Supporting Information. Umaña, M.A., G. Arellano, N.G. Swenson, and J. Zambrano. 2020. Tree seedling trait optimization and growth in response to local-scale soil and light variability. Ecology. Change Umaña M.A. by Umaña M.N.

Appendix S1

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Table S1. Range and mean values for canopy openness and soil nutrients across 200 seedling plots in Puerto Rico.

	Mean	Min	Max	CV
Canopy openness (%)	6.6	0.38	20.56	0.47
K (mg/kg)	65.68	25	369	0.52
Mg (mg/kg)	213.03	36	737	0.57
N (%)	0.46	0.13	2.48	0.72

Table S2. Pearson correlations between pairs of abiotic factors. Values above the diagonal show the r statistic. Values under the diagonal show the P-values.

	Canopy openness	K (mg/kg)	Mg (mg/kg)	Nitrogen
Canopy openness	–	r=0.13	r=0.05	r=0.12
K (mg/kg)	P=0.07	–	r=0.35	r=0.56
Mg (mg/kg)	P=0.47	P=0.001	–	r=0.03
Nitrogen (%)	P=0.08	P<0.001	P=0.63	–

Table S3. Number of plots selected per resource level.

Resource level	Canopy Openness	K	Mg	N
Common	20	20	20	32
Low	20	23	23	24
High	20	20	20	20

