

# Elsoms Run 2

Petra Guy

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This analysis summarizes Elsoms run 2. Nursery Trials/Experiments/Run 1/Elsoms Run 2 Results

The first few charts look at oak mortality. The oaks were very mildewed and I had almost decided to omit them from the experiment. However, I did a mortality check first. Some trees had died immediately on planting, and this number is deducted from the total number of trees per tray. The mortality is then the number of trees which died subsequently/this reduced starting number

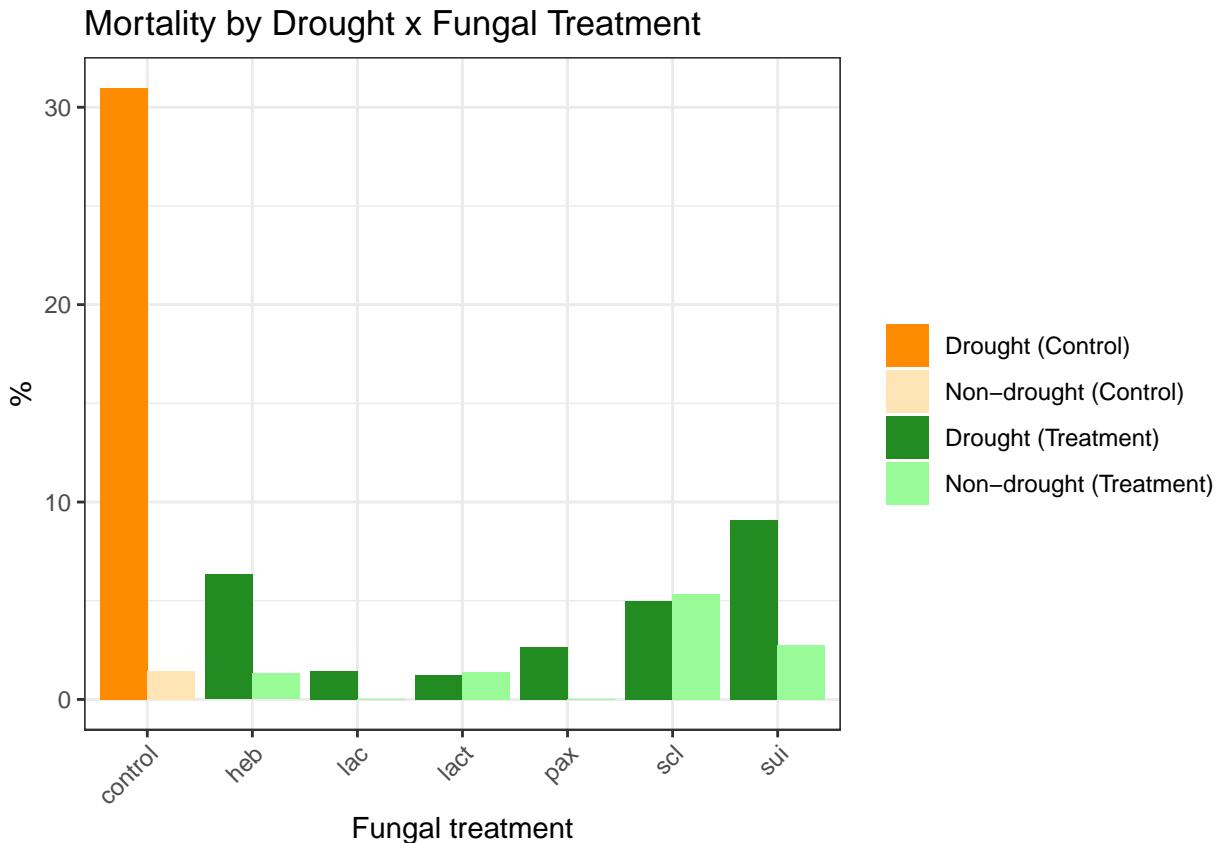


Fig caption: Control, trees which received no inoculum. Treatment, these trees received liquid inoculum of 6 different emf, heb = *Hebeloma spp*, lac = *Laccaria bicolor*, lact = *Lactarius torminosus*, pax = *Paxillus involutus*, scl = *Scleroderma areolatum*, sui = *Suillus bovinus*

If the droughting is to be believed, and this is an issue, because it was an oversight by Elsoms rather than a controlled experiment, then the emf only had an impact on mortality in the droughting treatment. This data may be useful to inform future runs - but perhaps used with caution with customers. Next graph combines all the oaks ignoring the droughting treatment.

