

Mechanisms by Which Pre-Commercial Thinning Increases Black Spruce Growth in Different Climates and Soil Types

Supplementary data: Results of two-way mixed-model ANOVA using 'lme' package in Rnstatistical software

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From section 2.7 *Statistical Analysis* of the submitted manuscript:

"The effects of PCT, site type and sampling year (when applicable), as well as their interactions, were tested using mixed effects models, with site ID and sampling date coded as random variables. When significant interactions were found between PCT and site type, we tested the effects of PCT within each individual site type. When a significant effect of sampling year was found, the analysis was repeated within each sampling year."

Presented here, are the results of the two-way mixed-model ANOVA.

Output of two-way mixed-model ANOVA testing the effects of treatments, sites and their interaction on tree mensuration data

Tree Height

##	numDF	denDF	F-value	p-value
## (Intercept)	1	155	1582.9729	<.0001
## Site	2	9	4.7884	0.0390
## Trt	1	155	0.0412	0.8394
## Site:Trt	2	155	0.5268	0.5916

Tree DBH

##	numDF	denDF	F-value	p-value
## (Intercept)	1	155	2413.5238	<.0001
## Site	2	9	0.3636	0.7049
## Trt	1	155	32.6037	<.0001
## Site:Trt	2	155	1.3208	0.2699

Quadratic mean diameter

##	numDF	denDF	F-value	p-value
## (Intercept)	1	75	259.30726	<.0001
## Site	2	9	5.62237	0.0750
## Trt	1	75	4.02140	0.0003
## Site:Trt	2	75	0.04838	0.9528

Basal area

##	numDF	denDF	F-value	p-value
## (Intercept)	1	78	105.40494	<.0001
## Site	2	9	1.72661	0.2319
## Trt	1	78	7.68197	0.0009
## Site:Trt	2	78	0.16348	0.8495

Stand density

##	numDF	denDF	F-value	p-value
## (Intercept)	1	24	158.26771	<.0001
## Site	2	10	7.07544	0.0122
## Trt	1	24	40.33628	<.0001
## Site:Trt	2	24	0.11079	0.8956

Forest Floor Depth

##	numDF	denDF	F-value	p-value
## (Intercept)	1	9	172.13551	<.0001
## Site	2	9	7.85151	0.0106
## Trt	1	7	0.50327	0.5010
## Site:Trt	2	7	0.38749	0.6925

Results of two-way mixed-model ANOVA testing the effects of treatments, sites and their interaction on soil data

Gravimetric moisture content

##	numDF	denDF	F-value	p-value
## (Intercept)	1	116	477.1780	<.0001
## Site	2	9	10.5645	0.0044
## Trt	1	116	3.3754	0.0687
## Year	1	11	12.6585	0.0045
## Site:Trt	2	116	0.6771	0.5101

Soil N Mineralization (per g of soil)

2016 Soil N Mineralization (per g of soil)

##	numDF	denDF	F-value	p-value
## (Intercept)	1	9	35.45724	0.0002
## Site	2	9	4.32058	0.0484
## Trt	1	8	1.64432	0.2356
## Site:Trt	2	8	1.11533	0.3739

2017 Soil N Mineralization (per g of soil)

##	numDF	denDF	F-value	p-value
## (Intercept)	1	105	482.4896	<.0001
## Site	2	9	18.2836	0.0007
## Trt	1	105	0.9086	0.3427
## Site:Trt	2	105	2.4858	0.0882

Soil N Mineralization (per ha)

2016 Soil N Mineralization (per ha)

##	numDF	denDF	F-value	p-value
## (Intercept)	1	9	35.52820	0.0002
## Site	2	9	3.55218	0.0729
## Trt	1	8	2.29358	0.1684
## Site:Trt	2	8	0.37228	0.7005

2017 Soil N Mineralization (per ha)

##	numDF	denDF	F-value	p-value
## (Intercept)	1	105	178.24794	<.0001
## Site	2	9	1.48272	0.2776
## Trt	1	105	2.54411	0.1137
## Site:Trt	2	105	3.54464	0.0324

Basal Respiration

2016 Basal Respiration

##	numDF	denDF	F-value	p-value
## (Intercept)	1	53	795.7908	<.0001
## Site	2	9	102.3896	<.0001
## Trt	1	53	11.6187	0.0013
## Site:Trt	2	53	8.1826	0.0008

2017 Basal Respiration

##	numDF	denDF	F-value	p-value
## (Intercept)	1	104	787.9412	<.0001
## Site	2	9	3.7331	0.0660
## Trt	1	104	0.7262	0.3961
## Site:Trt	2	104	4.2897	0.0162

Microbial Biomass

2016 Microbial Biomass

##	numDF	denDF	F-value	p-value
## (Intercept)	1	53	534.4047	<.0001
## Site	2	9	7.7074	0.0112
## Trt	1	53	0.7563	0.3884
## Site:Trt	2	53	2.0056	0.1447

2017 Microbial Biomass

##	numDF	denDF	F-value	p-value
## (Intercept)	1	103	561.7065	<.0001
## Site	2	9	11.7969	0.0031
## Trt	1	103	1.2243	0.2711
## Site:Trt	2	103	1.3449	0.2651

Results of two-way mixed-model ANOVA testing the effects of treatments, sites and their interaction on foliage data

Foliar N

##	numDF	denDF	F-value	p-value
## (Intercept)	1	286	4491.843	<.0001
## Site	2	10	8.801	0.0080
## Trt	1	286	1.886	0.1707
## Site:Trt	2	286	0.931	0.3955

Foliar CN

##	numDF	denDF	F-value	p-value
## (Intercept)	1	286	5273.958	<.0001
## Site	2	10	7.146	0.0230
## Trt	1	286	1.124	0.2899
## Site:Trt	2	286	2.402	0.0924

δ13C Isotope Composition

##	numDF	denDF	F-value	p-value
## (Intercept)	1	10	29872.670	<.0001
## Site	2	10	0.200	0.8222
## Trt	1	9	0.270	0.6160
## Site:Trt	2	9	0.544	0.5982

δ18O Isotope Composition

##	numDF	denDF	F-value	p-value
## (Intercept)	1	10	17233.467	<.0001
## Site	2	10	0.516	0.6117
## Trt	1	9	0.621	0.4509
## Site:Trt	2	9	0.933	0.4283

Results of two-way mixed-model ANOVA testing the effects of treatments, sites and their interaction on canopy openness

Canopy openness

##	numDF	denDF	F-value	p-value
## (Intercept)	1	9	140.25018	<.0001
## Site	2	9	1.90386	0.2044
## Trt	1	9	5.21154	0.0520
## Site:Trt	2	9	0.73064	0.5081