

**Table S1.** Phenotypic correlation coefficients between resistance traits to halo blight races 1, 5, 7 and 9 in the UI3A52 and UI3T F<sub>2</sub> populations (above and below the diagonal, respectively).

Trait <sup>a</sup>	Race 1					Race 5					Race 7					Race 9						
	PLAUDPC	PLAREA	PDC	PAUDPC	PAREA	PLDC	PLAUDPC	PDC	PAUDPC	PAREA	PLDC	PLAUDPC	PLAREA	PDC	PAUDPC	PAREA	PLDC	PLAREA	PLAUDPC	PDC	PAUDPC	PAREA
Race 1	PLDC	0.96	0.63	0.32	0.35						0.84	0.84		0.39	0.39					0.38	0.41	
	PLAUDPC			0.65	0.35	0.37					0.86	0.85		0.42	0.43	0.28				0.42	0.44	0.29
	PLAREA					0.26					0.54	0.52		0.35	0.31					0.25	0.25	
	PDC					0.98	0.62				0.32	0.29	0.38	0.89	0.87	0.57				0.89	0.86	0.65
	PAUDPC				0.96		0.64				0.36	0.33	0.39	0.87	0.87	0.53				0.88	0.85	0.62
	PAREA				0.63								0.48	0.62	0.60	0.60				0.62	0.53	0.52
Race 5	PLDC																					
	PLAUDPC					0.99																
	PDC				0.93	0.87	0.78															
	PAUDPC				0.96	0.90	0.74			0.99												
	PAREA				0.78	0.63	0.73			0.81	0.83											
Race 7	PLDC											0.99		0.41	0.43	0.26				0.41	0.42	0.32
	PLAUDPC													0.38	0.39	0.25				0.39	0.4	0.30
	PLAREA													0.31	0.29	0.41				0.40	0.33	0.40
	PDC					0.78			0.62						0.99	0.63				0.88	0.87	0.65
	PAUDPC					0.81			0.68	0.61				0.99		0.61				0.88	0.87	0.63
	PAREA																			0.61	0.58	0.75
Race 9	PLDC					0.99	0.98									0.63						
	PLAUDPC					0.99	0.98									0.63						
	PLAREA					0.67	0.72															
	PDC				0.87	0.81	0.78			0.91	0.92	0.84			0.65	0.66					0.96	0.71
	PAUDPC				0.94	0.88	0.70			0.93	0.96	0.86								0.98		0.70
	PAREA					0.62		0.68	0.68	0.65	0.66	0.74				0.67	0.69	0.70	0.72	0.69		

<sup>1</sup>Correlations significant at  $P \leq 0.05$  are shown. UI3T = races 1, 5, 7 and 9 were evaluated in pod; races 5 and 9 were evaluated in primary leaf. UI3A52 = races 1, 7 and 9 were evaluated in pod; races 1 and 7 were evaluated in primary leaf. PDC = pod disease score, PAUDPC = pod area under the disease progress curve, PAREA = size of the lesion on pods, PLDC = primary leaf disease score, PLAUDPC = primary leaf area under the disease progress curve, PLAREA = size of the lesion on primary leaves.

**Table S2.** Distribution of molecular markers on the linkage map constructed from the F<sub>2</sub> UI3T population.

LG	Map length (cM)	N° markers	Marker density (cM/marker)	Marker types					
				SSR <sup>a</sup>	<i>Fin</i>	PFC <sup>b</sup>	<i>Pse-race1</i>	<i>Pse-race5</i>	<i>Pse-race7</i>
1	40.45	7	5.8	6	1				
2	97.82	11	8.9	11					
3	86.93	12	7.2	12					
4	38.24	5	7.7	5					
5	45.56	5	9.1	5					
6	126.28	11	11.5	10		1			
7	10.91	2	5.5	2					
8	79.76	10	8.0	10					
9	113.64	13	8.7	13					
10	48.80	10	4.9	7			1	1	1
11	62.42	5	12.5	5					
<b>Total</b>	750.81	91	89.8	86	1	1	1	1	1

<sup>a</sup>SSR: Simple sequence repeat. <sup>b</sup>PFC: flower colour marker.