## Mortality by Fungal Treatment

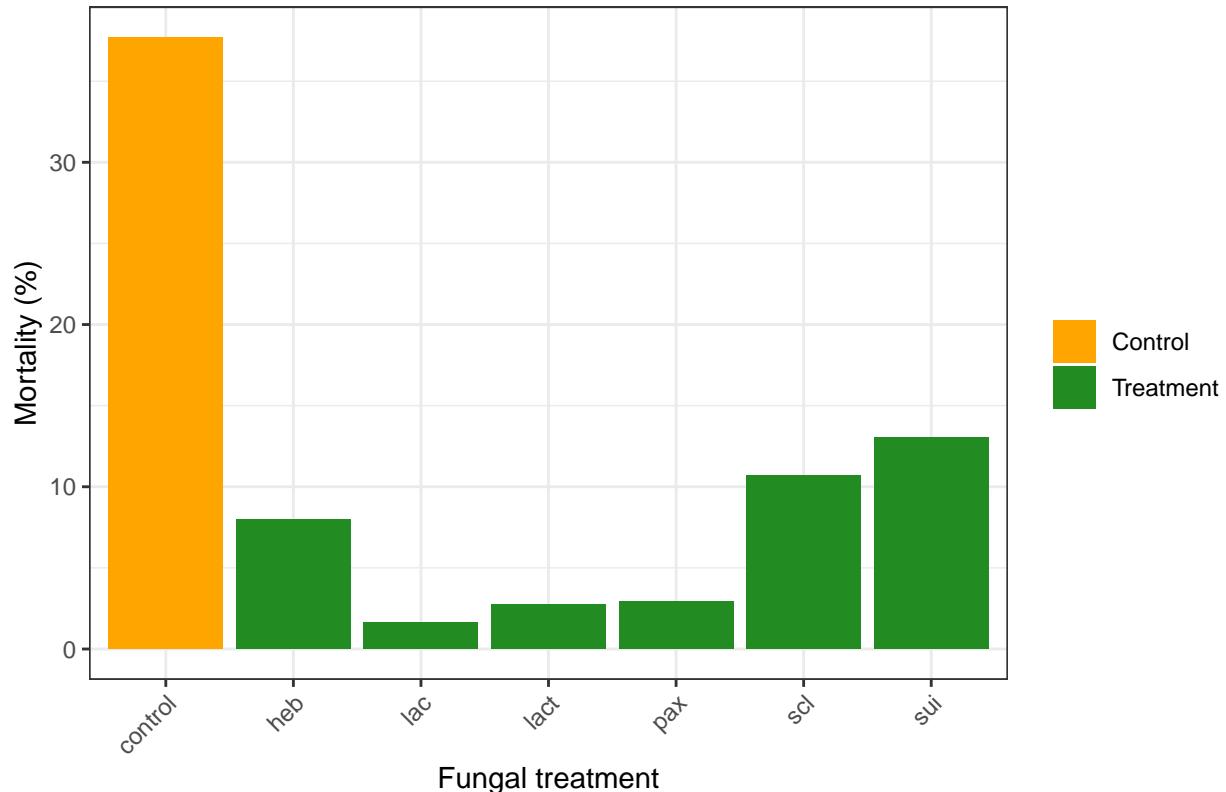


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Above we ignore whether the trays were on the droughted or non-droughted bench. Since some of the trees died immediately on the same day as planting, these were removed from the analysis as this was not related to treatment. each group then has slightly different starting number of trees and mortality is calculated as number of trees which subsequently died/(80-number which died immediately)

