

Supporting information



Figure S1. Stigma receptivity analysis of 'O'Neal'

Note: Bar =0.5mm.

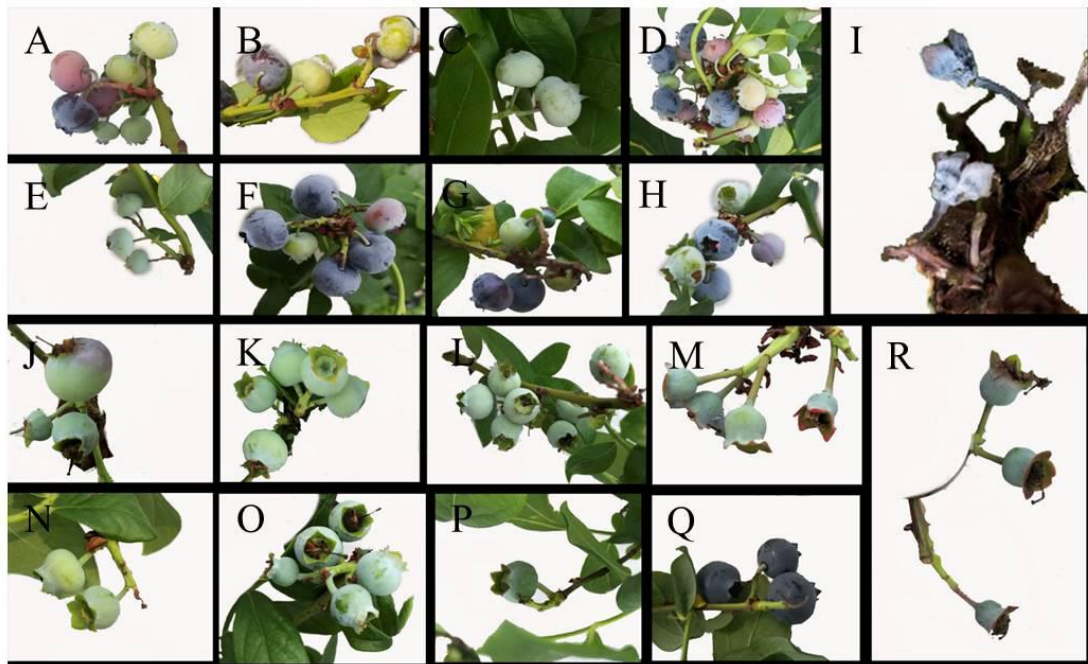


Figure S2. Fruit set status when 'Emerald' and 'O'Neal' pollinated with different SHB pollen donors

A. 'Emerald' × 'Gulfcoast'; B. 'Emerald' × 'Jewel'; C. 'Emerald' × 'Emerald'; D. 'Emerald' × 'Bluerain'; E. 'Emerald' × 'Sharpblue'; F. 'Emerald' × 'Star'; G. 'Emerald' × "8 Mixed"; H. 'Emerald' × 'O'Neal'; I. 'Emerald' × 'Misty'; J. 'O'Neal' × 'Jewel'; K. 'O'Neal' × 'Emerald'; L. 'O'Neal' × 'Bluerain'; M. 'O'Neal' × "8 Mixed"; N. 'O'Neal' × 'Sharpblue'; O. 'O'Neal' × 'Star'; P. 'O'Neal' × 'Misty'; Q. 'O'Neal' × 'O'Neal'; R. 'O'Neal' × 'Gulfcoast';



Figure S3. Comparisons of fruit sizes from different pollination combinations

Table S1. Primer sequence of 6 core SSR markers selected in this study

SSR locus	Repeat motif	Primer sequence (5'→3')	Production size/bp
VcSSR11	(TCA)*5	F: <Tail>-GCTCCCTCTTTCGCTTCTTT R: CCCCGAAACTATCAGAGCAG	308~348
VcSSR14	(GT)*7	F: <Tail>-CAGTTTGCACATCACCCCTTG R: ATGGATACATGGACCTTGCC	184~206
VcSSR19	(CA)*6	F: <Tail>-CCAACCCTCGTACTCTTCCA R: CCCACCTCAGAAAACCGATA	364~430
VcSSR28	(GT)*6	F: <Tail>-GCAGCGAACCCTAAACTCAA R: ACGGAGCTGGCTCACACTAT	279~315
VcSSR35	(ACT)*6	F: <Tail>-CCCCCACTACTACTTTGCCA R: TATGGCTACGGTTACGGAGG	203~212
VcSSR47	(TCA)*5	F: <Tail>-CTCCCTTGTTGTTGTTGCCT R: CAACCAACCTCATCCTCACC	229~244
Tail sequence		<FAM>or<HEX>-TGTA AAAACGACGGCCAGT	

