

Evaluation of Yield and Leaf Quality in Tobacco Varieties Screened and Unscreened for Low Conversion of Nicotine to Nornicotine

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Major Tobacco Types in TN



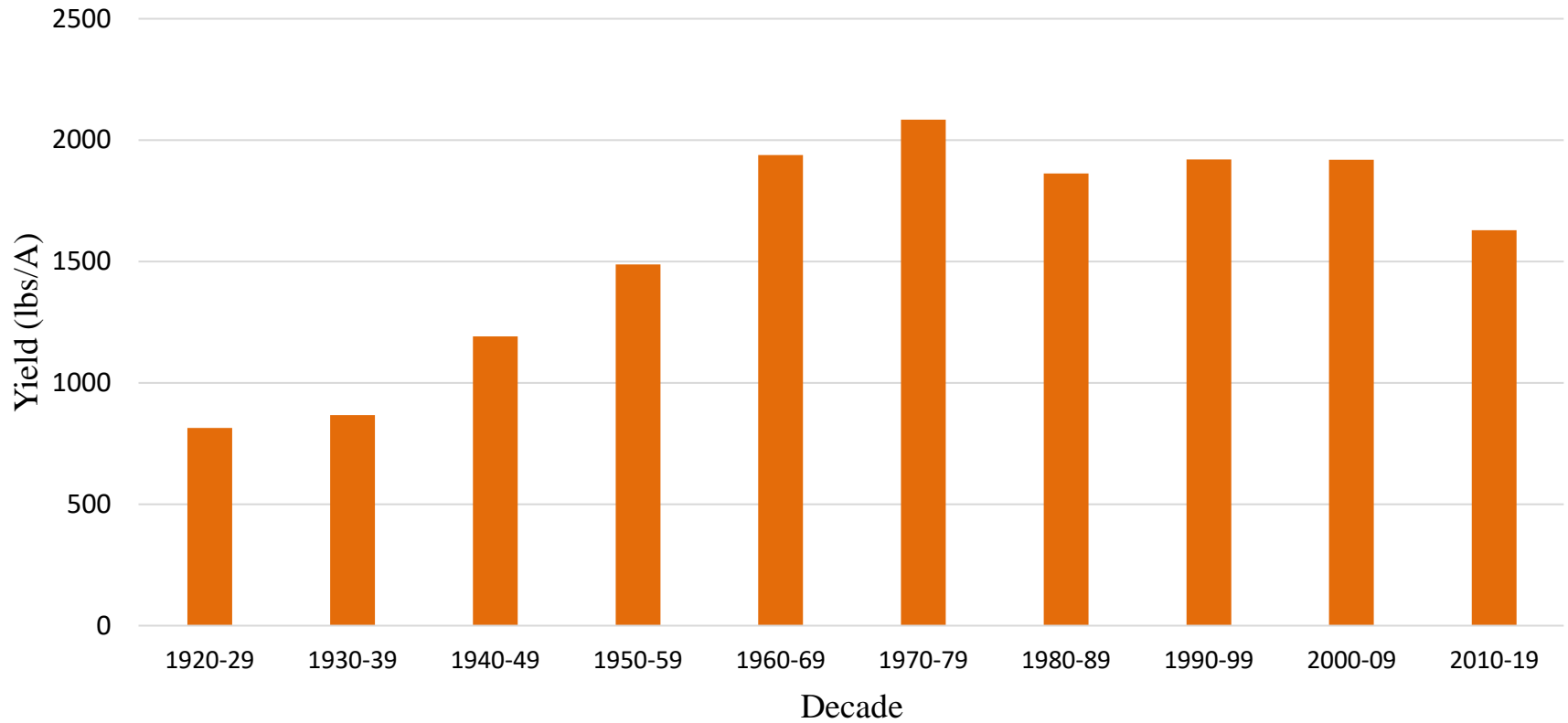
Burley Tobacco Production - 2022

	Tennessee	United States	Percentage
Acres Harvested	2,700	32,410	8%
Production (lbs)	4,185,000	58,607,000	7%
Production (\$)	\$9,081,000	\$129,467,000	7%

