

Supplementary Information

Appendix A: Details on Statistical Analyses

Post hoc analyses

Survivorship by treatment

We conducted these analyses with a GLMM, using binomial error structure (these tests are in addition to the within-light-level tests reported in the main text).

Table A-1. Post hoc analyses of differences in survivorship by treatment.

Comparison	Statistics	Result
Both open treatments vs. the other four treatments	$z = 5.277$; $p < 0.001$	Open treatments differ from Tree and Canopy
Tree-Fern treatment vs. Canopy treatments (CF and CN grouped)	$z = 0.115$; $p = 0.908$	Tree-Fern treatments do not differ from canopy treatments
Both open treatments vs. Tree-No Fern treatment	$z = 2.337$; $p = 0.0194$	Open treatments (grouped) differ from Tree-No Fern treatment
Tree-No Fern treatment Vs. Canopy-No Fern treatment	$z = -1.433$; $p = 0.152$	Tree-No Fern treatment does not differ from Canopy-No Fern treatment

Relative Height by Species

We conducted these analyses with a GLMM, using Gaussian error structure. Plot and Treatment were specified as random effects. Since the `lmer` function does not provide p -values when Gaussian error structure is used, we found approximate p -values using the `pvals.fnc` function in the `languageR` library.

Table A-2. Post hoc analyses of species-specific differences in relative height. Most differences were significant and are listed in italics; those that were not are in bold and non-italics, as these indicate the “pairings” of relative gains in height.

	hoawa	kolea	mamaki	maile	naio	pilo
kolea	$t = -4.929$, $p < 0.0001$	---	---	---	---	---
mamaki	$t = -0.07$, $p = 0.944$	$t = 4.268$, $p < 0.0001$	---	---	---	---
maile	$t = -6.056$, $p < 0.0001$	$t = -1.67$, $p = 0.097$	$t = -5.686$, $p < 0.0001$	---	---	---
naio	$t = 3.14$, $p = 0.002$	$t = 8.477$, $p < 0.0001$	$t = 3.163$, $p = 0.002$	$t = 9.705$, $p < 0.0001$	---	---
pilo	$t = 2.316$, $p = 0.0218$	$t = 6.46$, $p < 0.0001$	$t = 2.461$, $p = 0.015$	$t = 7.759$, $p < 0.0001$	$t = -.271$, $p = 0.787$	---

Appendix B: Calculations of cost per surviving seedling.

Table B-1. Details on cost calculations per surviving seedling. Excel files are available by request from the first author.

SEEDLINGS					SEEDS						
FIXED COSTS SEEDLINGS	ALL light levels	TREE and CANOPY only	OPEN only	OPEN and TREE only	FIXED COSTS SEEDS	ALL spp. and light levels	ALL light levels, no mamaki	TREE and CANOPY, all species	TREE and CANOPY, no mamaki	OPEN only, no mamaki	OPEN and TREE, no mamaki
Number of planting sites	720	480	240	480	Number of planting sites	720	600	480	400	200	400
Number of seedlings planted	720	480	240	480	Number of seeds planted	3,960	3,240	2,640	2,160	1,080	2,160
Number of survivors	541	387	154	342	Number of sprouted seeds	90	90	62	62	28	59
Survival rate	0.75	0.81	0.64	0.71	Percent germination	0.023	0.028	0.023	0.029	0.026	0.027
Cost per plant materials and site prep	\$ 5.18	\$ 5.18	\$ 5.18	\$ 5.18	Cost for collection and cleaning	\$ 400.00	\$ 333.33	\$ 266.67	\$ 222.22	\$ 111.11	\$ 222.22
Total cost for seedlings (collection, raising) and site prep	\$ 3,730	\$ 2,486	\$ 1,243	\$ 2,486	Cost for metal grates to cover seeds	\$ 216.00	\$ 180.00	\$ 144.00	\$ 120.00	\$ 60.00	\$ 120.00
						\$ 0.26	\$ 0.26	\$ 0.26	\$ 0.26	\$ 0.26	\$ 0.26
					Cost for site prep per site	\$ 0.26	\$ 0.26	\$ 0.26	\$ 0.26	\$ 0.26	\$ 0.26
					Site Prep Cost total	187.20	156.00	\$ 124.80	\$ 104.00	52.00	104.00
					Total cost for seeds (collection, cleaning) and site prep	\$803.20	\$ 669.33	\$ 535.47	\$ 446.22	\$ 223.11	\$ 446.22

Table B-1. Cont.

