STIMSON HIDDEN MEADOWS STUDY:

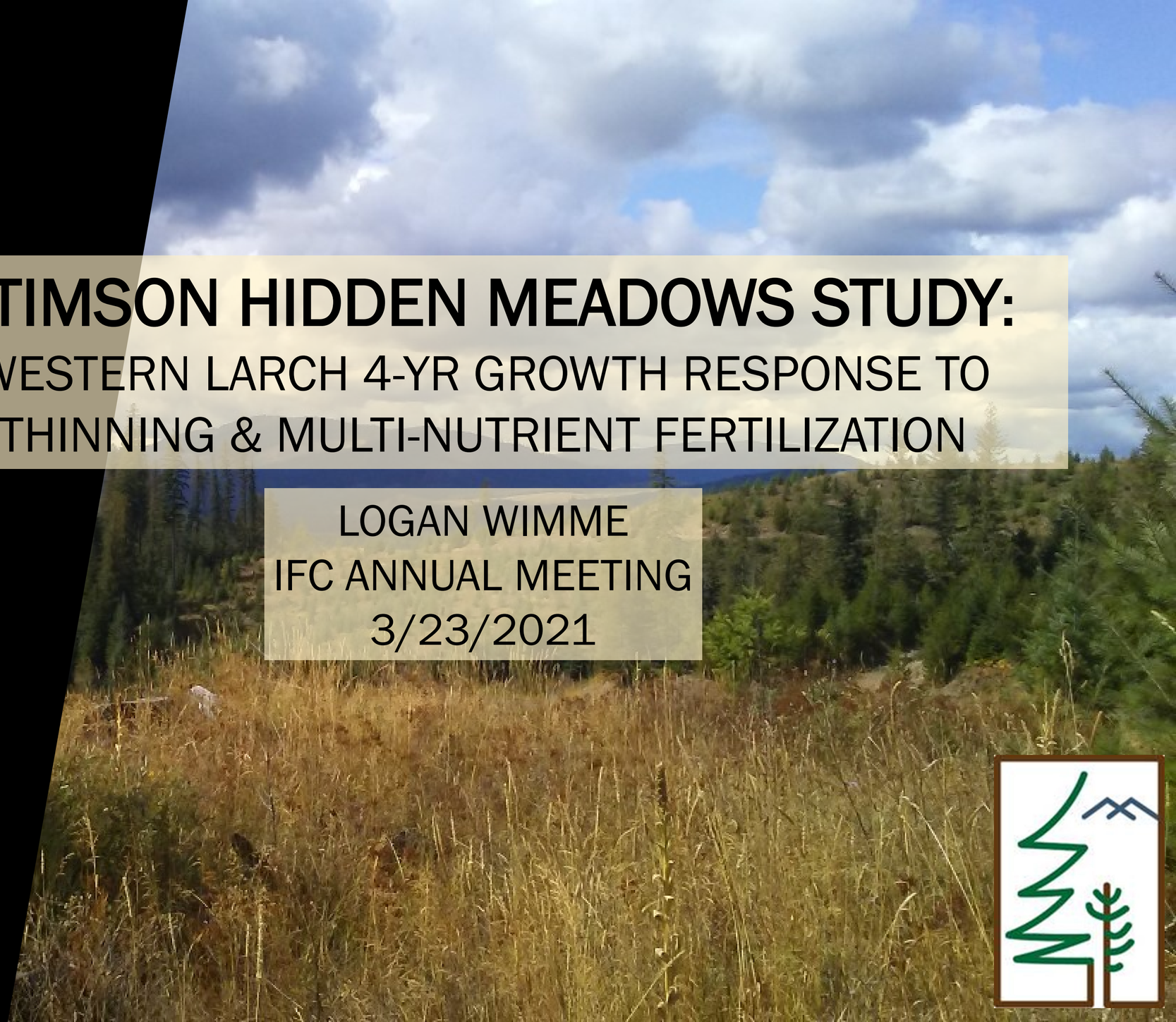
WESTERN LARCH 4-YR GROWTH RESPONSE TO THINNING & MULTI-NUTRIENT FERTILIZATION

LOGAN WIMME

IFC ANNUAL MEETING

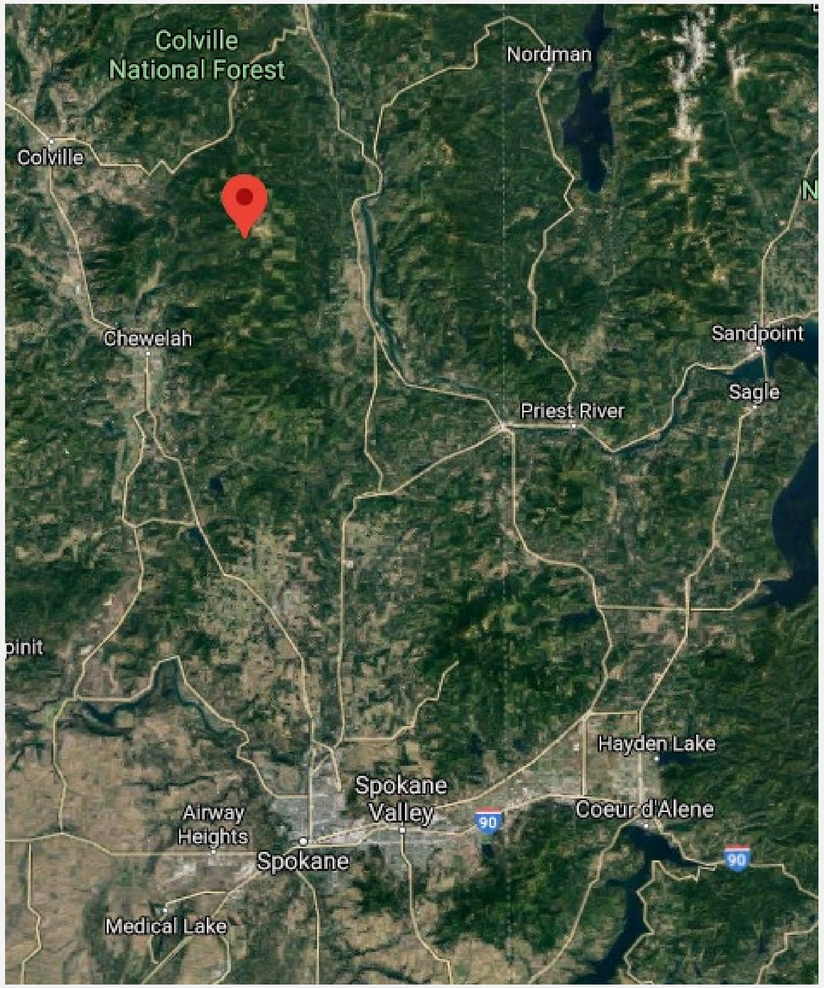
3/23/2021

University of Idaho
College of Natural Resources



SITE DESCRIPTION

- NE WA
- STAND TYPE: MID-ROTATION WL PLANTATION
- HABITAT TYPE: ABLA/CLUN
- SOIL PARENT MATERIAL: VOLCANIC ASH / GRANITIC GLACIAL TILL
- ELEVATION: 4600’



SITE HISTORY

- SEED TREE HARVESTED AND BROADCAST BURNED IN 1980
- OVERSTORY REMOVAL IN 1985
- PCT IN 1992 – 14’ SPACING
- STUDY PLOTS FERTILIZED AND/OR THINNED VIA MASTICATION IN 2016 (AGE ~35 YEARS)

TREATMENTS

- CONTROL: NO FERTILIZATION

  NO THINNING

- FERT: 200 LB/AC N (UREA) AND 90 LB/AC S (SULFATE-SULFUR)

