

egosphere-2026-682

How is the functioning of saplings limited by soil nutrients in tropical rainforests?

Author(s): Anne L. van Poecke et al.

BIOGEOSCIENCE – Comment on egosphere-2026-682 – 29/05/2026

Responses to comments by referee #1, Dr. S. Joseph Wright (23 March 2026)

The author's comments and responses are in blue, and the referees' comments are in black.

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RC1: 'Comment on egosphere-2026-682', S. Joseph Wright, 23 Mar 2026

The authors evaluated the impact of combined nitrogen and phosphorus addition (+NP) for soil N and P concentrations, foliar N and P concentrations, photosynthetic potentials, overstory leaf area index (LAI), and stem diameter, stem volume, and height growth for saplings of four tree species. The experiment took place in an old-growth tropical rain forest in French Guiana. The +NP treatment was maintained for eight years and increased overstory LAI and sapling height growth. These are important results that will be of particular interest for readers concerned with nutrient limitation and tropical forests.

I have one important suggestion, one problem with the presentation of statistical analyses that really must be fixed, one problem with the emphasis placed on topographic position, and several moderately important and minor suggestions.

Response: We thank Dr. Wright very much for his positive feedback and constructive suggestions.

My most important suggestion concerns the growth analyses. Stem diameter, stem volume, and height do not grow independently. All three are allometrically related. Consider the immediate implication. If +NP increased height growth but not stem diameter growth, then +NP also changed the allometric relationship between stem diameter and height. I believe the authors should recast their growth analysis in an allometric framework. Stem volume should be dropped entirely because the authors calculate stem volume from stem diameter and height.

Response: We thank Dr. Wright for this valuable comment. We agree with Reviewer #1 and have decided to remove the volume variable (and remade Figures 7 and 8, but this time for diameter). To study the changes in allometry, we carried out the following steps:

- 1) We fitted a linear regression to the 2016 values, with height on the y-axis and diameter on the x-axis. This gave us a functional equation of the form $y = ax + b$ for each species.
- 2) We then substituted the diameter measured in 2024 into the previously derived equations. The resulting height was the expected height if the allometry had not changed.
- 3) We then subtracted the expected height from the measured height in 2024. This difference represents the anomaly in allometry relative to pre-treatment conditions.
- 4) Finally, we tested whether the anomalies in the NP-fertilised saplings differed statistically from those in the control saplings.

On average, the anomalies for the fertilised saplings were 25.3 cm greater than those for the unfertilised saplings ($p < 0.0001$; see Fig. 1), and this applied to all four species. The interaction

between species and treatment was not significant. Figure 2 shows that, for each species, the regression line for the NP-fertilised saplings in 2024 lies above the regression line for the control saplings in 2024 (and above the measurements made in 2016). This difference is statistically significant: the stems of the fertilised saplings were on average 26.8 cm taller than those in the control plots ($p < 0.0001$).

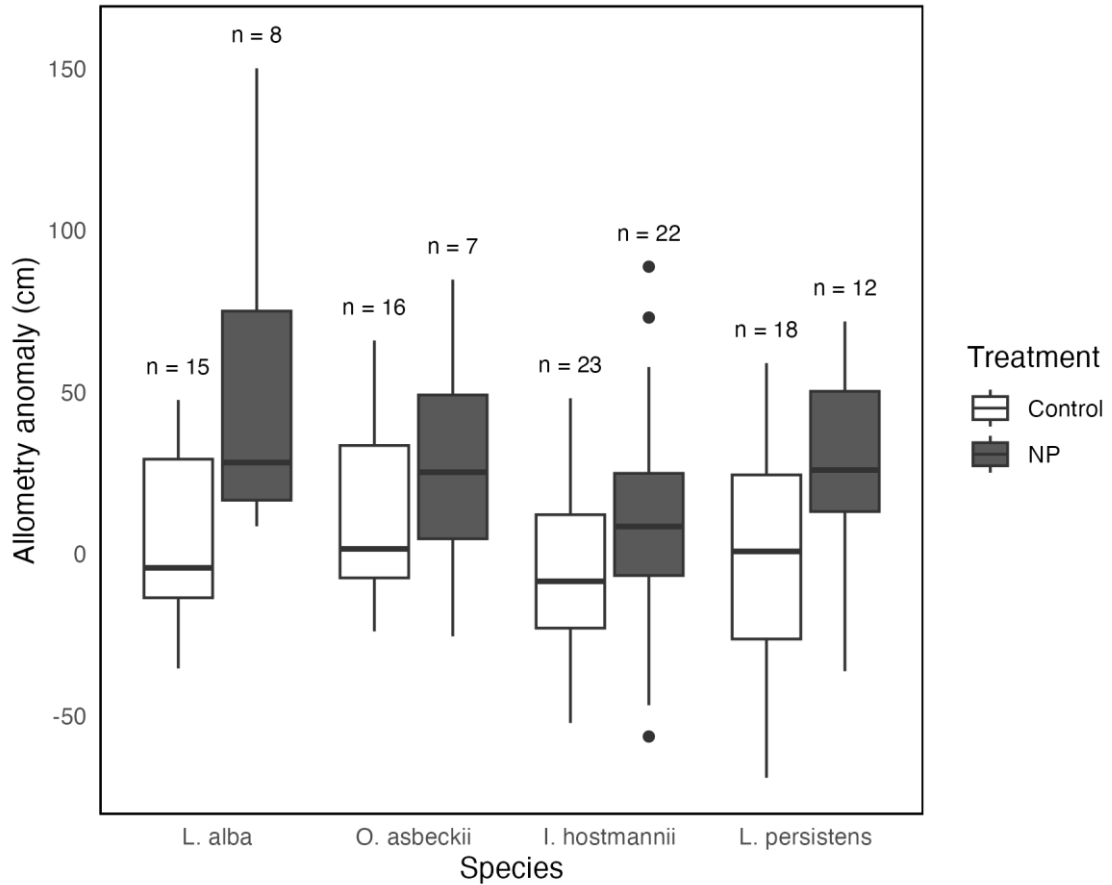


Figure 1: Allometric anomalies are compared between NP-fertilised and control saplings of each species. The box is formed by the lower and upper quartiles; the horizontal line within the box indicates the median. Vertical lines represent fences, which are determined by points in the dataset that fall within 1.5 times the interquartile distance above and below the box. Observations that fall outside the fences are represented by circles. The number of saplings used is indicated above each box plot.