VARIABLE COSTS/ SCENARIOS					VARIABLE COSTS/ SCENARIOS						
PAID LABOR					PAID LABOR						
Time to plant each site	0.50	0.50	0.50	0.50	Time to plant each site	0.17	0.17	0.17	0.17	0.17	0.17
Hours to plant seedlings (including grass clearing, mattoxing))	360	240	120	240	Number of hours required to plant seeds (including grass clearing, mattoxing)	122	102	82	68	34	68
Cost per employee hour	\$ 10	\$ 10	\$ 10	\$ 10	Cost per employee hour	\$ 10	\$ 10	\$ 10	\$ 10	\$ 10	\$ 10
Total cost for labor	\$ 3,600	\$ 2,400	\$ 1,200	\$ 2,400	Total cost for labor	\$ 1,224	\$ 1,020	\$ 816	\$ 680	\$ 340	\$ 680
Total cost (materials + labor)	\$ 7,330	\$ 4,886	\$ 2,443	\$ 4,886	Total cost seeds (materials + labor)	\$ 2,027	\$ 1,689	\$ 1,351	\$ 1,126	\$ 563	\$ 1,126
Amount per surviving seedling	\$ 13.55	\$ 12.63	\$ 15.86	\$ 14.29	Cost per sprouted seed	\$ 22.52	\$ 18.77	\$ 21.80	\$ 18.16	\$ 20.11	\$ 19.09
Amount per planted seedling	\$ 10.18	\$ 10.18	\$ 10.18	\$ 10.18	Cost per planted seed	\$ 0.51	\$ 0.52	\$ 0.51	\$ 0.52	\$ 0.52	\$ 0.52
VOLUNTEER LABOR					VOLUNTEER LABOR (20 volunteers)						
Number of volunteers	20	20	20	20	Number of volunteers	20	20	20	20	20	20
Hours worked per volunteer	18	12	6	12	Hours worked per volunteer	6.12	5.1	4.08	3.4	1.7	3.4
Number of staff hours required	27	18	9	18	Number of staff hours required	9.18	7.65	6.12	5.1	2.55	5.1
Cost per coordinator hour	25	25	25	25	Cost per coordinator hour	25	25	25	25	25	25

Table B-1. *Cont.*

VARIABLE COSTS/ SCENARIOS					VARIABLE COSTS/ SCENARIOS						
PAID LABOR					PAID LABOR						
Total cost for labor	\$ 675	\$ 450	\$ 225	\$ 450	Total cost for labor	\$ 230	\$ 191	\$ 153	\$ 128	\$ 64	\$ 128
Total cost (materials + labor)	\$ 4,405	\$ 2,936	\$ 1,468	\$ 2,936	Total cost (materials + labor)	\$ 1,033	\$ 861	\$ 688	\$ 574	\$ 287	\$ 574
Amount per surviving seedling	\$ 8.14	\$ 7.59	\$ 9.53	\$ 8.59	Cost per sprouted seed	\$ 11.47	\$ 9.56	\$ 11.10	\$ 9.25	\$ 10.25	\$ 9.72
Amount per planted seedling	\$ 6.12	\$ 4.08	\$ 2.04	\$ 4.08	Cost per planted seed	\$ 0.26	\$ 0.27	\$ 0.26	\$ 0.27	\$ 0.27	\$ 0.27