**Table S3.** Distribution of molecular markers on the linkage map constructed from the F<sub>2</sub> UI3A52 population.

LG	Map length (cM)	N° markers	Marker density (cM/marker)	Marker types				
				SSR <sup>a</sup>	<i>Fin</i>	PFC <sup>b</sup>	<i>Pse-race1</i>	<i>Pse-race7</i>
1	45.92	5	9.2	4	1			
2	92.62	15	6.2	15				
3	50.90	12	4.2	12				
4	84.40	9	9.4	9				
5	51.55	4	12.9	4				
6	91.83	12	7.7	11		1		
7	41.12	3	13.7	3				
8	65.85	8	8.2	8				
9	87.20	14	6.2	14				
10	45.45	10	4.5	8			1	1
11	69.75	7	10.0	7				
<b>Total</b>	726.59	99	92.2	95	1	1	1	1

<sup>a</sup>SSR: Simple sequence repeat. <sup>b</sup>PFC: flower colour marker.

**Table S4.** The annotated potential candidate genes identified on QTL intervals, their chromosome (Chr) location (start and end), the putative predicted function resulting from Phytozome and TAIR functional annotations and their homologs in Arabidopsis.

Gene Name	Chromosome	Gene Start...End (bp)	Description Pytozome	Arabidopsis Homolog	Description TAIR
<i>PhnuL008G.09500</i>	Chr08	10319464...10323106	Flavonol synthase	AT5G05600	Encodes a protein with similarity to flavonol synthases
<i>PhnuL008G.02600</i>	Chr08	10505620...10509420	Serine/Threonine protein kinase	AT5G02290	Protein kinase NAK
<i>PhnuL008G.099001</i>	Chr08	10681885...10685563	Esterase	AT3G11210	SGNH hydrolase-type esterase protein
<i>PhnuL008G.03900</i>	Chr08	11325850...11327848	Glucosyl transferase	AT4G34131	UDP-glucosyl transferase 7383
<i>PhnuL008G.04900</i>	Chr08	11539614...11542822	Zinc finger C3HC4 type	AT5G01520	RING/U-box protein
<i>PhnuL008G.05300</i>	Chr08	11594807...11609778	Serine/Threonine protein kinase	AT3G09010	Protein kinase
<i>PhnuL008G.05600</i>	Chr08	11643663...11646782	NL-like protein	AT3G47570	Leucine-rich repeat protein kinase protein
<i>PhnuL008G.05700</i>	Chr08	11650196...11651706	Galactosyl transferase	AT2G38150	1,4-galactosyltransferase protein
<i>PhnuL008G.05700</i>	Chr08	11661123...11665557	Pentatricopeptide repeat family (PPR)	AT2G42810	Tetatricopeptide repeat (TPR)-like protein
<i>PhnuL008G.06400</i>	Chr08	11726822...11728705	Aquaporin	AT4G00430	Plasma membrane intrinsic protein
<i>PhnuL008G.06500</i>	Chr08	11754183...11757722	NL-like protein	AT4G08850	Leucine-rich repeat receptor-like protein
<i>PhnuL008G.06700</i>	Chr08	11833930...11837425	Serine/Threonine protein kinase	AT4G08850	Leucine-rich repeat receptor-like protein
<i>PhnuL008G.07400</i>	Chr08	11938397...11941731	Glycerol transferase	AT2G38110	Glycerol-3-phosphate acyltransferase 6
<i>PhnuL008G.07400</i>	Chr08	11938397...11941731	Pentatricopeptide repeat family (PPR)	AT3G09060	Pentatricopeptide repeat (PPR) protein
<i>PhnuL008G.08400</i>	Chr08	12155232...12159861	NL-like protein	AT1G74710	Receptor like protein 13
<i>PhnuL008G.08500</i>	Chr08	12177794...12182886	NL-like protein	AT1G74710	Receptor like protein 13