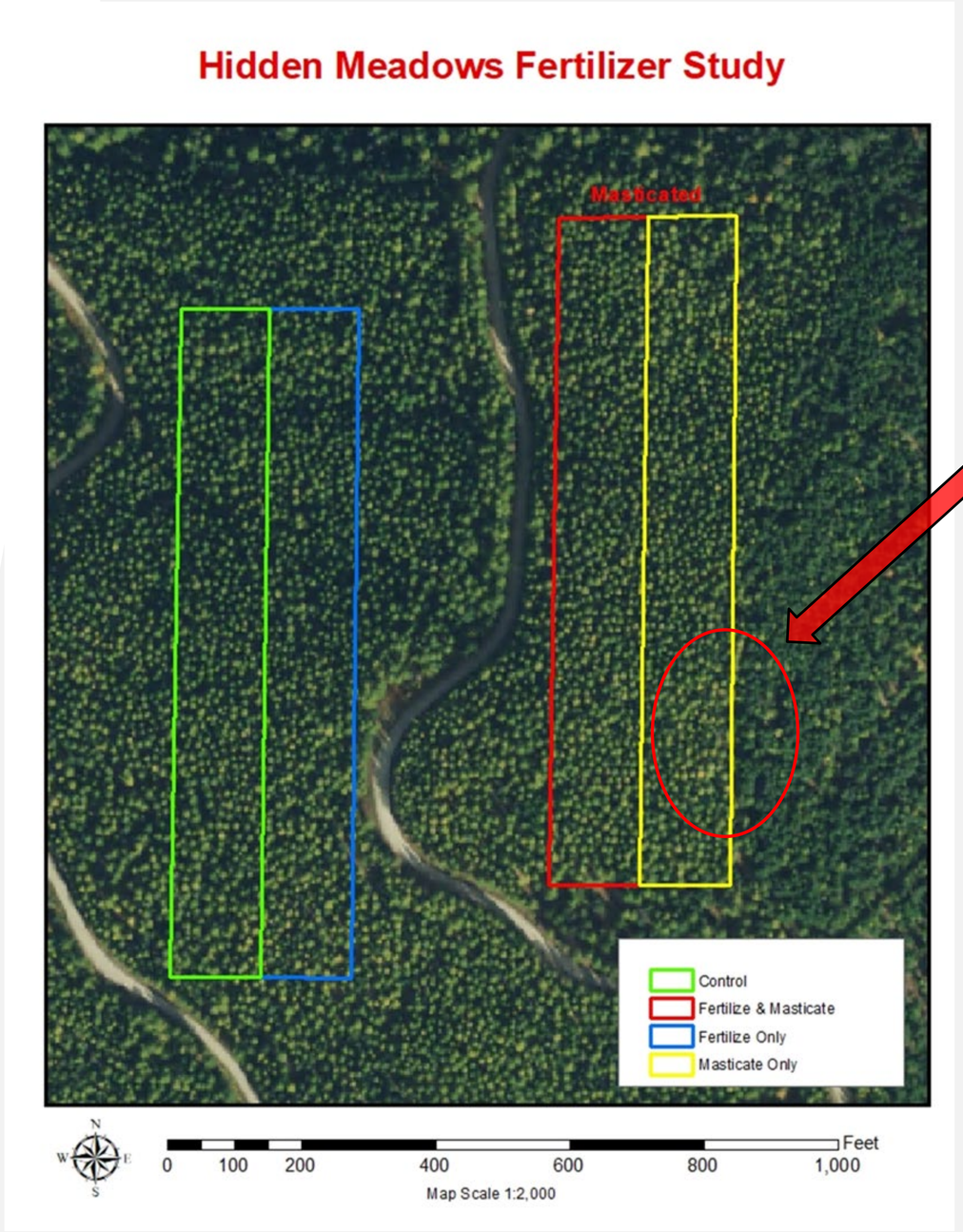
  NO THINNING

- THIN: PLOTS THINNED VIA MASTICATION

  NO FERTILIZATION

- FERT+THIN: 200 LB/AC N (UREA) AND 90 LB/AC S (SULFATE SULFUR)

  PLOTS THINNED VIA MASTICATION



Exposed subsurface SPM in thin only block – near ridgeline

HYPOTHESES

1. GROWTH RESPONSE IS EXPECTED TO BE POSITIVE FOR BOTH THINNING AND FERTILIZATION.

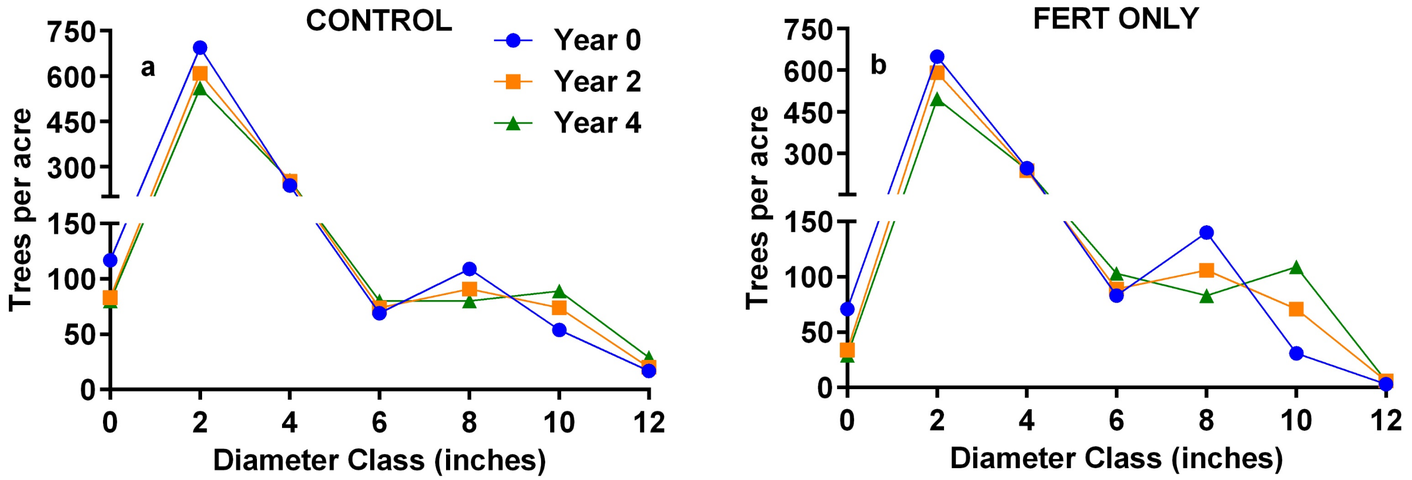
2. THINNING AND FERTILIZATION WILL YIELD A GREATER GROWTH RESPONSE WHEN PAIRED.

