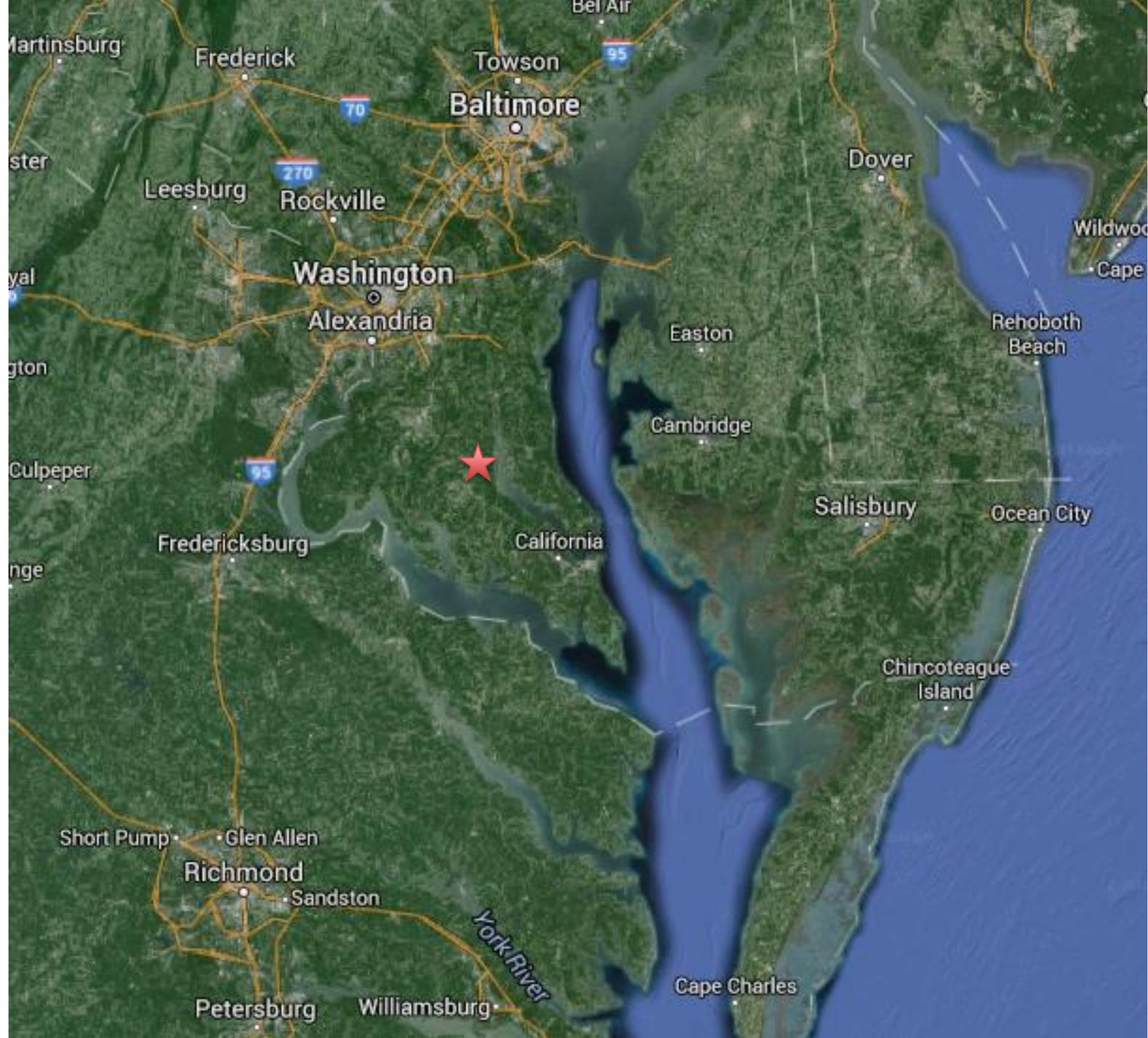


# Performance of Alternative Nitrogen Source/Fertility Programs for Burley Tobacco in Maryland

Ben Beale

Extension Agent

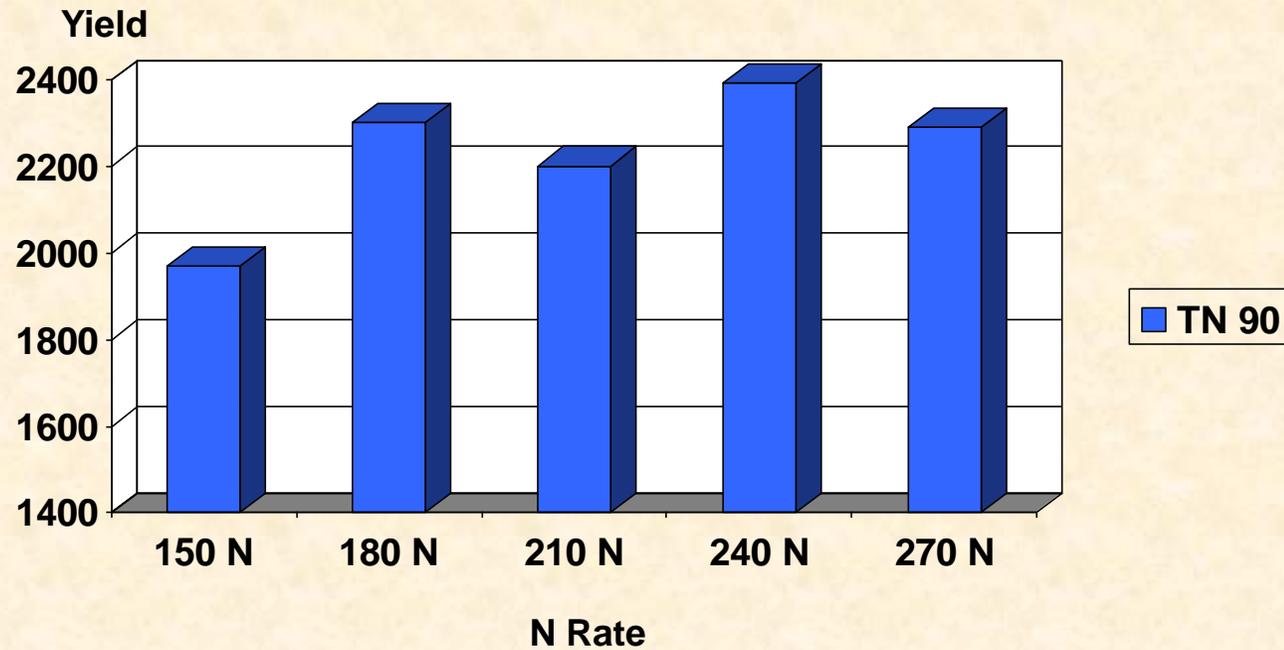
University of Maryland Extension



# Background Information

- Fertilizer distributors unable to source bulk (SOP) Potash of Sulfate.
- Nitrogen sources limited in many cases to urea, ammonium sulfate and calcium ammonium nitrate
- Maryland's nutrient management regulation require individual field specific recommendations making standard blends difficult to use across several fields/farms
- Alternative programs being promoted:
  - “Recommendations” to only use MAP instead of DAP
  - Farmers using foliar programs as stand alone programs or supplemental programs
  - UAN liquid programs, especially for no-till systems and side-dress applications

**Burley Variety x Nitrogen Rate Study,  
CMREC-UMF, UMD, 2006 and 2007 Average.**



Variety	Rate
KT 204	180
NC 7; TN 90; Ky14-L8; R-610	240
NC 2002	210
All other varieties	200

# 2017 Field Trial

- Treatment 1: Standard Treatment (240-60-180)
- Treatment 2: ½ N Rate
- Treatment 3: Sulfur Based Program
- Treatment 4: DAP Program
- Treatment 5: Urea/Muriate of Potash Program
- Treatment 6: UAN/Liquid Program
- Treatment 7: Foliar plus Sidedress Fertilizer
- Treatment 8: Foliar plus Partial Fertilizer

# Treatment 1: Standard Program

Standard Treatment	N	P	K
Broadcast at planting	120	60	120
First Sidedress	60	0	60
Second Sidedress	60	0	0
Total	240	60	180

## Broadcast at Planting:

Ammonium Nitrate

MAP

Sulfate of Potash

Micronutrient Package

Per Acre Cost: \$362

## First Sidedress:

Potassium Nitrate

Calcium Ammonium Nitrate

## Second Sidedress:

Calcium Ammonium Nitrate

# Treatment 2: ½ N rate

Per Acre	N	P	K
Broadcast at planting	60	60	120
First Sidedress	30	0	60
Second Sidedress	30	0	0
Total	120	60	180