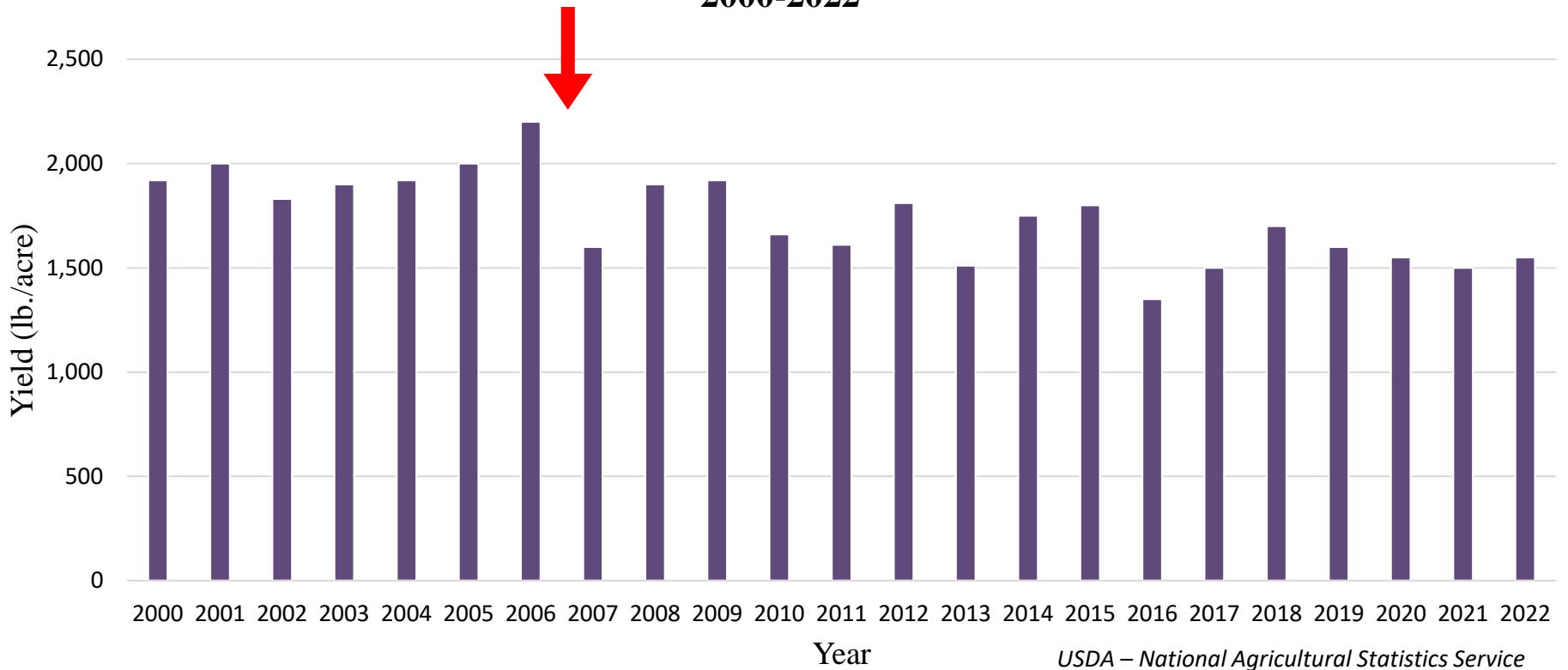
Dark Tobacco Production - 2022

	Tennessee	United States	Percentage
Acres Harvested	10,000	25,750	39%
Production (lbs)	29,780,000	76,350,000	39%
Production (\$)	\$82,995,000	\$212,041,000	39%

