

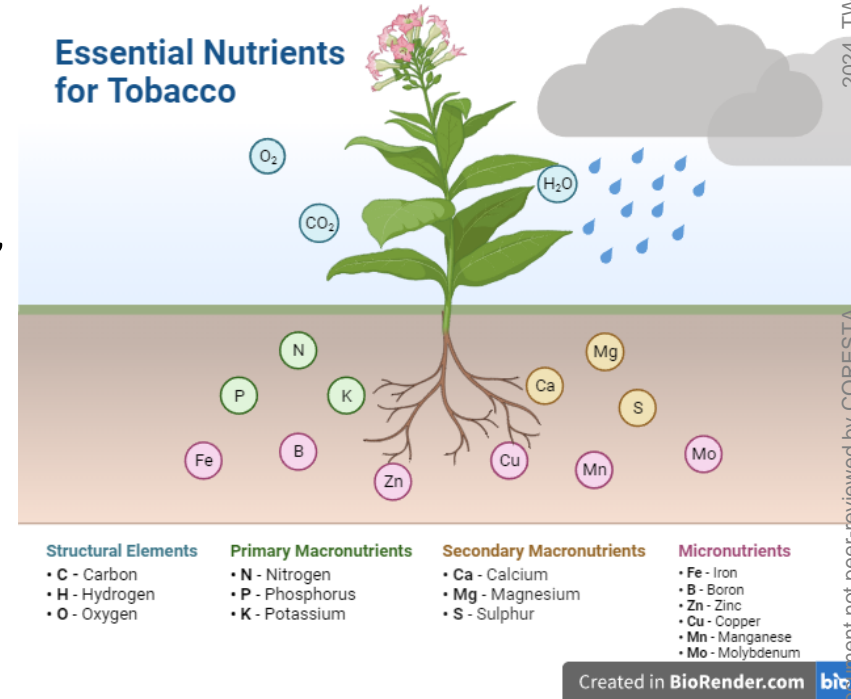


Potassium Source Influences Yield and TSNA of Burley and Dark Tobacco in Tennessee

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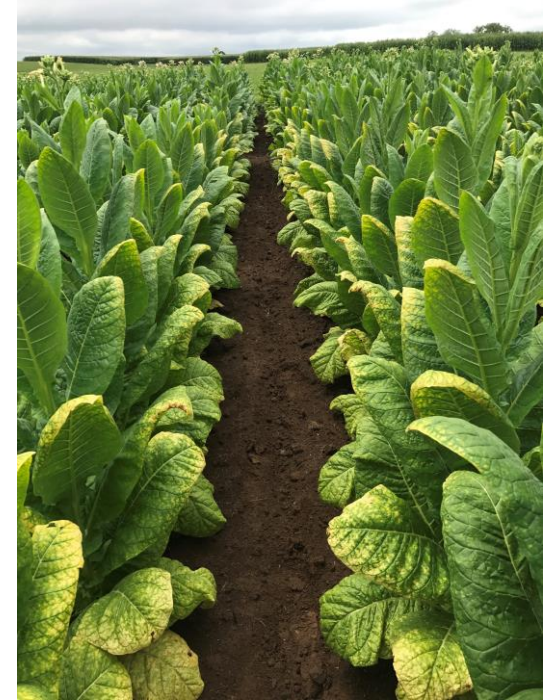
Potassium in Tobacco

- Potassium is one of the essential nutrient required by tobacco
- Tobacco is a luxury consumer of potassium, as it consumes this nutrient in excess of physiological needs of the plant
- Potassium is mobile and will translocate from mature to younger tissues
 - Deficiency symptoms often develop on lower parts of the plant



Potassium Fertilization

- There are two major sources available in the burley and dark tobacco belt of TN and KY:
 - Potassium Sulfate : 0-0-50 (K_2SO_4) : Sulfate of Potassium (SOP)
 - Potassium Chloride : 0-0-60 (KCl) : Muriate of Potassium (MOP)
- Potassium Chloride has been shown to detrimentally impact leaf quality when used in the Spring
 - Chloride (Cl) >1% in cured leaf:
 - Higher moisture content
 - Aroma and combustion issues
- Many producers apply KCl in the Fall due to lower price (30-50% cheaper)



