

Chemical Topping Burley Tobacco

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Rationale and Significance

- Reduced labor cost for topping and suckering burley tobacco
 - 6-10 man-hours per acre
 - \$70 to 120 per acre
- Possible reduction in maleic hydrazide (MH) residues on cured leaf
- Uses currently labeled suckercides in tobacco production
 - Maleic hydrazide (MH)
 - Butralin (DNA)
 - Fatty Alcohol (FA)
- Purchasing/modifying equipment is not required

Limitations and Considerations

- Weather
 - Wet seasons are difficult
 - Applying pesticides
 - Rainfast
- Variability of growth in the field
 - Only one topping event vs. more than one
- Suckercide coverage in less than ideal fields
 - Tobacco that is not straight
 - Problematic in conventional method of topping as well
- Length of plant/number of leaves going to the barn
 - May result in more time housing and stripping

Objectives

- Evaluate chemical topping efficacy on burley tobacco
- Determine appropriate **RATE** and optimum **TIMING** of suckercide applications on agronomic and quality traits
- Investigate which varieties are best suited for this method of topping (Maturity)

Study 1: Impact of Suckercide Rate

A wide-angle photograph of a tobacco field. The plants are arranged in rows. On the left side, the plants are heavily yellowed, indicating stress or damage. On the right side, the plants are green and have many small pink flowers. The background shows a green field and a line of trees under a cloudy sky.

Materials and Methods

Suckercide Rate

- Burley tobacco varieties:
 - Spindletop - KT210 (late maturing)
 - Murray - KT215 (late maturing)
- Treatments:
 1. Man. topped: No Sucker Control (Untreated Control)
 2. Man. topped: 1.5 GPA MH + 0.5 GPA Butralin (Standard)
 3. Chem. topped: 2.0 GPA MH (Full)
 4. Chem. topped: 1.5 GPA MH (Reduced)
 5. Chem. topped: 2.0 GPA MH + 0.5 GPA Butralin (Full Mix)
 6. Chem. topped: 1.5 GPA MH + 0.5 GPA Butralin (Red. Mix)
 7. Chem. topped: 1.0 GPA Butralin (DNA)
 8. Chem. topped: 10% concentration of Fatty Alcohol (FA)
- Treatments applied at:
 - Man. topped treatments applied at 10% bloom
 - Chem. topped treatments applied at prebud (10% button)

Materials and Methods

Suckercide Rate

- Randomized Complete Block Design
 - Four replications
- Sprayer calibrated at 50 gal/A
 - Three nozzle/row configuration
- Data Collected:
 - Sucker control effectiveness
 - Cured leaf yield
 - TSNA/Alkaloid determination
 - Leaf/Plant dimensions
 - Leaf quality
 - MH residue analysis
- Statistical Analysis
 - SAS 9.4
 - Proc. GLIMMIX LSmeans at $\alpha=0.05$