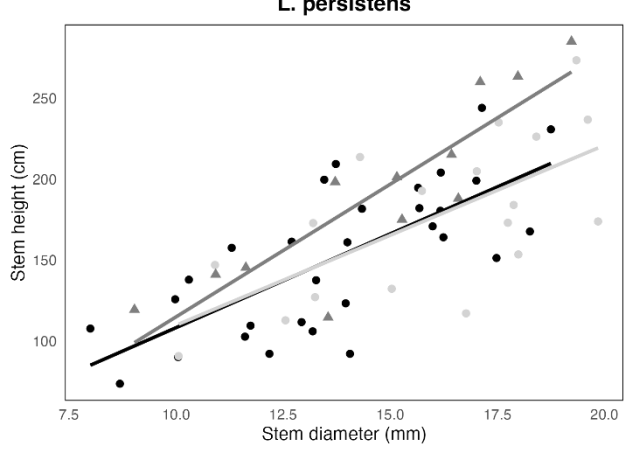
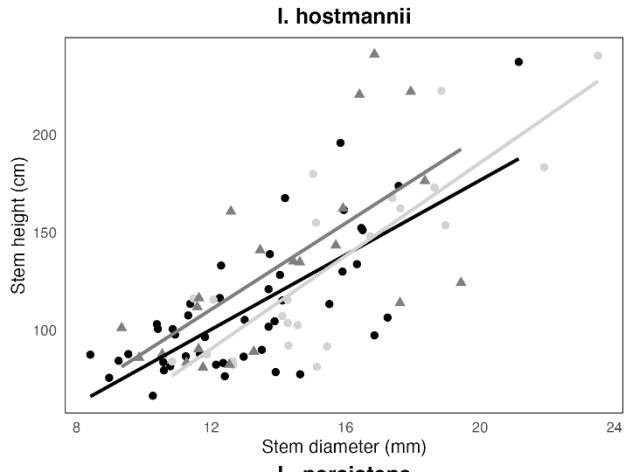
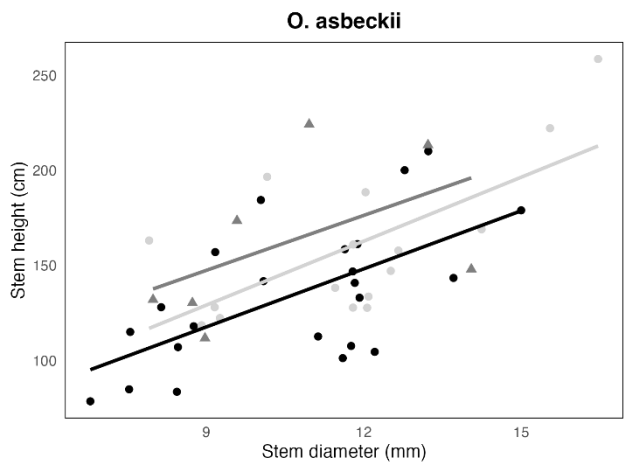
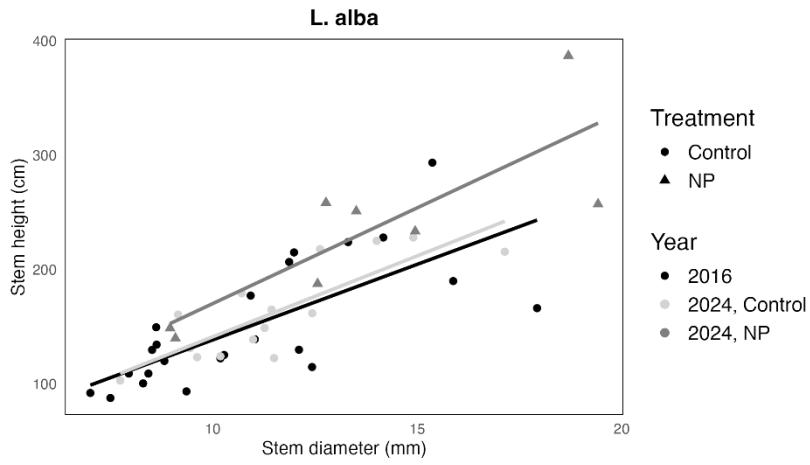


Figure 2: For each species, stem height is plotted against stem diameter. The different regression lines show the year in which the measurements were taken. For 2024, there is a distinction between fertilised and control saplings.

Also, the authors really must describe their statistical analyses and present the results of those analyses in standard fashion. Section 2.5 describes the statistical analyses and devotes just one sentence to this crucial description. That one sentence states: “The main statistical model was an ANCOVA model, with treatment, species, topography and overstorey LAI as key explanatory variables (sometimes ANOVA, when overstorey LAI had no statistically significant effect).” That is not acceptable. For example, the reader is never told whether the authors evaluated interactions among their “key explanatory variables” (see Figure 5 for an interaction that might be significant). The full results of ANCOVA models are never presented. Appendices E, F and G present ANCOVA model results but in a non-standard and uninformative format. The presentation of all statistical analyses and results must be improved.

Response: That is absolutely right; thank you for pointing that out. Below you can find a more detailed description of section 2.5 on the statistics for the adjusted models.

“We analysed foliar nutrient concentrations (N and P), photosynthetic capacity, relative diameter increment, relative height increment, SLA, total leaf area and ratio total leaf area/wood volume variables using linear mixed-effects models corresponding to an ANCOVA framework. Fertilisation treatment, overstorey leaf area index (LAI), and species identity were included as fixed effects, along with their interactions. Topographic position (lowland, plateau, uphill) was included as a fixed blocking factor to account for environmental heterogeneity, as treatments were not replicated within topographic positions. Plot identity was included as a random effect to account for the non-independence of saplings within plots. Interactions and explanatory variables that were not statistically significant were removed in each case to simplify the models. This is discussed in more detail for each model in the results section.

We also analysed soil nutrient concentrations (N, P and C) and overstorey LAI variables, using linear mixed-effects models corresponding to an ANOVA framework. Fertilisation treatment was included as the only fixed effect here, topographic position was included as a fixed blocking factor and plot identity was included as a random effect.

Finally, we also analysed changes in the allometric relation between stem height and stem diameter. In order to do so, we looked at stem height measured in 2016 as a first variable and we used a linear mixed-effects model corresponding to an ANCOVA framework for this purpose. Stem diameter measured in 2016 and species identity were included as fixed effects, along with their interactions to test for species-specific responses to stem diameter. Topographic position was included as a fixed blocking factor to account. However, both the interaction ($F_{3,116} = 1.0862$, $p = 0.3588$) as the blocking factor ($F_{2,116} = 0.9264$, $p = 0.4861$) were not statistically significant and were removed to simplify the model. Plot identity was included as a random effect to account for the non-independence of saplings within plots. We also looked at stem height measured in 2024 as a variable and used a linear mixed-effects model corresponding to an ANCOVA framework. Here fertilisation, stem diameter measured in 2024 and species identity were included as fixed effects, along with their interactions. Topographic position was included as a fixed blocking factor to account. However, the interaction between stem diameter and species was not significant ($F_{3,115} = 0.7952$, $p = 0.4992$), as well as the interaction between stem diameter and treatment ($F_{1,115} = 0.7119$, $p = 0.4006$) and the interaction between treatment and species ($F_{3,115} = 0.7525$, $p = 0.5232$). Also, the blocking factor topography was not statistically significant ($F_{2,115} = 0.7764$, $p = 0.4625$) and was removed together with all the interactions, to simplify the model. Plot identity was included as a random effect to account for the non-independence of saplings within plots. To analyse the height anomaly as a last variable, we used a linear mixed-effects model corresponding to an ANOVA framework for this purpose. Fertilisation treatment and species identity

were included as fixed effects, along with their interaction. Topographic position was included as a fixed blocking factor to account. However, both the interaction ($F_{3,116} = 1.0679$, $p = 0.3658$) as the blocking factor ($F_{2,116} = 1.2095$, $p = 0.3022$) were not statistically significant and were removed to simplify the model. Plot identity was included as a random effect to account for the non-independence of saplings within plots.”

