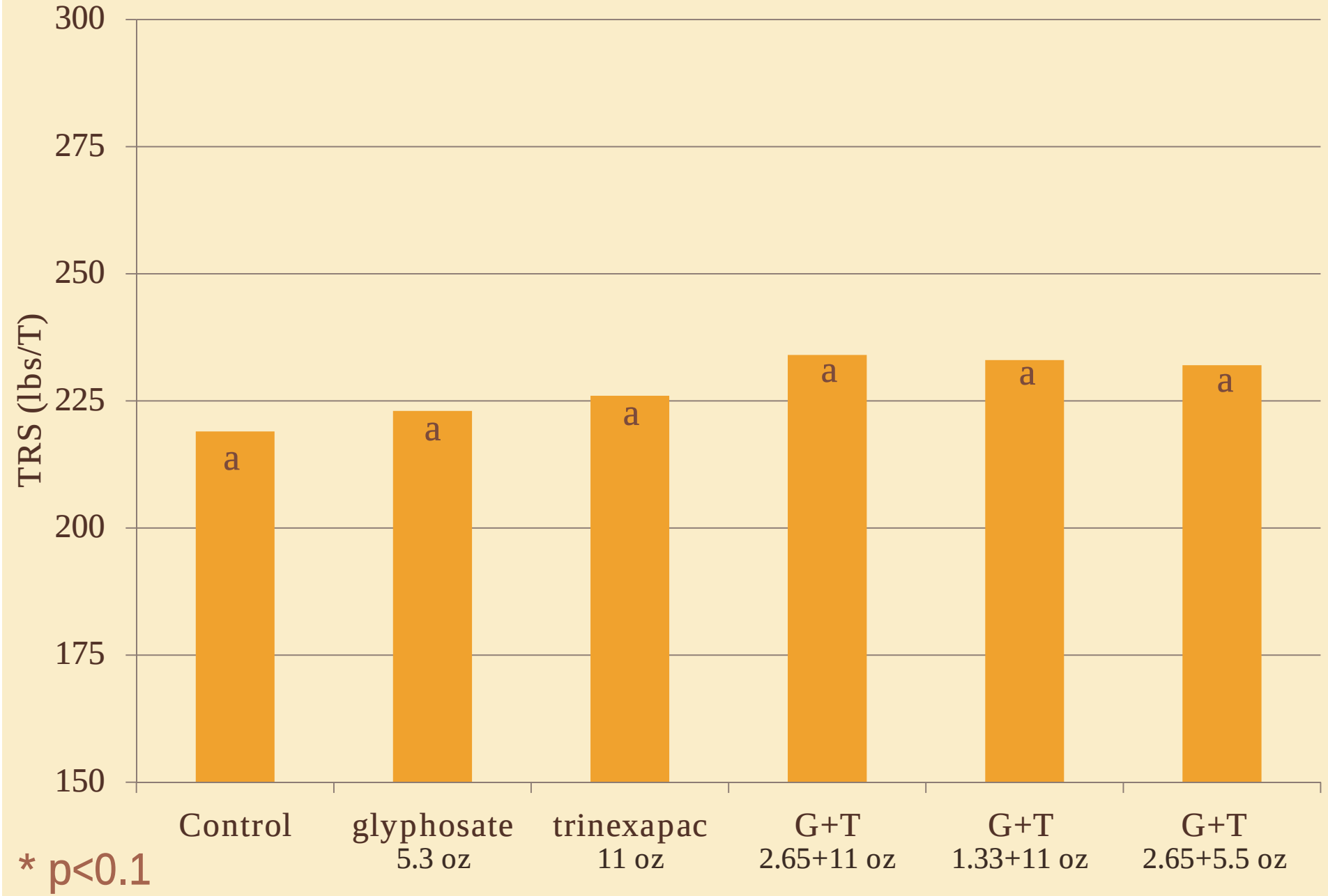
* p<0.1

Trinexapac Tank-mix with Glyphosate

- Trial conducted in second-stubble HoCP 96-540
  - Treatments
    - Roundup PowerMAX (5.3 oz / A)
    - Palisade (11 oz / A)
    - 0.5X PowerMAX + Palisade (2.65 + 11 oz / A)
    - 0.25X PowerMAX + Palisade (1.33 + 11 oz / A)
    - 0.5X PowerMAX + 0.5X Palisade (2.65 + 5.5 oz / A)
    - Non-treated control
  - Harvest
    - 10 stalk sample (continuous)
    - 4, 6, 8, and 10 weeks after application
  - Experimental design
    - Plot size: 3 rows wide by 40 feet in length
    - 4 reps
    - 10 gallons / A @ 4 MPH
    - Applied on August 21, 2012
      - Tractor-mounted (Cameco 3500) spray boom