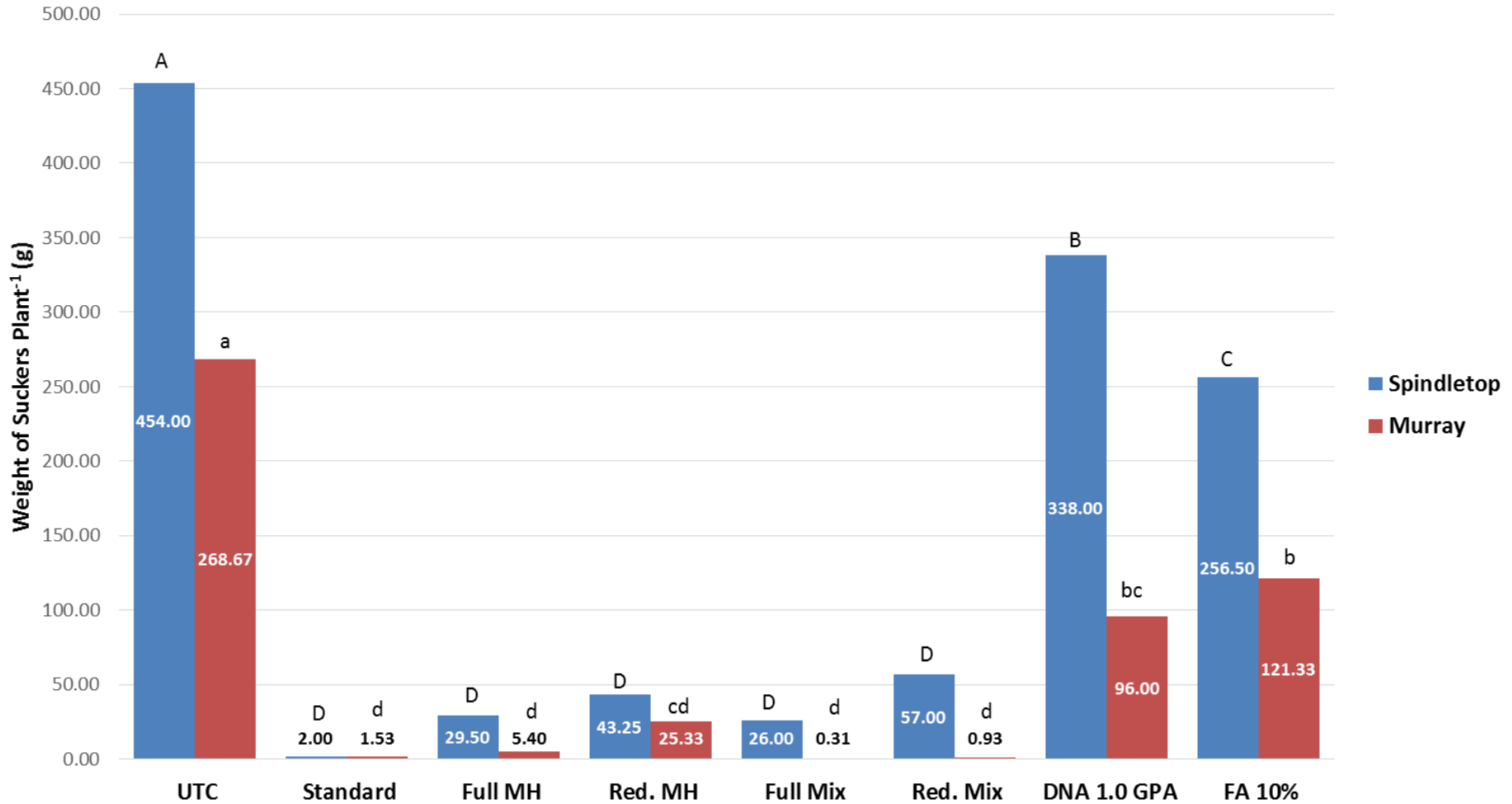


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