

Supplementary Figures

2022-03-18

Table S1: Spatial model summaries for Est describing effective and nominal dimensions, their ratio, and parameter type across all traits

	TY				TN				TV			
	Effective Dimension	Nominal Dimension	Ratio	Type ^a	Effective Dimension	Nominal Dimension	Ratio	Type ^a	Effective Dimension	Nominal Dimension	Ratio	Type ^a
Intercept	1.0	1	1.00	F	1.0	1	1.00	F	1.0	1	1.00	F
Control	1.0	1	1.00	F	1.0	1	1.00	F	1.0	1	1.00	F
Genotype	505.5	604	0.84	R	483.0	604	0.80	R	539.6	604	0.89	R
R-Row	12.2	18	0.68	R	12.2	18	0.68	R	8.5	18	0.47	R
R-Column	0.0	63	0.00	R	0.0	63	0.00	R	0.0	63	0.00	R
Column	1.0	1	1.00	S	1.0	1	1.00	S	1.0	1	1.00	S
Row	1.0	1	1.00	S	1.0	1	1.00	S	1.0	1	1.00	S
Column:Row	1.0	1	1.00	S	1.0	1	1.00	S	1.0	1	1.00	S
f(Column)	2.9	21	0.14	S	3.4	21	0.16	S	0.9	21	0.04	S
f(Row)	0.0	66	0.00	S	0.0	66	0.00	S	0.0	66	0.00	S
f(Column):Row	3.8	21	0.18	S	0.0	21	0.00	S	3.0	21	0.14	S
Column:f(Row)	0.7	66	0.01	S	0.6	66	0.01	S	0.0	66	0.00	S
f(Column):f(Row)	16.5	1386	0.01	S	11.7	1386	0.01	S	2.9	1386	0.00	S
Total	546.7	2250	0.24		515.9	2250	0.23		559.8	2250	0.25	
Residual	635.3				666.1				622.2			

^a F = Fixed, R = Random, S = Semi-parametric

Table S2: Spatial model summaries for Heelsum describing effective and nominal dimensions, their ratio, and parameter type across all traits

	TY				TN				TV			
	Effective Dimension	Nominal Dimension	Ratio	Type ^a	Effective Dimension	Nominal Dimension	Ratio	Type ^a	Effective Dimension	Nominal Dimension	Ratio	Type ^a
Intercept	1.0	1	1.00	F	1.0	1	1.00	F	1.0	1	1.00	F
Control	1.0	1	1.00	F	1.0	1	1.00	F	1.0	1	1.00	F
Genotype	634.0	718	0.88	R	585.6	718	0.82	R	643.0	718	0.90	R
R-Row	0.0	18	0.00	R	0.0	18	0.00	R	0.0	18	0.00	R
R-Column	37.3	83	0.45	R	39.7	83	0.48	R	45.3	83	0.55	R
Column	1.0	1	1.00	S	1.0	1	1.00	S	1.0	1	1.00	S
Row	1.0	1	1.00	S	1.0	1	1.00	S	1.0	1	1.00	S
Column:Row	1.0	1	1.00	S	1.0	1	1.00	S	1.0	1	1.00	S
f(Column)	4.5	21	0.21	S	3.2	21	0.15	S	2.2	21	0.10	S
f(Row)	0.0	86	0.00	S	0.4	86	0.01	S	0.9	86	0.01	S
f(Column):Row	0.0	21	0.00	S	0.2	21	0.01	S	0.0	21	0.00	S
Column:f(Row)	0.0	86	0.00	S	0.3	86	0.00	S	0.0	86	0.00	S
f(Column):f(Row)	18.3	1806	0.01	S	13.3	1806	0.01	S	6.4	1806	0.00	S
Total	699.2	2844	0.25		647.6	2844	0.23		702.8	2844	0.25	
Residual	771.8				823.4				731.2			

^a F = Fixed, R = Random, S = Semi-parametric

Table S3: Variance components from hybrid model with standard errors included in parantheticals for total tuber number (TN), average tuber volume (TV), and total tuber yield (TY). Covariances between traits excluded here for brevity.

