

CEREMONY MEDICINE TEA

PREPARED BY LOUTHOMANN

Introduction

Discuss:

Ceremonial Use

Medicinal Use

Stimulating Beverage

Grant Research

State of Yaupon Industry

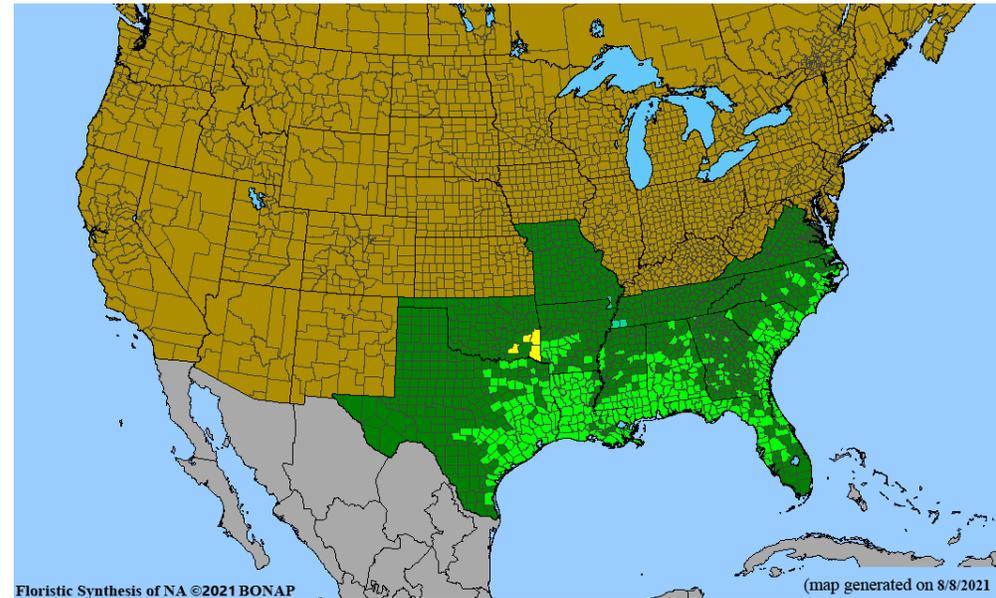
Legend of Yaupon

What is Yaupon?

Yaupon is a dioecious Holly Tree native to the southeastern US . Its leaves & twigs have been used for thousands of years in traditional medicine, native ceremonies and as a stimulating tea like beverage among the indigenous tribes of the southeast

Only Native source of Caffeine in N.A.

- **Pre-Columbian era**
 - Revered for Ceremonies, Medicine, Trade and Caffeinated Tea.
- **Colonial Era**
 - Cycles of popular use and suppression
- **21st Century**
 - Surging in popularity around the continent



Present in state

Present in county and native

The “Holly Trinity” of Caffeinated Ilex Hollies



- *Ilex Paraguariensis* - Yerba Mate from South America
 - *Ilex Guayusa* - Guayusa from South America
 - *Ilex Vomitoria* - Yaupon Holly from North America*
-
- All are Sacred and used in ceremonies
 - All are used in Traditional Medicine
 - All are used as stimulating beverage

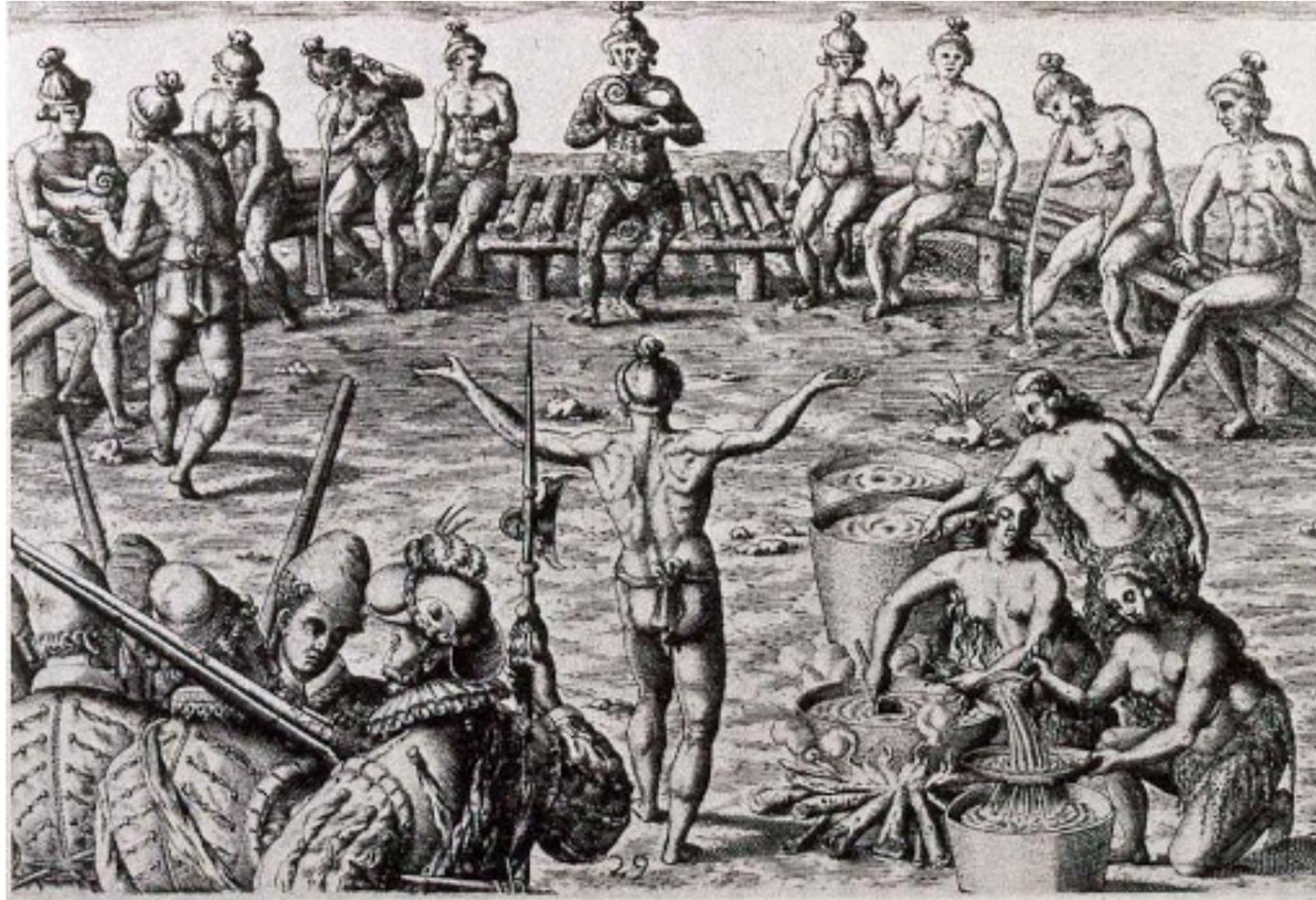
*Does not cause vomiting

The many names for Yaupon?

It was known by many names, varied by language (tribe) and application:

- Yaupon - Catawban word *yápa*, from *yá*- tree + *pá* leaf
- Cassina - Spanish derivation of Timicua word
- Assi-luputski - Muscogee (Creek) meaning The Purifier
- Black Drink - European name due to dark color of brew
- **White Drink – Derivative name due to both nature of friendship ceremonies and color of foam after frothing practice**
- The Beloved Tree - Cherokee tribe
- Big Medicine - Various tribes

I. CEREMONY



■ Black Drink

Important Events
Treaties
Battles
Sporting events

White Drink

Peace Ritual
Similar to Matcha



Engraved whelk shell cup (replica)
on display at the en:Wickliffe Mounds
site in en:Wickliffe, Kentucky. Source
Own work Author Herb
Roe, www.chromesun.com

II. Medicine

Called "Big Medicine"

Salve for treatment of wounds

Purified water (*Spiritually or Anti Bacterial*)