Burley Yield in TN: 10 Year Average by Decade USDA-NASS



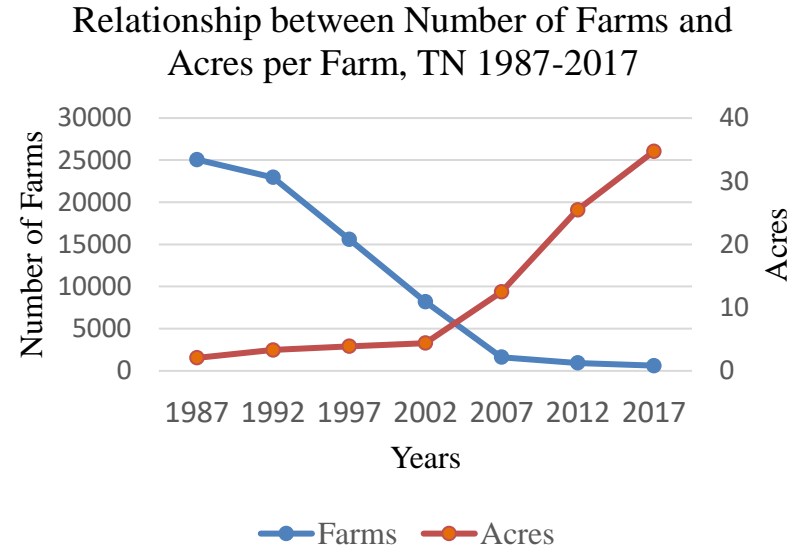
Burley Yield in Tennessee 2000-2022



USDA – National Agricultural Statistics Service

Potential Related Factors for Yield Drags?

- End of the Quota system/Government buyouts
 - Growers communicate directly to tobacco companies
- Low Converter (LC) Protocol
- Environment during growing season (*rainfall or temperatures*)
- Size of grower operations increase
 - Production Practices (*planting densities, crop rotation, disease*)



“In 1982, there were 4,100 growers in Greene County. Today, there are less than 10.”

– Dr. Bob Miller

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My Master's Project

Objective:

- Compare LC screened populations to unscreened populations for yield



What are Low Converter (LC) varieties?

- Tobacco Specific-Nitrosamines (TSNA)
 - Nitrogenous compounds
 - Formed from alkaloids in leaf and smoke
 - Produced during curing stages
 - Known to be carcinogenic
 - (NNN, NNK, NAT, NAB)
- Low Conversion
 - Genetically influenced
 - Screen and select for desirable characteristic
 - All modern/ public/ commercially varieties available today are screened

Why do we want LC?

- Reduces nornicotine (*TSNA precursor*)

Figure 1. NNN formation.

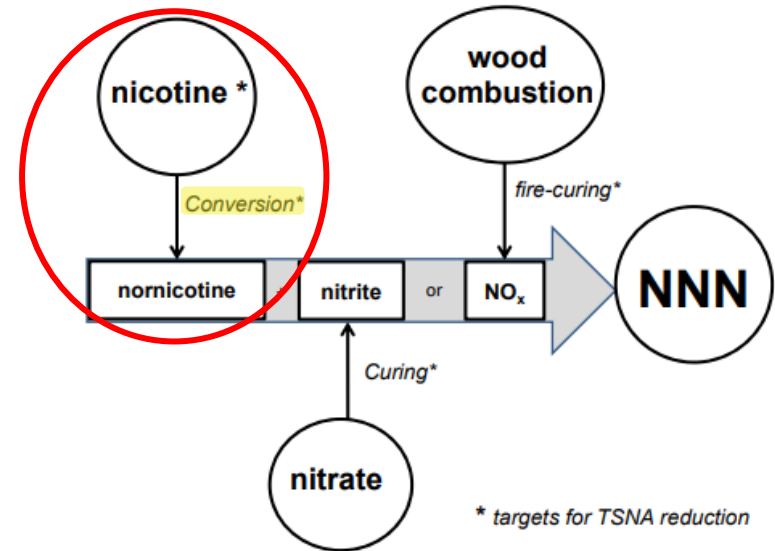


Figure 1: from '23-'24 Burley and Dark Tobacco Production Guide

Low Converter (LC) vs Un-Screened (Un)

- Varieties
 - Burley
 - TN86 (LC & Un)
 - TN90 (LC, Un, & HC*) HC* = High Conversion
 - KY14xL8 (LC & Un)
 - H403 (LC & Un)
 - Dark
 - NL Madole (LC & Un)
 - TND950 (LC & Un)
- Hypothesis
 - No yield influence from LC variation of variety