Fig caption: Control, trees which received no inoculum. Treatment, these trees received liquid inoculum of 6 different emf, heb = *Hebeloma spp*, lac = *Laccaria bicolor*, lact = *Lactarius torminosus*, pax = *Paxillus involutus*, scl = *Scleroderma areolatum*, sui = *Suillus bovinus*. The stars represent the significance of a Welch's t test with \*\* p <= 0.01, \*\*\* p <= 0.001. Applied emf gives a significant change in height for Lactarius, Paxillus and Scleroderma. Note that we do not expect a difference for Suillus, this treatment included partially as cross check and partially to keep treatments equal across all tree species tested. Seeing an effect for Suillus may have alerted us to some other unmeasured effect

Here is above splitting into drought and non-drought

## Mean Change in Height by Drought x Fungal Treatment

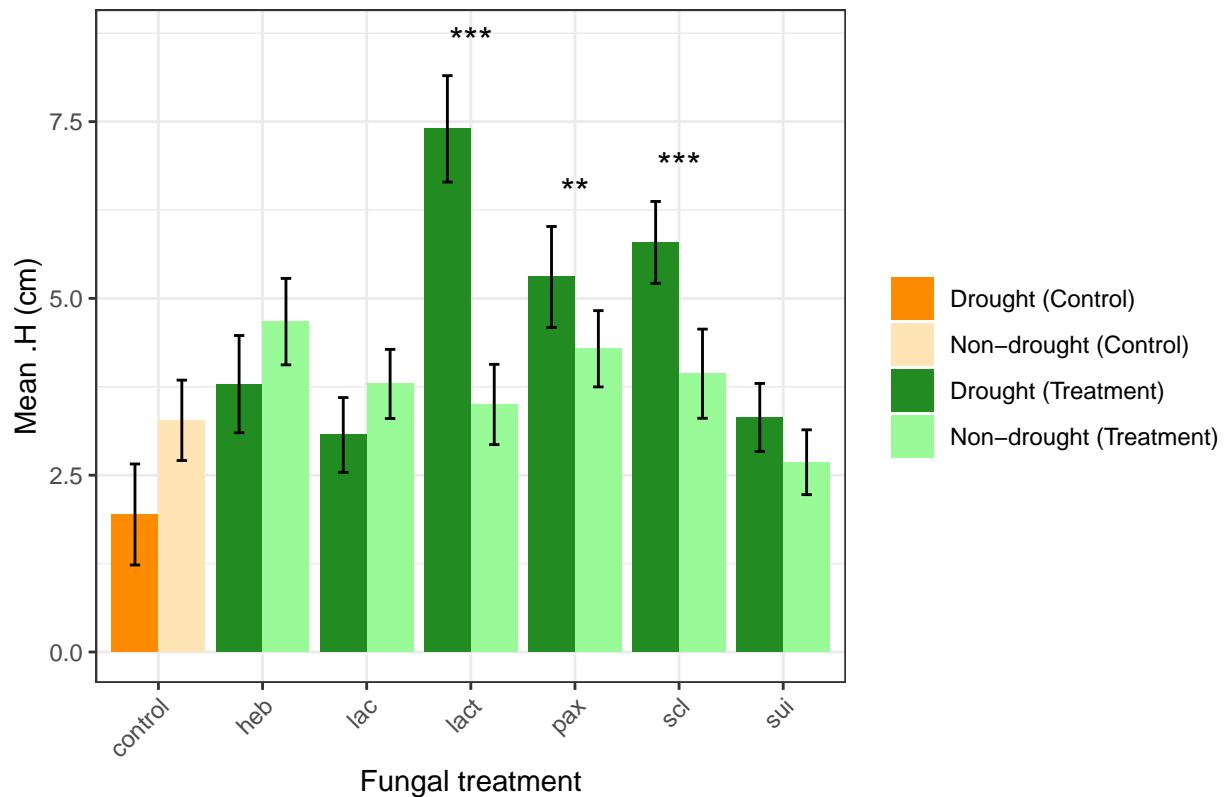
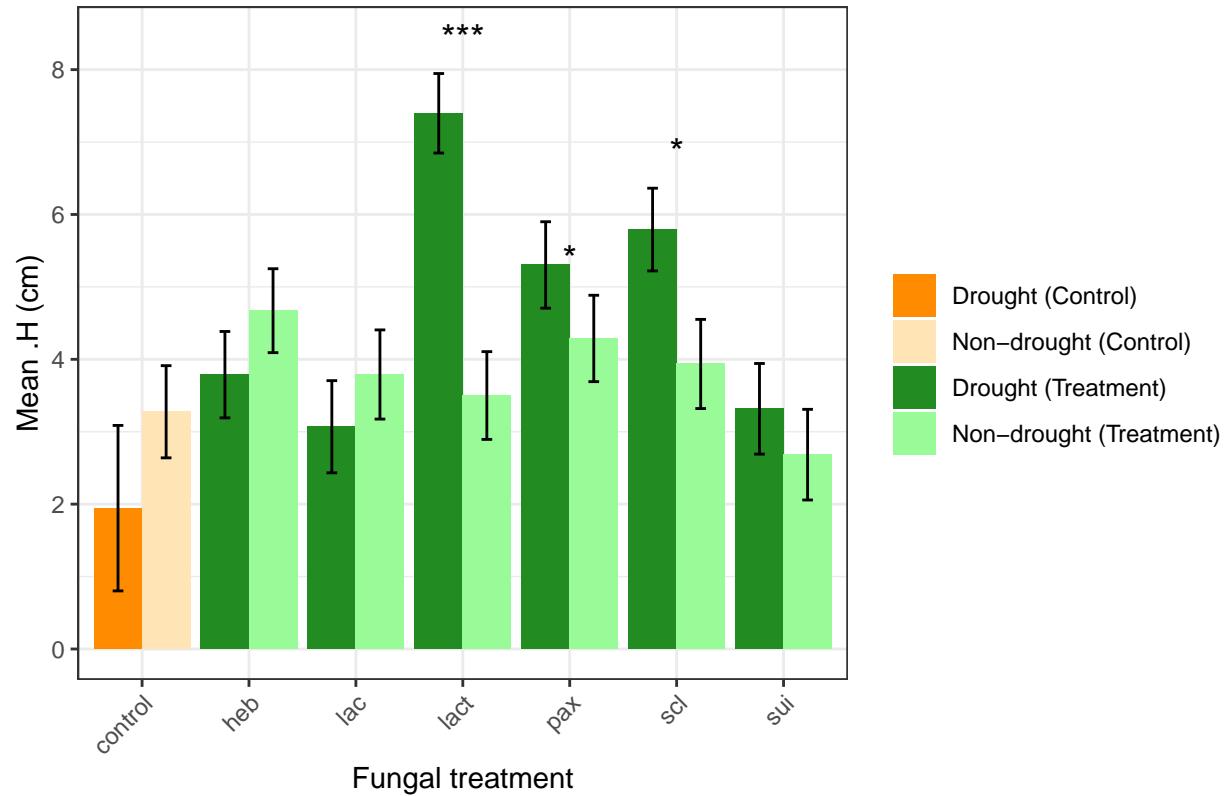


Fig caption: Control, trees which received no inoculum. Treatment, these trees received liquid inoculum of 6 different emf, heb = *Hebeloma spp*, lac = *Laccaria bicolor*, lact = *Lactarius torminosus*, pax = *Paxillus involutus*, scl = *Scleroderma areolatum*, sui = *Suillus bovinus*. The stars represent the significance of a Welch's t test with \*\*  $p \leq 0.01$ , \*\*\*  $p \leq 0.001$ .