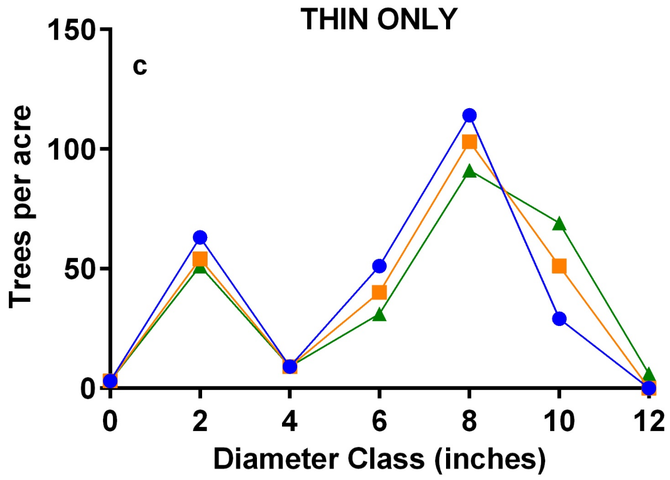
STATISTICAL ANALYSIS

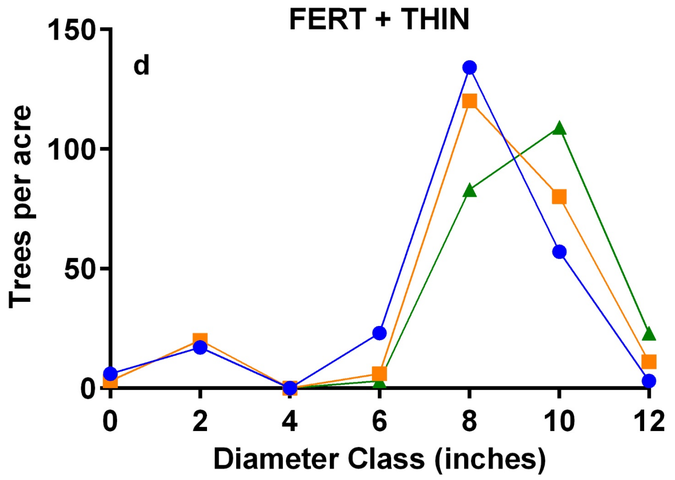
- FACTORIAL ANCOVA DESIGN
- $\alpha = 0.1$ USED FOR SIGNIFICANCE
- COVARIATES: D_0 FOR AVERAGE TREE RESPONSE & BAC_0 FOR STAND RESPONSE
- YEAR 0 POST TREATMENT STAND METRICS

Treatment	No. of Plots	TPA	QMD (in)	Avg. Crop Tree Ht. (ft)	BA (ft^2/ac)	VOL (ft^3/ac)
CONTROL	7	1297	4.15	57	122	975
FERT ONLY	7	1223	4.09	54	112	787
THIN ONLY	7	240	7.10	53	66	681
FERT+THIN	7	269	7.55	58	84	914