The full results of linear mixed-effects models are presented below:

Table 1: Output from the statistical model for soil P concentrations.

Fixed effects:					
	Estimate	Std. Error	df	t value	Pr(> t)
(Intercept)	-0.0018016	0.0025529	1.9999987	-0.706	0.5535
TreatmentNP	0.0192679	0.0025529	1.9999987	7.547	0.0171 *
TopographySlope	0.0010281	0.0031266	1.9999987	0.329	0.7735
TopographyTop	-0.0001439	0.0031266	1.9999987	-0.046	0.9675

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					

Table 2: Output from the statistical model for soil N concentrations.

Fixed effects:					
	Estimate	Std. Error	df	t value	Pr(> t)
(Intercept)	-0.049061	0.012045	26.000000	-4.073	0.000386 ***
TreatmentNP	-0.005129	0.012045	26.000000	-0.426	0.673768
TopographySlope	0.031686	0.014753	26.000000	2.148	0.041220 *
TopographyTop	0.022369	0.014753	26.000000	1.516	0.141516

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					

Table 3: Output from the statistical model for soil C concentrations.

Fixed effects:					
	Estimate	Std. Error	df	t value	Pr(> t)
(Intercept)	-0.5548	0.2569	26.0000	-2.160	0.0402 *
TreatmentNP	-0.2243	0.2569	26.0000	-0.873	0.3904
TopographySlope	0.3410	0.3146	26.0000	1.084	0.2882
TopographyTop	0.1455	0.3146	26.0000	0.462	0.6476

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					

Table 4: Output from the statistical model for foliar P concentrations.

Fixed effects:					
	Estimate	Std. Error	df	t value	Pr(> t)
(Intercept)	0.05661	0.02834	25.99343	1.998	0.05630 .
Speciesasbeckii	-0.02338	0.03780	101.30719	-0.619	0.53763
Specieshostmannii	-0.01399	0.03719	101.00346	-0.376	0.70756
Speciespersistens	-0.01528	0.03780	101.30719	-0.404	0.68695
Speciesalba:TreatmentNP	0.05364	0.04069	27.51336	1.318	0.19835
Speciesasbeckii:TreatmentNP	0.25960	0.04463	30.65856	5.817	2.15e-06 ***
Specieshostmannii:TreatmentNP	0.29912	0.03841	22.80794	7.788	7.18e-08 ***
Speciespersistens:TreatmentNP	0.13938	0.04353	28.18388	3.202	0.00337 **

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					

Table 5: Output from the statistical model for foliar N concentrations.

Fixed effects:						
	Estimate	Std. Error	df	t value	Pr(> t)	
(Intercept)	-0.53807	0.51833	103.00000	-1.038	0.301658	
Speciesasbeckii	-2.17153	0.66254	103.00000	-3.278	0.001428	**
Specieshostmannii	-0.02722	0.65170	103.00000	-0.042	0.966764	
Speciespersistens	-1.43812	0.66254	103.00000	-2.171	0.032257	*
TopographySlope	-0.79595	0.44015	103.00000	-1.808	0.073472	.
TopographyTop	1.05600	0.41838	103.00000	2.524	0.013129	*
Speciesalba:TreatmentNP	0.56510	0.67449	103.00000	0.838	0.404070	
Speciesasbeckii:TreatmentNP	4.84794	0.75033	103.00000	6.461	3.5e-09	***
Specieshostmannii:TreatmentNP	1.77556	0.63157	103.00000	2.811	0.005907	**
Speciespersistens:TreatmentNP	2.80305	0.73083	103.00000	3.835	0.000216	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1						

Table 6: Output from the statistical model for overstorey LAI.

Fixed effects:						
	Estimate	Std. Error	df	t value	Pr(> t)	
(Intercept)	-1.1282	0.2828	53.00000	-3.990	0.000204	***
TreatmentNP	1.5057	0.3193	53.00000	4.715	1.79e-05	***
TopographyTop	1.0202	0.3187	53.00000	3.201	0.002316	**

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1						

Table 7: Output from the statistical model for Asat.

Fixed effects:						
	Estimate	Std. Error	df	t value	Pr(> t)	
(Intercept)	4.42752	1.13460	6.84100	3.902	0.00615	**
TreatmentNP	-0.07766	0.79315	1.00247	-0.098	0.93784	
Speciesasbeckii	0.48795	0.55337	48.24894	0.882	0.38227	
Specieshostmannii	0.86112	0.44323	48.08440	1.943	0.05790	.
Speciespersistens	1.47500	0.45031	48.00543	3.276	0.00196	**
LAI_2024	-0.60471	0.13539	48.82061	-4.466	4.71e-05	***
TopographyTop	0.71179	0.80123	1.04395	0.888	0.53250	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1						

Table 8: Output from the statistical model for relative diameter increment.

Fixed effects:						
	Estimate	Std. Error	df	t value	Pr(> t)	
(Intercept)	0.277359	0.062092	27.065660	4.467	0.000127	***
TreatmentNP	0.034285	0.029334	1.838868	1.169	0.371790	
Speciesasbeckii	-0.076174	0.027887	110.842237	-2.732	0.007337	**
Specieshostmannii	-0.019740	0.024580	111.576273	-0.803	0.423623	
Speciespersistens	-0.011113	0.027055	112.991191	-0.411	0.682028	
LAI_2024	-0.019857	0.007319	112.660279	-2.713	0.007715	**
TopographySlope	0.029999	0.036242	1.895685	0.828	0.498966	
TopographyTop	-0.030176	0.036223	1.912544	-0.833	0.495877	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1						

Table 9: Output from the statistical model for relative height increment.

Fixed effects:						
	Estimate	Std. Error	df	t value	Pr(> t)	
(Intercept)	0.500545	0.104824	113.000000	4.775	5.43e-06	***
TreatmentNP	0.163379	0.033658	113.000000	4.854	3.91e-06	***
Speciesasbeckii	-0.065720	0.051566	113.000000	-1.274	0.20511	
Specieshostmannii	-0.106648	0.045334	113.000000	-2.352	0.02038	*
Speciespersistens	-0.061000	0.049306	113.000000	-1.237	0.21859	
LAI_2024	-0.045352	0.013285	113.000000	-3.414	0.00089	***
TopographySlope	0.132582	0.041933	113.000000	3.162	0.00201	**
TopographyTop	0.008817	0.042340	113.000000	0.208	0.83541	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1						

Table 10: Output from the statistical model for the allometry between stem height and stem diameter, measured in 2016.