When we also split out the drought and non drought we have the same pattern of lactarius, paxillus and scleroderma giving significant changes in height, so whilst the droughting may influence mortality, it does not appear to influence change in height.

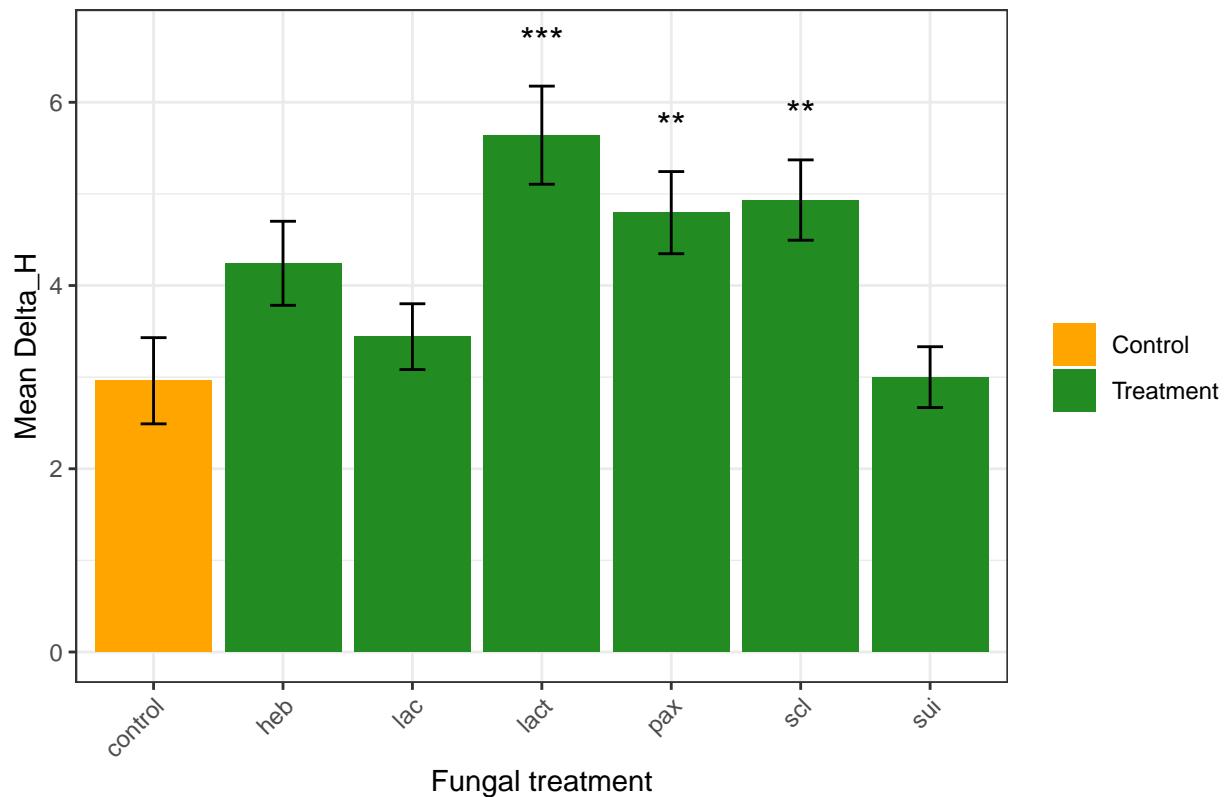
Cleaner here to run a lm with droughting as an effect as multipl pairwise t tests can inflate type 1 errors

### Mean Change in Height by Drought x Fungal Treatment (LM-based)



Linear model, main effects are fungi and drought, interaction effect of drought (i.e, how each fungi responds differently under drought vs non drought). Estimated marginal means ( $\text{lm\_model} \sim \text{Fungi} | \text{Drought}$ ) - this is delta H of lact for each drought level, estimated by the model - not just the raw average. Contrast(emm) compares model adjusted mean of lact under drought to model adjusted mean of control under drought - similarly for non-drought.