## Broadcast at Planting:

Ammonium Nitrate

MAP

Sulfate of Potash

Micronutrient Package

Per Acre Cost: \$265

## First Sidedress:

Potassium Nitrate

Calcium Ammonium Nitrate

## Second Sidedress:

Calcium Ammonium Nitrate

# Treatment 3: Sulfur Program

Per Acre	N	P	K
Broadcast at planting	120	60	120
First Sidedress	60	0	60
Second Sidedress	60	0	0
Total	240	60	180

## Broadcast at Planting:

~~Ammonium Nitrate~~ Ammonium Sulfate

~~MAP~~ Triple Super Phosphate

Sulfate of Potash

Micronutrient Package

Per Acre Cost: \$386

## First Sidedress:

Potassium Nitrate

Calcium Ammonium Nitrate

## Second Sidedress:

Calcium Ammonium Nitrate

# Treatment 4: DAP Program

Per Acre	N	P	K
Broadcast at planting	120	60	120
First Sidedress	60	0	60
Second Sidedress	60	0	0
Total	240	60	180

## Broadcast at Planting:

Ammonium Nitrate

~~MAP~~ DAP

Sulfate of Potash

Micronutrient Package

Per Acre Cost: \$345

## First Sidedress:

Potassium Nitrate

Calcium Ammonium Nitrate

## Second Sidedress:

Calcium Ammonium Nitrate

# Treatment 5: Urea/Muriate of Potash Program

Per Acre	N	P	K
Broadcast at planting	120	60	120
First Sidedress	60	0	60
Second Sidedress	60	0	0
Total	240	60	180

## Broadcast at Planting:

~~Ammonium Nitrate-Urea~~

~~MAP DAP~~

~~Sulfate of Potash-KMag and Muriate of Potash~~

~~Micronutrient Package~~

Per Acre Cost: \$313

\*0-0-60 @100 lbs acre supplies 45 lbs Cl

## First Sidedress:

Potassium Nitrate

Calcium Ammonium Nitrate

## Second Sidedress:

Calcium Ammonium Nitrate

# Treatment 6: UAN/Liquid Program

Per Acre	N	P	K
Dry Granular Broadcast at planting	12	60	120
Liquid at planting	66		
First Sidedress	33	0	0
Second Sidedress	33	0	0
<b>Total</b>	<b>144</b>	<b>60</b>	<b>120</b>

## Dry Granular

MAP-Granular

Sulfate of Potash-Granular

Per Acre Cost: \$366

## At Planting:

UAN	20	gal
Humic Acid/Micro	1	gal
Fertilizer Catalyst	4.00	gal

## First Sidedress

UAN	10	gal
Propriety K Blend	1.5	gal

## Second Sidedress

UAN	10	gal
Propriety K Blend	1.5	gal
ZN Product	2	gal
MicroPak	16.00	ozs

# Treatment 7: Fertilizer plus Foliar Program

Per Acre	N	P	K
Broadcast at planting	120	60	120
Late Sidedress (July 7)	60	0	60
First Foliar	1.2	2.4	1.2
Second Foliar	.33	1.44	3
<b>Total</b>	<b>182</b>	<b>64</b>	<b>184</b>

## Broadcast at Planting:

Ammonium Nitrate  
 MAP  
 Sulfate of Potash  
 Micronutrient Package

## Late Sidedress:

Potassium Nitrate  
 Calcium Ammonium Nitrate

## First Foliar:

8 lbs 15-30-15 soluble  
 1 quart Propriety Blend  
 8 oz Propriety Blend  
 3 lbs Epsom Salts

## Second Foliar:

8 lbs 4-18-38  
 1 quart Propriety Amendment Blend  
 8 oz Propriety Amendment Blend  
 3 lbs Epsom Salts

Per Acre Cost: \$484

# Treatment 8: Foliar Program

Per Acre	N	P	K
Broadcast at planting	120	60	120
First Foliar	1.2	2.4	1.2
Second Foliar	.33	1.44	3
Total	122	64	124