Previous Work at University of Kentucky

- Andrea Webb (Keeney)
 - ~32% reduction in TSNA associated with application of MOP
 - ~84% increase in chloride in cured leaf with MOP application
- Pearce and Bailey
 - MOP increased chloride levels in leaf
 - MOP increased moisture content in cured leaf
 - MOP did not have a negative impact on leaf yield or visual leaf quality

Burley and Dark Tobacco Trials Established in 2022

- Randomized complete block design with 4 replications
- Experiments established on low potassium sites
- Burley variety KT204LC;
Dark variety KTD6LC
 - Burley trials continued in 2023
- Data collection:
 - Yield
 - Moisture
 - Chloride content
 - Quality Grade Index
 - Total TSNA

2022

pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
Soil pH	Buffer Value	P	K	Ca	Mg	Zn	Fe	Mn	B	Na
		Pounds per acre - Mehlich 1								
6.59	7.8	20 M	72 L	1834 S	84 S	1.3 S	11 S	12 S	0.5	10

2023

pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
Soil pH	Buffer Value	P	K	Ca	Mg	Zn	Fe	Mn	B	Na
		Pounds per acre - Mehlich 1								
6.27	7.69	22 M	42 L	2296 S	85 S	2 S	9 S	24 S	0.9	12

L = Low, M= Medium, H=High, V= Very High, S = Sufficient

TOBACCO (Burley and Dark)
Soil Test Recommendations for N, P₂O₅ and K₂O (Pounds per Acre)

Practice	Nitrogen	Phosphate (P ₂ O ₅)				Potash (K ₂ O)				Notes	
	Soil Test Levels*										
	(NT)	L	M	H	V	L	M	H	V		
1. Establishment	150-200	150	90	30	0	300	180	90	0	1,2,4,5	
2. Beds										3	

*NT = Not Tested L = Low M = Medium H = High V = Very High

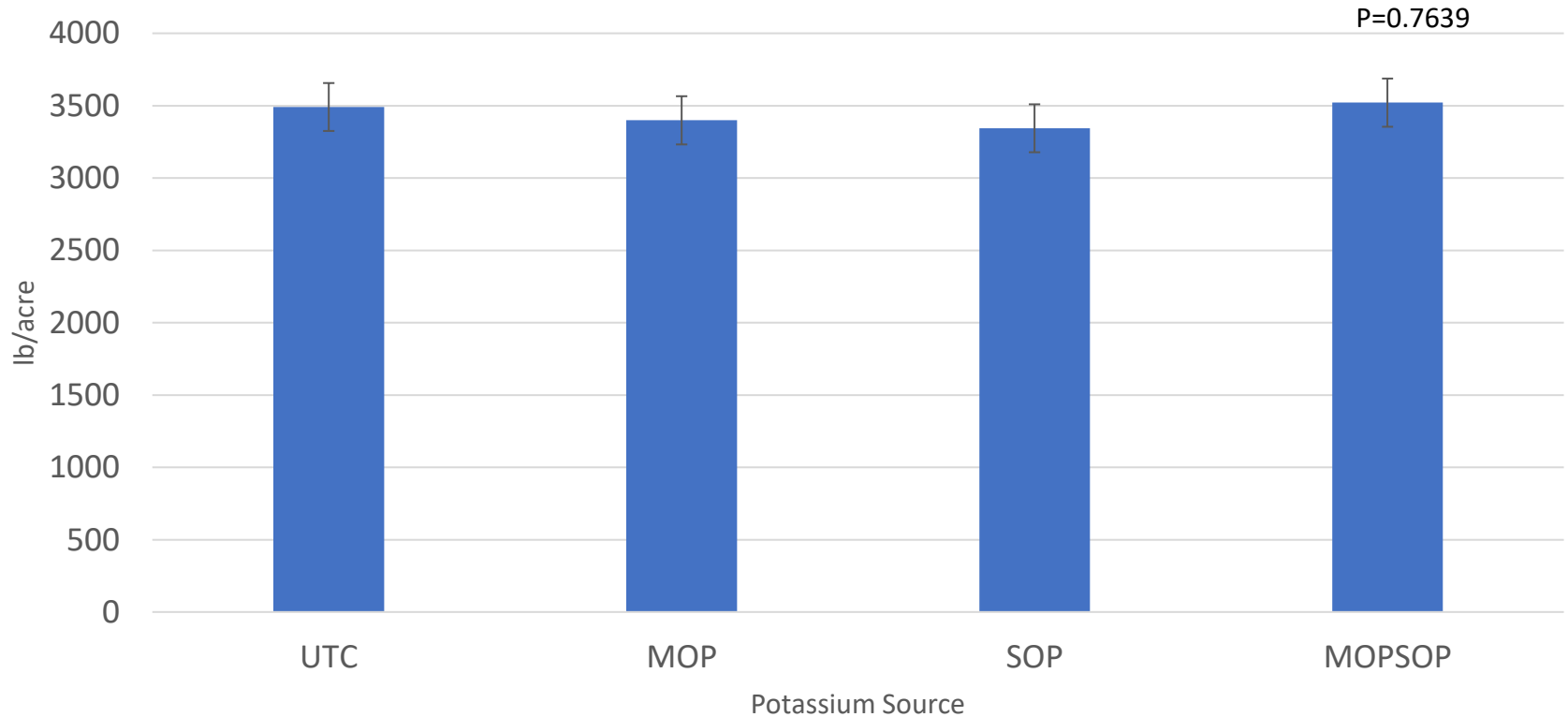
Notes: Lime recommendations from Lime Chart 2 for Burley and from Lime Chart 3 for Dark Tobacco fields. Use Lime Chart 5 for Burley and Lime Chart 6 for Dark Tobacco beds. Use Note 4 only as indicated.