Component	TN	TV	TY
σ_G^2	1432.98 (131.33)	27.29 (2.04)	25.60 (2.42)
σ_{GE}^2	589.55 (73.30)	5.27 (0.60)	15.06 (1.41)
σ_ε^2	923.07 (43.72)	6.66 (0.32)	11.84 (0.56)

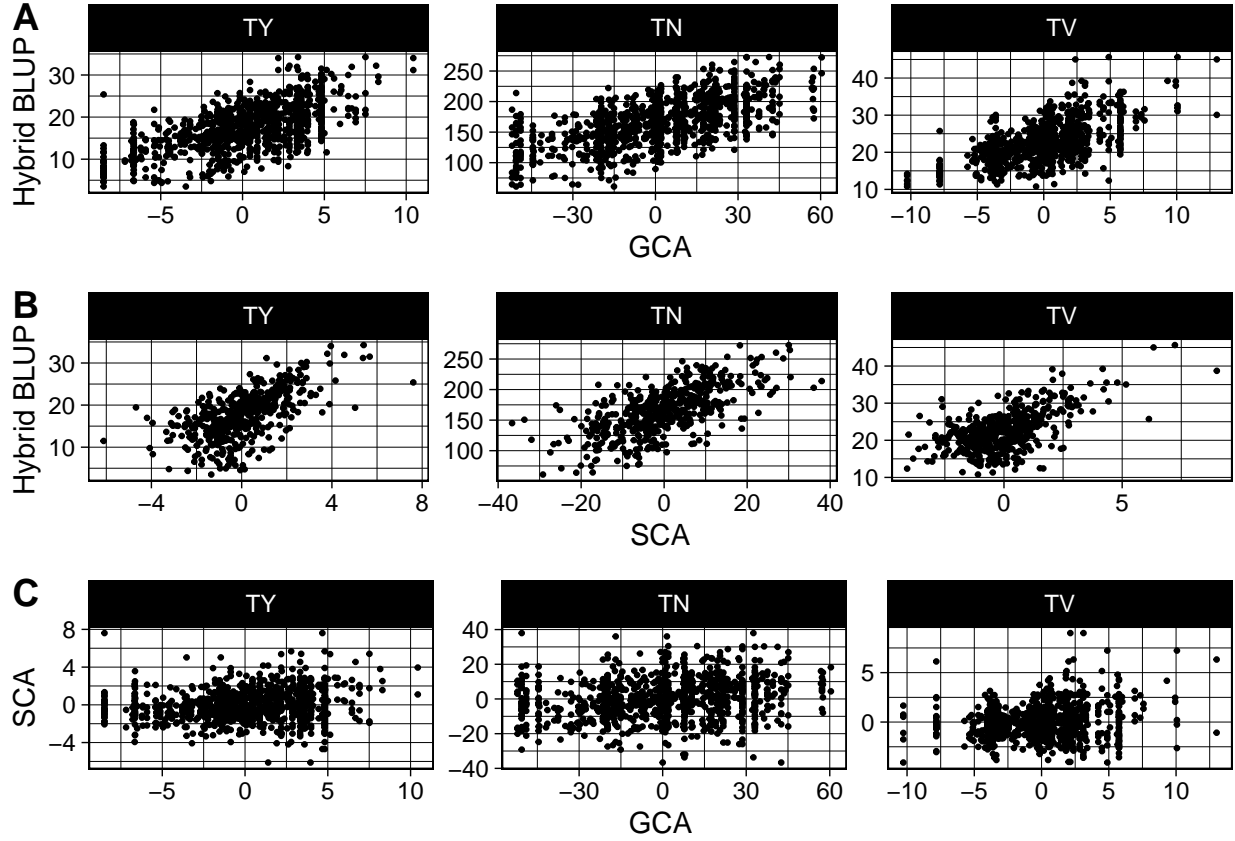


Figure S1: Scatterplots for each tuber trait with (A) hybrid BLUP's plotted with GCA's, (B) SCA's, and (C) GCA's on SCA's

Table S4: Ratio between the sample quantiles of GCA and SCA effects for total yield (TY), tuber number (TN), and average tuber volume (TV). Included are the 0, 10th, 25th, 40th, 60th, 75th, 90th and 100th percentiles along with an average ratio of quantiles in \bar{q} .

Trait	0%	10%	25%	40%	60%	75%	90%	100%	\bar{q}
TN	1.4	2.0	2.4	2.4	2.5	2.1	2.2	1.6	2.1
TV	2.5	2.0	1.7	1.6	1.8	2.1	1.7	1.4	1.9
TY	1.4	2.4	2.0	2.4	2.3	2.5	2.0	1.4	2.0