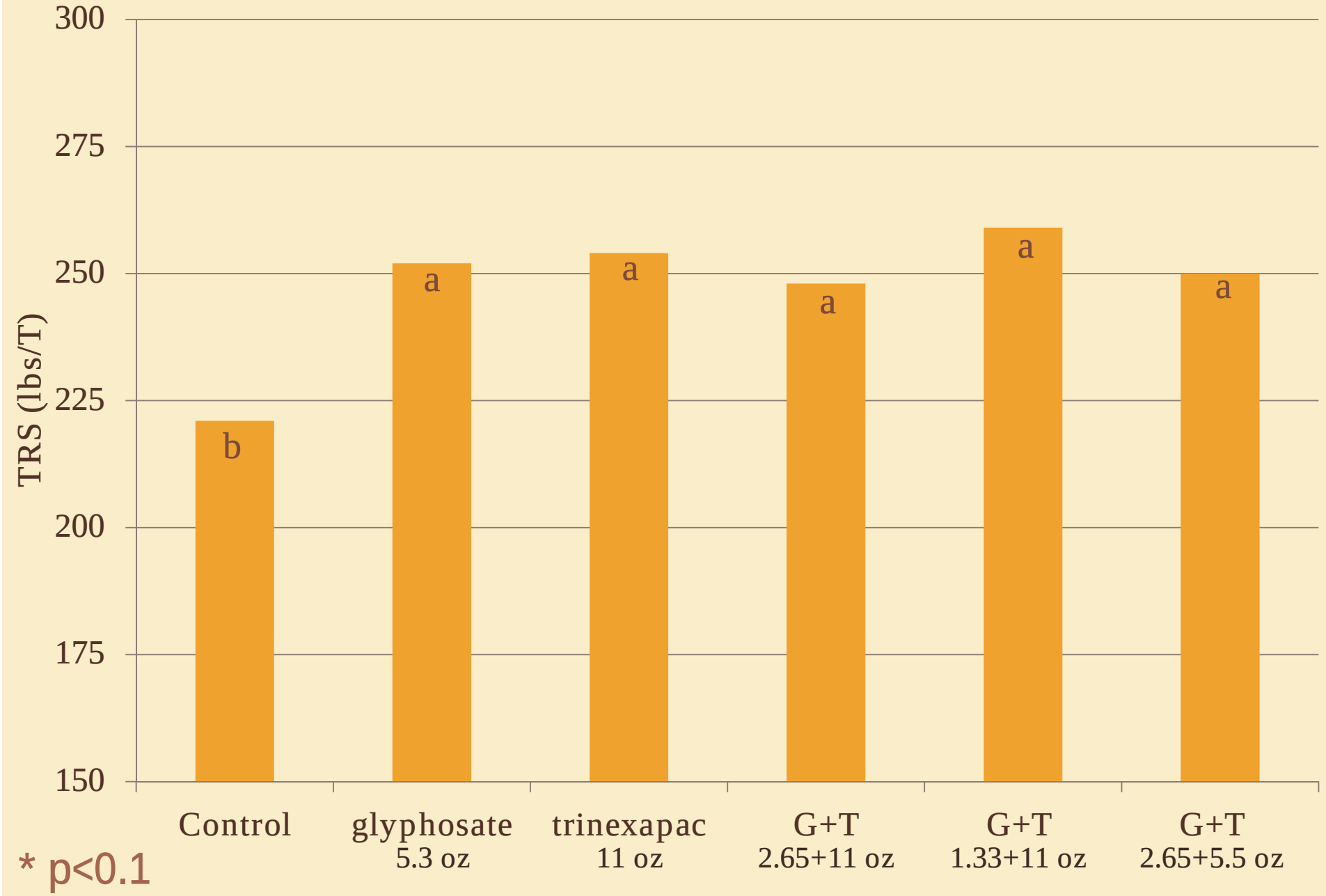

CAMECO

TRS: 4 WAT


300
275
250
225
200
175
150
TRS (lbs/T)
a
a
a
a
a
a
Control
glyphosate 5.3 oz
trinexapac 11 oz
G+T 2.65+11 oz
G+T 1.33+11 oz
G+T 2.65+5.5 oz