## Broadcast at Planting:

Ammonium Nitrate

MAP

Sulfate of Potash

Micronutrient Package

## First Foliar:

8 lbs 15-30-15 soluble

1 quart Propriety Blend

8 oz Propriety Blend

3 lbs Epsom Salts

## Second Foliar:

8 lbs 4-18-38

1 quart Propriety Amendment Blend

8 oz Propriety Amendment Blend

3 lbs Epsom Salts

Per Acre Cost: \$394

### Soil Test Results

Farmer/Operator	Ben Beale	Plan Year	2017
Street Address	120 Leonardtown rd	Date Plan Prepared	7-6-2017
City, State, Zip, County	Leonardtown MD 20664 St. Mary's	Phone	

Tract No.	Field No.	Lab	Test Date	Soil Texture	Test Number	pH	O.M	P	K	Mg	Ca	Al	Fe
Stolzfus Tob Trial	1	AGL	5/11/17	SiL	611	6.60	1.30	114	59	82	502		
<b>Conversion to FIV</b>						<b>6.60</b>	<b>1.30</b>	<b>126 (E)</b>	<b>36 (M)</b>	<b>65 (O)</b>	<b>37 (M)</b>		

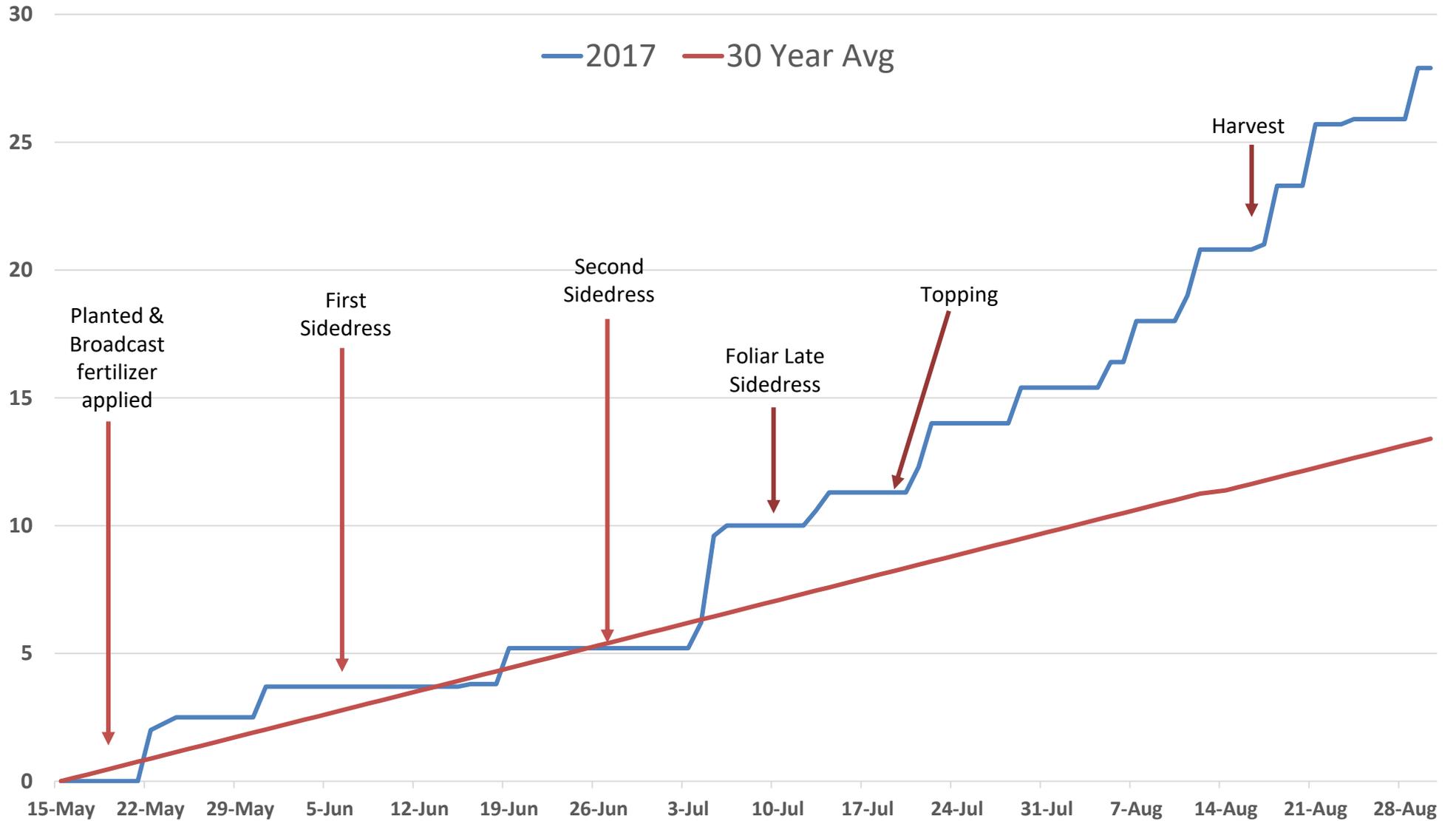
### Fertilizer Recommendations

Farmer/Operator		Ben Beale				Plan Year			2017					
Street Address		120 Leonardtown rd				Date Plan Prepared			7-6-2017					
City, State, Zip, County		Leonardtown MD 20664 St. Mary's				Phone								
Tract No. / Farm Name	Field No.	Crops & Note Numbers	Area	Yield Goal	Plant Nutrients Needed N-P2O5-K2O	Nitrogen Credits			Fertilizer To Be Applied					Lime
						Leg.	Man.	Slu.	Method	N	P2O5	K2O	Mg	
Stolzfus Tob Trial	1 2017 [*]	Tobacco, Burley; Var: NC7 1 3 7 9 240 241 267	1.0 Acres	2.5	240-40-160 #/A	0 #/A	0 #/A	0 #/A	Total	240 #/A	40 #/A	160 #/A		0.0 t/A