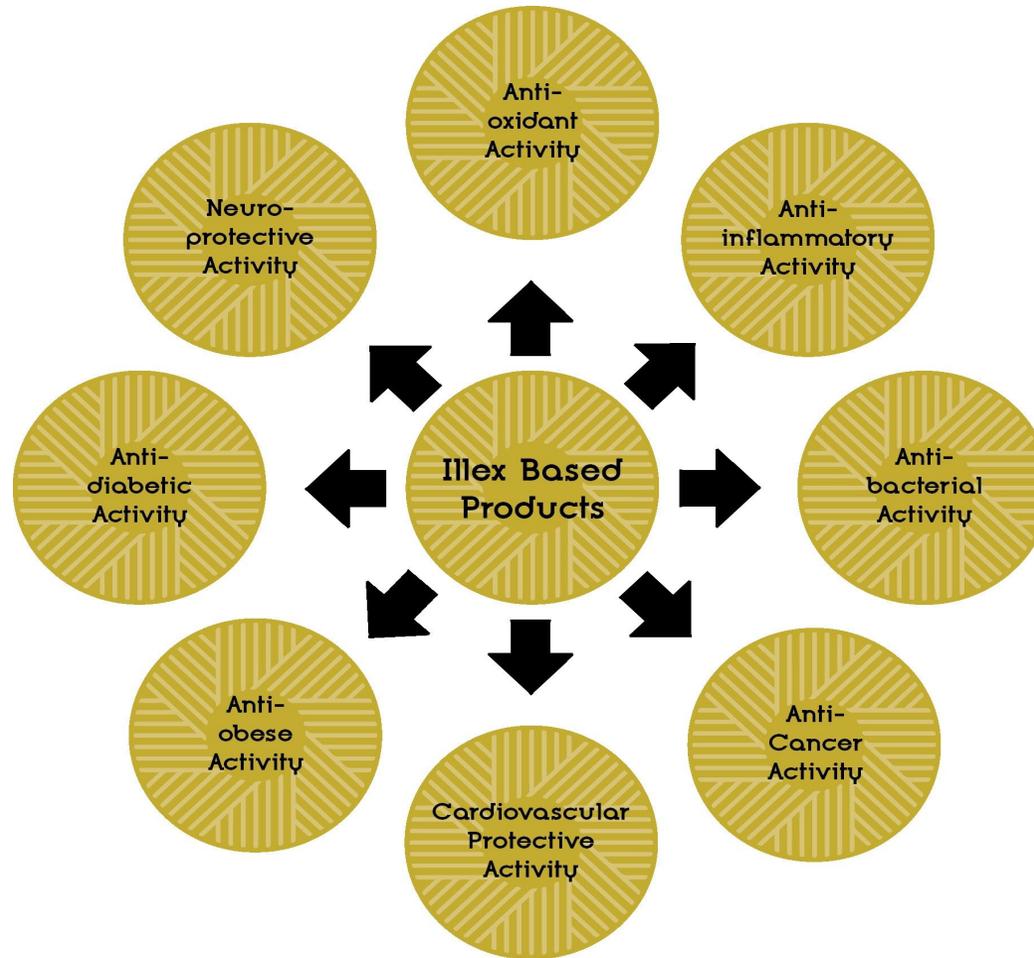
Medicine Men smoked it

Calmed nerves

Helped regulate women's menstrual cycles



Health benefits of Ilex Compounds



Health Benefits of Bioactive Compounds from the Genus *Ilex*, a Source of Traditional Caffeinated Beverage; Ren-You Gan †, Dan Zhang †, Min Wang and Harold Corke *. Department of Food Science & Technology, School of Agriculture and Biology, Shanghai Jiao Tong University, Shanghai 200240, China;



III. NATIVE TEA

DAILY RITUAL
COMMUNAL DRINK
FOSTERING DEEPER
FRIENDSHIPS
MEETING HOUSE GATHERINGS

Among Southern Tribes

- *Yaupon was ubiquitous among most of the southern tribes*
- *Preparation: Muddled to break the leaves then roasted over a fire in a earthen pot.*
- *Yaupon was traded to northern tribes and to the Mayans*

Muscogee (Creeks) (First person accounts of Seminole tribal member Ben Yahola)

- Spirit animal is the Wolf spirit. Was summoned to aid in the foraging of the good plants
- Harvested while facing East

Cherokees

- Transplanted for cultivation throughout territory
- Traded as far as modern Minnesota

Choctaw and smaller tribes throughout modern day Louisiana and Texas

- Traded for cacao, both containing caffeine and theobromine

Consumption at Cahokia Mounds

Story of Cahokia

Chemical analyses of organic residues in fragments of pottery from the large site of Cahokia and surrounding smaller sites in Illinois reveal theobromine, caffeine, and ursolic acid, biomarkers for species of *Ilex* (holly) used to prepare the ritually important Black Drink. As recorded during the historic period, men consumed Black Drink in portions of the American Southeast for ritual purification. This first demonstrated discovery of biomarkers for *Ilex* occurs in beaker vessels dating between A.D. 1050 and 1250 from Cahokia, located far north of the known range of the holly species used to prepare Black Drink during historic times. The association of *Ilex* and beaker vessels indicates a sustained ritual consumption of a caffeine-laced drink made from the leaves of plants grown in the southern United States.



Cahokia Mound
(Credit: Fotosearch/Getty Images)



European experience with Yaupon:

- The earliest settlers learned about yaupon from the Southeastern tribes.
- The early settlers compared it favorably to "Asian tea".
- Shipped back to Europe in muslin bags after gaining favor as a healthy stimulating beverage due to the health of the native population prior to disease.
- The Spanish Settlers called it "Chocolate de Indio"
- English settlers called it "Carolina Tea & "South Seas Tea"
- French called it "Appalachine" after the Apalachee Tribes.
- Agrarian North Carolina outer banks residents that grew and used yaupon were sometimes called "yaupon eaters" as a derogatory nickname

IV. GRANT RESEARCH

USDA-SBIR Grants – Phase I& II

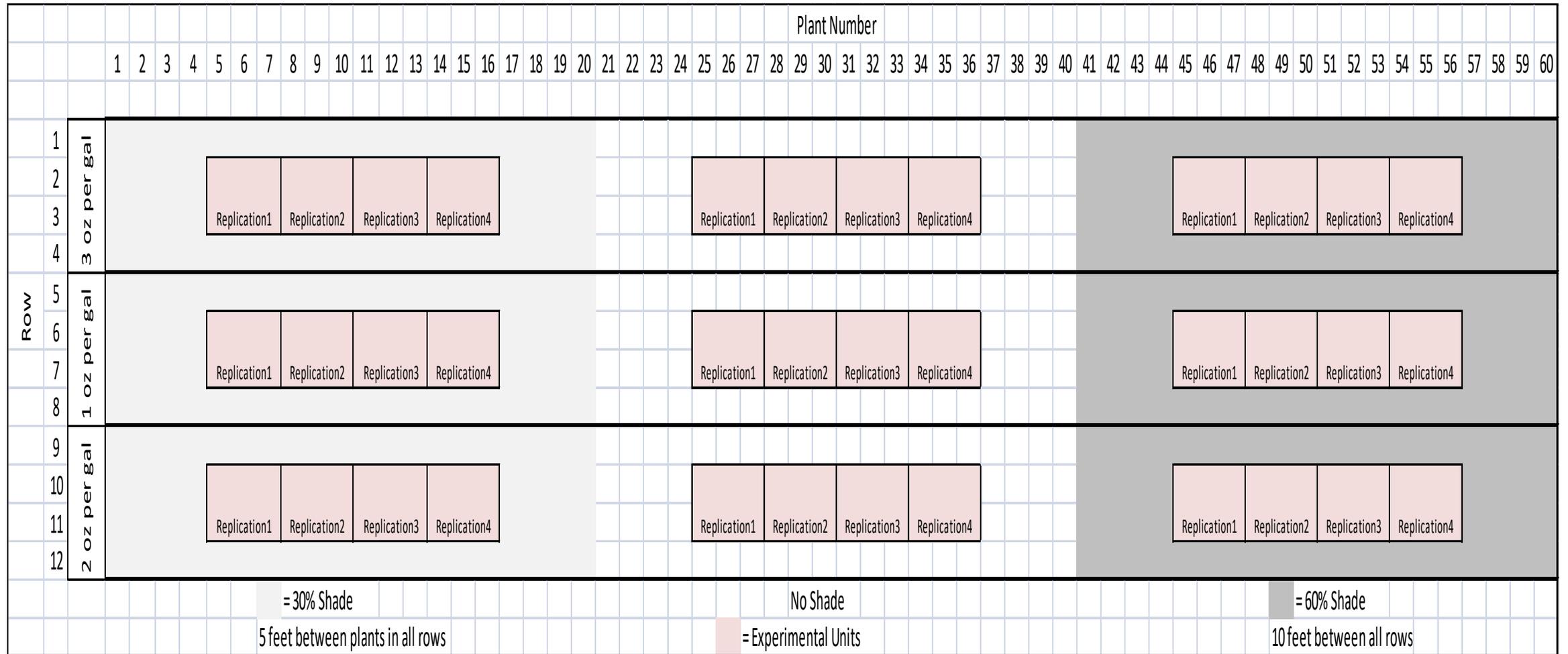
The feasibility of growing yaupon & phytochemical research:

Objectives

- Characterization of clonal plantings of Yaupon on the YWC pilot farm from a chemical, agronomic, and human taste perspective.
- Creating optimal production recommendations and finalize enterprise budget.
- Developing Good Agricultural Practices (GAPs) and design of specialized harvesting equipment for a new crop, Yaupon.
- Developing grower education materials and working with specialists to disseminate the material in both digital and hardcopy form.