Fixed effects:						
	Estimate	Std. Error	df	t value	Pr(> t)	
(Intercept)	31.435	12.942	109.350	2.429	0.01677	*
DM10_2016	10.997	1.025	115.794	10.726	< 2e-16	***
Speciesasbeckii	-12.464	8.729	113.047	-1.428	0.15607	
Specieshostmannii	-64.435	7.952	114.808	-8.103	6.43e-13	***
Speciespersistens	-29.686	8.798	115.925	-3.374	0.00101	**

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1						

Table 11: Output from the statistical model for the allometry between stem height and stem diameter, measured in 2024.

Fixed effects:						
	Estimate	Std. Error	df	t value	Pr(> t)	
(Intercept)	18.460	14.621	115.000	1.263	0.209	
DM10_2024	12.961	1.016	115.000	12.763	< 2e-16	***
TreatmentNP	26.776	6.153	115.000	4.351	2.94e-05	***
Speciesasbeckii	-13.451	9.671	115.000	-1.391	0.167	
Specieshostmannii	-90.561	8.797	115.000	-10.295	< 2e-16	***
Speciespersistens	-47.154	9.607	115.000	-4.908	3.06e-06	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1						

Table 12: Output from the statistical model for the allometry anomaly.

Fixed effects:						
	Estimate	Std. Error	df	t value	Pr(> t)	
(Intercept)	11.717	7.208	116.000	1.626	0.1068	
TreatmentNP	25.297	6.177	116.000	4.095	7.84e-05	***
Speciesasbeckii	-2.891	9.734	116.000	-0.297	0.7670	
Specieshostmannii	-21.097	8.502	116.000	-2.481	0.0145	*
Speciespersistens	-11.205	9.151	116.000	-1.224	0.2232	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1						

Table 13: Output from the statistical model for the SLA.

Fixed effects:						
	Estimate	Std. Error	df	t value	Pr(> t)	
(Intercept)	-35.259	13.384	53.000	-2.634	0.01103	*
TreatmentNP	15.337	4.895	53.000	3.133	0.00282	**
LAI_2024	4.022	1.877	53.000	2.142	0.03679	*

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1						

Table 14: Output from the statistical model for the total leaf area.

Fixed effects:						
	Estimate	Std. Error	df	t value	Pr(> t)	
(Intercept)	3324.729	742.001	9.415	4.481	0.00137	**
TreatmentNP	490.387	846.480	4.032	0.579	0.59320	
Speciesasbeckii	-1451.223	729.485	117.114	-1.989	0.04899	*
Specieshostmannii	645.995	712.431	117.195	0.907	0.36640	
Speciespersistens	23.760	723.324	117.074	0.033	0.97385	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1						

Table 15: Output from the statistical model for the ratio total leaf area / wood volume.

Fixed effects:						
	Estimate	Std. Error	df	t value	Pr(> t)	
(Intercept)	55.831	9.731	35.148	5.738	1.69e-06	***
Speciesasbeckii	-18.116	13.415	114.260	-1.350	0.179559	
Specieshostmannii	-11.921	13.196	114.103	-0.903	0.368202	
Speciespersistens	-21.459	13.415	114.260	-1.600	0.112458	
Speciesalba:TreatmentNP	-16.606	13.761	35.148	-1.207	0.235585	
Speciesasbeckii:TreatmentNP	53.405	14.174	38.763	3.768	0.000548	***
Specieshostmannii:TreatmentNP	24.101	13.574	33.665	1.776	0.084844	.
Speciespersistens:TreatmentNP	14.551	13.969	36.953	1.042	0.304333	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1						

I believe the authors place too much emphasis on topographic position. There is just one control plot and just one +NP plot in each of three topographic positions. Treatments are not replicated within topographic positions! This is important. Lacking replication within topographic positions, the experiment cannot convincingly demonstrate effects of topographic position. Rather, I believe the authors should treat their experimental design as a blocked design with respect to topographic position. The question becomes whether experimental results are consistent across topography and NOT whether experimental results are stronger in one topographic position than another.

Response: Yes, you are right; thank you very much for reminding us of this. We have amended our models accordingly. Topographic position is now included as a fixed blocking factor to account for environmental heterogeneity, as treatments were not replicated within topographic positions. Topography was therefore also excluded from interactions with other explanatory variables. We also included plot identity as a random effect. For a detailed description of the statistical models, see above.

Despite the adjustments made to the models, the results remain the same. There are minor changes here and there for a particular species or topography, but the main results remain unchanged. This means that all p-values and some figures will need to be adjusted slightly, but the discussion and conclusion will remain largely unchanged.

Three moderately important suggestions follow:

Line 249-250: The authors wrote “The increment was then calculated by subtracting the 2016 measurements from the 2024 measurements.” The increment refers to a sapling diameter. Diameter growth (or increment) depends strongly on initial diameter. If the authors decide to stick with a separate analysis of stem diameter, then the authors should consider an analysis that uses initial diameter as a covariate.

Response: We thank Dr. Wright for raising this relevant point. We will take the initial height and diameter of the stem into account. Instead of using the absolute difference between the measured diameters and heights in 2016 and 2024, we will now use the relative difference.

For the diameter increase: $(\text{diameter in 2024} - \text{diameter in 2016}) / \text{diameter in 2016}$

For a height increase: $(\text{height in 2024} - \text{height in 2016}) / \text{height in 2016}$.

The format of Figure 3 (and similar figures) is ineffective. The black edges cannot be seen on many plotting symbols, and the journal will not publish a figure in this large format. The format of Figure 2 is effective and might be adopted for Figure 3.

Response: We agree that Figures 3, 6, 8 and 9 are unclear.

Figure 3 is replaced with box plots comparing the fertilised saplings and the unfertilised saplings for each of the four sapling species and for both foliar P and foliar N concentration. For the relative change in foliar nutrient concentrations and for the other three figures, topography is removed as a symbol, as it is less important. The symbols (a circle for control and a triangle for NP-fertilised saplings) are used to indicate fertilisation.