									broadcast	100 #/A	40 #/A	100 #/A		
									sidedress	140 #/A	0 #/A	60 #/A		

# Production Overview

- Variety: KY 14-L8
- Previous crop: Tobacco followed by annual rye cover crop plowed down in the spring. No manure history.
- Evesboro Loamy Sand, Excessively well drained
- Planted: May 19 on 38 inch wide rows with 22 inch in-row spacing
- First Cultivation: June 7
- Second Cultivation: June 26
- Third Cultivation: June 29
- Topped: July 20
- Cut: August 21
- Stripped: November 29
  
- Crop Protectants (all rates per acre):
  - Coragen at 7.5 ozs; Nuprid (imidacloprid) at 16 ozs, Orthene 97 at  $\frac{3}{4}$  lbs and 20-10-20 soluble grade fertilizer applied in 200 gallons per acre transplant setter water
  - Command herbicide applied at 2 pints May 27 post
  - Warrior at 3.5 ozs and Aliaas at 1.6 ozs applied on July 3 for hornworms and aphids
  - Quadris at 9 ozs applied July 4 for Target Spot and Frogeye Leaf Spot
  - 2 quart Flupro plus 2 gallons MH-30 applied July 20 for sucker control after topping

# Seasonal Rainfall/Irrigation





4	3	1	5	7	2	6	8
2	1	5	4	7	8	6	3
8	1	3	2	7	6	4	5
1	2	6	8	5	7	4	3

Randomized complete block design with four replications  
Each replication contained four rows 50 feet long  
Yield data taken from center rows