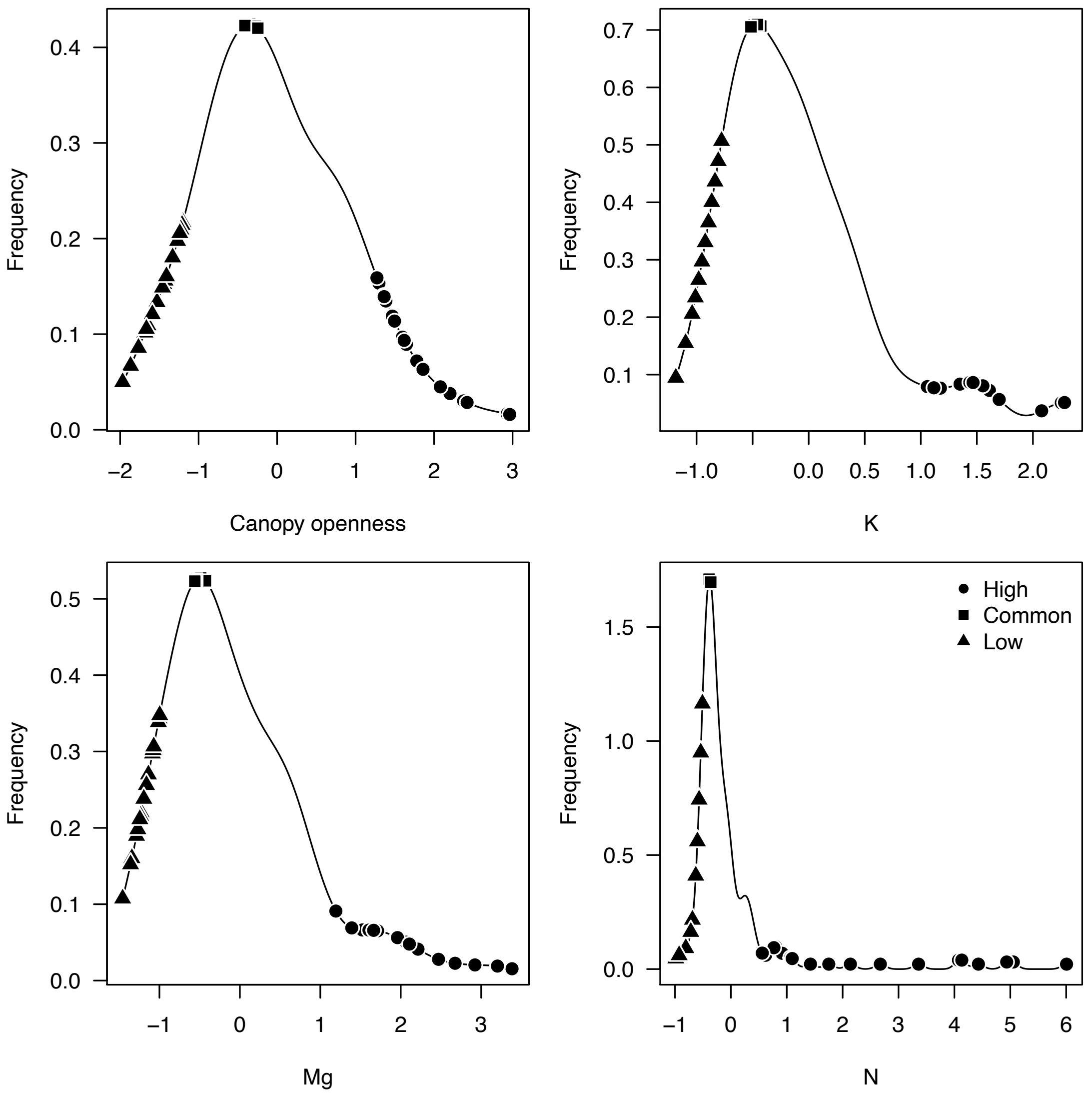

Figure S1. Resource distribution in 200 seedling plots in Puerto Rico (all variables were scaled to mean 0 and standard deviation of 1). Canopy openness was log-transformed before the standardization. Triangles indicate the plots found at resource values that were located under the 10th percentile of the distribution. Squares indicate the plots found at resource values that were located in the 10% of the commonest region of the resource distribution. Circles indicate the plots found at resource values that were located above the 90th percentile of the distribution.