Instead of Figure 3, the following three figures were produced:

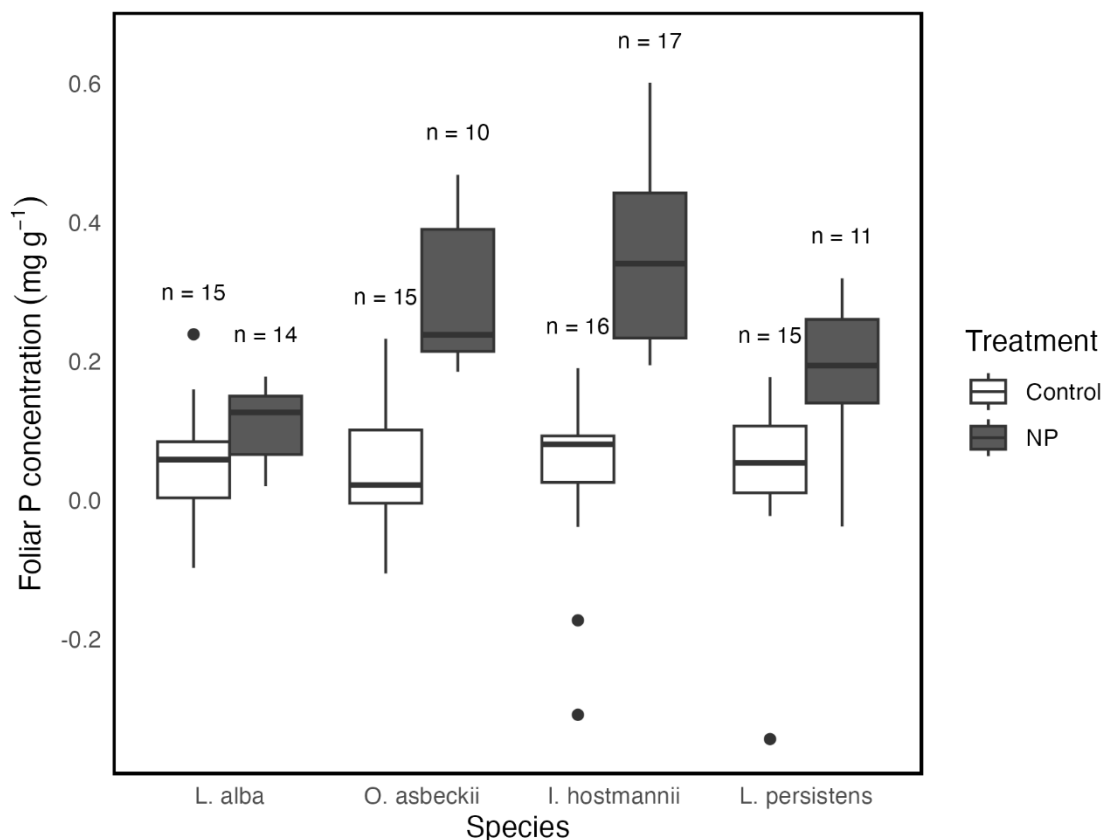


Figure 3: Foliar P concentrations are compared between NP-fertilised and control saplings of each species. The box is formed by the lower and upper quartiles; the horizontal line within the box indicates the median. Vertical lines represent fences, which are determined by points in the dataset that fall within 1.5 times the interquartile distance above and below the box. Observations that fall outside the fences are represented by circles. The number of saplings used is indicated above each box plot.

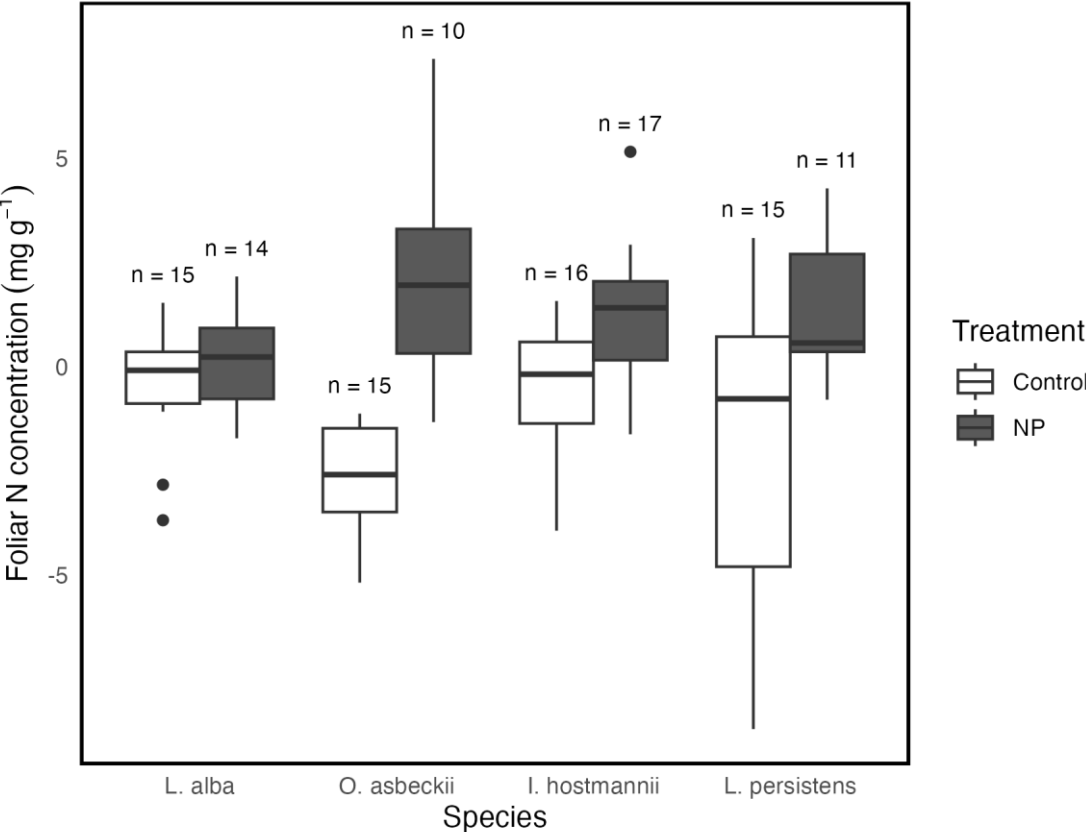


Figure 4: Foliar N concentrations are compared between NP-fertilised and control saplings of each species. The box is formed by the lower and upper quartiles; the horizontal line within the box indicates the median. Vertical lines represent fences, which are determined by points in the dataset that fall within 1.5 times the interquartile distance above and below the box. Observations that fall outside the fences are represented by circles. The number of saplings used is indicated above each box plot.