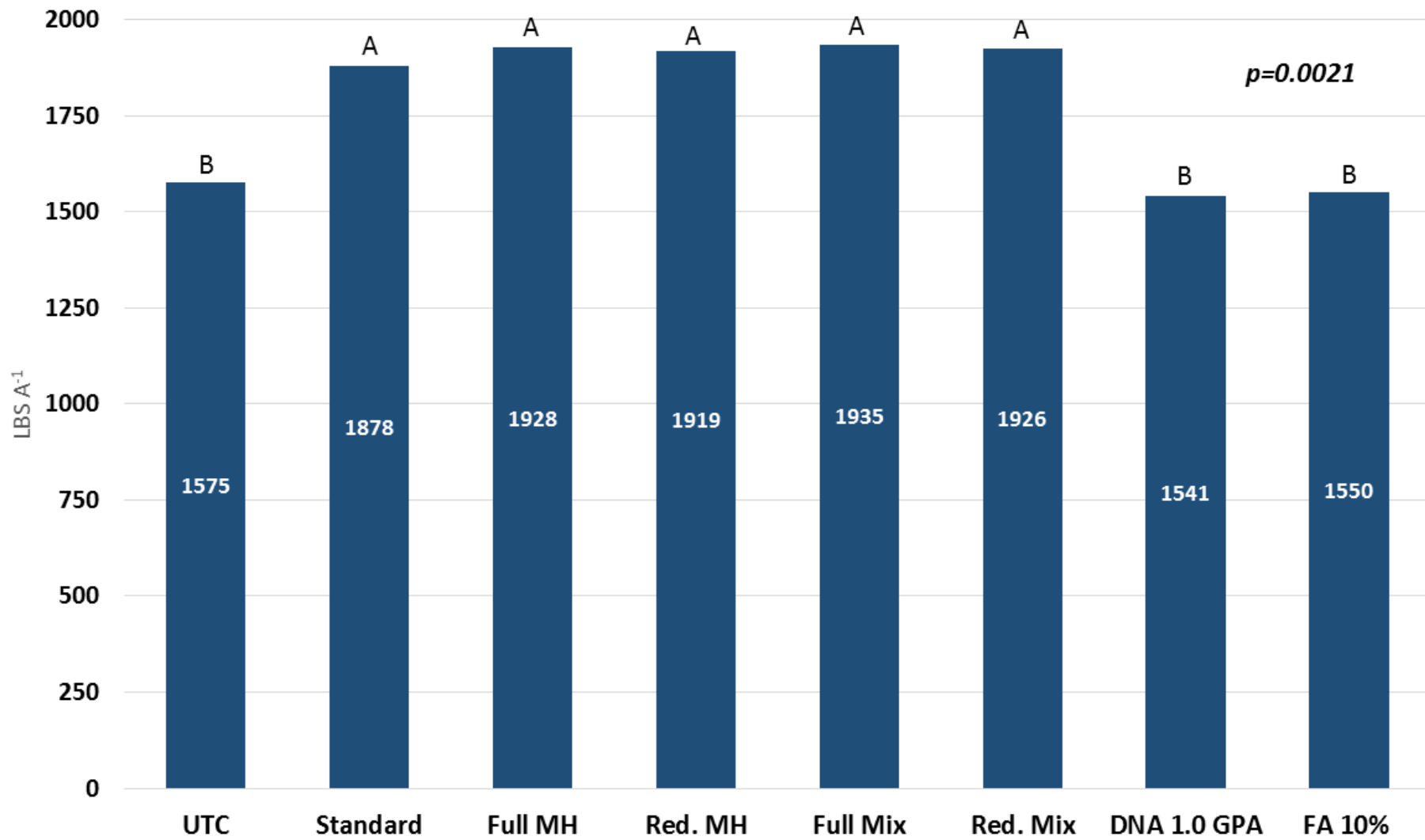