Soil test called for 300 lbs K₂O

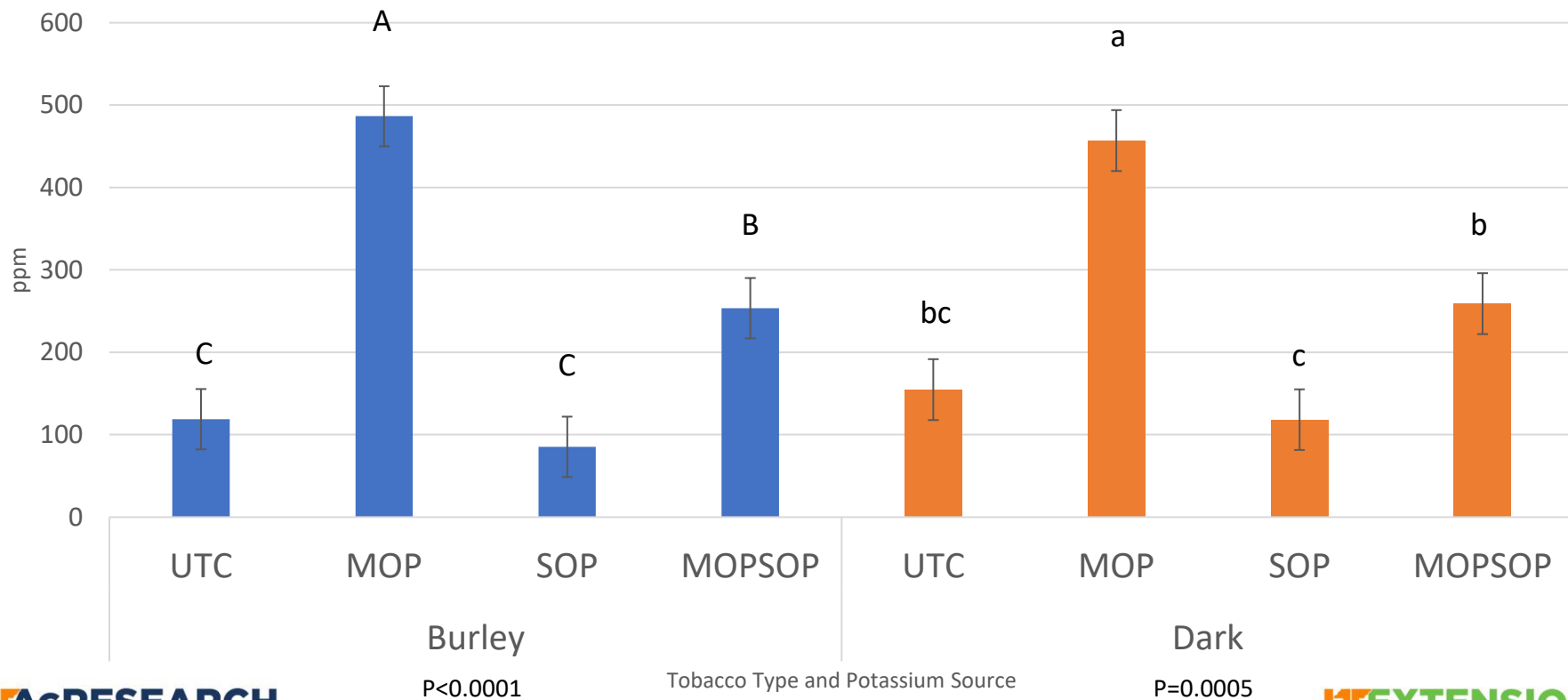
Treatments Applied

1. Untreated Control (**UTC**) – 0 lbs K₂O/acre
 2. Sulfate of Potash (**SOP**) - 300 lbs K₂O as 0-0-50 = 600 lbs SOP/acre
 3. Muriate of Potash (**MOP**) – 300 lbs K₂O as 0-0-60 = 500 lbs MOP/acre
 4. Muriate of Potash + Sulfate of Potash (**MOPSOP**)
 - 60 lbs of K₂O supplied as MOP (100 lbs MOP)
 - 240 lbs of K₂O supplied as SOP (480 lbs SOP)
- 2022 – burley and dark types; 2023 only used burley
 - All other practices followed Extension recommendations