DIAMETER DISTRIBUTIONS

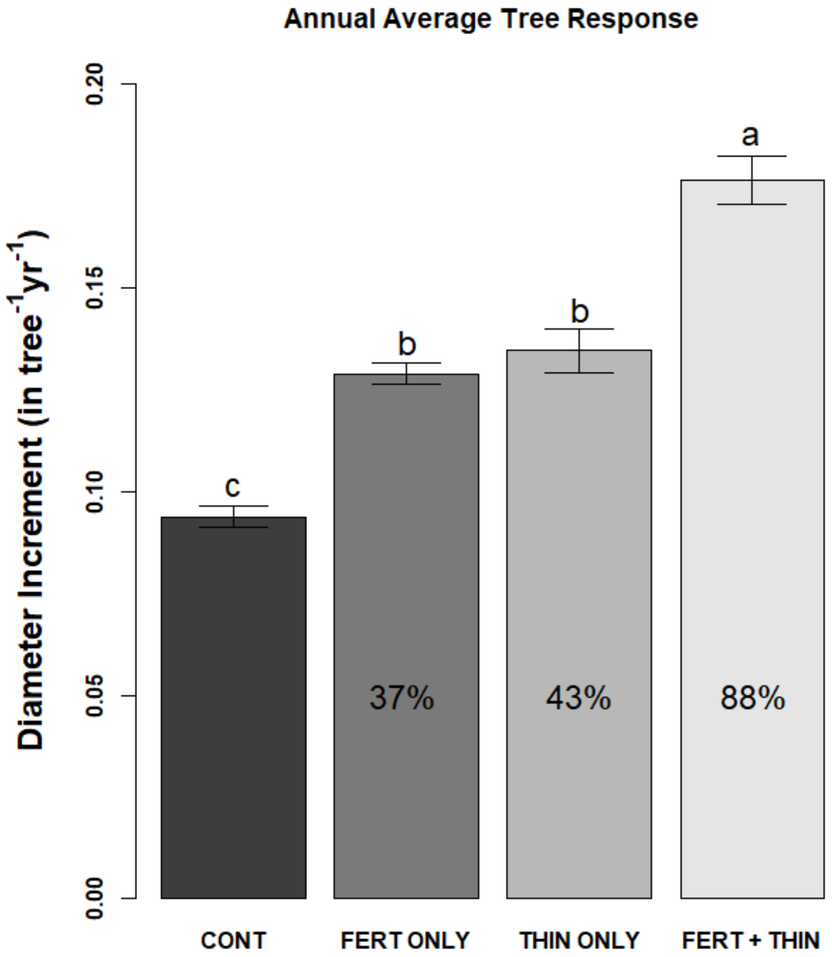


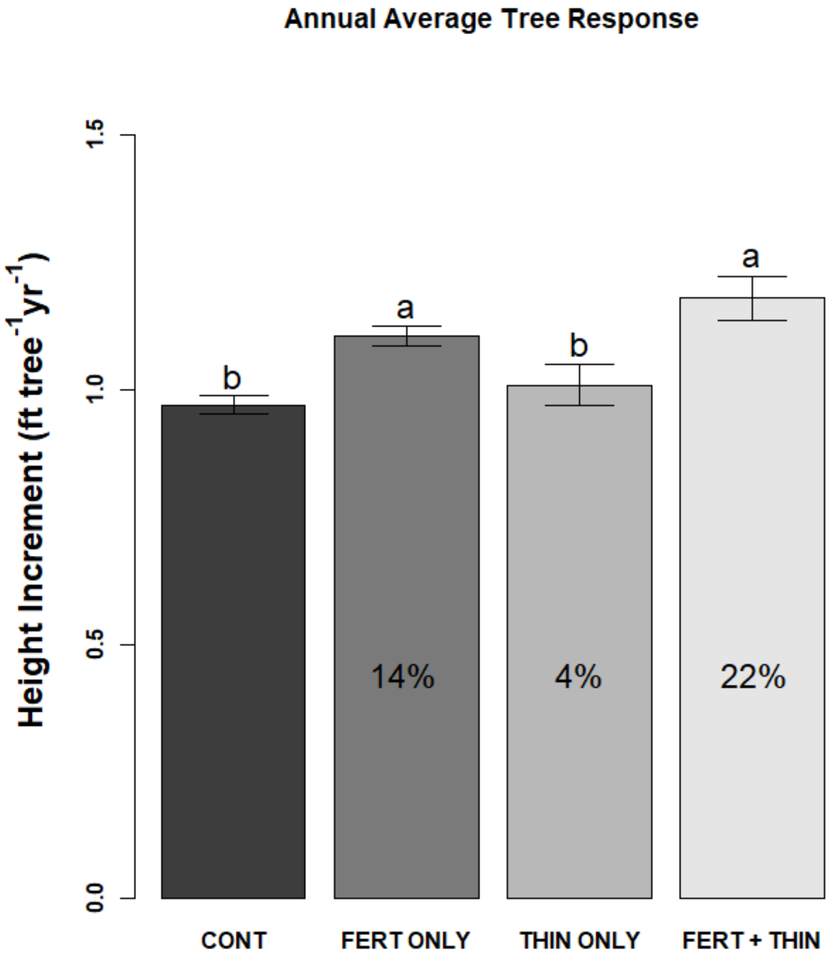




RESULTS:

INDIVIDUAL TREE RESPONSE

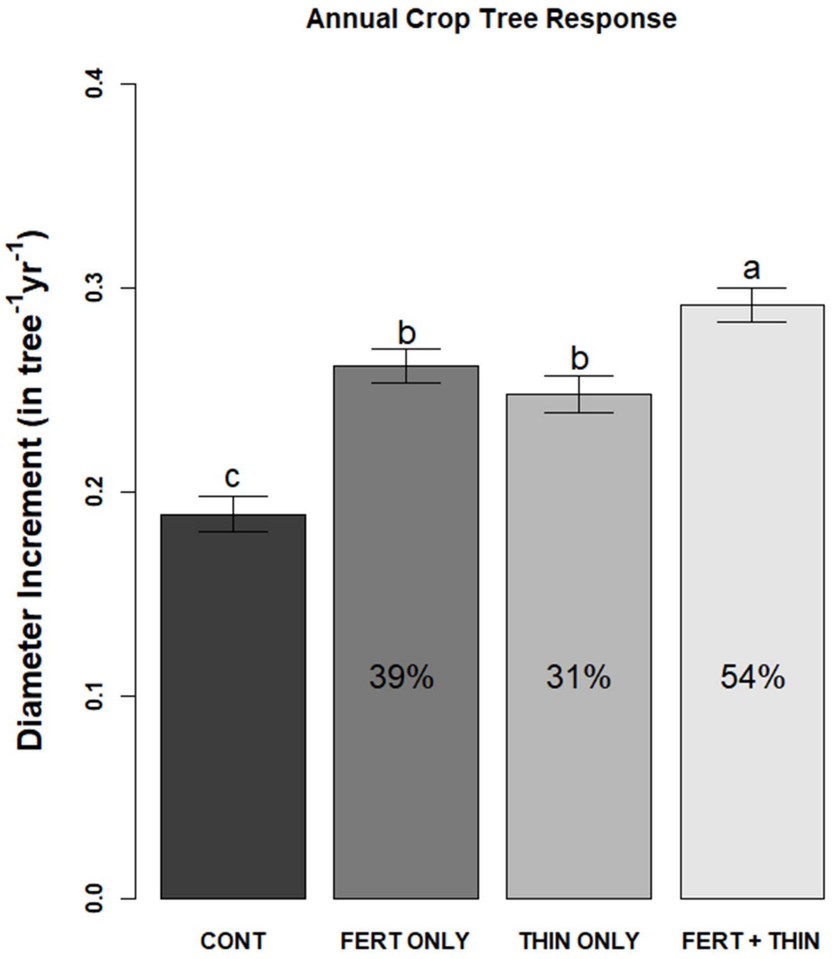


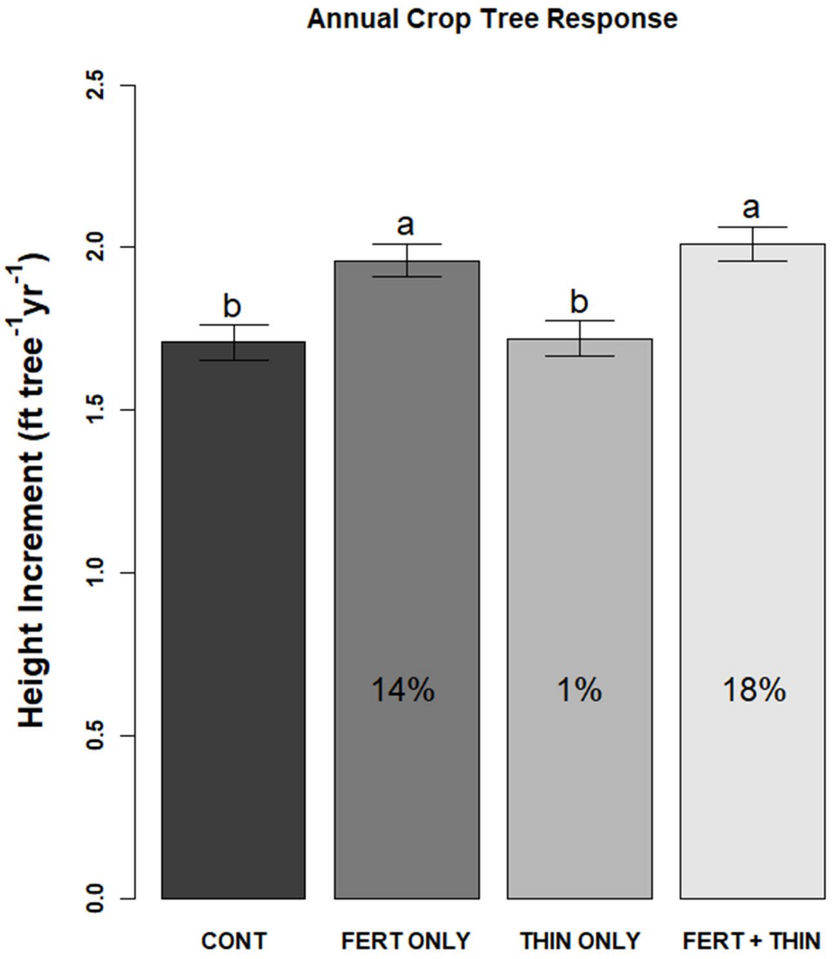


RESULTS:

INDIVIDUAL CROP TREE RESPONSE

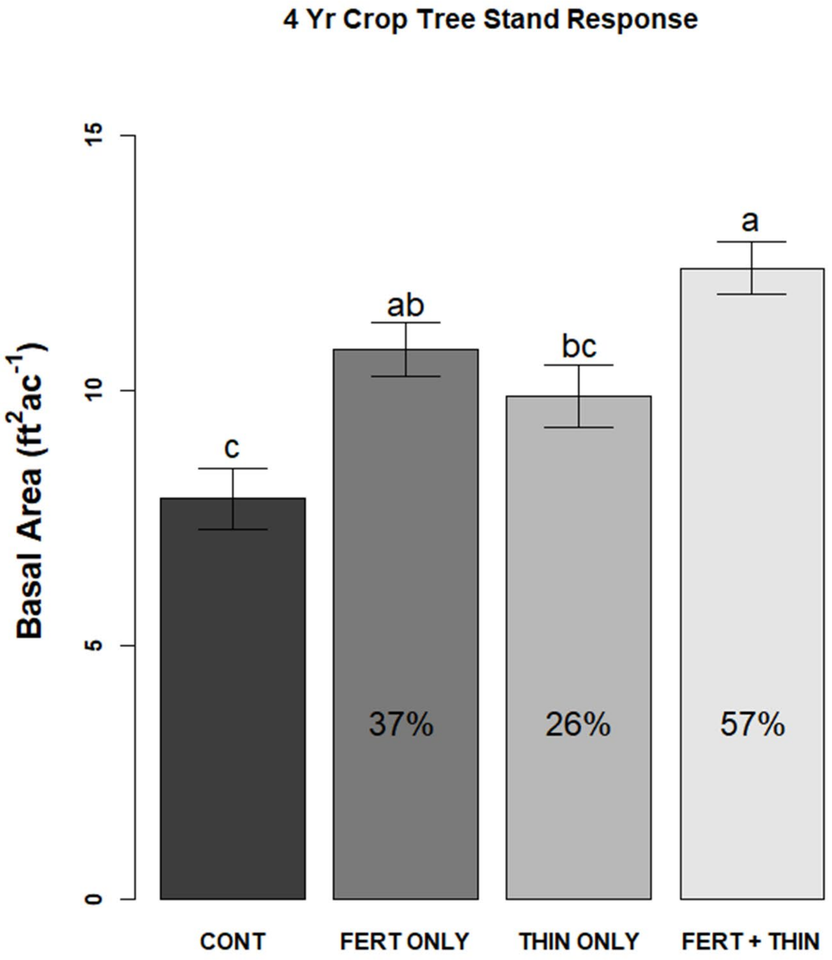
*5 LARGEST TREES/PLOT
BY BA & VOL

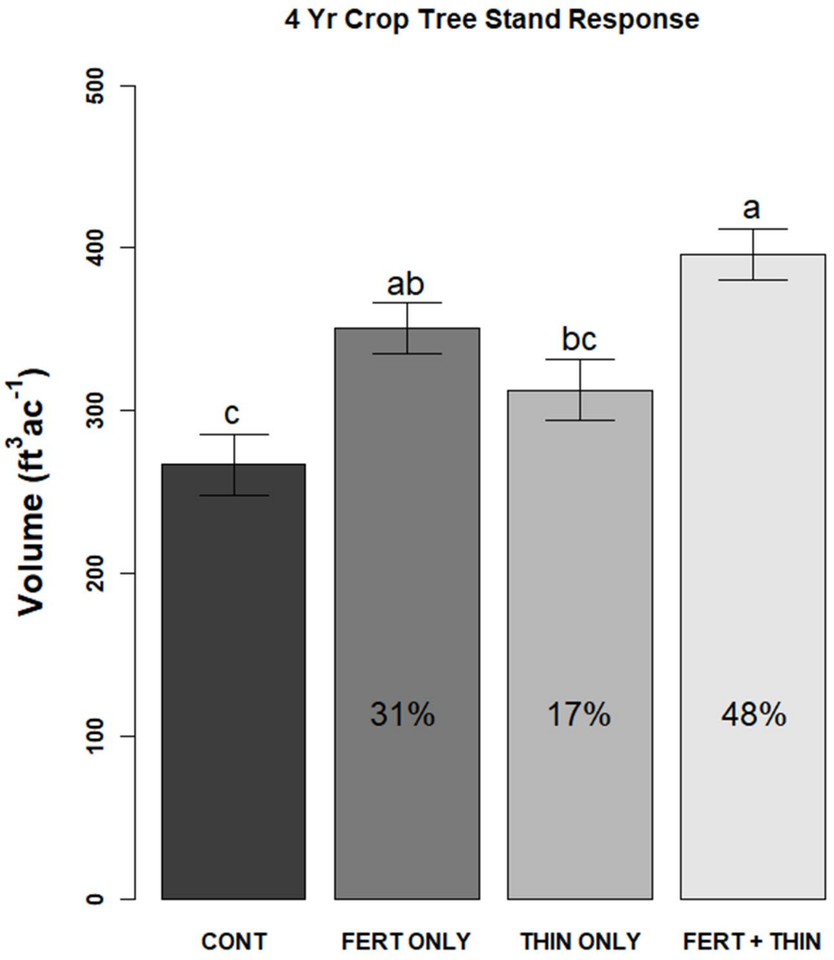




RESULTS:

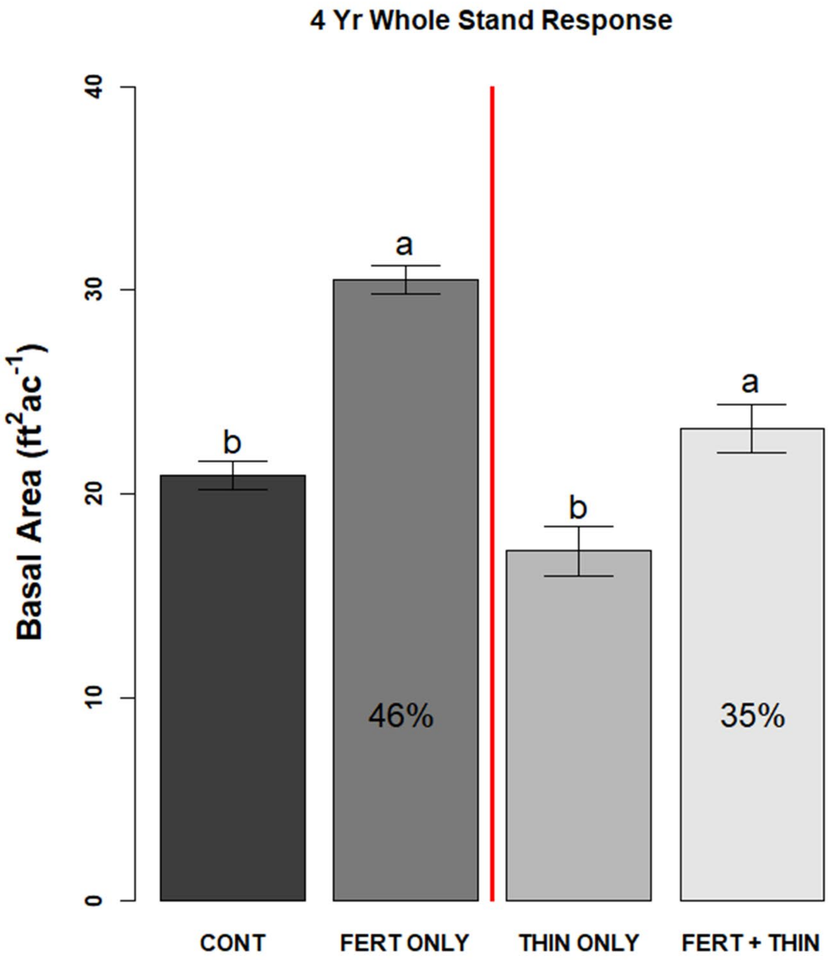
4 YR CROP TREE STAND RESPONSE

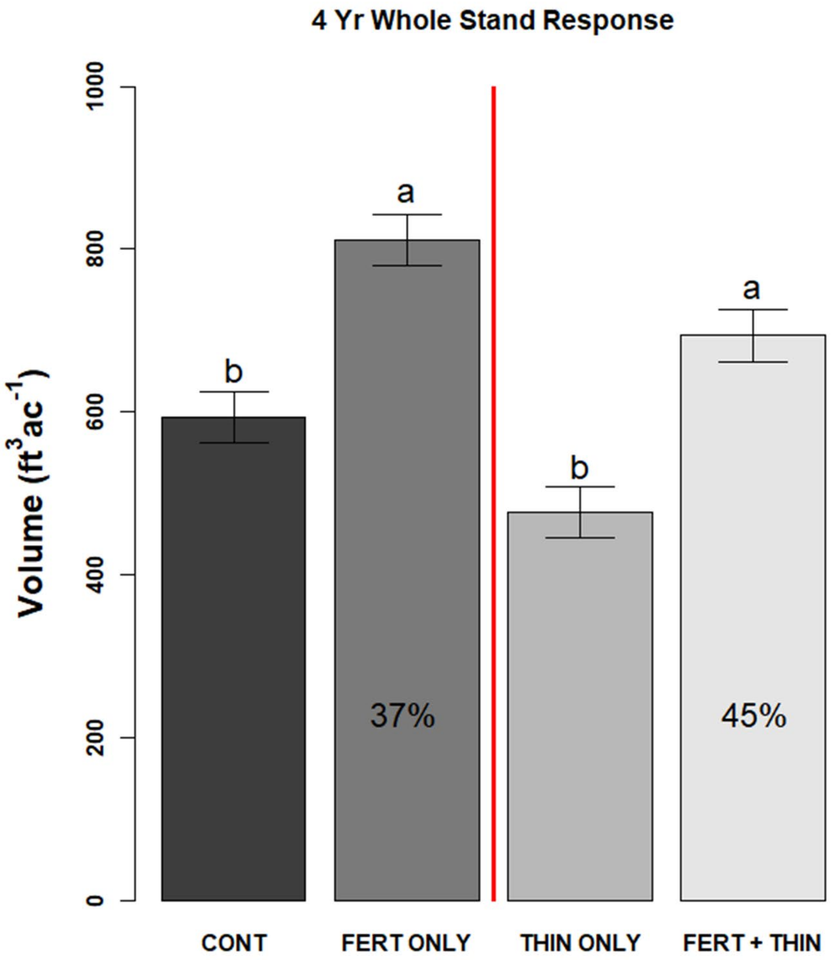




RESULTS:

4 YR WHOLE STAND RESPONSE – FERTILIZATION EFFECT





KEY CONCEPTS

- GROWTH RESPONSES WERE <u>POSITIVE</u> FOR ALL FERT AND/OR THIN TREATMENTS

  - THIN NOT ALWAYS SIGNIFICANT

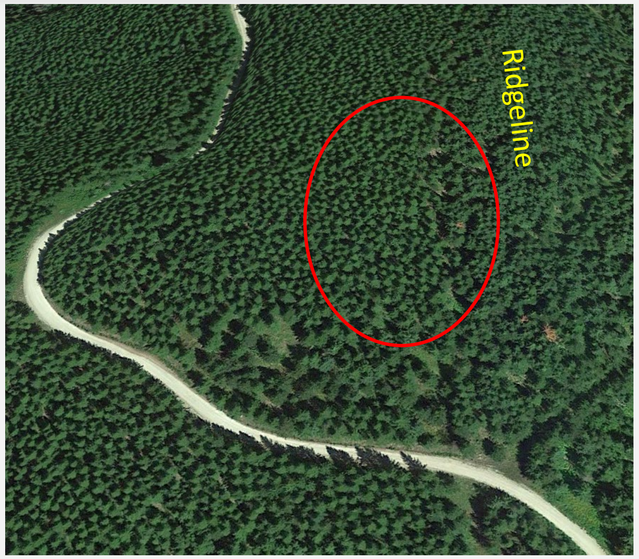
- FERT+THIN YIELDED GREATEST GROWTH RESPONSES (INDIVIDUAL AND CROP TREE LEVEL)

- THIN GENERALLY YIELDED SMALLEST RESPONSES (INDIVIDUAL AND CROP TREE LEVEL)

  -INDIVIDUAL AVG. DIAMETER WAS THE ONLY EXCEPTION

  -COULD BE RESULT OF MINIMAL UPPER CROWN COMPETITION PRE-TREATMENT

  -POSSIBLY IMPACTED BY TOPOGRAPHIC POSITION AND EXPOSED SUBSURFACE SPM



KEY CONCEPTS

- FERTILIZER TREATMENTS (FERT AND FERT+THIN) PROVIDED IMPRESSIVE RESPONSES IN BA/AC AND VOL/AC OVER UNFERTILIZED PLOTS AT WHOLE STAND LEVEL
- TREATED PLOTS (FERT AND/OR THIN) HAVE MORE TREES ENTERING 10” CLASS AT FASTER RATES COMPARED TO CONTROL
- FERT+THIN HAD GREATEST TRANSITION OF TREES FROM 10” CLASS TO 12” CLASS

ACKNOWLEDGMENTS

WE’D LIKE TO THANK DON PATTERSON AND STIMSON LUMBER COMPANY FOR ALLOWING US TO SHARE THESE RESULTS.