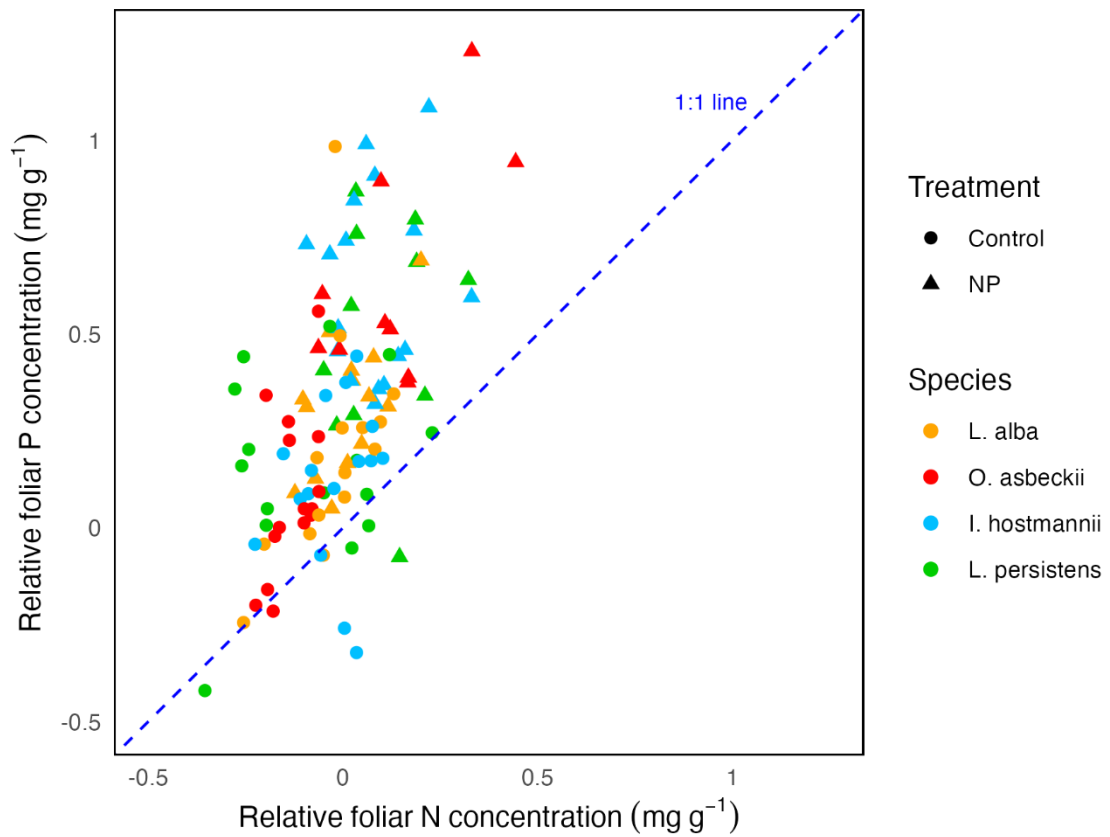


Figure 5: The relative change in foliar P concentration between 2016 and 2024 is compared with the relative change in foliar N concentration between 2016 and 2024, each time calculated as (2024 values - 2016 values) / 2016 values. The blue dashed line indicates the 1:1 line. Points above the line indicate a stronger increase in foliar P concentration, points below the line indicate stronger increase in foliar N concentration between 2016 and 2024.

Instead of Figure 6, the following figure was produced:

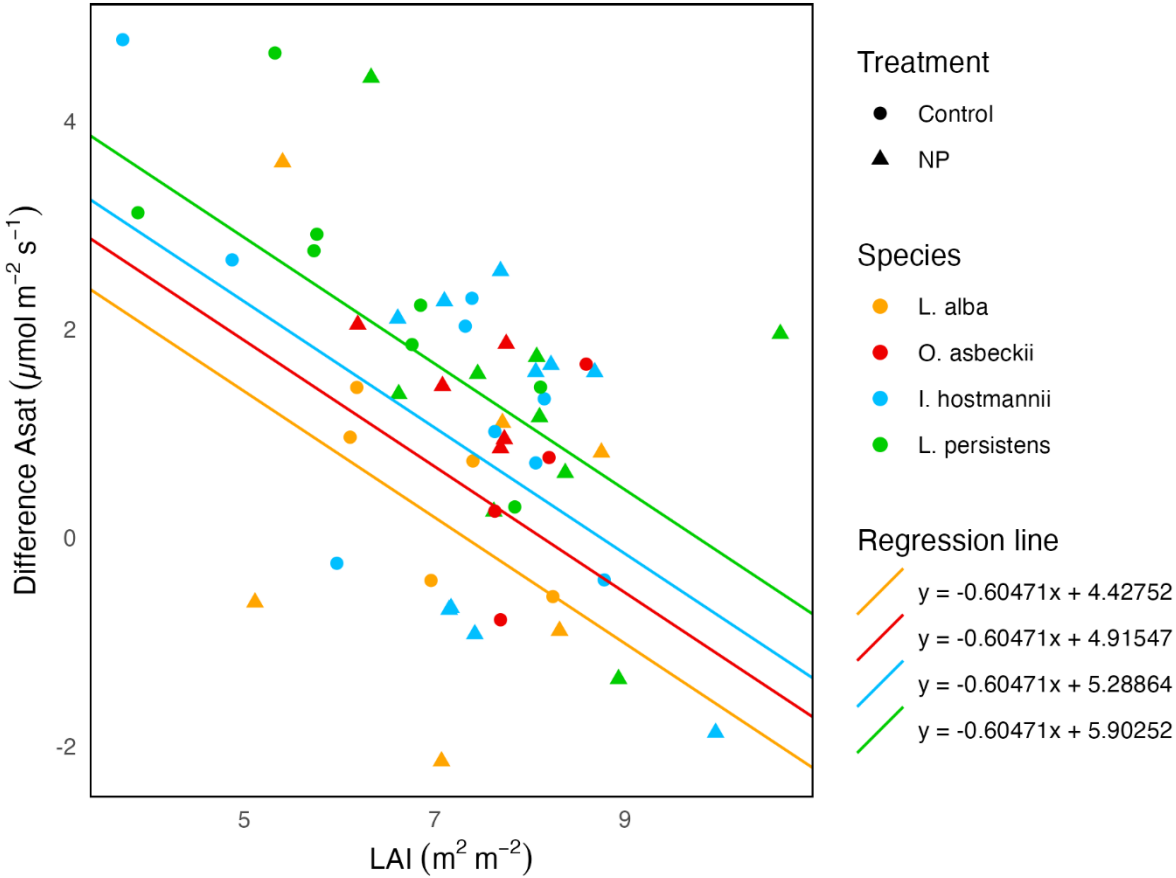


Figure 5: Difference in Asat between 2016 and 2024 is plotted against overstorey LAI (measured in 2024). The different regression lines are shown by species, for reasons of clarity this is each time shown for the bottom topography with control treatment only. The function formulas for all regression lines can be found in Table E1, in Appendix E.