Farm Research plan



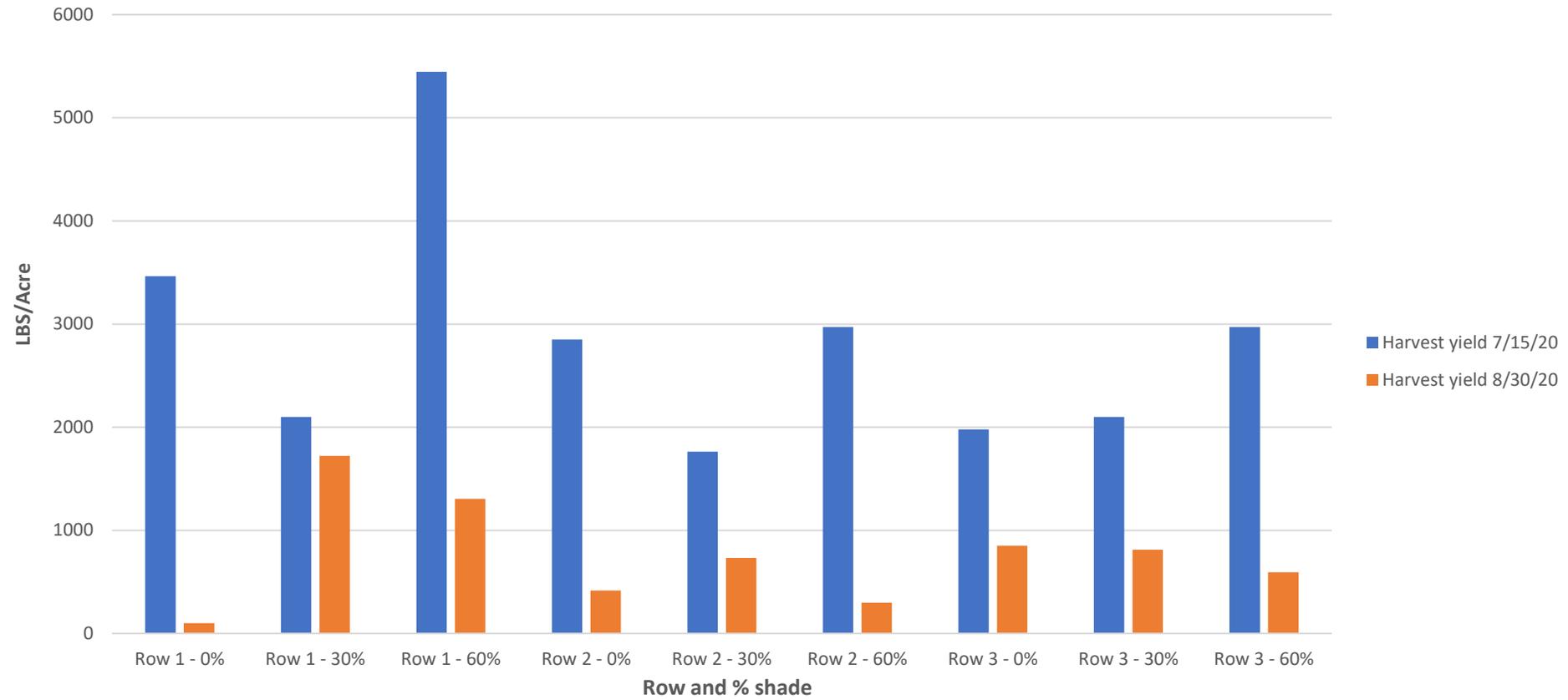


YAUPON HOLLY, MACHINE HARVEST						
ESTIMATED COSTS AND RETURNS PER ACRE						
10 FOOT ROWS, 2 FOOT SPACING: 2178 PLANTS/ACRE						
		UNIT	QUANTITY	PRICE OR COST/UNIT	TOTAL PER ACRE	YOUR FARM
1. GROSS RECEIPTS						
	YAUPON HOLLY, POUNDS (Dry)	LBS	600.00	\$12.00	\$7,200.00	
	TOTAL RECEIPTS:				\$7,200.00	\$0.00
2. VARIABLE COSTS						
	REPLACEMENT BUSHES	EACH	109	\$0.58	\$63.16	
	FERTILIZER (4%N Organic Fertilizer)	5 GAL	4.00	\$132.00	\$528.00	
	LIME (PRORATED)	TON	0.33	\$47.50	\$15.68	
	HERBICIDES & FUNGICIDES	ACRE	0.00	\$0.00	\$0.00	
	INSECTICIDES & NEMATOCIDES	ACRE	0.00	\$0.00	\$0.00	
	DRIP TAPE & ACCESSORIES	ACRE	1.00	\$150.00	\$150.00	
	PLASTIC MULCH - 60x400x1.25mil	ROLL	4.500	\$35.00	\$157.50	
	DRYING LABOR	HRS	2.00	\$15.00	\$30.00	
	GRINDING LABOR	HRS	1.00	\$15.00	\$15.00	
	HAULING & STORAGE	LBS	600.00	\$0.050	\$30.00	
	TRACTOR/MACHINERY	ACRE	1.00	\$553.12	\$553.12	
	HARVEST LABOR	HRS	8.00	\$15.00	\$120.00	
	ORGANIC CERTIFICATION	ACRE	1.00	\$125.00	\$125.00	
	INTEREST ON OP. CAP.	DOL.	\$893.73	5.5%	\$49.16	
	TOTAL VARIABLE COSTS:				\$1,836.62	\$0.00
3. INCOME ABOVE VARIABLE COSTS:					\$5,363.38	\$0.00
4. FIXED COSTS						
	TRACTOR/MACHINERY (SEE BELOW)	ACRE	1.00	\$20.52	\$20.52	
	SHADE CLOTH 30%	ACRE	0.05	\$8,276.00	\$413.80	
	SHADE CLOTH 60%	ACRE	0.05	\$11,325.00	\$566.25	
	ESTABLISHMENT - PLANTS	ACRE	2178	\$0.06	\$126.32	
	ESTABLISHMENT - PLANTING	ACRE	0.10	\$5,000.00	500.00	
	TOTAL FIXED COSTS:				\$1,626.89	\$0.00
5. OTHER COSTS						
	LAND RENT	ACRE	1.00	\$75.00	\$75.00	
	GENERAL OVERHEAD (calculated)	DOL.	\$1,836.62	7.0%	\$128.56	
	TOTAL OTHER COSTS:				\$203.56	\$0.00
6. TOTAL COSTS:					\$3,667.07	\$0.00
7. NET RETURNS TO RISK AND MANAGEMENT:					\$3,532.93	\$0.00
BREAK-EVEN YIELD						
	VARIABLE COSTS	153	LBS	BREAK-EVEN PRICE	VARIABLE COSTS	\$3.06
	TOTAL COSTS	306	LBS	TOTAL COSTS	TOTAL COSTS	\$6.11
PER ACRE MACHINERY AND LABOR REQUIREMENTS FOR MACHINE HARVEST YAUPON TEA						
MONTH	OPERATION	TIMES OVER	LABOR HOURS	MACHINE HOURS	VARIABLE COST/AC	FIXED COST/AC
5,6,7,8	HARVEST - TRIMMING (2 Trimmers)	8.00		8.00	\$20.00	\$0.40
5,6,7,8	HARVEST - VACUUM HARVEST	4.00		4.00	\$155.00	\$2.52
All Year	MAINTENANCE	1.00		2.00	\$62.00	\$4.00
5,6,7,8	PROCESSING: TUMBLE AND SEPARATE	4.00		12.00	\$90.00	\$6.24
5,6,7,8	PROCESSING: DRYER	4.00		4.00	\$64.12	\$2.56
5,6,7,8	PROCESSING: GRINDING	4.00		12.00	\$162.00	\$4.80
PER ACRE TOTALS FOR SELECTED OPERATIONS				42.00	\$ 553.12	\$ 20.52

Clemson University Cooperative Extension Service offers its programs to people of all ages, regardless of race, color, gender, religion, national origin, disability, political beliefs, sexual orientation, gender identity, marital or family status and is an equal opportunity employer.

FARM ENTERPRISE BUDGET

Harvest yield



Field Harvest
Year round
harvest

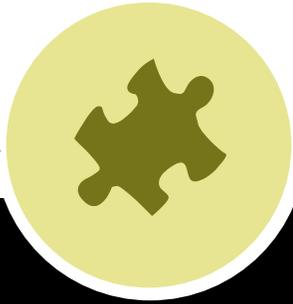
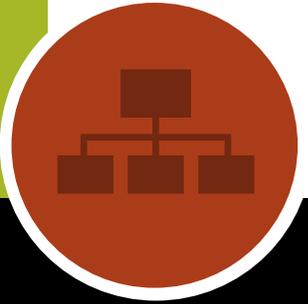
Leaf Removal
Proprietary
system for leaf
removal

Roasting/Dry
Proprietary
time & temp
roasting

Cut & Sift
Custom cut &
sift sizing

Packaging
Bulk Packaging

Products
Shipped for
Product making



When scaling, group all elements to be scaled. Scale as needed. Use the "Increase Font Size," "Decrease Font Size" buttons or manually change the font size for the editable text. Delete unwanted elements. Change the line weight of the circles or connecting bars as needed.