<i>PhnuL008G.09000</i>	Chr08	12247176...12250708	Pectinase	AT1G58190	Receptor like protein 9
<i>PhnuL008G.09100</i>	Chr08	12255903...12260296	Serine/Threonine protein kinase	AT1G74190	Receptor like protein 15
<i>PhnuL008G.09200</i>	Chr08	12298571...12300950	Pectinase	AT1G58190	Receptor like protein 9
<i>PhnuL008G.09300</i>	Chr08	12306228...12312218	NL-like protein	AT1G74180	Receptor like protein 14
<i>PhnuL008G.09600</i>	Chr08	12386198...12388610	NL-like protein	AT1G74180	Receptor like protein 14
<i>PhnuL008G.11100</i>	Chr08	12599137...12601627	Zinc finger C3HC4 type	AT5G38580	E3 ligase involved in membrane trafficking and salt stress
<i>PhnuL008G.11600</i>	Chr08	12695718...12699577	NL-like protein	AT5G49290	Receptor like protein 56
<i>PhnuL008G.11700</i>	Chr08	12704332...12705929	Pectinase	AT1G58190	Receptor like protein 9
<i>PhnuL008G.11800</i>	Chr08	12731112...12735272	NL-like protein	AT1G58190	Receptor like protein 9
<i>PhnuL008G.12400</i>	Chr08	12920518...12926327	Zinc finger C3HC4 type	AT5G05830	RING/FYVE/PHD zinc finger protein
<i>PhnuL008G.12500</i>	Chr08	13219256...13220618	Universal stress protein	AT5G03990	ATLUP, UNIVERSAL STRESS PROTEIN
<i>PhnuL008G.13600</i>	Chr08	13221659...13223083	Glutathione transferase	AT3G09270	ATGSTU8, GLUTATHIONE S-TRANSFERASE TAU 8
<i>PhnuL008G.13700</i>	Chr08	13237819...13238946	Glutathione transferase	AT3G09270	ATGSTU8, GLUTATHIONE S-TRANSFERASE TAU 8
<i>PhnuL008G.14300</i>	Chr08	13258029...13259010	Lipid transfer protein (LTP)	AT3G03980	Bifunctional inhibitor/lipid-transfer protein
<i>PhnuL008G.15500</i>	Chr08	13661070...13663788	Serine/Threonine protein kinase	AT5G02070	Protein kinase protein
<i>PhnuL008G.15700</i>	Chr08	1377513...13783413	Serine/Threonine protein kinase	AT2G31280	LHW-like protein
<i>PhnuL008G.17100</i>	Chr08	14441681...14443499	Lipase	AT5G44180	Myzus persicae-induced lipase 1
<i>PhnuL008G.18200</i>	Chr08	14476637...14478004	Pathogenesis related Thaumatin (PRTLTP)	AT5G02140	Pathogenesis-related thaumatin protein
<i>PhnuL008G.18300</i>	Chr08	14495367...14495922	Oxidoreductase	AT3G21420	LATERAL BRANCHING OXIDOREDUCTASE L1, LBO1
<i>PhnuL008G.18500</i>	Chr08	14548063...14551199	Serine/Threonine protein kinase	AT3G47110	Leucine-rich repeat protein kinase protein
<i>PhnuL008G.18600</i>	Chr08	14575781...14577231	Zinc finger C3HC4 type	AT3G46620	ABA- and drought-induced RING-DUF1117 gene
<i>PhnuL008G.19400</i>	Chr08	14740208...14743225	WRKY TF	AT5G43290	WRKY DNA-binding protein 49
<i>PhnuL008G.01600</i>	Chr08	15405866...15411823	Pentatricopeptide repeat family (PPR)	AT5G65560	Pentatricopeptide repeat (PPR) protein
<i>PhnuL008G.01200</i>	Chr08	15435624...15438255	Pentatricopeptide repeat family (PPR)	AT5G16420	Pentatricopeptide repeat (PPR-like) protein
<i>PhnuL008G.099300</i>	Chr08	16248222...16249847	Zinc finger C3HC4 type	AT5G02060	Dot-type zinc finger DNA-binding protein