Note: "<Tail>-" indicated the tail sequence (5' to 3'); <FAM> and <HEX> meant that 5' ends of the sequences were modified by carboxyfluorescein or hexachlorofluorescein, respectively.

Table S2. Fruit setting ratio of two self-pollination methods

Cultivar	Artificial self-pollination	Bagged self-pollination
O'Neal	37.62%±8.65% ab	15.72%±5.87% c
Misty	31.11%±28.41% ab	0 a
Emerald	19.64%±7.58% ab	0.50%±0.37% a
Sharpblue	10.10%±3.40% ab	0 a
Jewel	7.14%±1.23% a	0 a
Star	30.95%±3.37% ab	9.54%±3.55% b
Gulfcoast	22.62%±8.42% ab	0 a
Bluerain	44.55%±6.40% b	2.45%±1.92% a

Note: Difference lowercase letters indicate significant difference at $P \leq 0.05$ level using Duncan test.

Table S3. The correlation of fruit quality for 'Emerald' as the maternal cultivar

	Firmness	Soluble solids	Anthocyanin content	Titratable acidity	Soluble sugar	SS/TA	Transverse diameter	Longitudinal diameter	Fruit shape index	Fruit weight
Firmness	1	-0.187	0.27	-0.083	-.763*	-0.614	-0.628	-.791*	0.131	-0.702
Soluble solids		1	0.207	0.506	0.185	-0.049	-0.03	0.377	0.453	0.119
Anthocyanin content			1	-0.507	0.18	0.36	0.08	-0.096	-0.306	0.093
Titratable acidity				1	-0.168	-0.604	-0.235	0.161	0.619	-0.133
Soluble sugar					1	.852**	.826*	.853**	-0.444	.869**
SS/TA						1	0.647	0.567	-0.478	0.65
Transverse diameter							1	.830*	-.768*	.985**
Longitudinal diameter								1	-0.284	.894**
Fruit shape index									1	-0.668
Fruit weight										1

**, *, indicate significance at $P < 0.01$, $P < 0.05$, respectively.

Table S4. The correlation of fruit quality for 'O'Neal' as the maternal cultivar

	Firmness	Soluble solids	Anthocyanin content	Titratable acidity	Soluble sugar	SS/TA	Transverse diameter	Longitudinal diameter	Fruit shape index	Fruit weight
Firmness	1	-0.338	0.432	-0.516	0.448	0.679	0.321	0.399	-0.068	0.127
Soluble solids		1	-0.315	0.406	0.271	0.096	-.758*	-.867**	0.31	-.679*
Anthocyanin content			1	-.745*	0.145	0.551	0.558	0.614	-0.276	0.47
Titratable acidity				1	0.139	-0.425	-0.313	-0.456	-0.068	-0.148
Soluble sugar					1	.832*	0.144	-0.035	-0.461	0.076
SS/TA						1	0.229	0.152	-0.312	0.079
Transverse diameter							1	.962**	-.810**	.966**
Longitudinal diameter								1	-0.623	.904**
Fruit shape index									1	-.846**
Fruit weight										1

** , * , indicate significance at $P < 0.01$, $P < 0.05$, respectively.

Table S5. The correlation coefficient range of fruit quality, fruit setting ratio and seed number