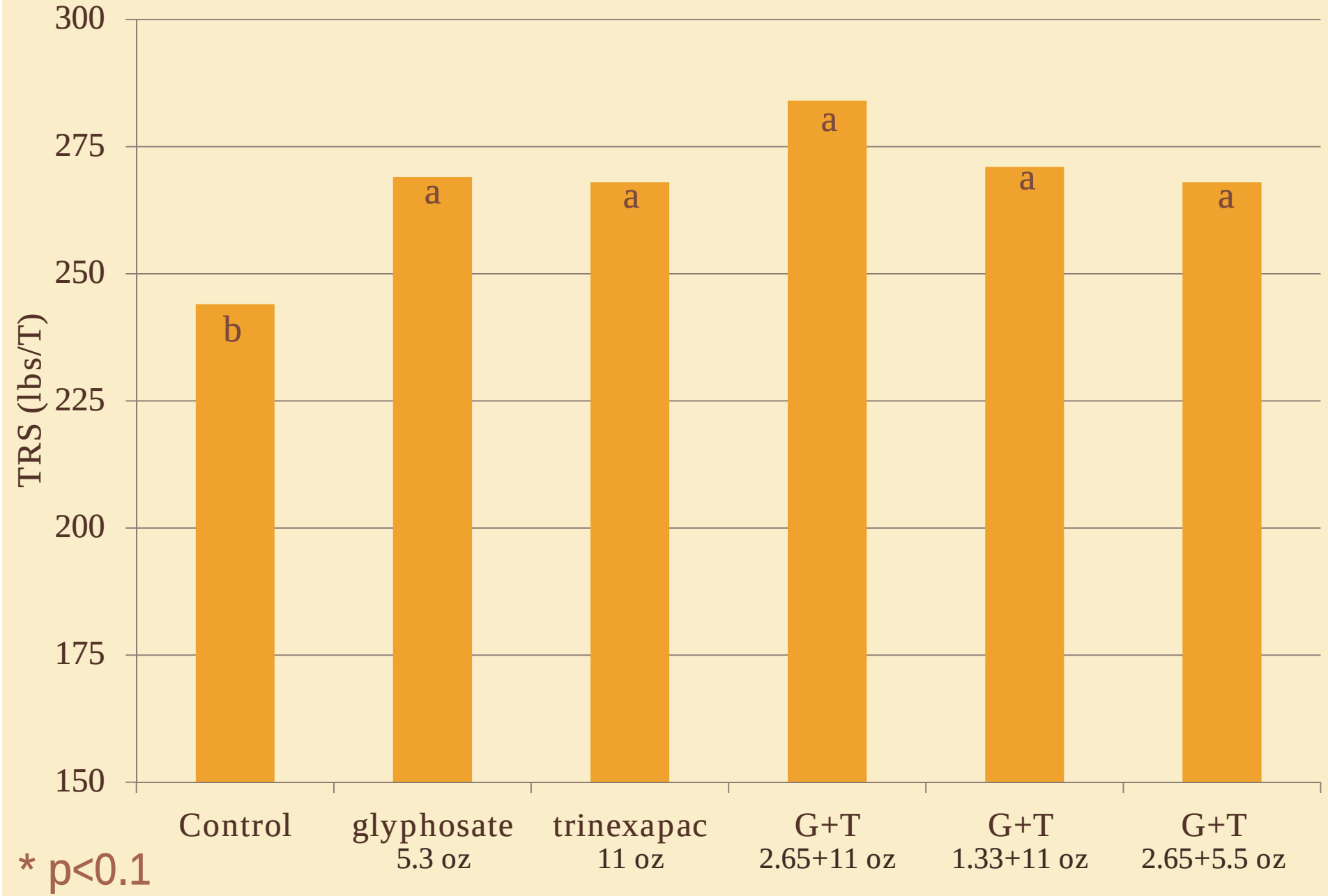
* p<0.1

TRS: 6 WAT


300
275
250
225
200
175
150
TRS (lbs/T)
b
a
a
a
a
a
Control
glyphosate 5.3 oz
trinexapac 11 oz
G+T 2.65+11 oz
G+T 1.33+11 oz
G+T 2.65+5.5 oz