Potassium Source Did Not Impact Dark Tobacco Yield in 2022



2022 Chloride Content in Dark and Burley Cured Leaf - Main Effect of Potassium Source

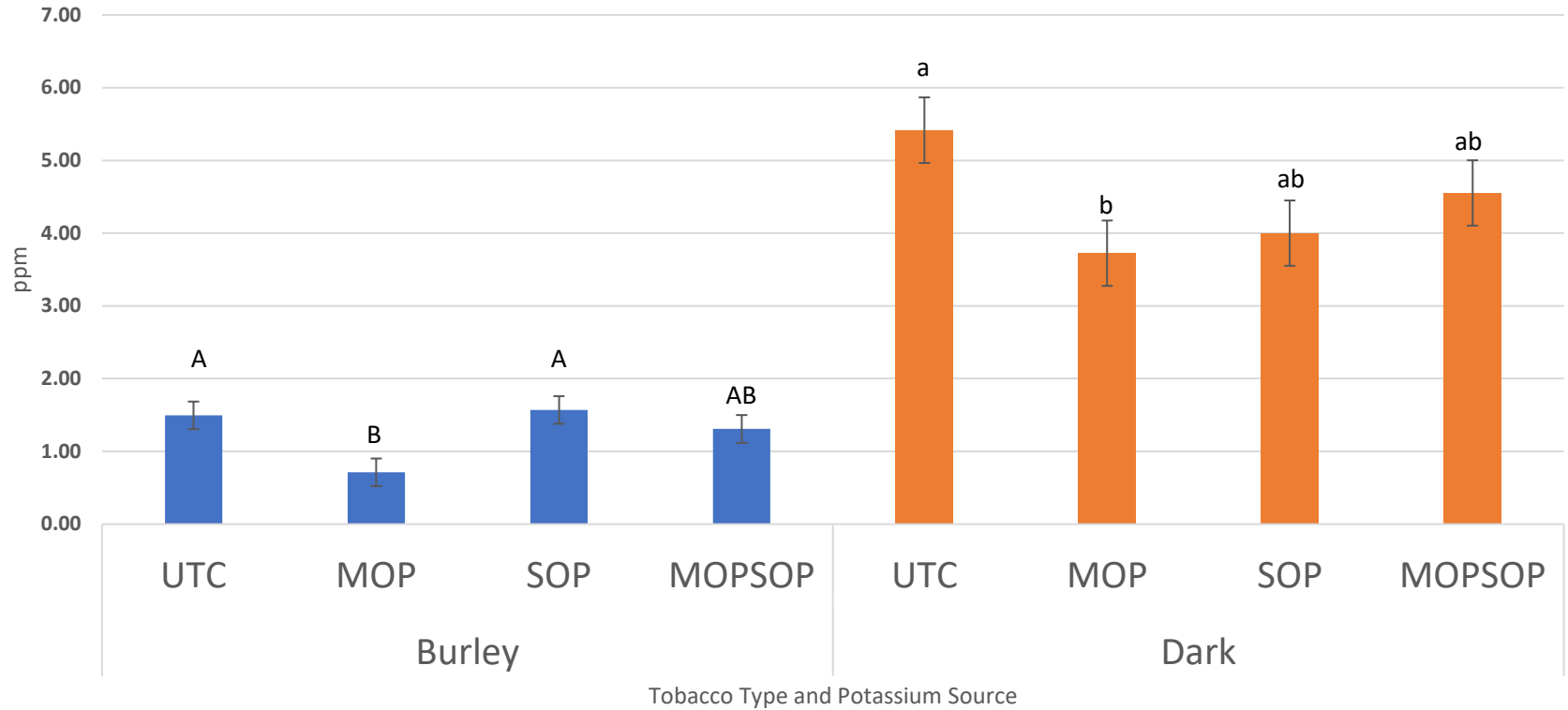