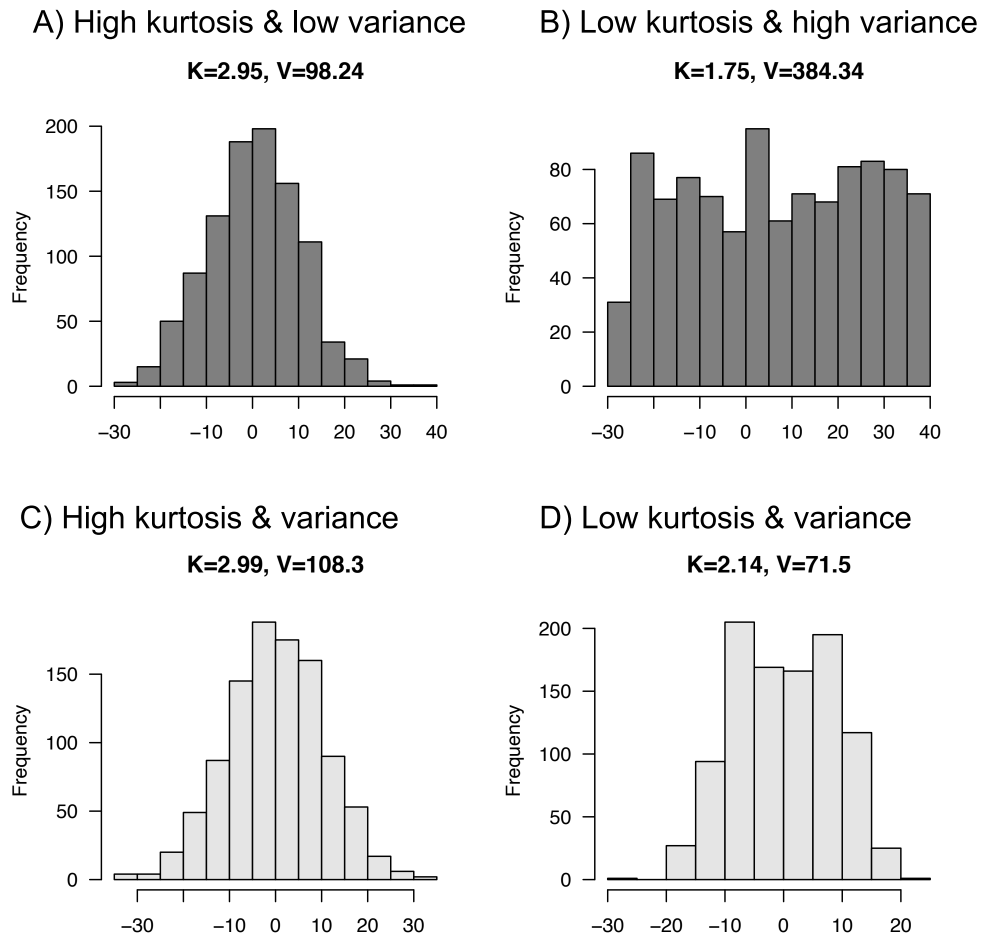

Figure S2. Comparison between kurtosis and variance. In this figure, we show why kurtosis and not variance is the appropriate metric to examine trait optimization. K – kurtosis, V – variance. We randomly generated 1000 values 4 times with the same mean, but variable kurtosis and variance. Plot A shows the distribution with high kurtosis and low variance, while in B, the distribution has low kurtosis and high variance. Plot C shows a distribution with high kurtosis and high variance while in D, the distribution has low kurtosis and low variance. The degree of variance in all four cases is not an indicator of how peaked or optimized is the distribution, therefore it is not a useful metric for the objective of the present study. However, higher kurtosis values do indicate the most convergent distributions.