V. CHEMISTRY OF YAUPON

USDA SBIR PHASE I & II

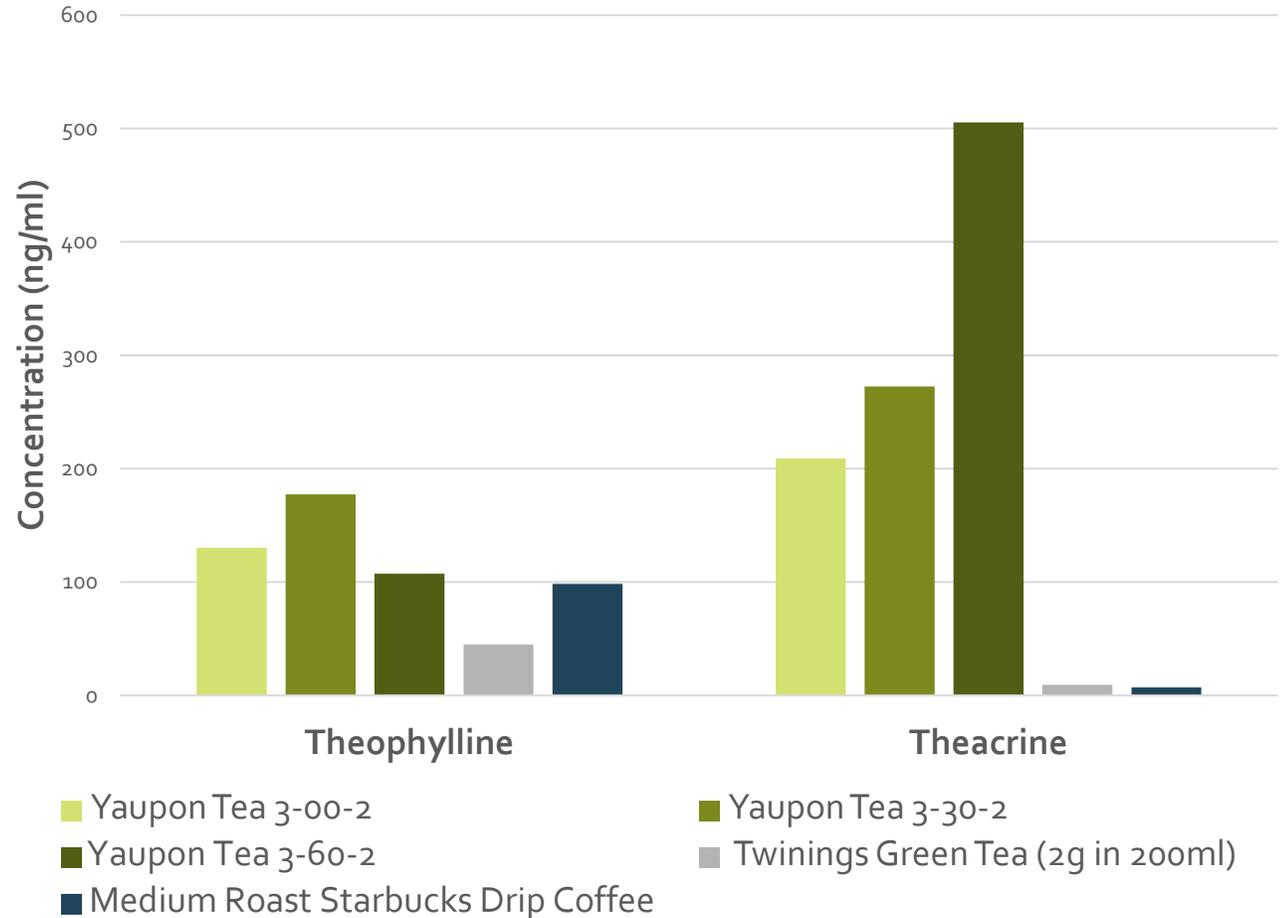
Quantitative analysis of theanine, theophylline, and theacrine

Table 1. Concentration (ng/ml) of theanine, theophylline, and theacrine in yaupon tea, green tea, and coffee beverages.

Sample	Concentration (ppb)		
	Theanine	Theophylline	Theacrine
Yaupon Tea 3-00-2	NA	130.18	209.02
Yaupon Tea 3-30-2	NA	177.39	272.51
Yaupon Tea 3-60-2	NA	107.39	505.39
Twinings Green Tea (5.85 mg/ml)	22791	37.17	6.31
Twinings Green Tea (2g in 200ml)	35108	44.83	9.33
Medium Roast Starbucks Drip Coffee	NA	98.44	7.23

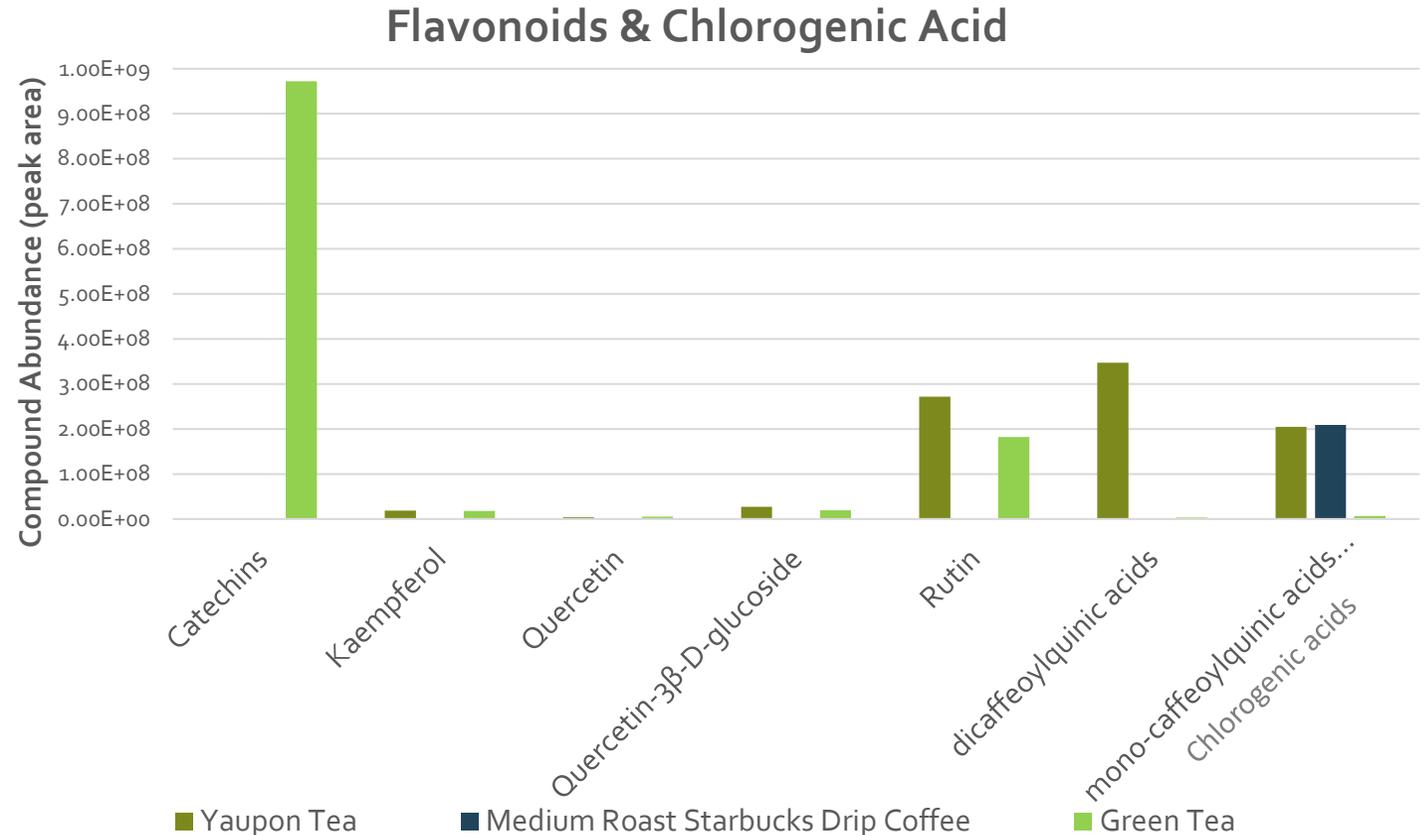
- Theanine** was found in green tea beverage only, at a concentration of 35 ug/ml in a standard cup (prepared by steeping 2 g dried tea in 200 ml 80C water for 2 minutes)
- The highest concentration of **theophylline**, 0.177 ug/ml, was detected in the yaupon tea beverage (yaupon 3-30-2)
- Theacrine** was most abundant in yaupon tea when compared to coffee and green tea beverages, the highest concentration of theacrine was detected in yaupon tea (yaupon 3-60-2).

Theophylline & Theacrine



Non-targeted analysis for flavonoids & chlorogenic acids

- **Dicaffeoylquinic acid** was uniquely abundant in yaupon tea, which was at least 100 times higher than that of the green tea and coffee.
- The content of **mono-caffeoylquinic acid (chlorogenic acid)** in yaupon tea was similar to that of coffee, which was ~30 times higher than that of green tea.
- **Flavonoids** like **kaempferol**, **quercetin**, **quercetin glucoside** and **rutin** were detected in yaupon tea at abundances similar to that of green tea, which was at least 10 times more abundant than that of coffee.
- The flavonoid **catechin** was detected in yaupon tea at an abundance similar to that of coffee, both of which were ~1,000 times lower than the catechin content in green tea. **Epicatechin** was found to be more abundant in yaupon tea than coffee and green tea, but comparatively lower than the catechin content.