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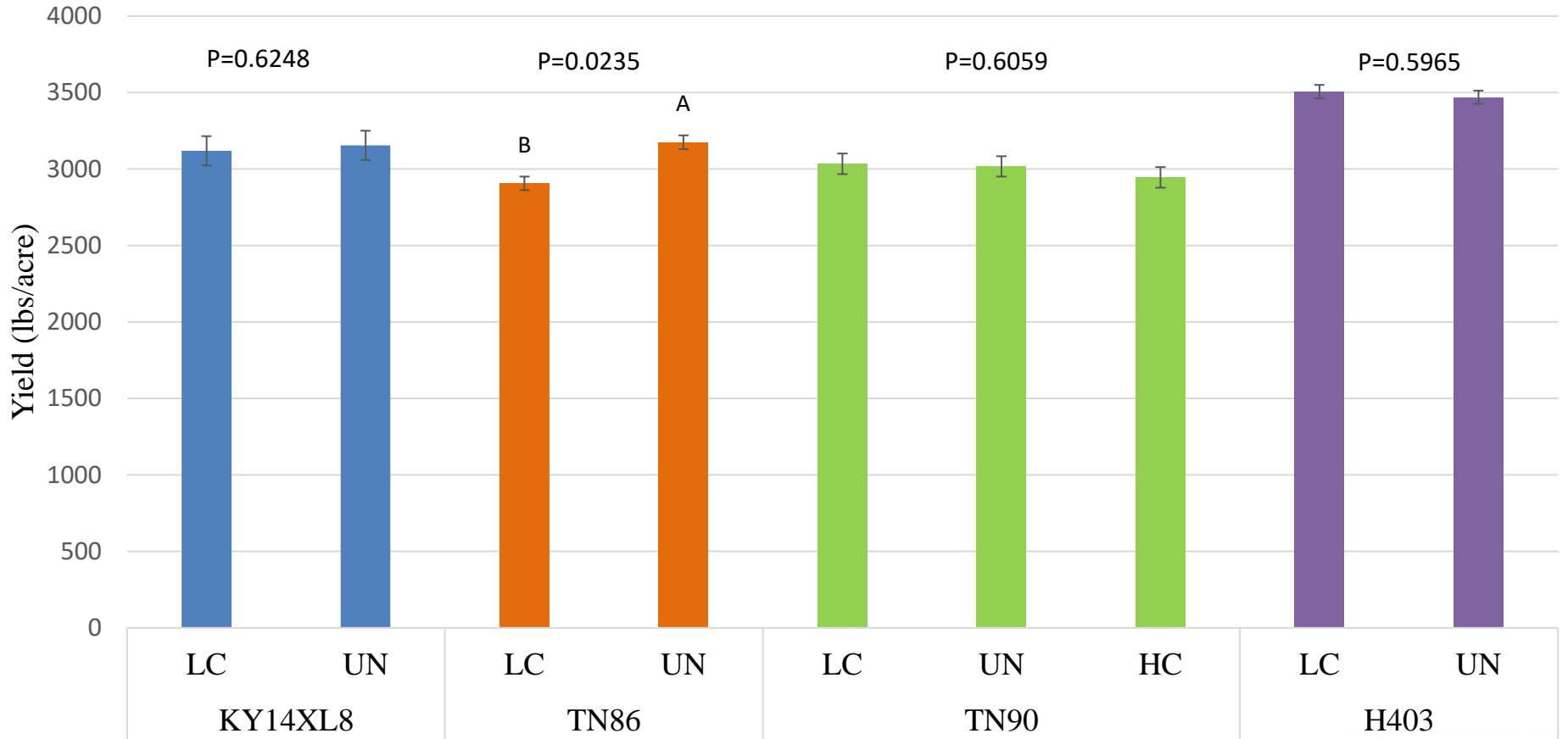