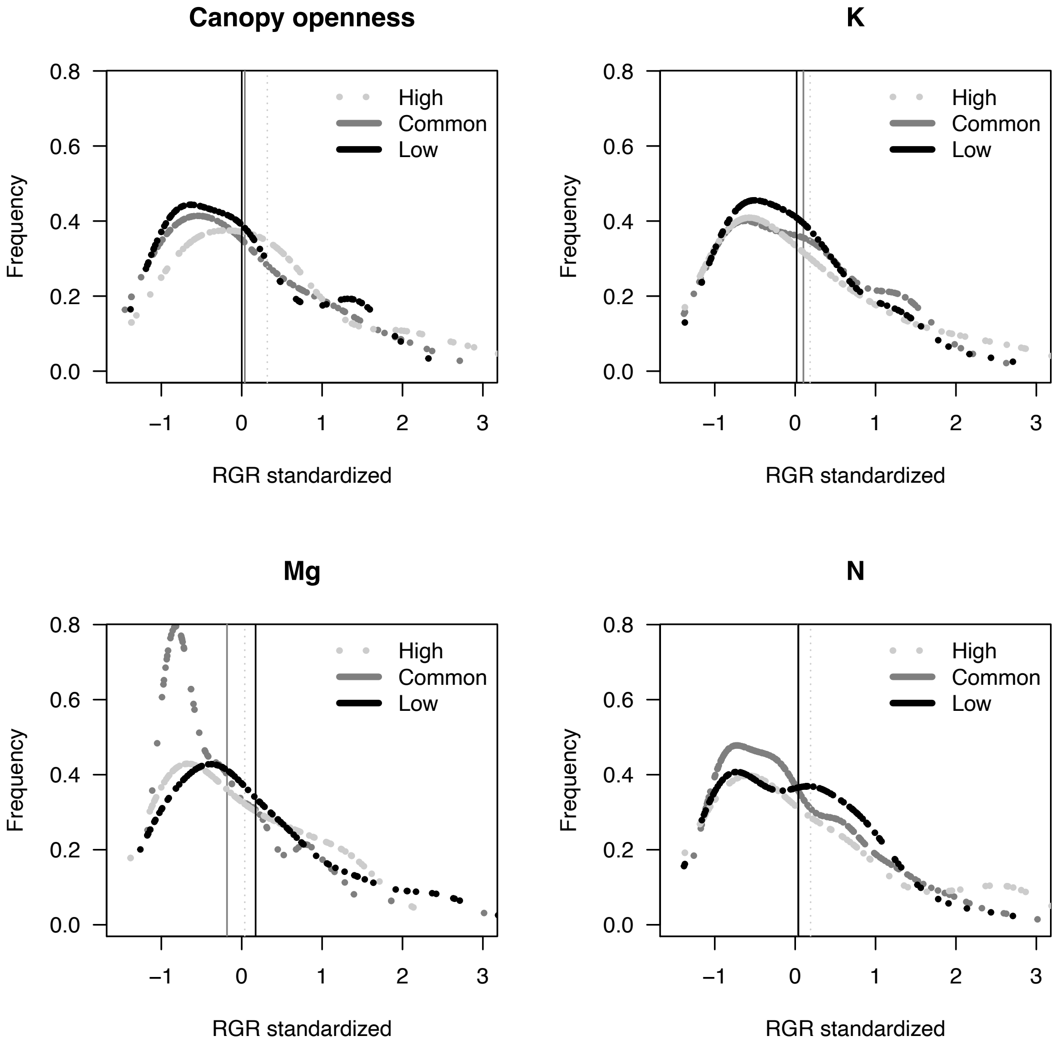

Figure S3. Distributions for seedling relative growth rates (RGR) in each resource-level (low, common, and high) in Puerto Rico. RGR was standardized at the species level. Vertical lines indicate the mean RGR per resource level.

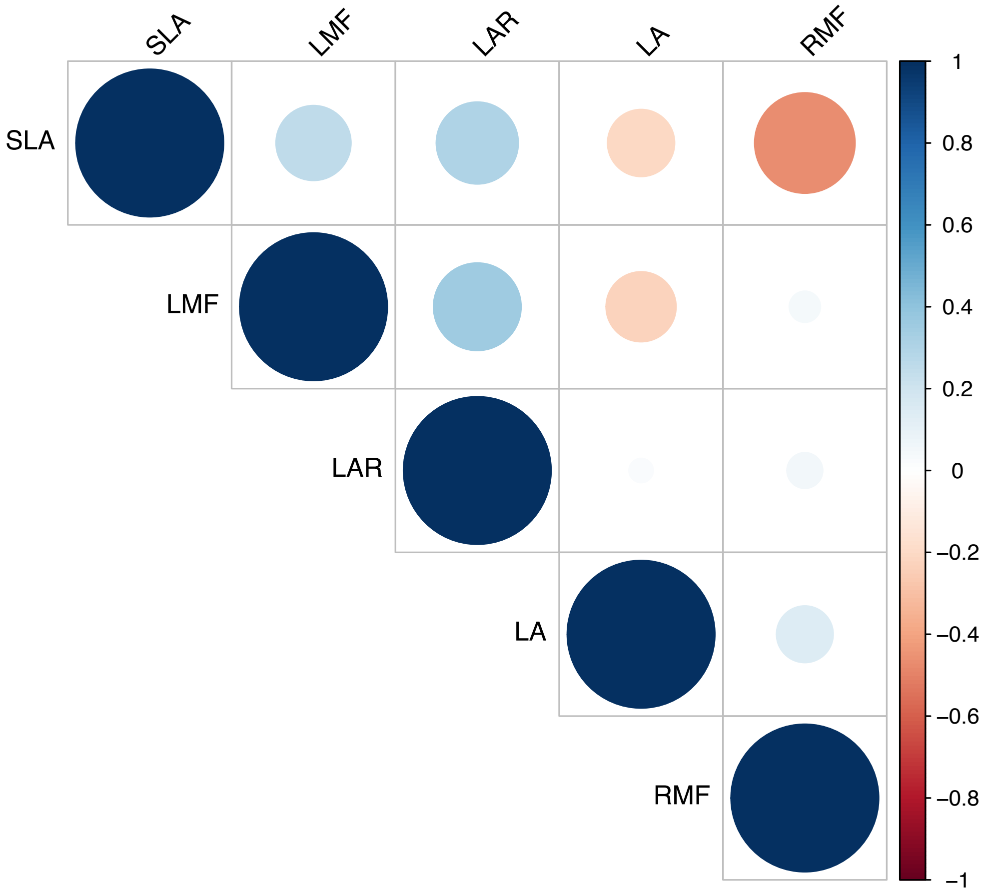

Figure S4. Pairwise Pearson correlation between traits. Color indicates the sign and the magnitude of the correlation coefficients. Non-significant correlations have a blank square. The magnitude of correlation coefficients ranged between 0.02 and 0.45.