Mean Delta\_H by Fungal Treatment



### Mean .H by Fungal Treatment (ignoring drought)

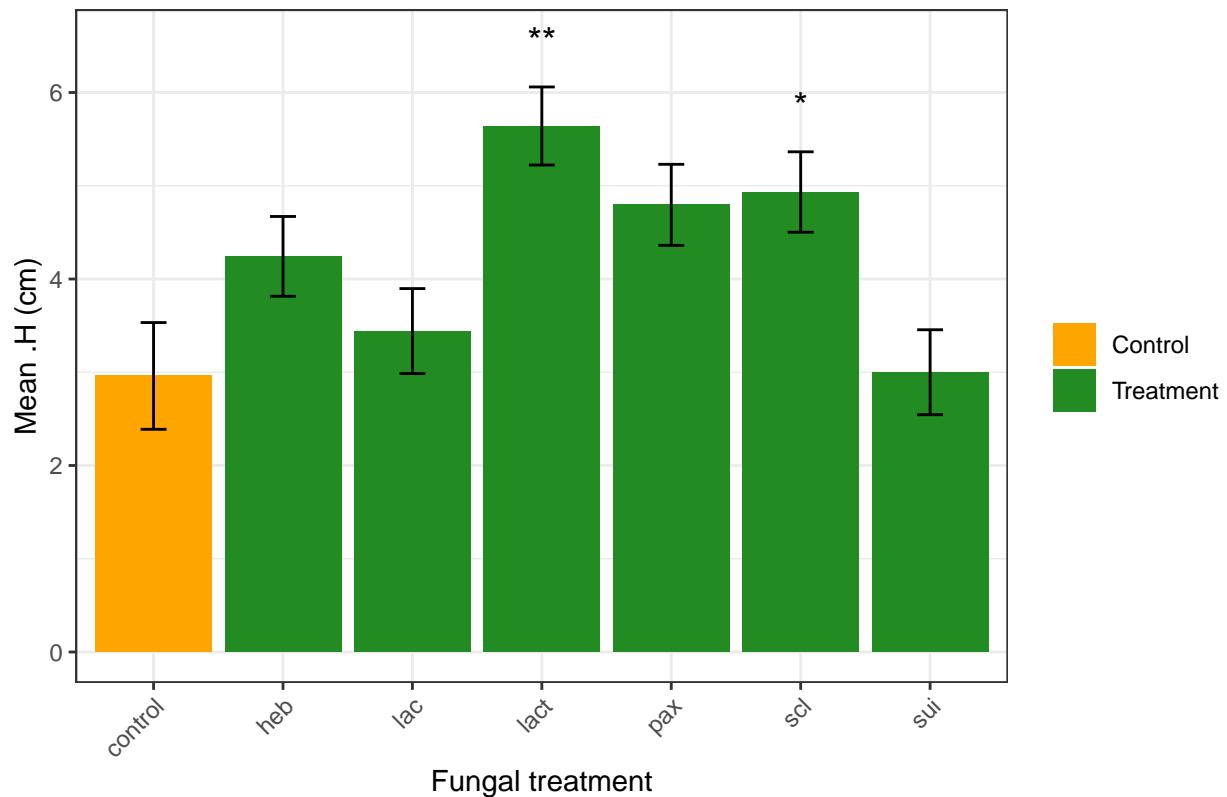


Table 1: Summary of Delta H by Fungal Treatment

Fungi	n	Mean Delta H (cm)	SD (cm)	Variance
control	38	2.96	2.90	8.41
<i>heb</i>	69	4.24	3.81	14.50
<i>lac</i>	60	3.44	2.78	7.75
<i>lact</i>	71	5.64	4.51	20.36
<i>pax</i>	66	4.80	3.64	13.27
<i>scl</i>	67	4.93	3.59	12.88
<i>sui</i>	60	3.00	2.57	6.61

Distribution of delta\_H by Fungal Treatment