LC	Un	LC	Un	HC	LC	Un	LC	Un	LC	Un	LC	Un
TN 86		TN 90		KY14XL8		H403		NLMad		TND950		

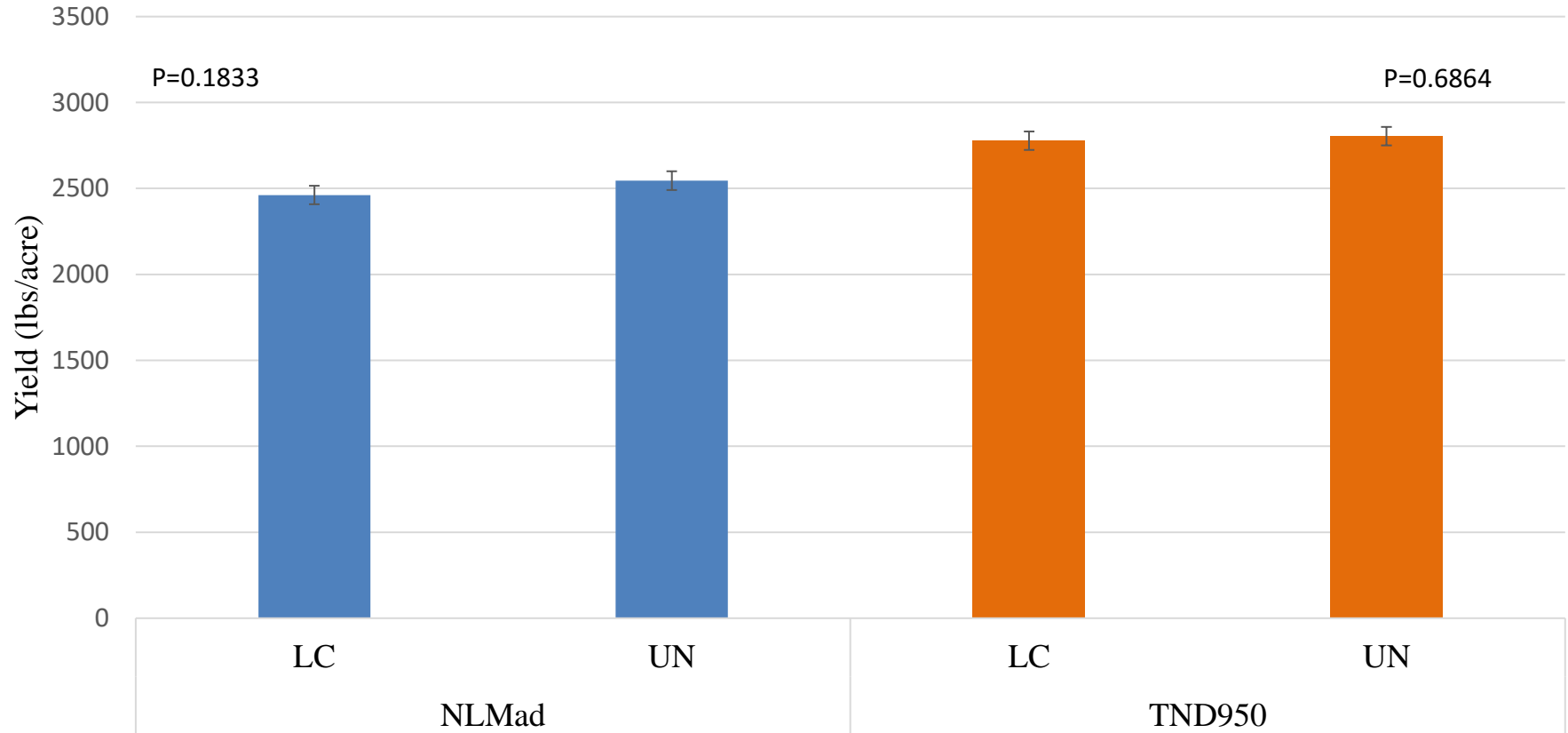