Conclusion: Yaupon is unique due to the abundance of **dicaffeoylquinic acid**; yaupon is similar to coffee due to the similar abundance of **chlorogenic acids**; yaupon is similar to green tea due to the similar abundance of **flavonoids**.

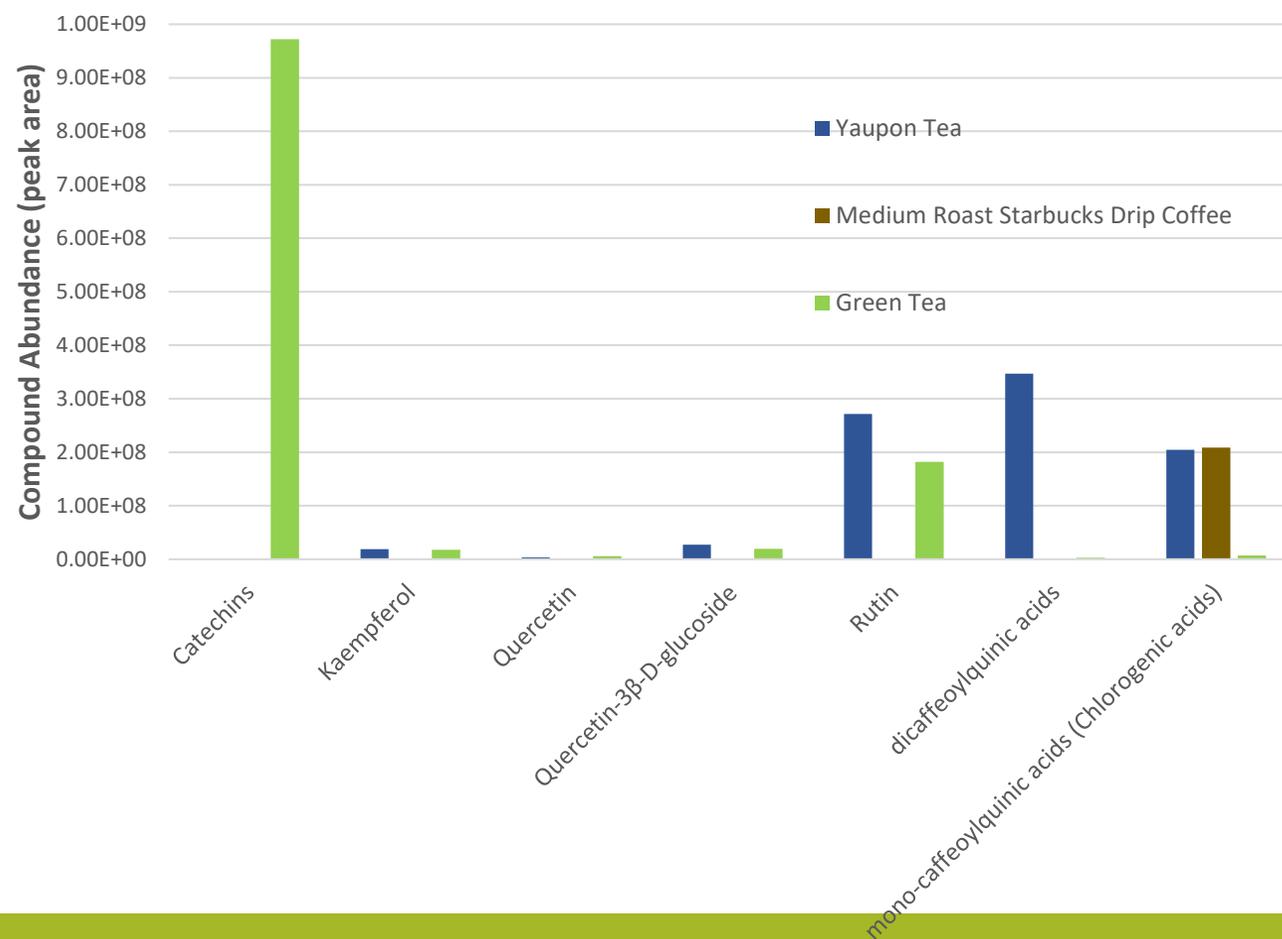
Important Notes:

- Compounds reported as tentative IDs & require additional verification. Compound list is not complete for each compound class.
- The data collected for the non-targeted analysis of flavonoids and chlorogenic acids is not normalized by weight for green tea and coffee. Starbucks medium roast drip coffee sampled directly from Starbucks café in the Ingles grocery store in Clemson, SC.

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Medium Roast Starbucks Drip Coffee	NA	98.44	7.23

Table 1. Theanine, theophylline, and theacrine concentrations in yaupon (three different lots), commercial green tea, and Starbuck drip coffee.

Flavonoids & Chlorogenic Acid



Non-targeted analysis for flavonoids & chlorogenic acid: Supplementary data

- Table 2. Abundance of flavonoids and caffeoylquinic acids in yaupon teas, coffee, and green tea.

Name	Abundance (peak area)					
	Yaupon 3-00-2	Yaupon 3-30-2	Yaupon 3-60-2	Yaupon Tea Average	Coffee	Twinings Green Tea
Catechins	1.82E+06	6.80E+05	1.11E+05	8.72E+05	6.64E+05	9.72E+08
Kaempferol	1.71E+07	2.34E+07	1.55E+07	1.87E+07	2.45E+05	1.79E+07
Quercetin	6.21E+06	2.12E+06	2.74E+06	3.69E+06	1.22E+05	5.56E+06
Quercetin-3β-D-glucoside	4.11E+07	3.12E+07	9.98E+06	2.74E+07	2.07E+05	1.95E+07
Rutin	4.02E+08	3.05E+08	1.08E+08	2.71E+08	3.53E+05	1.82E+08
dicaffeoylquinic acids	4.25E+08	3.53E+08	2.63E+08	3.47E+08	7.37E+05	2.89E+06
mono-caffeoylquinic acids (Chlorogenic acid)	2.79E+08	2.25E+08	1.09E+08	2.05E+08	2.09E+08	6.72E+06