for ‘Emerald’ as the maternal cultivar

	Transverse diameter	Longitudinal diameter	Fruit shape index	Fruit weight	Firmness	Soluble solids	Anthocyani n content	Titratabl e acidity	Solubl e sugar	SS/TA	Seed number	Fruit setting ratio
Transverse diameter	1	.830*	-.768*	.985**	-0.628	-0.03	0.08	-0.235	.826*	0.647	0.441	.809*
Longitudinal diameter		1	-0.284	.894**	-.791*	0.377	-0.096	0.161	.853**	0.567	0.446	.807*
Fruit shape index			1	-0.668	0.131	0.453	-0.306	0.619	-0.444	-0.478	-0.281	-0.495
Fruit weight				1	-0.702	0.119	0.093	-0.133	.869**	0.65	0.52	.851**
Firmness					1	-0.187	0.27	-0.083	-.763*	-0.614	-0.197	-0.54
Soluble solids						1	0.207	0.506	0.185	-0.049	0.669	0.277
Anthocyanin content							1	-0.507	0.18	0.36	0.62	0.424
Titrateable acidity								1	-0.168	-0.604	-0.037	-0.184
Soluble sugar									1	.852**	0.535	.935**
SS/TA										1	0.369	.775*
Seed number											1	0.674
Fruit setting ratio												1

** , * , indicate significance at $P < 0.01$, $P < 0.05$, respectively.

Table S6. The correlation coefficient range of fruit quality, fruit setting ratio and seed number for ‘O’Neal’ as the maternal cultivar

	Transverse diameter	Longitudinal diameter	Fruit shape index	Fruit weight	Firmness	Soluble solids	Anthocy anin content	Titratabl e acidity	Solubl e sugar	SS/TA	Seed number	Fruit setting ratio
Transverse diameter	1	.962**	-.810**	.966**	0.321	-.758*	0.558	-0.313	0.144	0.229	0.116	0.16
Longitudinal diameter		1	-0.623	.904**	0.399	-.867**	0.614	-0.456	-0.035	0.152	0.125	0.079
Fruit shape index			1	-.846**	-0.068	0.31	-0.276	-0.068	-0.461	-0.312	-0.02	-0.235
Fruit weight				1	0.127	-.679*	0.47	-0.148	0.076	0.079	0.02	0.003
Firmness					1	-0.338	0.432	-0.516	0.448	0.679	0.491	0.291
Soluble solids						1	-0.315	0.406	0.271	0.096	-0.026	0.053
Anthocyanin content							1	-.745*	0.145	0.551	0.296	0.32
Titratable acidity								1	0.139	-0.425	0.04	-0.272
Soluble sugar									1	.832*	0.612	.797*
SS/TA										1	0.557	.864**
Seed number											1	0.643
Fruit setting ratio												1

** , *, indicate significance at $P < 0.01$, $P < 0.05$, respectively.

Table S7. Characteristic eigenvalue and accumulative contribution rate of each principal component

Maternal cultivar	Principal component	Eigenvalue	Contribution rate %	Cumulative percentage %	Maternal cultivar	Principal component	Eigenvalue	Contribution rate %	Cumulative percentage %
Emerald	PC 1	5.33	53.26	53.26	O’Neal	PC 1	4.99	49.85	49.85
	PC 2	2.32	23.23	76.49		PC 2	2.43	24.29	74.14
	PC 3	1.48	14.78	91.27		PC 3	1.22	12.20	86.34

Table S8. Component loading table for ‘Emerald’ and ‘O’Neal’ as the maternal cultivar

Maternal cultivar: ‘Emerald’	Factor	Firmness	Soluble solids	Anthocyanin	Titrateable acidity (TA)	Soluble sugar (SS)	SS/TA	Transverse diameter	Longitudinal diameter	Fruit shape index	Fruit weight
	PC 1	-0.77	0.07	0.17	-0.30	0.95	0.84	0.95	0.87	-0.66	0.96
	PC 2	-0.41	0.66	-0.49	0.91	0.11	-0.32	0.00	0.45	0.56	0.14
	PC 3	0.12	0.70	0.84	-0.11	0.16	0.27	-0.21	0.02	0.32	-0.11
Maternal cultivar: ‘O’Neal’	Factor	Firmness	Soluble solids	Anthocyanin	Titrateable acidity (TA)	Soluble sugar (SS)	SS/TA	Transverse diameter	Longitudinal diameter	Fruit shape index	Fruit weight
	PC 1	0.46	-0.83	0.76	-0.44	-0.14	0.04	0.98	0.98	-0.72	0.94
	PC 2	0.14	-0.14	-0.15	0.73	0.98	0.90	0.14	0.05	-0.21	0.02
	PC 3	0.80	-0.37	-0.07	-0.23	-0.05	0.19	-0.14	0.05	0.48	-0.31