Burley
P<0.0001

Tobacco Type and Potassium Source

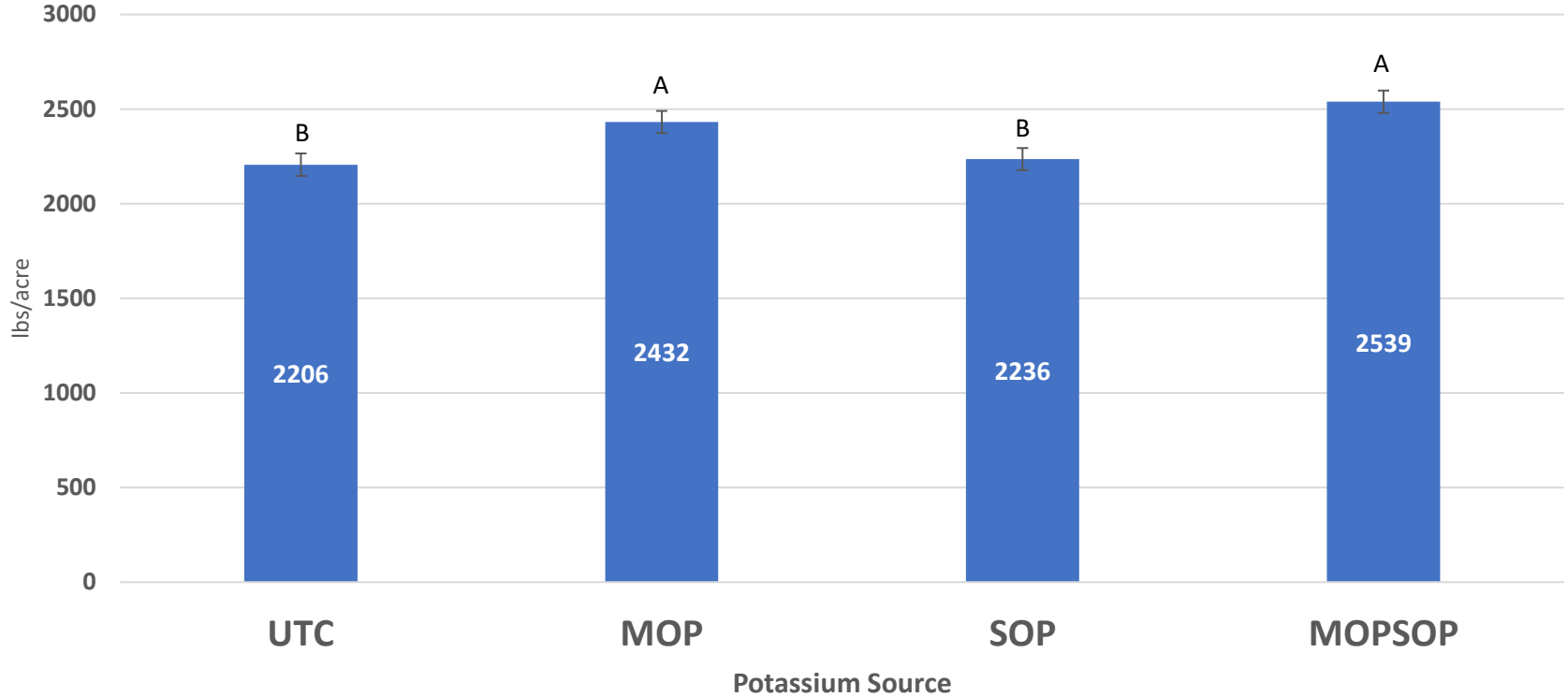
Dark
P=0.0005

Main Effect of Potassium Source on Total TSNA for Burley and Dark Tobacco in 2022