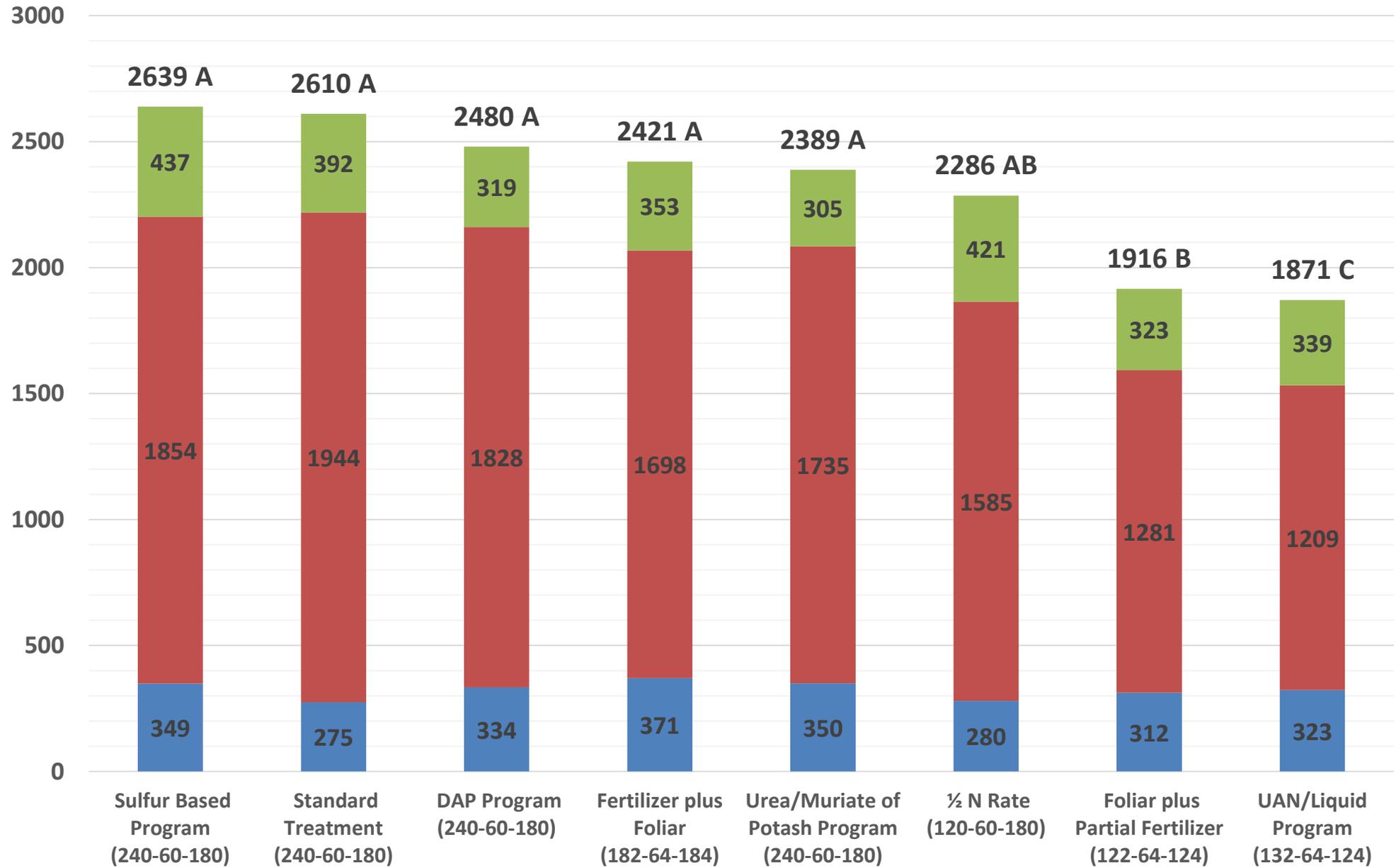




Note: Field edge herbicide injury, resulting in damage to two plots.



# Treatment Effect on Per Acre Yield



Treatments followed by different letters are significantly different at the .05 level.

■ C (cutter) ■ L (leaf) ■ T (tip)

# Quality/Grade Assessment

	Standard Program (240-60-180)	½ N Rate (120-60-180)	DAP Program (240-60-180)	Sulfur Based Program (240-60-180)	Urea/ Muriate of Potash Program (240-60-180)	UAN/Liquid Program (132-64-124)	Fertilizer plus Foliar (182-64-184)	Foliar plus Partial Fertilizer (122-64-124)
<b>C (lugs or cutter)</b>	2	2	2	2	4	2	2	2
<b>B (bright or leaf )</b>	1	2	1	2	2	3	2	3
<b>T (tip)</b>	1	2	2	2	2	3	1	2

Grading performed by Phillip Morris based upon the following scale:

- 1: Premium quality
- 2: Average quality
- 3: Fair quality
- 4: Poor quality

# Quality/Grade Assessment

	Standard Program (240-60-180)	½ N Rate (120-60-180)	DAP Program (240-60-180)	Sulfur Based Program (240-60-180)	Urea/ Muriate of Potash Program (240-60-180)	UAN/Liquid Program (132-64-124)	Fertilizer plus Foliar (182-64-184)	Foliar plus Partial Fertilizer (122-64-124)
<b>C (lugs or cutter)</b>	2	2	2	2	4	2	2	2
<b>B (bright or leaf )</b>	1	2	1	2	2	3	2	3
<b>T (tip)</b>	1	2	2	2	2	3	1	2

Grading performed by Phillip Morris based upon the following scale:

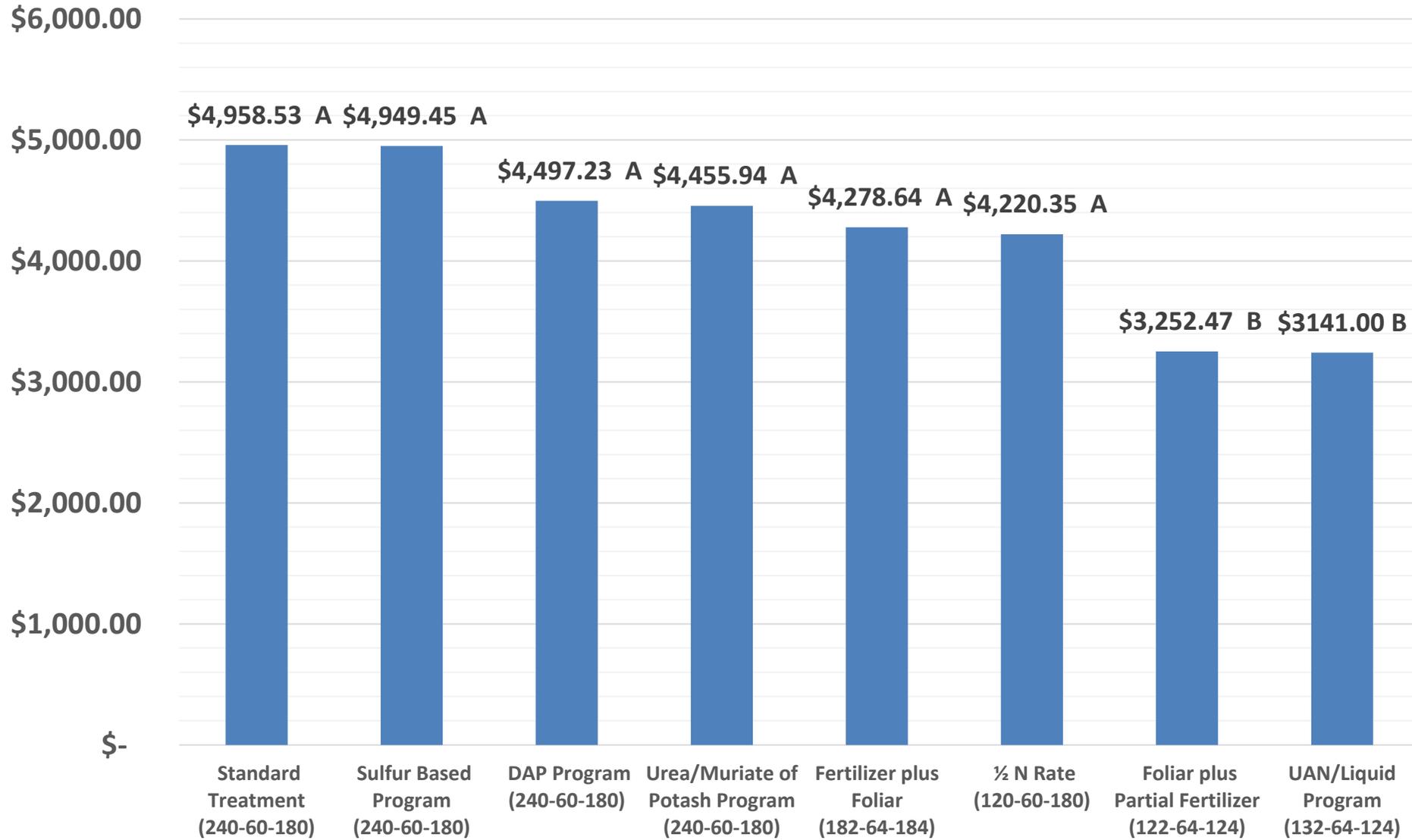
- 1: Premium quality
- 2: Average quality
- 3: Fair quality
- 4: Poor quality

## Treatment Effect on Gross Dollars per Acre



- Price per pound by grade based on farmer feedback and not representative of any one company

# Treatment Effect on Net Dollars per Acre (Gross-Fertilizer Cost)



Treatments followed by different letters are significantly different at the .05 level.

## **Special thanks:**

**Altria**

**Joe Stoltzfus-Farm Collaborator**

**UME Agronomy Action Team**

# Questions?

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