Instead of Figure 8, the following figure was produced:

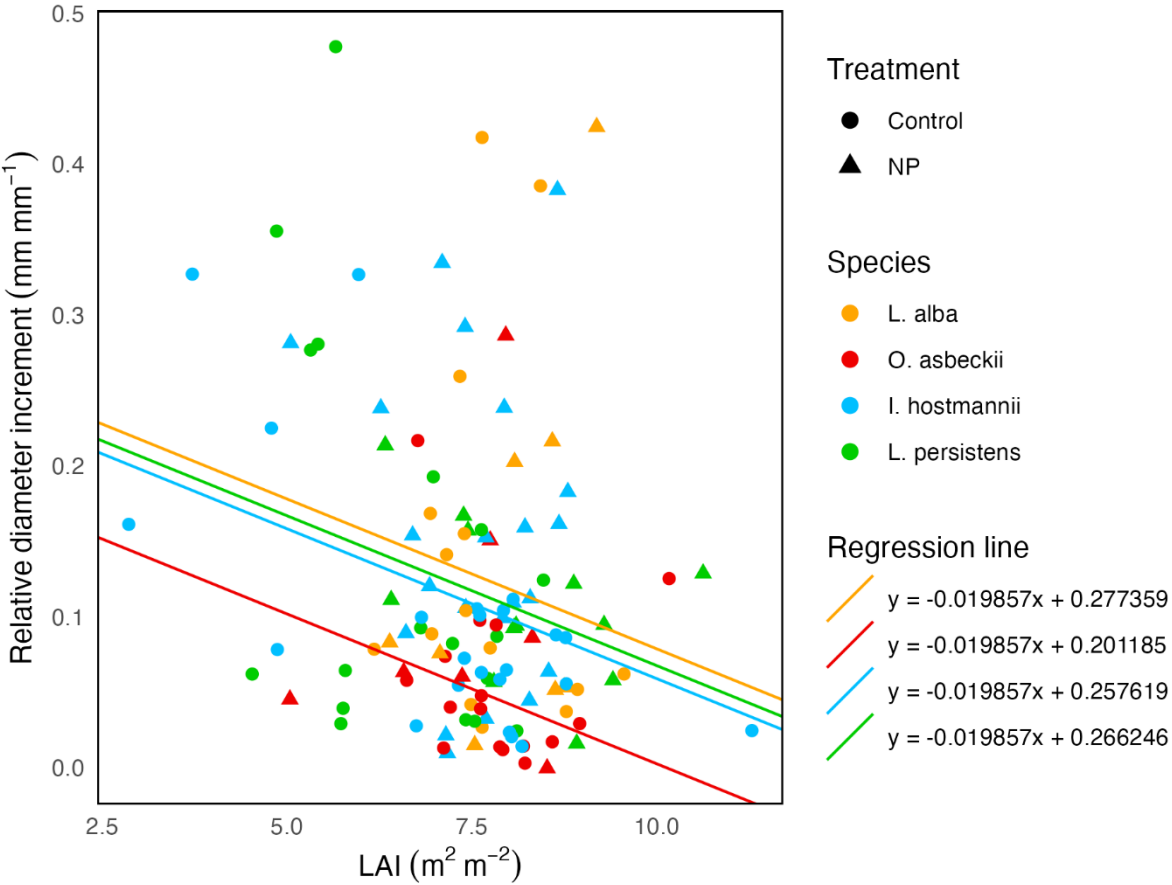


Figure 7: Relative diameter increment ((2024 diameter – 2016 diameter) / 2016 diameter) is plotted against overstorey LAI (measured in 2024). The different regression lines are shown by species, for reasons of clarity this is each time shown for the bottom topography with control treatment only. The function formulas for all regression lines can be found in Table F1, in Appendix F.

Instead of Figure 9, the following figure was produced:

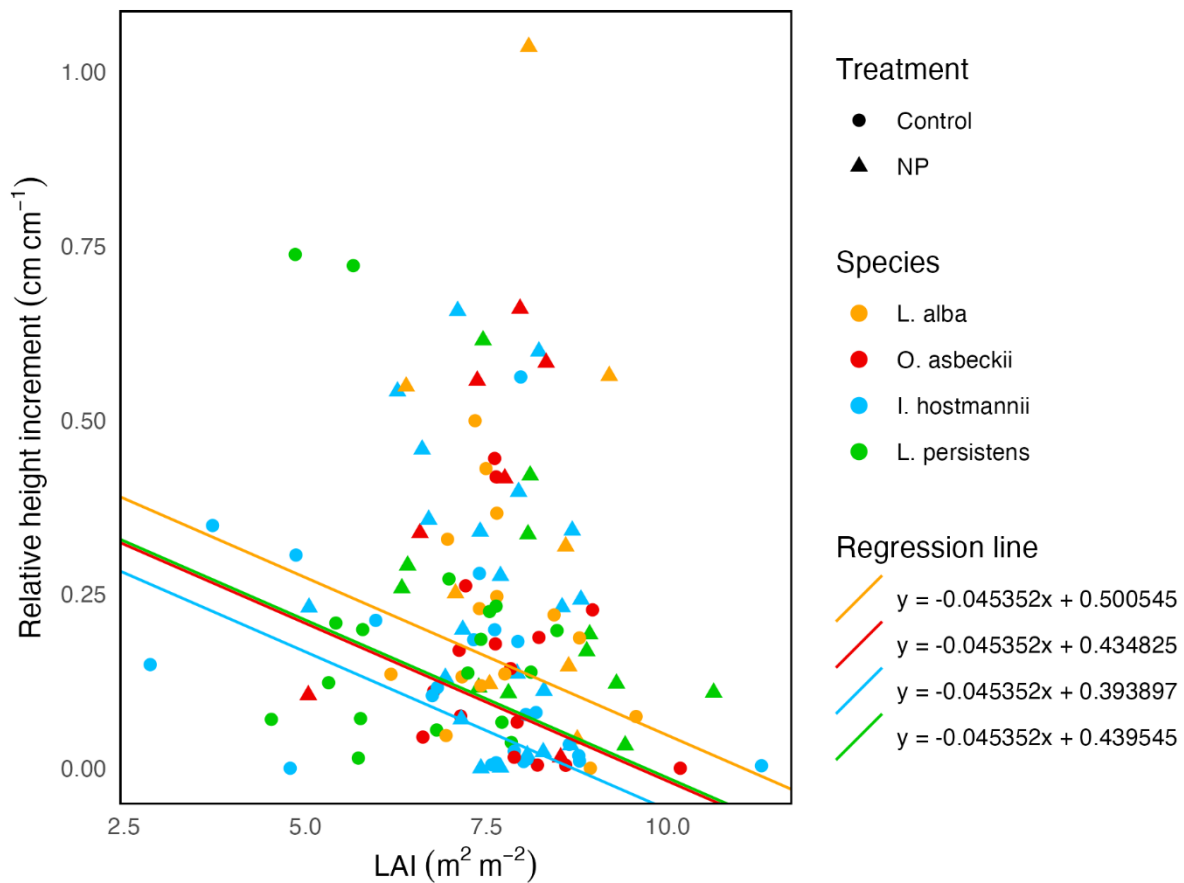


Figure 8: Relative height increment ((2024 height – 2016 height) / 2016 height) is plotted against overstorey LAI (measured in 2024). The different regression lines are shown by species, for reasons of clarity this is each time shown for the bottom topography with control treatment only. The function formulas for all regression lines can be found in Table G1, in Appendix G.