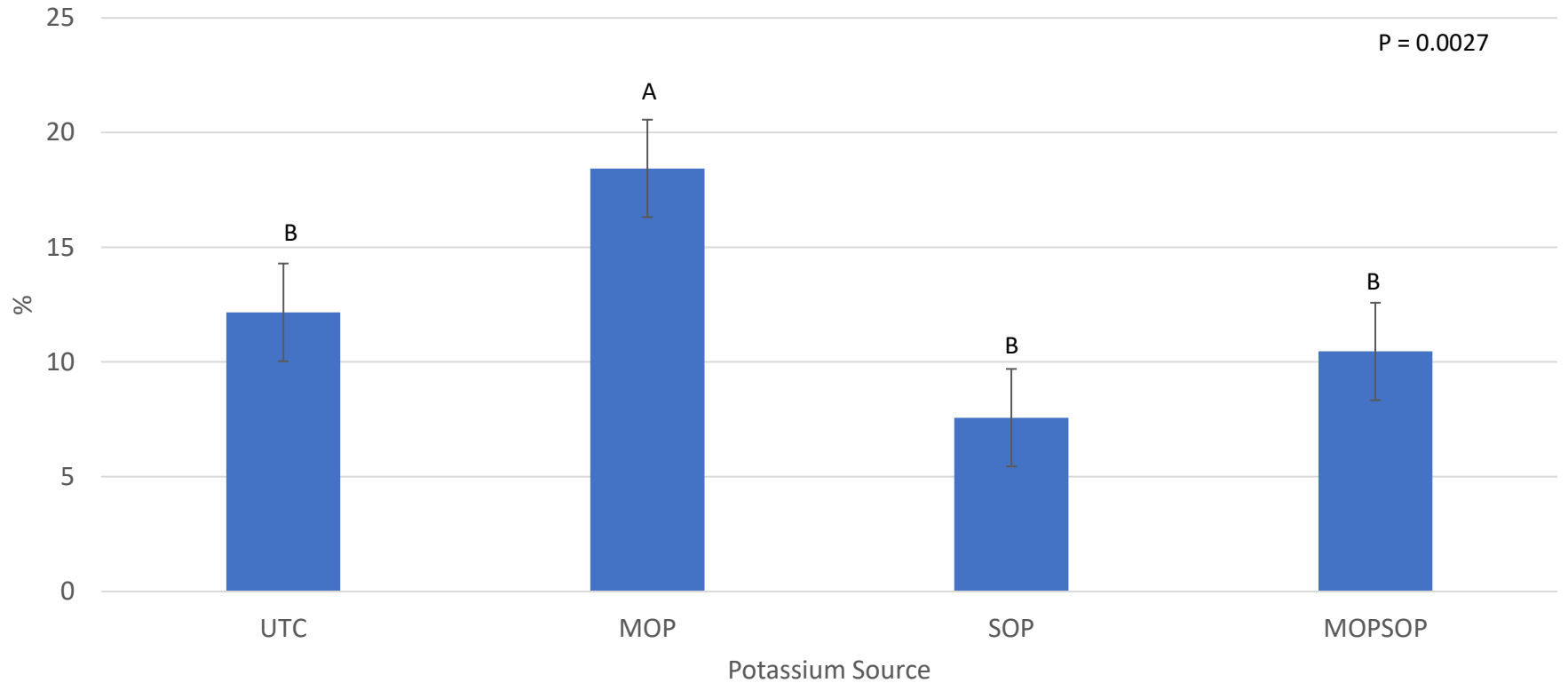


Impact of Potassium Source on Burley Tobacco Yield (2022 + 2023)