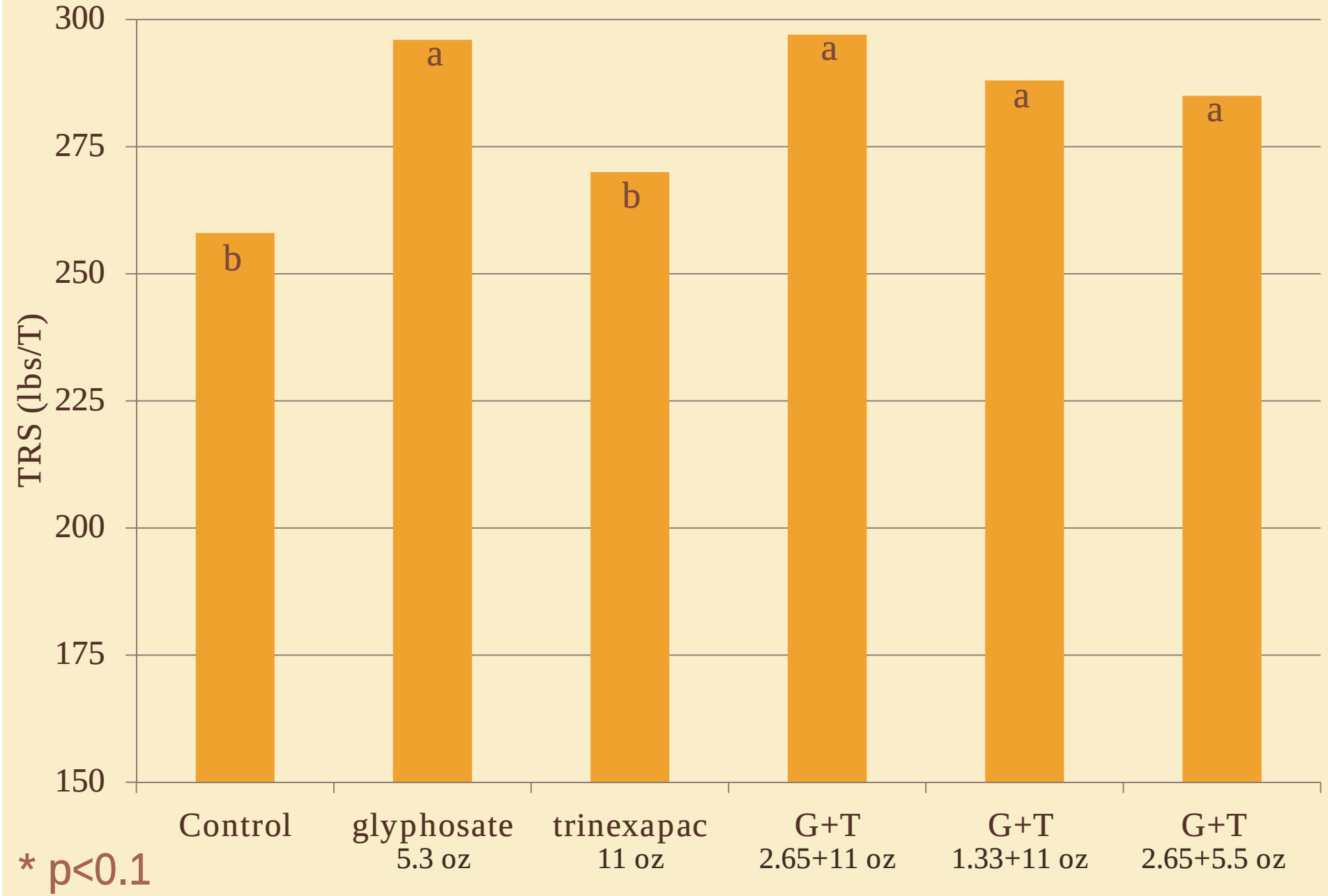
* p<0.1

TRS: 8 WAT


300
275
250
225
200
175
150
TRS (lbs/T)
b
a
a
a
a
a
Control
glyphosate 5.3 oz
trinexapac 11 oz
G+T 2.65+11 oz
G+T 1.33+11 oz
G+T 2.65+5.5 oz