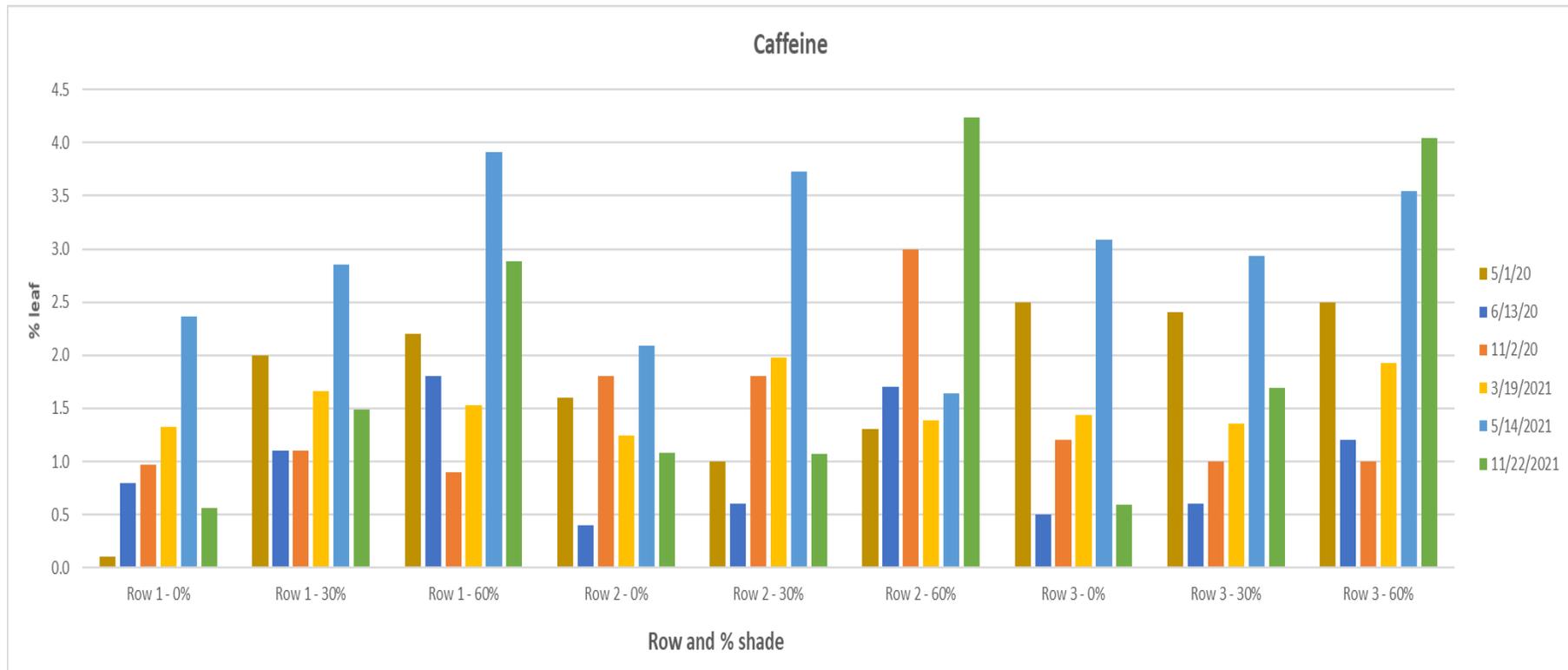
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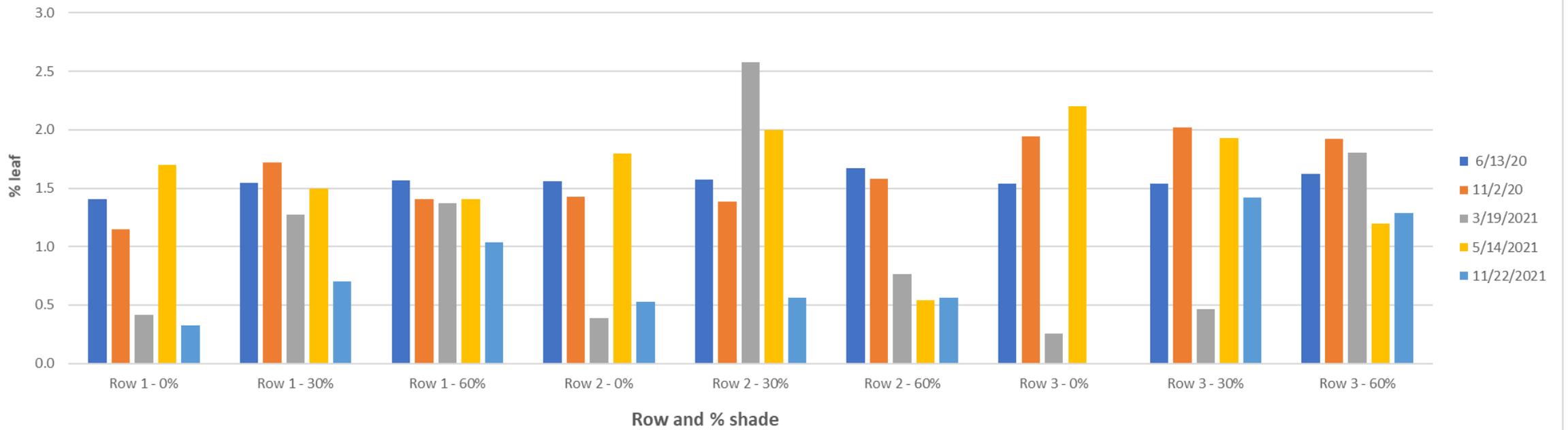
**CAFFEINE
CONTENTS IN WILD
HARVESTED
YAUPON LEAVES
IN FLORIDA AND
TEXAS.**

No	Harvesting region	Harvesting month	Caffeine (mg/g)
1	Texas	February 2020	1.86
2	Texas	March 2020	2.35
3	Florida-1	March 2020	0.58
4	Florida-1	April 2020	2.12
5	Florida-2	March 2020	N/D*
6	Florida-2	April 2020	2.36
7	Florida-3	March 2020	0.024
8	Florida-3	April 2020	2.87