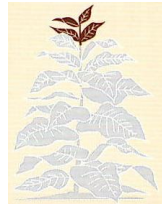
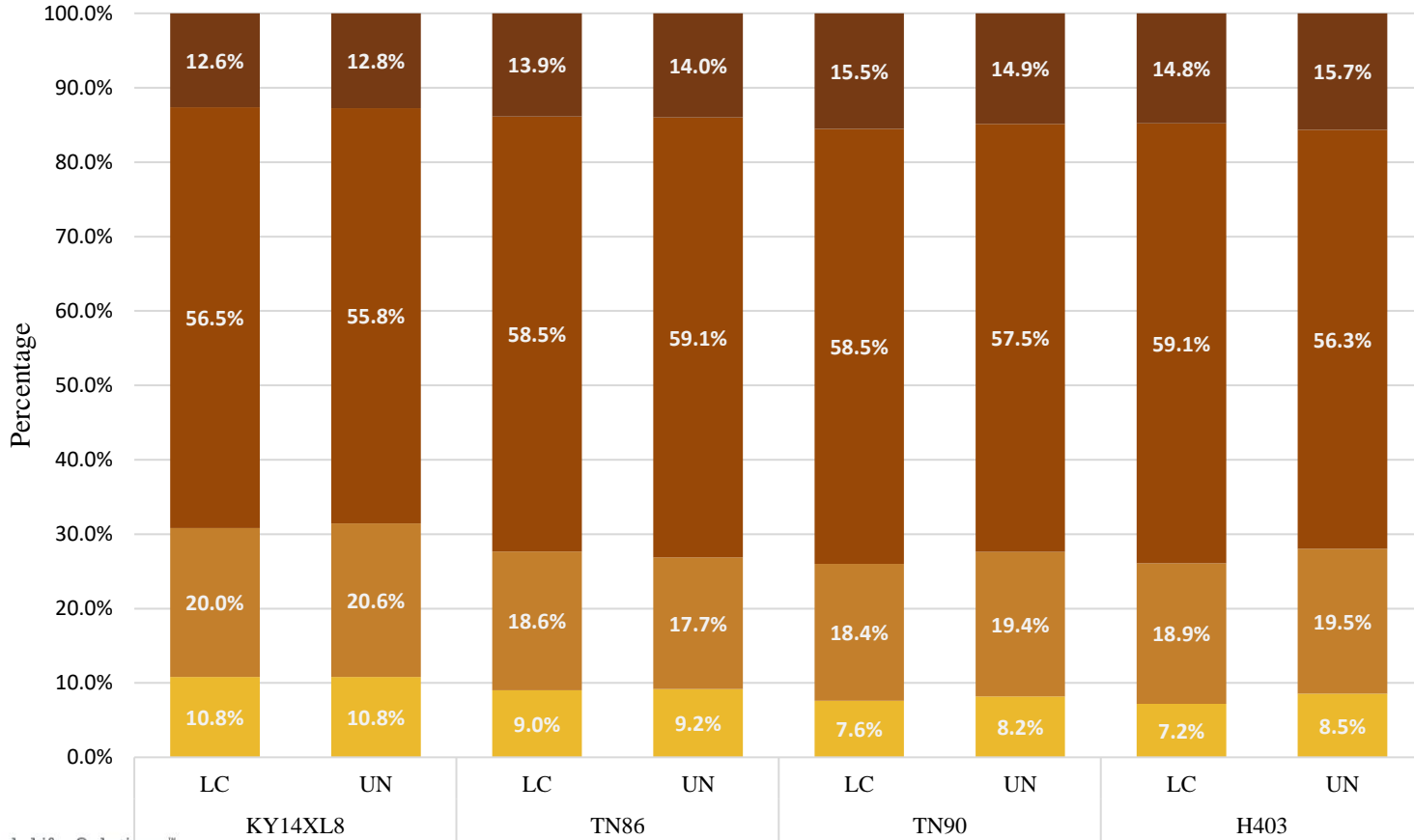
Burley Variety - LC vs Unscreened -2023