Rate Results

Total Weight of Suckers Plant⁻¹ Location by Treatment Interaction

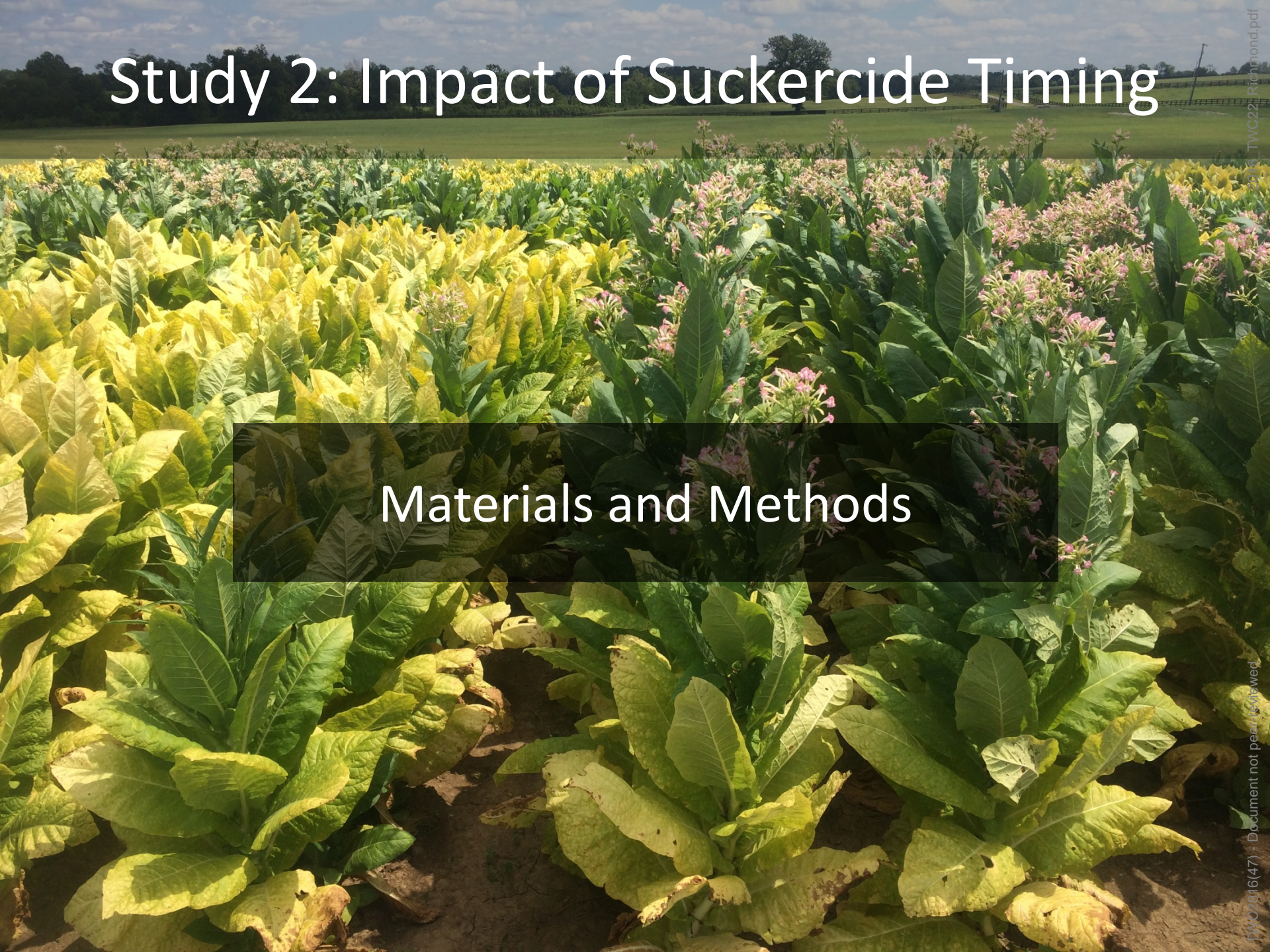


Chemical Topping Rate: 2015 Total Yield for Murray and Spindletop



Study 2: Impact of Suckercide Timing

Materials and Methods



Materials and Methods

Suckercide Timing

- Burley tobacco varieties:
 - Spindletop - KT210 (late maturing) and TN90 (medium maturity)
 - Murray - KT215 (late maturing) and TN90 (medium maturity)
- Treatments:
 1. Manually topped at 10% Bloom: Untreated Control
 2. Manually topped: 2.0 GPA MH + 0.5 GPA Butralin
 3. Chemically topped at pre-bud (10% button)
 4. Chemically topped at early bud (50% button)
 5. Chemically topped at 10% bloom
- All chemically topped treatments use 2.0 GPA MH + 0.5 GPA Butralin

Materials and Methods

Suckercide Timing

- Randomized Complete Block Design
 - Four replications
- Sprayer calibrated at 50 gal/A
 - Three nozzle/row configuration
- Data Collected:
 - Growth Stage
 - Sucker control effectiveness
 - Cured leaf yield
 - TSNA/Alkaloid determination
 - Usable leaf number
 - Leaf dimensions
 - Leaf quality
 - MH residue analysis
- **Statistical Analysis**
 - SAS 9.4
 - Proc. GLIMMIX LSmeans at $\alpha=0.05$