Lines 399-400: The authors wrote “We therefore conclude that hypotheses 1 and 2 could not be rejected and that N and P addition increased the availability of these elements and subsequently also their foliar concentrations.” Statistical analyses can lead one to reject the null hypothesis. In this case, the null hypothesis is that soil and foliar nutrient levels did not change. The null hypothesis is rejected. The authors must fix this! The same problem recurs at line 448.

Response: We agree and have reworded the sentence positively: “Hypotheses 1 and 2 can be accepted”, which implies a rejection of the null hypothesis (no effect/change). We have made the necessary changes to the text. Thank you for bringing this to our attention.

Line 399-400: “We therefore conclude that hypotheses 1 and 2 can be accepted and that N and P addition increased the availability of these elements and subsequently also their foliar concentrations, at least for some species.”

Line 448: “As such hypothesis 4 cannot be accepted.”

Minor stuff follows.

Given the study motivation presented in the first paragraph of the Introduction, the authors should cite Peter Hietz' work on N deposition impacts for tropical forests (see Hietz et al 2011 Science 334: 664-666).

Response: Peter Hietz' work has been cited in the text.

Line 35: The authors wrote tropical forests are "absorbing about 40 billion tons of CO₂ annually". The value given exceeds 90% of all anthropogenic CO₂ emissions. The standard inventory suggests the value should be about 30%, not 90% (Pan et al. 2024 Nature).

Response: This has been corrected accordingly "absorbing about nine billion tons of CO₂ annually". This was calculated by adding together the values for tropical intact forests and tropical regrowth forests from Pan et al. (2024) and then multiplying the result by 3.66 to obtain a value for CO₂ instead of carbon.

Line 234: The authors wrote "... the stomatal ratio was set at 0.5." What does this mean? I am familiar with the LI-6400 being used but have never heard of setting a "stomatal ratio".

Response: For the measurements with the LI-6400, we used the instruction manual "Using the LI-6400/XT; Instruction manual for software version 6". Step 8 under "Clamping onto the First Leaf" (on page 175) states the following:

"In New Measurements mode, press 3, and set the leaf area and stomatal ratio for this leaf. Leaf area is simply the area exposed inside the chamber. If you are using a 2 x 3 chamber and filling it, the area is 6 cm². Stomatal ratio is an estimate of the ratio of stomata on one side of the leaf to the other. Use 1 for equal stomatal density on top and bottom; 0 for stomata on only one side. If you aren't sure, use 0.5. It doesn't matter if you use the ratio of top to bottom, or bottom to top. Thus, 0.5 is the same as 2; 0.333 is the same as 3, etc."

LI-COR: Using the LI-6400 / LI-6400XT Version 6, <https://licor.app.boxenterprise.net/s/s8zyqu2vwndny903qutg>, last access: 5 May 2026.

As the number of stomata was neither known nor counted during the 2016 measurements, a stomatal ratio of 0.5 was used. To enable a comparison of the results, the same settings were used in 2024 as in 2016, and therefore a stomatal ratio of 0.5 was used again.

Lines 343-345 describe an interesting correlation. Please consider adding a scatterplot that shows the data to the supplementary material.

Response: A scatter plot illustrating this relationship was already included in Appendix B. You can find the relevant figure here, with some recent adjustments:

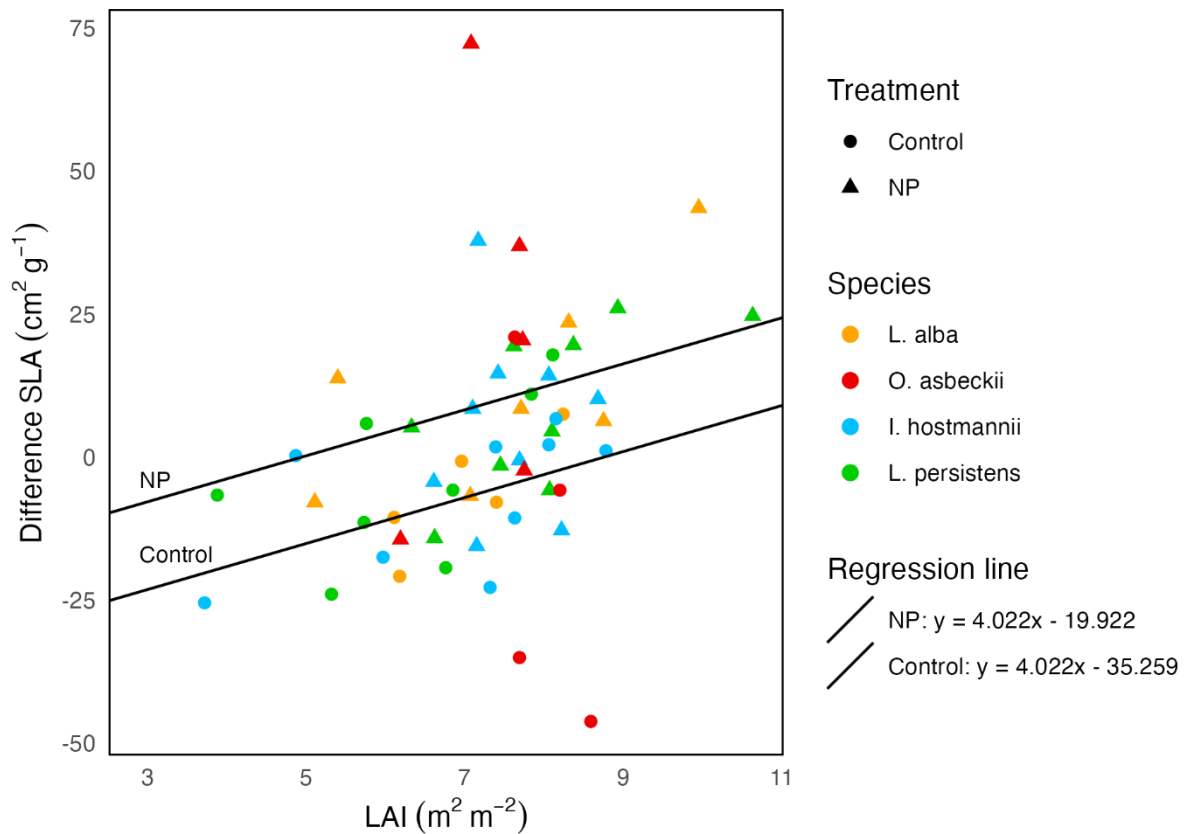


Figure B1: The difference in specific leaf area (SLA) is plotted against the overstorey LAI (measured in 2024), with 'NP' the regression line for the fertilised saplings and 'Control' the regression line for the saplings growing in the control treatment.

Lines 425-430: The authors should reference the meta-analysis of Ostertag and DiManno (2016. Detecting terrestrial nutrient limitation: a global meta-analysis of foliar nutrient concentrations after fertilization. *Frontiers in Earth Science* 4.)

Response: Ostertag and DiManno's work has been cited in the text.

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