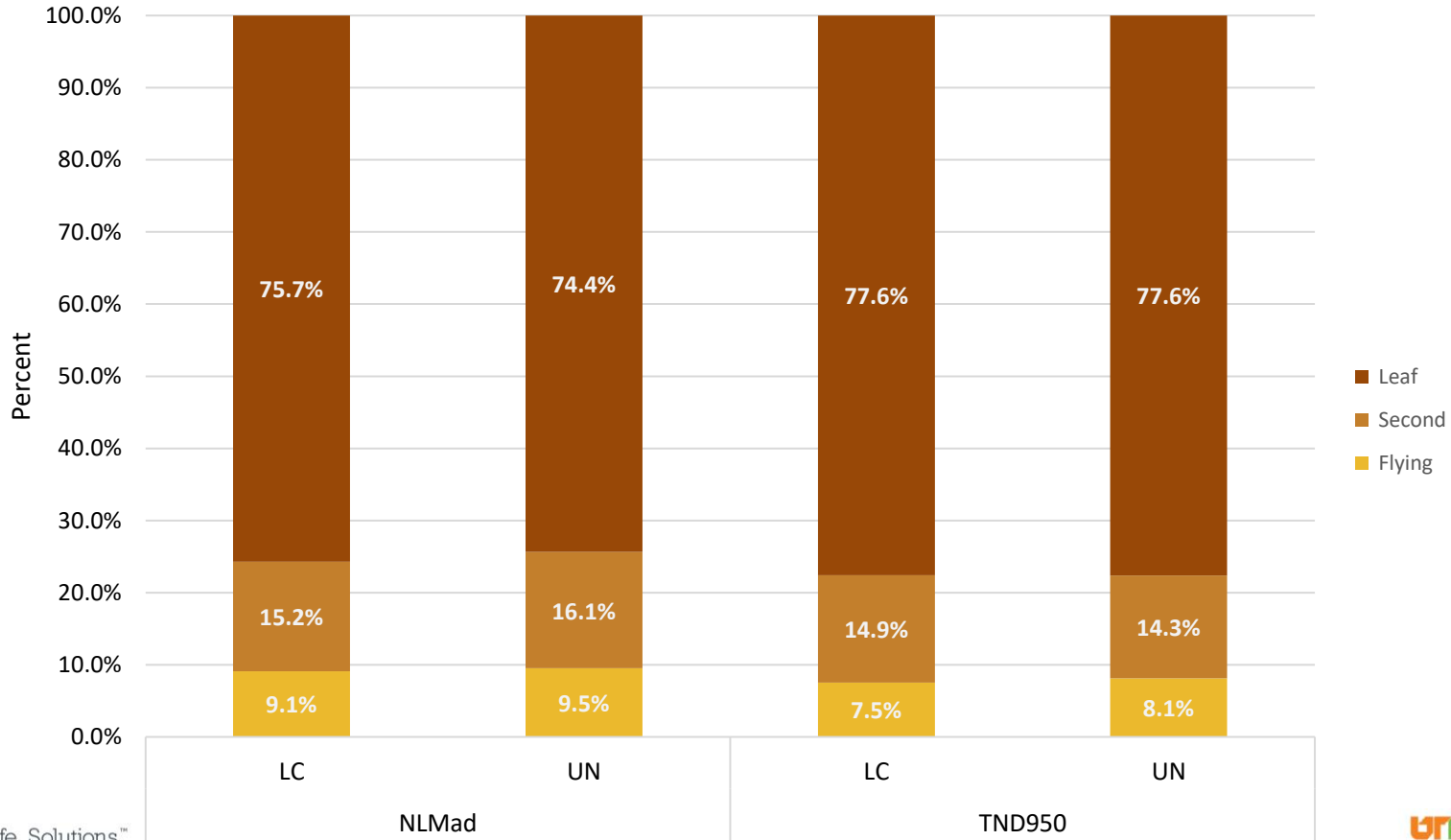
Dark Tobacco Variety - Unscreened vs. LC - 2023



Burley Tobacco Crop Throw - 2023



Dark Tobacco Crop Throw - 2023



LC vs Un Trial Summary

Preliminary Results

- 3 out of 4 Burley varieties showed no significant difference in average yield
 - *1 variety showed a significant difference where Un had a higher average yield (TN86)*
- 2 out of 2 Dark varieties showed no significant difference in average yield
- Chemistry and Quality data will be collected
- Additionally, more locations and modern KT burley varieties will be included in the 2024 growing season.

** Results discussed are preliminary and obtained from one year and one location. Trial will be replicated in the 2024 growing season.*

Acknowledgements



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UT Tobacco Agronomy Program

Thank you for your time!