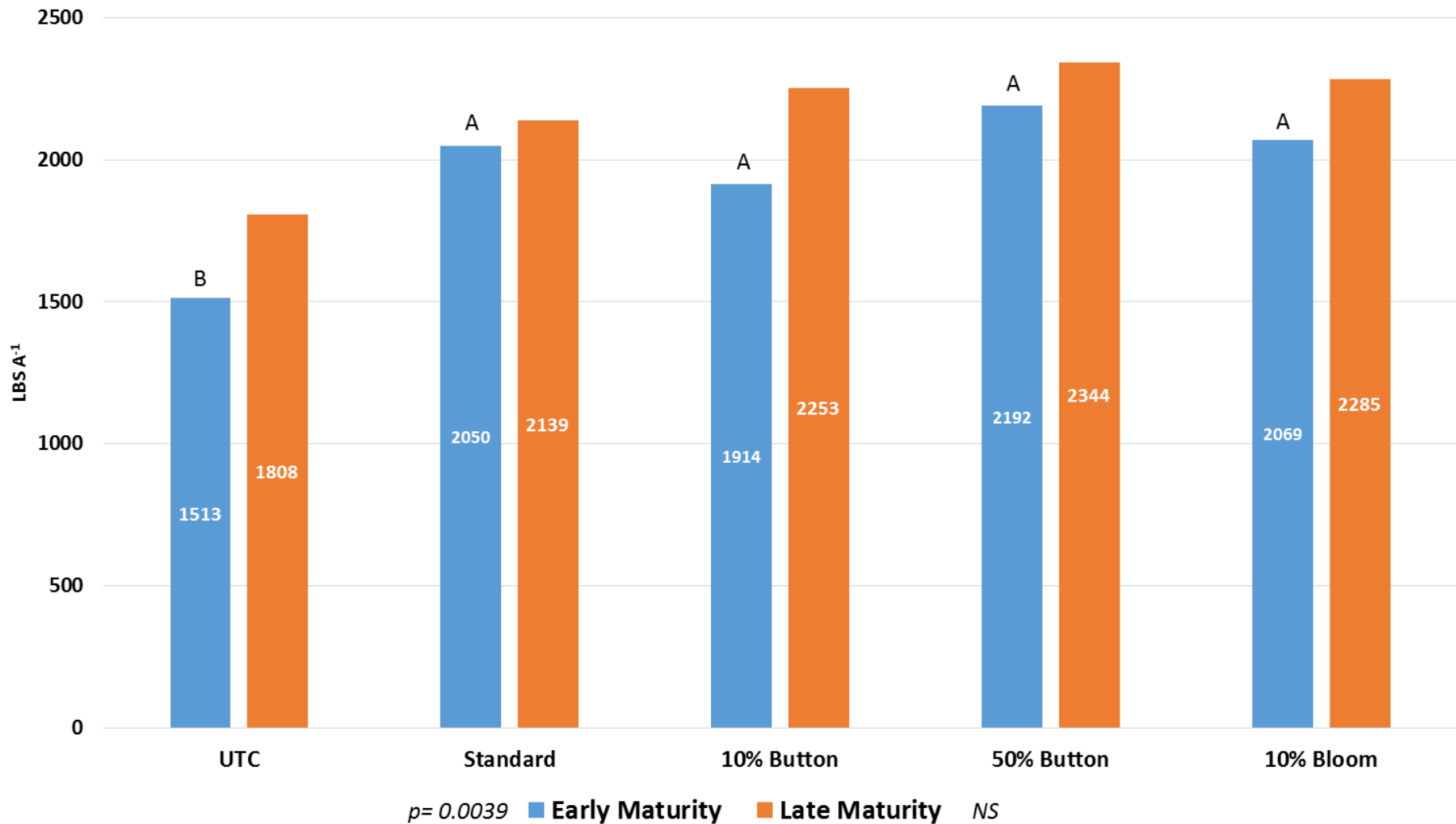


2015 Timing Results

Spindletop and Murray Timing: Weight of Sucker Plant⁻¹ as a Percent of Control

Treatment	Percent Control			
	Spindletop		Murray	
	TN90	KT210	TN90	KT215
	_____ % _____			
UTC	0 a	0 a	0 a	0 a
Standard	99 b	99 b	99 b	99 b
10% Button	97 b	97 b	99 b	99 b
50% Button	97 b	99 b	99 b	99 b
10% Bloom	95 b	99 b	98 b	99 b
<i>p-value</i>	<i><.0001</i>	<i><.0001</i>	<i><.0001</i>	<i><.0001</i>

Chemical Topping Timing: 2015 Total Yield for Murray and Spindletop



Ideal Chemical Topping System

- Chemical solution applied in one application
- Topped terminal bud and inhibited sucker growth
- No adverse effects on yield, quality, and leaf chemistry
- Similar cutting, housing, and stripping as traditional topping

Summary

- Significant differences for rate and timing studies detected:
 - Total Yield
 - Number of suckers/plant
 - Total weight of suckers/plant
 - Average weight of suckers/plant
- Preliminary observations suggested prebud and early bud timings should be targeted
 - 10% bloom treatments have a flower
- Application must include MH
- This may be suited for late(r) maturing varieties of burley tobacco
 - More forgiving of timing of application
- A third study will be initiated soon:
 - Impact of chemical topping on gene expression

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A wide-angle photograph of a tobacco field. The foreground is filled with rows of lush green tobacco plants, their large, veined leaves clearly visible. The field extends to a distant horizon line where a line of trees and a few buildings are visible. The sky is a vibrant blue, filled with numerous white, fluffy clouds. The overall scene is bright and sunny.

Questions?