<i>PhnuL008G.12400</i>	Chr08	16271031...16271907	Zinc finger C3HC4 type	AT2G37580	RING/U-box superfamily protein
<i>PhnuL008G.12400</i>	Chr08	16608575...16610205	NL-like protein	AT4G10400	F-box/RNI-like/FBD-like domains-containing protein
<i>PhnuL008G.124300</i>	Chr08	16672270...16675230	NL-like protein	AT2G19130	S-locus lectin protein kinase family protein
<i>PhnuL008G.12400</i>	Chr08	16755582...16757827	Serine/Threonine protein kinase	AT3G07070	Protein kinase superfamily protein
<i>PhnuL008G.122700</i>	Chr08	17085291...17103461	Serine/Threonine protein kinase	AT3G24715	Protein in kinase protein with octicosapeptide/Phox/Bem1p
<i>PhnuL008G.122400</i>	Chr08	17352547...17355788	Serine/Threonine protein kinase	AT3G24660	Transmembrane kinase-like 1
<i>PhnuL008G.122200</i>	Chr08	17397673...17401925	Serine/Threonine protein kinase	AT5G48940	Leucine-rich repeat transmembrane protein in kinase
<i>PhnuL008G.127537</i>	Chr08	18554390...18555807	Lipase	AT2G15230	Lipase 1
<i>PhnuL008G.126700</i>	Chr08	18742319...18746922	Pentatricopeptide repeat family (PPR)	AT5G48730	Pentatricopeptide repeat (PPR) protein
<i>PhnuL008G.124900</i>	Chr08	19421181...19423526	NL-like protein	AT4G00340	Receptor-like protein in kinase 4
<i>PhnuL008G.124800</i>	Chr08	19448115...19450586	NL-like protein	AT2G19130	S-locus lectin protein kinase protein
<i>PhnuL008G.124500</i>	Chr08	19803079...19804421	NL-like protein	AT4G26340	F-box/RNI-like/FBD-like domains-containing protein
<i>PhnuL008G.128400</i>	Chr08	20659106...20661492	Zinc finger C3HC4 type	AT3G07120	RING/U-box protein
<i>PhnuL008G.129100</i>	Chr08	20795642...20799197	Glucosyl transferase	AT4G13090	Xyloglucan endotransglucosylase/hydrolase 2
<i>PhnuL008G.129800</i>	Chr08	20990182...20992380	NL-like protein	AT5G22660	FBD, F-box, Skp2-like and Leucine Rich Repeat protein
<i>PhnuL008G.129900</i>	Chr08	21029894...21032325	Glucosyl transferase	AT4G13090	Xyloglucan endotransglucosylase/hydrolase 2
<i>PhnuL008G.130600</i>	Chr08	21193569...21195702	RPM1-interacting protein 4 (RIN4)	AT3G25070	RPM1 interacting protein 4
<i>PhnuL008G.130800</i>	Chr08	21212388...21217383	Esterase	AT3G25110	Fata acyl-ACP thioesterase
<i>PhnuL008G.132200</i>	Chr08	21617510...21620576	Galacturonosyl transferase	AT3G25110	Fata acyl-ACP thioesterase
<i>PhnuL008G.133000</i>	Chr08	22089795...22092762	Galactosyl transferase	AT1G05170	Galactosyltransferase protein
<i>PhnuL008G.134100</i>	Chr08	22468880...22470560	Oxidoreductase	AT3G19000	2-oxoglutarate (2OG) and Fe(II)-dependent oxygenase
<i>PhnuL008G.134600</i>	Chr08	22643571...22647976	Pentatricopeptide repeat family (PPR)	AT1G74600	Pentatricopeptide repeat (PPR) protein
<i>PhnuL008G.137100</i>	Chr08	27792568...27793248	Lipid transfer protein (LTP)	AT5G48490	Bifunctional inhibitor/lipid-transfer protein/seed storage
<i>PhnuL008G.139200</i>	Chr08	29375892...29378417	Serine/Threonine protein kinase	AT2G32800	Protein in kinase

