

Supplement data2: Two-way ANOVA of two QTL epistatic interaction in substitution segments of each DSSL

Grain length(mm):

D1:

Tests of Between-Subjects Effects					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	4.793 ^a	3	1.598	100.259	.000
Intercept	4479.572	1	4479.572	281115.297	.000
<i>qGL5</i> (S1)	.543	1	.543	34.069	.000
Substitution Seg. (S2)	3.721	1	3.721	233.511	.000
<i>qGL5</i> (S1)×substitution seg.(S2)	.529	1	.529	33.197	.000
Error	.574	36	.016		
Total	4484.939	40			
Corrected Total	5.367	39			

a. R Squared = .893 (Adjusted R Squared = .884)

D2:

Tests of Between-Subjects Effects					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.807 ^a	3	.269	14.932	.000
Intercept	4559.293	1	4559.293	253118.255	.000
<i>qGL9</i> (S3)	.023	1	.023	1.253	.270
<i>qGL12</i> (S4)	.378	1	.378	21.002	.000
<i>qGL9</i> (S3)× <i>qGL12</i> (S4)	.406	1	.406	22.541	.000
Error	.648	36	.018		
Total	4560.748	40			
Corrected Total	1.455	39			

a. R Squared = .554 (Adjusted R Squared = .517)

Grain width(mm):

D1:

Tests of Between-Subjects Effects					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2.355 ^a	3	.785	189.367	.000
Intercept	445.623	1	445.623	107486.955	.000
<i>qGW5</i> (S1)	1.250	1	1.250	301.416	.000
<i>qGW7</i> (S2)	.013	1	.013	3.213	.081
<i>qGW5</i> (S1)× <i>qGW7</i> (S2)	1.092	1	1.092	263.470	.000
Error	.149	36	.004		
Total	448.127	40			
Corrected Total	2.504	39			

a. R Squared = .940 (Adjusted R Squared = .935)

D2:

Tests of Between-Subjects Effects					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	8.540 ^a	3	2.847	669.731	.000
Intercept	515.883	1	515.883	121376.317	.000
<i>qGW9</i> (S3)	5.439	1	5.439	1279.696	.000
<i>qGW12</i> (S4)	.158	1	.158	37.057	.000
<i>qGW9</i> (S3)× <i>qGW12</i> (S4)	2.943	1	2.943	692.440	.000
Error	.153	36	.004		
Total	524.576	40			
Corrected Total	8.693	39			

a. R Squared = .982 (Adjusted R Squared = .981)

1000-grain weight (g):

D1:

Tests of Between-Subjects Effects					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	507.330 ^a	3	169.110	604.133	.000
Intercept	36302.576	1	36302.576	129688.342	.000
<i>qGWT5</i> (S1)	449.124	1	449.124	1604.462	.000
<i>qGWT7</i> (S2)	15.863	1	15.863	56.670	.000
<i>qGWT5</i> (S1)× <i>qGWT7</i> (S2)	35.855	1	35.855	128.088	.000
Error	8.678	31	.280		
Total	38882.220	35			
Corrected Total	516.007	34			

a. R Squared = .983 (Adjusted R Squared = .982)

D2:

Tests of Between-Subjects Effects					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	286.159 ^a	3	95.386	102.155	.000
Intercept	31565.256	1	31565.256	33805.256	.000
<i>qGWT9</i> (S3)	96.528	1	96.528	103.378	.000
Substitution Seg. (S4)	76.557	1	76.557	81.990	.000
<i>qGWT9</i> (S3)× substitution seg.(S4)	85.676	1	85.676	91.756	.000
Error	28.946	31	.934		
Total	33137.908	35			
Corrected Total	315.105	34			

a. R Squared = .908 (Adjusted R Squared = .899)

Ratio of length to width:

D1:

Tests of Between-Subjects Effects					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1.707 ^a	3	.569	113.274	.000
Intercept	405.833	1	405.833	80776.123	.000
<i>qRLW5</i> (S1)	.754	1	.754	149.976	.000
<i>qRLW7</i> (S2)	.301	1	.301	59.915	.000
<i>qRLW5</i> (S1)× <i>qRLW7</i> (S2)	.653	1	.653	129.932	.000
Error	.181	36	.005		
Total	407.721	40			
Corrected Total	1.888	39			

a. R Squared = .904 (Adjusted R Squared = .896)

D2:

Tests of Between-Subjects Effects					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	6.030 ^a	3	2.010	647.730	.000
Intercept	365.723	1	365.723	117858.851	.000
<i>qRLW9</i> (S3)	3.534	1	3.534	1138.975	.000
<i>qRLW12</i> (S4)	.040	1	.040	12.994	.001
<i>qRLW9</i> (S3)× <i>qRLW12</i> (S4)	2.455	1	2.455	791.221	.000
Error	.112	36	.003		
Total	371.864	40			
Corrected Total	6.142	39			

a. R Squared = .982 (Adjusted R Squared = .980)