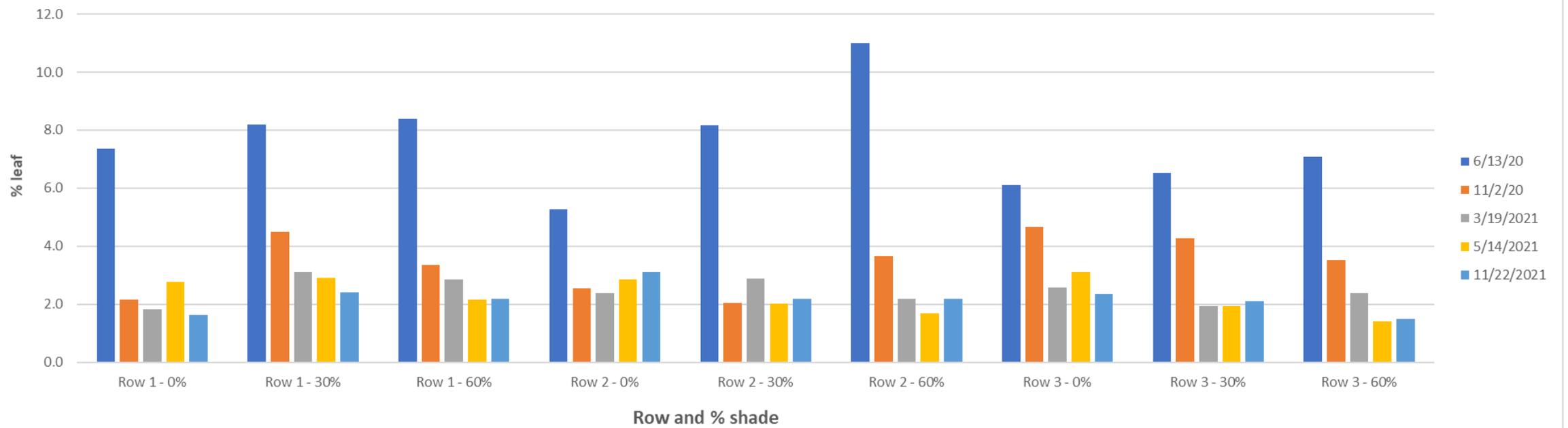
Caffeine 0, 30, 60% Shade



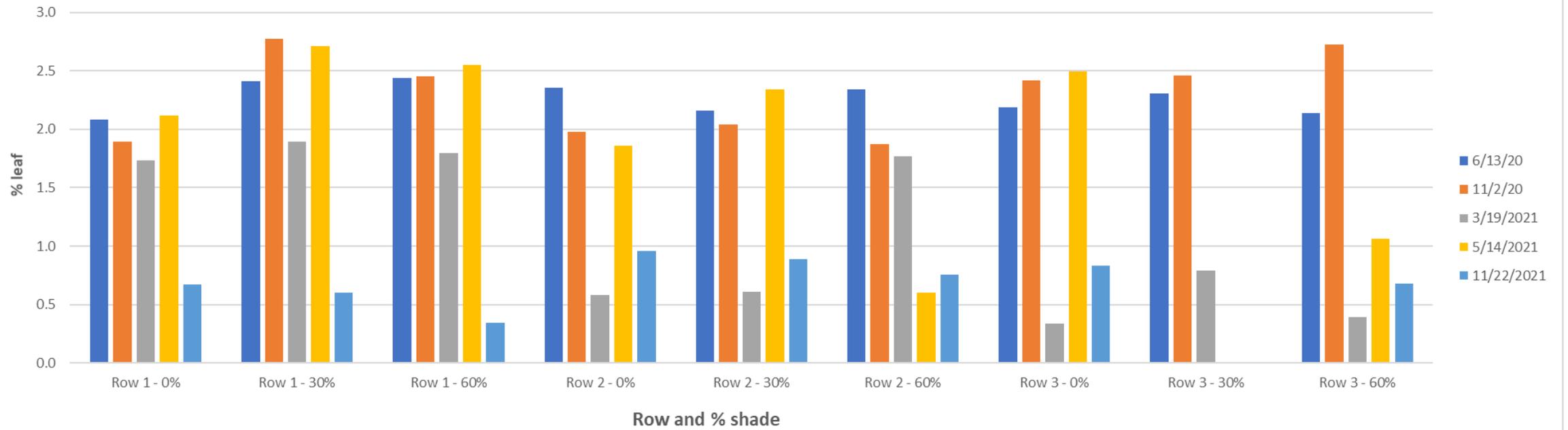
Theobromine



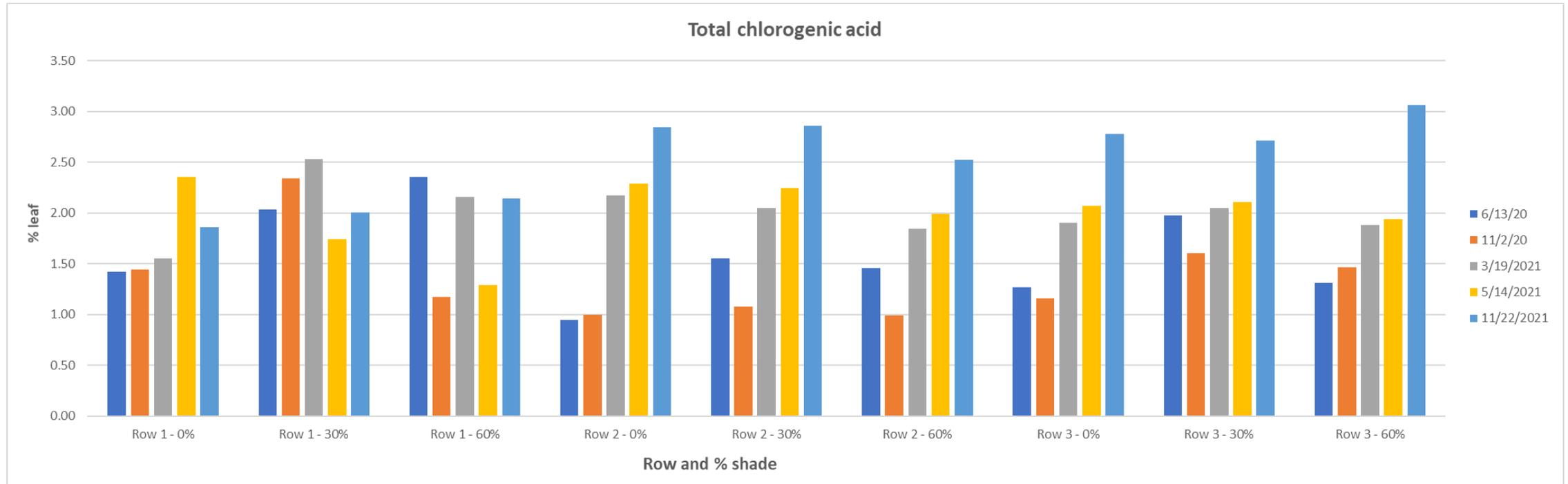
Theophylline



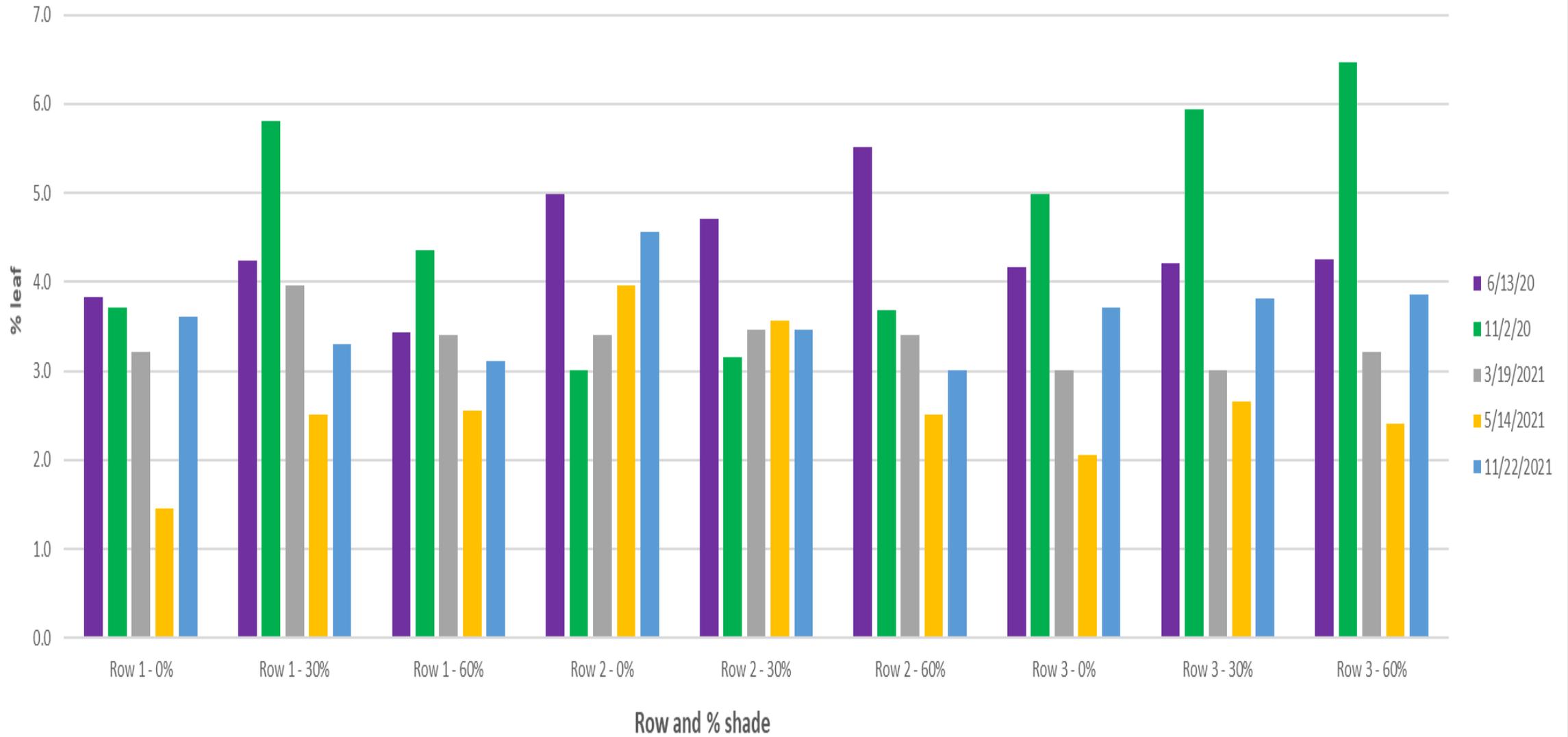
Theacrine



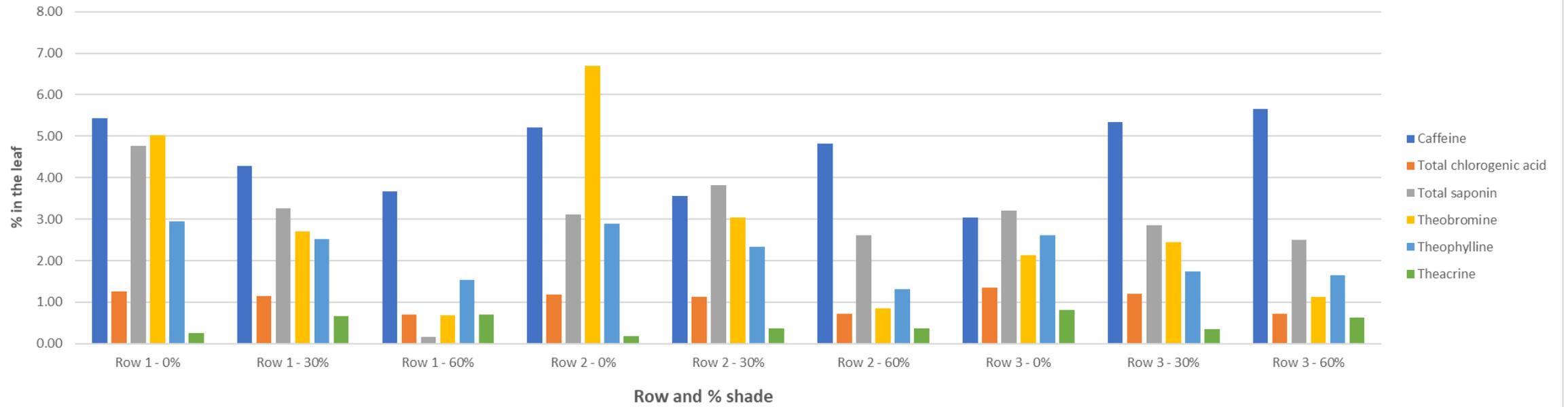
Phytonutrients



Total Saponin



Phytochemicals in yaupon sticks



So, Why did Yaupon disappear?

In her article, *Ceremony, Medicine, Caffeinated Tea: Unearthing the Forgotten Faces of the North American Stimulant Yaupon (Ilex vomitoria)*, Christine Folch proposes the following reasons for both the relative obscurity and ongoing resurgence of yaupon:

- First contact with spiritual purging ceremonies resulted in the name *Ilex vomitoria* and association with religion and purging.
- Displacement of yaupon-growing tribes resulted in loss of knowledge of cultivation, harvesting, preparation and cultural significance
- Most European settlers did not trust native medicine
 - Ongoing resurgence of native medicine wisdom
- Yaupon was labeled “ a poor man’s tea” as it was wild and freely available- Social norms dictated “High English tea”
 - Sustainable, affordable and regenerative
- Association with poverty and "uncivilized" behavior
 - Increasing interest in land-based lifestyle



Courtesy of Christine Folch

What's in a Botanical Name "*Ilex Vomitoria*"?

1st case of corporate espionage in N.A?