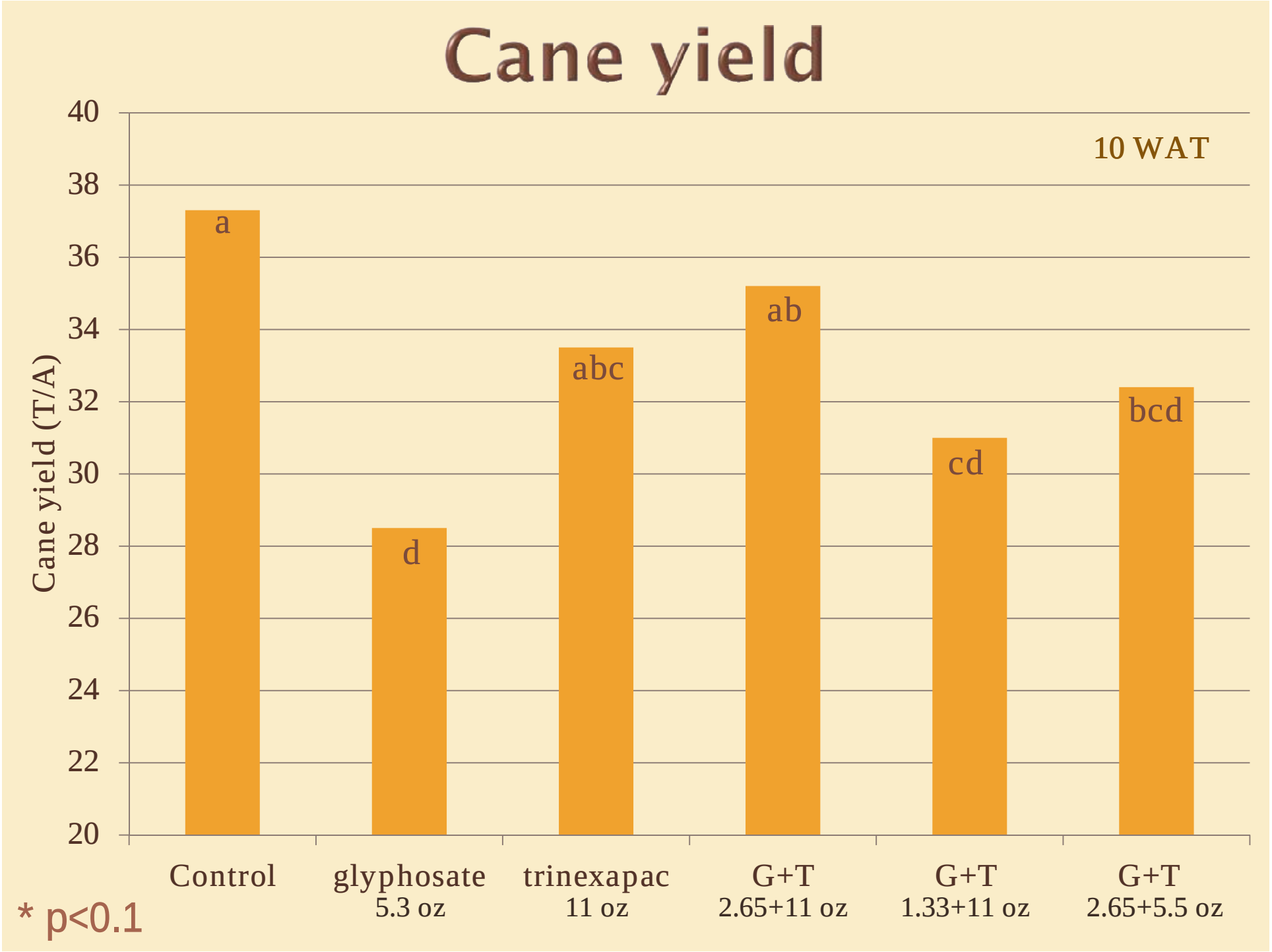
* p<0.1

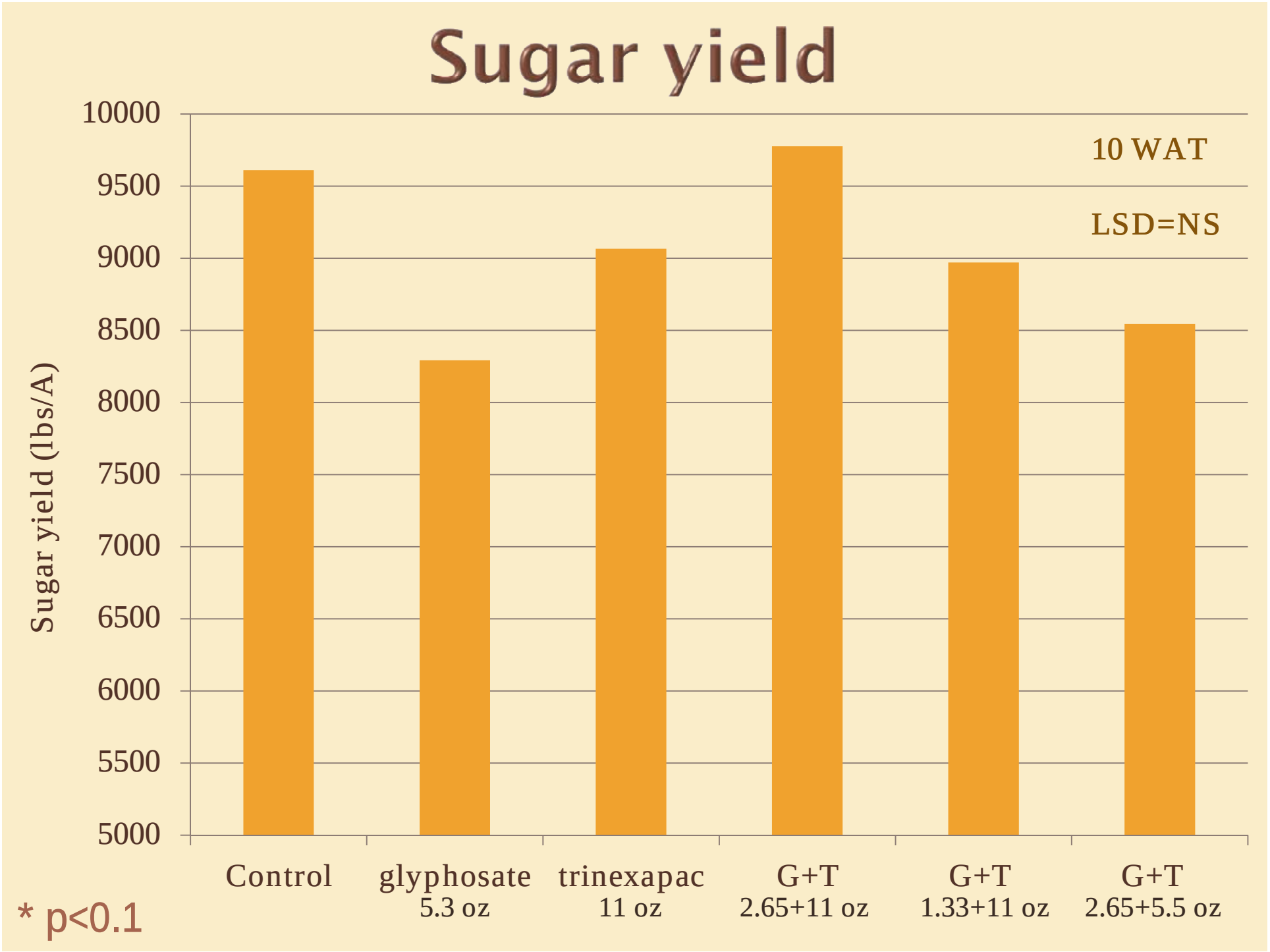
TRS: 10 WAT



* p<0.1

Cane yield


10 WAT
Cane yield (T/A)
40
38
36
34
32
30
28
26
24
22
20
a
d
abc
ab
cd
bcd
Control
glyphosate 5.3 oz
trinexapac 11 oz
G+T 2.65+11 oz
G+T 1.33+11 oz
G+T 2.65+5.5 oz
* p<0.1


Sugar yield
10000
9500
9000
8500
8000
7500
7000
6500
6000
5500
5000
Sugar yield (lbs/A)
10 WAT
LSD=NS
Control
glyphosate 5.3 oz
trinexapac 11 oz
G+T 2.65+11 oz
G+T 1.33+11 oz
G+T 2.65+5.5 oz
* p<0.1

