

# Reinvigorating Oleoresin Collection in the Southeastern USA: Evaluation of Stand Management and Tree Characteristics with Borehole Tapping

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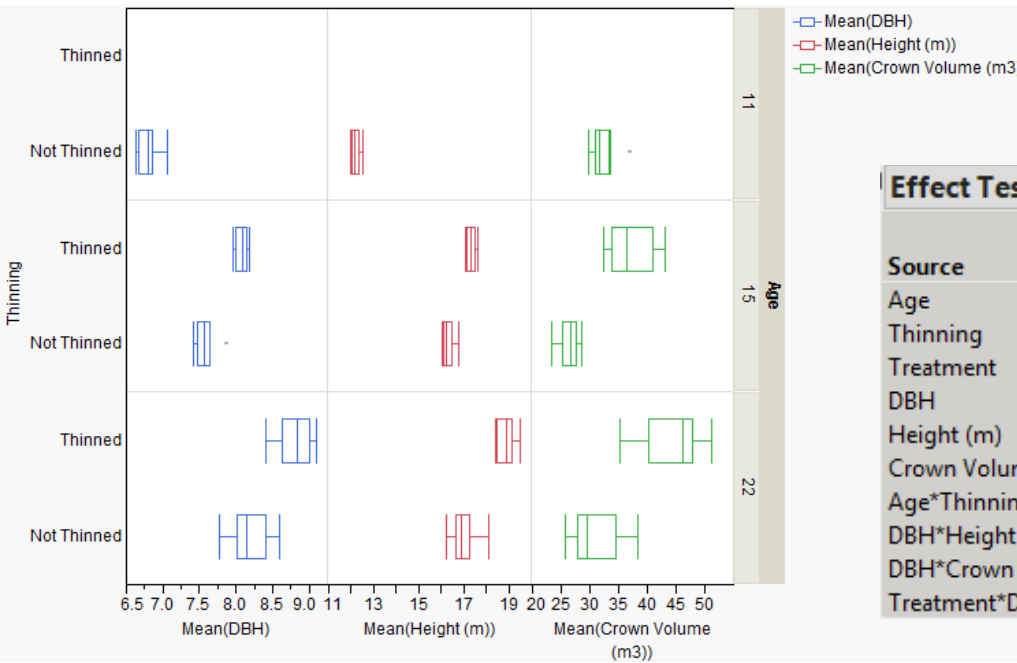
# FL Office of Energy Project Objectives

- 1. Develop more cost effective methods to collect terpenes from live slash pine trees for renewable chemicals and biofuel production**
- 2. Assess stand management, tree characteristics and age on oleoresin yield**
- 3. Assess feasibility and impact of expanding collection of oleoresin and terpene based jet fuel production in Florida**

**Borehole Tapping**



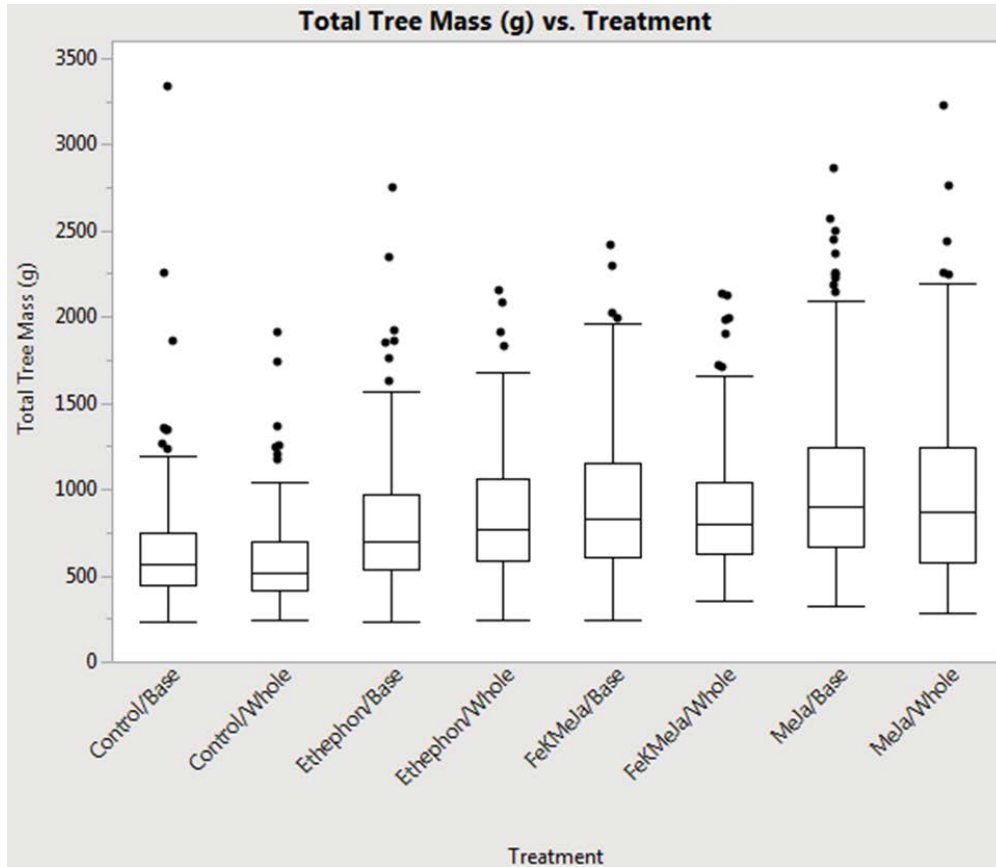
# Effect of Age & Management On Tree Size & Oleoresin Yield



Effect Tests					
Source	Nparm	DF	Sum of Squares	F Ratio	Prob > F
Age	1	1	150972	1.7134	0.1907
Thinning	1	1	774319	8.7877	0.0031*
Treatment	7	7	26663949	43.2296	<.0001*
DBH	1	1	6342330	71.9786	<.0001*
Height (m)	1	1	21897	0.2485	0.6182
Crown Volume (m3)	1	1	24478	0.2778	0.5982
Age*Thinning	1	1	2447646	27.7781	<.0001*
DBH*Height (m)	1	1	1376104	15.6173	<.0001*
DBH*Crown Volume (m3)	1	1	1961507	22.2610	<.0001*
Treatment*DBH*Crown Volume (m3)	7	7	1383274	2.2427	0.0285*

Age	Silviculture	Pine Straw	Mean DBH (in)	Range DBH (in)	Mean Yield (g/tree)
11	Not thinned	No	6.79	5.35-9	742.42
15	Not Thinned	No	7.57	5.9-12.5	751.71
15	Thinned	Yes	7.7	6-11.2	951.3
15	Thinned	No	8.45	6-12.15	731.05
22	Not thinned	No	8.17	5.4-12.3	989.33
22	Thinned	No	8.81	5.5-13.3	863.35

# Differences in Chemical Stimulants



## Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Treatment	7	34819011	4974144	32.7366	<.0001*
Error	1694	257393703	151944		
C. Total	1701	292212714			

## Level

Level	Mean	
MeJa/Base	A	1030.8333
MeJa/Whole	A B	983.4978
FeKMeJa/Base	B C	912.5225
FeKMeJa/Whole	C	863.8073
Ethephon/Whole	C D	843.4742
Ethephon/Base	D	777.8436
Control/Base	E	643.4804
Control/Whole	E	587.7949

# Conclusions

- Methyl jasmonate gives the greatest yields
- Tree stem diameter and not age significantly affects oleoresin yield, but significant 2-way and 3-way interactions were observed with stem diameter, tree height and crown size