- Names used included *Ilex Floridiana*, *Ilex Carolina*... (Source?)
- *Vomitoria* named by Scottish Botanist W. Aiton based on observations of "Black Drink" ceremony by early Europeans.
- No emetic properties whatsoever (U of Florida)
- *The current theory states that the East India Tea Company hired Aiton, a Scottish botanist, to assign the detrimental name. Much like the the camelia sinensis story when another scottish botanist named Robert Fortune was sent to China to learn the secrets of the Chinese tea industry and help start the Darjeeling tea trade (Source?)*

Some White Papers on Yaupon

Fitoterapia 82 (2011) 557-569



Contents lists available at ScienceDirect

Fitoterapia

journal homepage: www.elsevier.com/locate/fitote



Flavonol-rich fractions of yaupon holly leaves (*Ilex vomitoria*, Aquifoliaceae) induce microRNA-146a and have anti-inflammatory and chemopreventive effects in intestinal myofibroblast CCD-18Co cells

Giuliana D. Noratto^{a,b}, Youngmok Kim^a, Stephen T. Talcott^a, Susanne U. Mertens-Talcott^{a,b,*}

^a Department of Nutrition and Food Science, Texas A&M University, College Station, TX 77843, USA

^b Institute for Obesity Research and Program Evaluation, Texas A&M University, College Station, TX 77843, USA

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Yaupon holly (*Ilex vomitoria*, Aquifoliaceae)

Colon inflammation

MicroRNA-146a

ABSTRACT

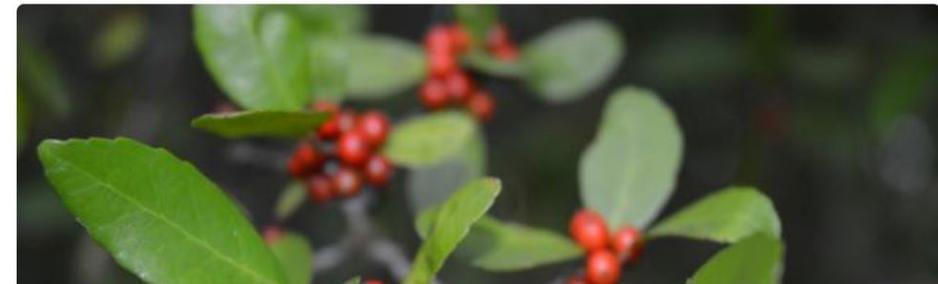
Polyphenolics extracted from yaupon holly (*Ilex vomitoria*, Aquifoliaceae) (YH) leaves were investigated in human colon cells for their chemopreventive and anti-inflammatory activities. An activity-guided fractionation allowed the selection of YH flavonol-rich fraction due to its preferential inhibition of HT-29 colon cancer viability over the normal CCD-18Co colon cells. Quercetin and kaempferol-3-rutinosides, main components identified in this fraction, protected CCD-18Co cells against reactive oxidative species (ROS) in part due to increased activity of antioxidant enzymes. In addition, up-regulation of microRNA-146a (miR-146a) known as a negative regulator of pro-inflammatory NF- κ B activation was the underlying molecular mechanism that protected CCD-18Co from inflammation.

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Is yaupon holly extract an effective and safe way to induce cancer cell death?

By Roslyn Crowder, Michael Morello, Munashe Y Holloman, Rachel Regester-Goumas, Makenzie Fourman, Rachel Wexler, and Anthony Bonilla

Backed by J Elliott Crowder, Elmore And Millie Benjamin, Evelyn Drain, Samuel Ray, Marie Crowder, Jacqueline And Henry Dyal, Rocco R. Miele, Vickie Lynn Bolinger, Robert And Sharon Holloman, Cindy Gulsby, and **47 other backers**▼



Last year our lab discovered that human leukemia cells treated with yaupon holly leaf extract caused cancer cell death. We tested both old and new yaupon holly leaf extract. This project is a follow-up to examine old and new yaupon holly leaf extract cell death mechanisms and normal cell toxicity. We hypothesize that normal cells are resistant to yaupon holly induced cell death and treated cancer cells undergo oxidative stress that leads to cancer cell death.

State of the Yaupon Industry

Supply Chain

- Currently 90% wild harvested- Short & long- term models
- small farmers planting yaupon in row crop model - Long Term
- developing scalable harvest machinery

Other Research: UGA is currently mapping the yaupon gene tree. This will lead into possible breeding for more desirable characteristics or phytochemistry.

Consumer packaged good products

More and more products are starting to enter the market- Kombucha makers are substituting yaupon for Asian tea, healthy drinks, tea in different formats, coffee shops, tea shops, independent health food stores....all

American Yaupon Association (AYA) has been formed to help promote yaupon

The New York Times

YAUPON NAMED A "GROWING TREND"

NYT - JANUARY 2023



YAUPON ON ANNUAL "IN LIST"

WASHINGTON POST - JANUARY 2023

Forbes

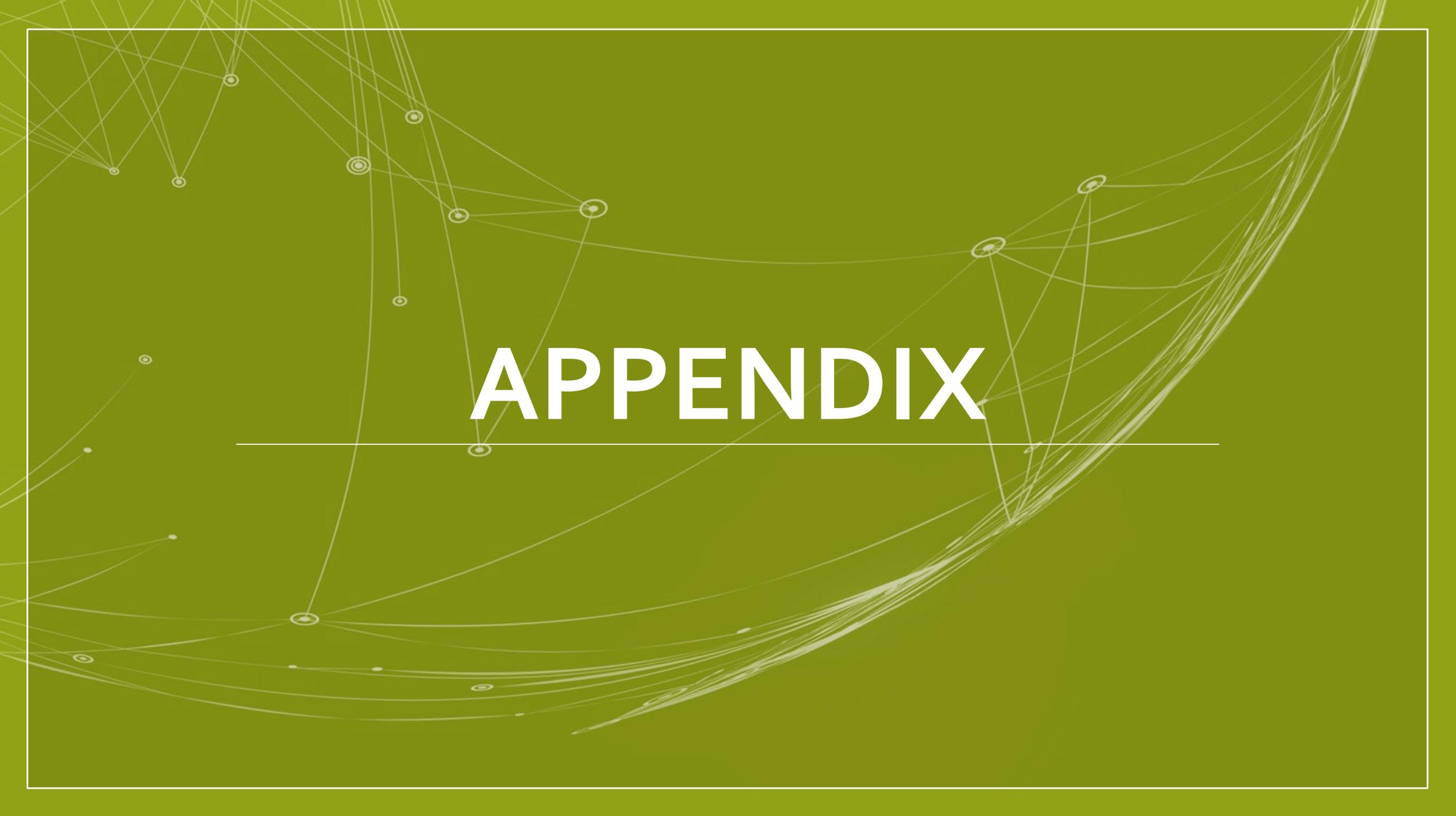
YAUPON NAMED A DRINK TREND

FORBES - JANUARY 2023



**"CLIMATE-CONSCIOUS" YAUPON:
TOP 10 FOOD TREND FOR 2023**

**YAUPON IS
"TRENDING"**

The background features a complex network of white lines and nodes on a green gradient. The nodes are represented by small circles, some of which are larger and more prominent. The lines connect these nodes in a web-like structure, with some lines being straight and others curved. The overall effect is a sense of interconnectedness and data flow.

APPENDIX

How was Yaupon used?

Daily ritual

- Communal drink
- Fostering deeper friendships (Source?)
- Meeting house gatherings (Source?)

Medicine

- Salve for treatment of wounds (Source?)
- Purified water (Source?)
- Medicine Men smoked it, calmed nerves (Source?)
- Helped regulate menstrual cycles (Source?)

Ceremony

- Black Drink (Source?)
- Important meetings (Source?)
- Treaties (Source?)
- Battles (Source?)
- Sporting events (Source?)
- White Drink Ceremony (Source?)
- Compare to Matcha (Source?)
- Friendship drink in the encountering of strangers to avoid confrontation (Source?)

World Friendship Drink!