Nontreated harvested 10 WAT; Picture taken 2/11/2013

Glyphosate (5.3 oz/A) harvested 10 WAT; Picture taken 2/11/2013

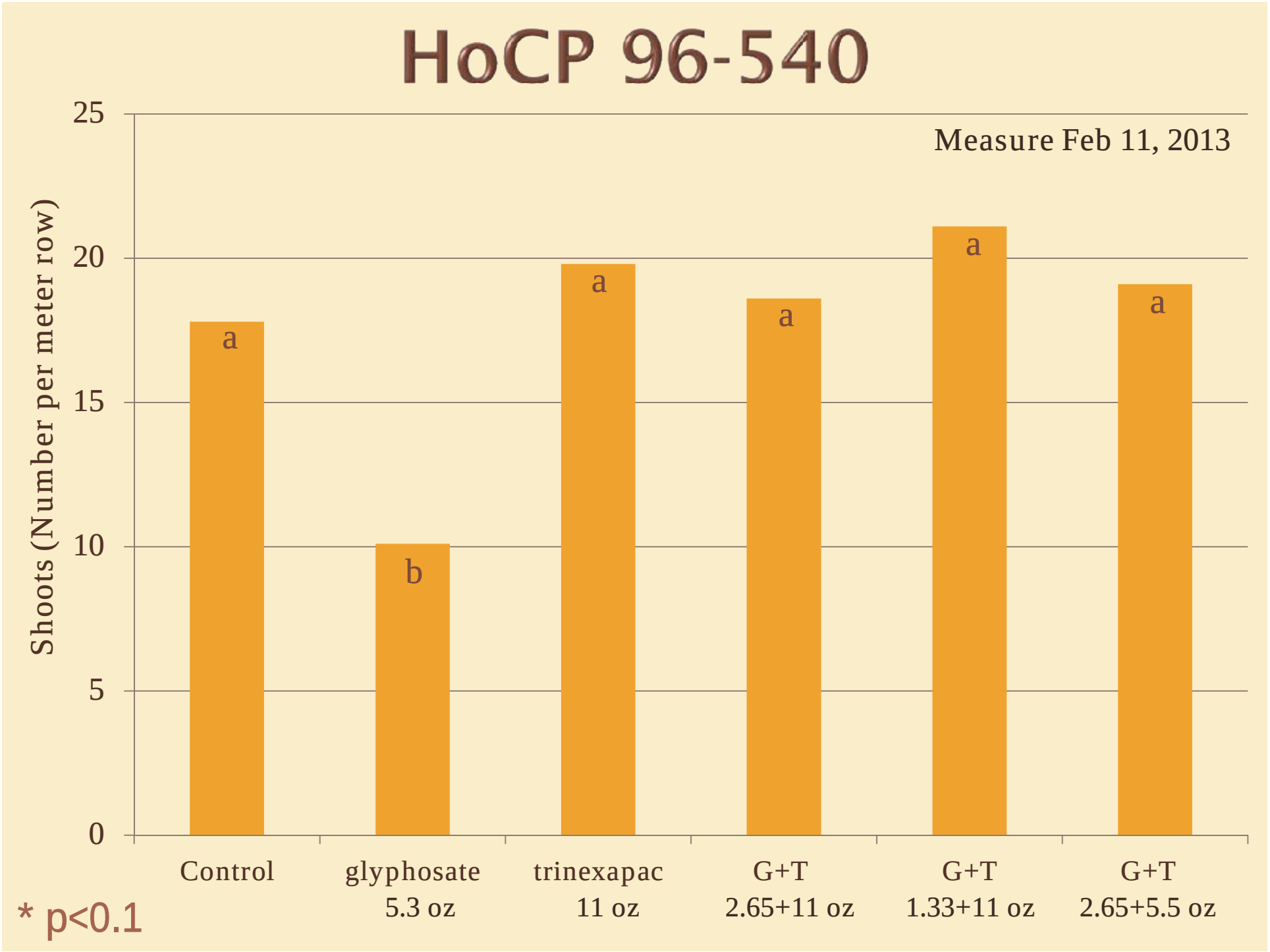
Trinexapac (11 oz/A) harvested 10 WAT; Picture taken 2/11/2013

Glyphosate 0.5X (2.65 oz/A) + Trinexapac (11 oz/A) harvested 10 WAT; Picture taken 2/11/2013

Glyphosate 0.25X (1.33 oz/A) + Trinexapac (11 oz/A) harvested 10 WAT; Picture taken 2/11/2013

Glyphosate 0.5X (2.65 oz/A) + Trinexapac 0.5X (5.5 oz/A) harvested 10 WAT; Picture taken 2/11/2013

HoCP 96-540



* p<0.1

Moddus (trinexapac-ethyl)

- Advantages:
  - Excellent crop safety: no long-term effect or carryover
    - Some reports (Brazil) of stimulation to root growth
  - No restrictions on crop age
    - can be used in plant cane through last stubble
  - Safety
    - no injury to adjacent crops or urban/suburban areas
    - Low toxicity (caution)
  - Wide window for harvest
    - 28 to 60 days after application

Moddus (trinexapac-ethyl)

- Disadvantages
  - Not as great a response as glyphosate
  - Varietal response not well known but there are going to be differences in sensitivity and response
- Research needed
  - Varietal response to trinexapac
  - Tank mixes of glyphosate and trinexapac
  - Effects of repeated annual applications through complete crop cycle
  - Sugarcane response to timing of application during harvest season (early, mid, late)


Thank You!