**Table S4.** Continued.

Gene Name	Chromosome	Gene Start...End (bp)	Description Phytozome	Arabidopsis Homolog	Description TAIR
<i>Phvud.010G001300</i>	Chr10	1289816...1293978	Glucosyl Transferase	<i>AT1G22340</i>	UDP-glucosyl transferase 85A7
<i>Phvud.010G001400</i>	Chr10	401790...407040	Adenosyl-Methionine-dependent Methyltransferase	<i>AT5G01470</i>	S-adenosyl-L-methionine-dependent methyltransferases protein
<i>Phvud.010G002000</i>	Chr10	453307...457549	Zinc finger C3HC4 type	<i>AT5G01520</i>	RING/U-box protein
<i>Phvud.010G002300</i>	Chr10	482796...483181	Defensin-like protein (DEFL)	<i>AT4G29273</i>	low-molecular-weight cysteine-rich 23
<i>Phvud.010G002400</i>	Chr10	488355...488692	Defensin-like protein (DEFL)	<i>AT4G29273</i>	low-molecular-weight cysteine-rich 23
<i>Phvud.010G002900</i>	Chr10	533958...537310	Glucan glucosidase	<i>AT5G01260</i>	Carbohydrate-binding-like fold
<i>Phvud.010G003100</i>	Chr10	552374...553612	lactosyl ceramide galactosyl transferase	<i>AT2G38150</i>	Alpha 1,4-glycosyltransferase family protein
<i>Phvud.010G004650</i>	Chr10	719323...722383	Glycerol-3-phosphate 2-O-acyltransferase	<i>AT2G38110</i>	Glycerol-3-phosphate acyltransferase 6
<i>Phvud.010G005300</i>	Chr10	818028...824698	Zinc finger C3HC4 type	<i>AT5G05830</i>	RING/FYVE/PHD zinc finger protein
<i>Phvud.010G005500</i>	Chr10	849926...851704	Lipid transferase	<i>AT5G05960</i>	Bifunctional inhibitor/lipid-transfer protein/seed storage 2S albumin protein
<i>Phvud.010G005800</i>	Chr10	875154...878597	Lipase LTL1	<i>AT5G33370</i>	GDSL-like Lipase/Acylhydrolase protein
<i>Phvud.010G008700</i>	Chr10	1236830...1248545	TIR-NL protein	<i>AT5G36930</i>	Disease resistance protein (TIR-NBS-LRR class)
<i>Phvud.010G008900</i>	Chr10	1268630...1271183	Universal stress protein family	<i>AT3G53990</i>	Adenine nucleotide alpha hydrolases-like protein
<i>Phvud.010G009000</i>	Chr10	1282831...1287667	Glucosyl Transferase	<i>AT1G22340</i>	UDP-glucosyl transferase 85A7
<i>Phvud.010G010300</i>	Chr10	1480675...1484047	Serine/Threonine protein kinase	<i>AT2G28930</i>	Protein kinase 1B
<i>Phvud.010G011400</i>	Chr10	1622170...1628245	Serine/Threonine protein kinase	<i>AT2G22970</i>	Serine carboxypeptidase-like 11
<i>Phvud.010G012700</i>	Chr10	2089803...2092764	Steroid 17alpha-monoxygenase	<i>AT2G45570</i>	Cytochrome P450, family 76, subfamily C, polypeptide 2
<i>Phvud.010G012800</i>	Chr10	2063963...2073914	ABC Transporter Family member	<i>AT3G62150</i>	P-glycoprotein 21
<i>Phvud.010G012900</i>	Chr10	2037888...2039846	Isoflavone 2'-hydroxylase / Isoflavone 2'-monoxygenase	<i>AT4G37370</i>	Cytochrome P450, family 81, subfamily D, polypeptide 8
<i>Phvud.010G013000</i>	Chr10	2027857...2029737	Isoflavone 2'-hydroxylase / Isoflavone 2'-monoxygenase	<i>AT4G37370</i>	Cytochrome P450, family 81, subfamily D, polypeptide 8
<i>Phvud.010G013100</i>	Chr10	2020026...2021761	Isoflavone 2'-hydroxylase / Isoflavone 2'-monoxygenase	<i>AT4G37370</i>	Cytochrome P450, family 81, subfamily D, polypeptide 8