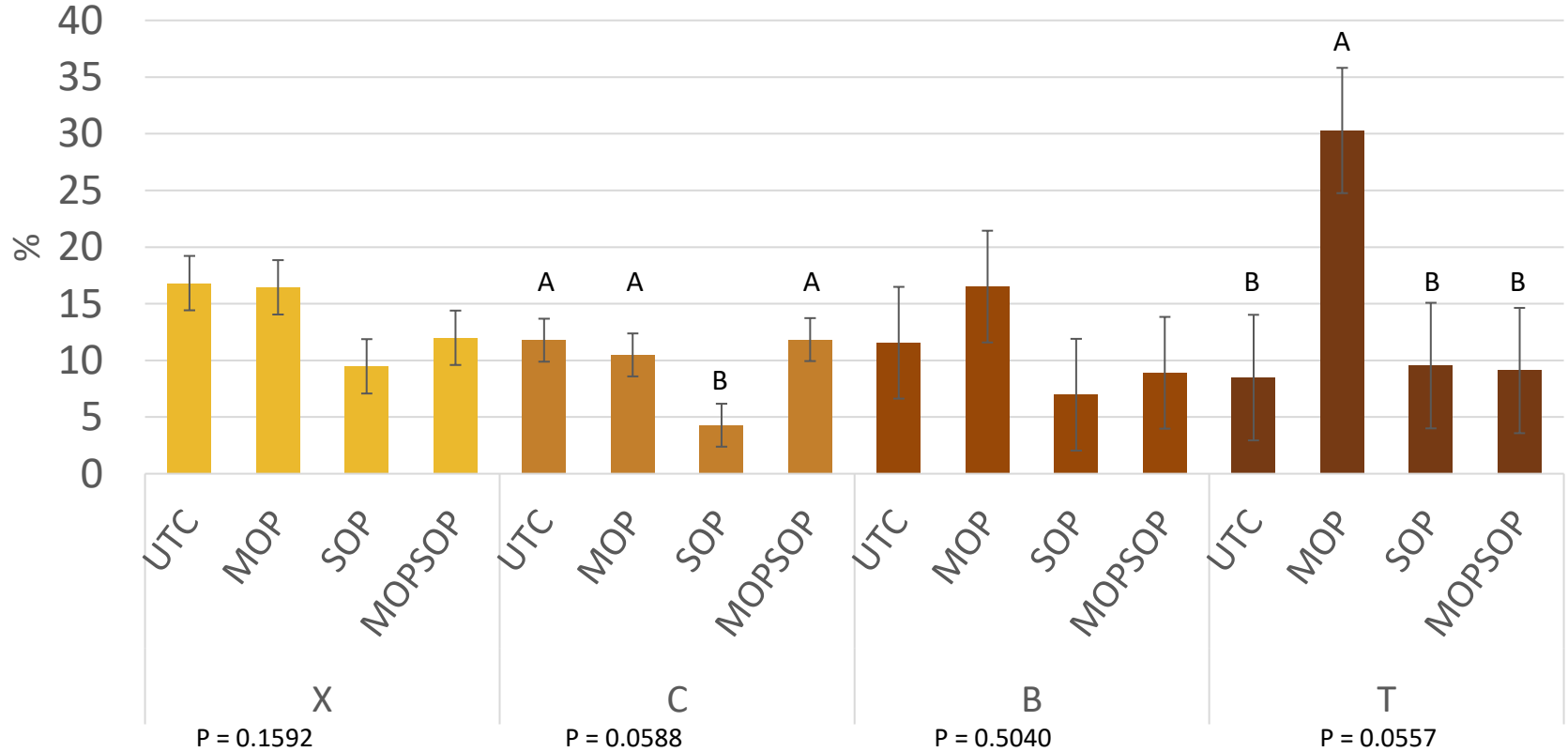
P = 0.0016



2023 Potassium Source Trial – Main Effect of Potassium Source on Burley Moisture Content



2023 Potassium Source Trial – Burley Cured Leaf Moisture Content



Conclusions

- Burley yielded higher when potassium fertilizer included MOP in 2022 and 2023
 - Experiment conducted on a low potassium site
- Dark tobacco did not have a yield response to potassium source in 2022
- In 2022, chloride content was higher in treatments with MOP
 - All samples were well below 1% chloride content
- Total TSNA in 2022 was significantly reduced with applications of MOP supplying 100% of recommended potassium
 - Dark tobacco responded differently than burley

Thank you for the support!



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**R.J. REYNOLDS
TOBACCO**