<i>Phvud.010G013600</i>	Chr10	1903841...1907125	NL-like protein	<i>AT1G45616</i>	Receptor like protein 6
<i>Phvud.010G013700</i>	Chr10	1892124...1895918	NL-like protein	<i>AT1G45616</i>	Receptor like protein 6
<i>Phvud.010G013800</i>	Chr10	1821464...1855683	Sterol Glucosyl Transferase	<i>AT3G07020</i>	UDP-Glycosyltransferase protein
<i>Phvud.010G014000</i>	Chr10	1807165...1814966	Glycosyl transferase	<i>AT2G37585</i>	Core-2/1-branching beta-1,6-N-acetylglucosaminyltransferase protein
<i>Phvud.010G014101</i>	Chr10	1920411...1922933	NL-like protein	<i>AT1G45616</i>	Receptor like protein 6
<i>Phvud.010G015100</i>	Chr10	2253323...2267345	Serine/Threonine protein kinase	<i>AT2G37840</i>	Protein kinase protein
<i>Phvud.010G015400</i>	Chr10	2305856...2316848	Glutamate-5-semialdehyde dehydrogenase	<i>AT2G39800</i>	delta1-pyrroline-5-carboxylate synthase 1
<i>Phvud.010G015900</i>	Chr10	2350908...2357176	Oxidoreductase	<i>AT3G19010</i>	2-oxoglutarate (2OG) and Fe(II)-dependent oxygenase protein
<i>Phvud.010G018000</i>	Chr10	2633076...2636748	Polygalacturonase / Pectinase	<i>AT3G15720</i>	Pectin lyase-like protein
<i>Phvud.010G018300</i>	Chr10	2658302...2665822	NL-like protein	<i>AT5G48740</i>	Leucine-rich repeat protein kinase protein
<i>Phvud.010G018400</i>	Chr10	2689239...2693034	TIR-NL protein	<i>AT5G36930</i>	Disease resistance protein (TIR-NBS-LRR class)
<i>Phvud.010G019900</i>	Chr10	2884093...2885050	Zinc finger C3HC4 type	<i>AT3G25030</i>	RING/U-box protein
<i>Phvud.010G021001</i>	Chr10	3006260...3010587	Lipase 5	<i>AT1G53920</i>	GDSL-motif lipase 5
<i>Phvud.010G021200</i>	Chr10	3035922...3042052	RPM1-interacting protein 4 (RIN4)	<i>AT3G25070</i>	RPM1 interacting protein 4
<i>Phvud.010G023100</i>	Chr10	3272172...3280327	NL-like protein	<i>AT5G63020</i>	Disease resistance protein (CC-NBS-LRR class)
<i>Phvud.010G023200</i>	Chr10	3283510...3296126	NL-like protein	<i>AT1G12280</i>	LRR and NB-ARC domains-containing disease resistance protein
<i>Phvud.010G023500</i>	Chr10	3306753...3310882	NL-like protein	<i>AT4G13020</i>	Protein kinase protein
<i>Phvud.010G023600</i>	Chr10	3315963...3326616	Serine/Threonine protein kinase	<i>AT4G13020</i>	Protein kinase protein
<i>Phvud.010G023800</i>	Chr10	3351907...3357035	Gycosyl Hydrolase	<i>AT3G07320</i>	O-Glycosyl hydrolases family 17 protein
<i>Phvud.010G024000</i>	Chr10	3382255...3384686	NL-like protein	<i>AT5G36930</i>	Disease resistance protein (TIR-NBS-LRR class)
<i>Phvud.010G024100</i>	Chr10	3388369...3391852	TIR-NL protein	<i>AT5G36930</i>	Disease resistance protein (TIR-NBS-LRR class)
<i>Phvud.010G024250</i>	Chr10	3412387...3416106	TIR-NL protein	<i>AT5G36930</i>	Disease resistance protein (TIR-NBS-LRR class)
<i>Phvud.010G024301</i>	Chr10	3434532...3438142	TIR-NL protein	<i>AT5G36930</i>	Disease resistance protein (TIR-NBS-LRR class)
<i>Phvud.010G024351</i>	Chr10	3445959...3449123	NL-like protein	<i>AT5G36930</i>	Disease resistance protein (TIR-NBS-LRR class)
<i>Phvud.010G024700</i>	Chr10	3484577...3492985	Xyloglucan Glycosyl transferase	<i>AT3G07330</i>	Cellulose-synthase-like C6

**Table S4.** Continued.

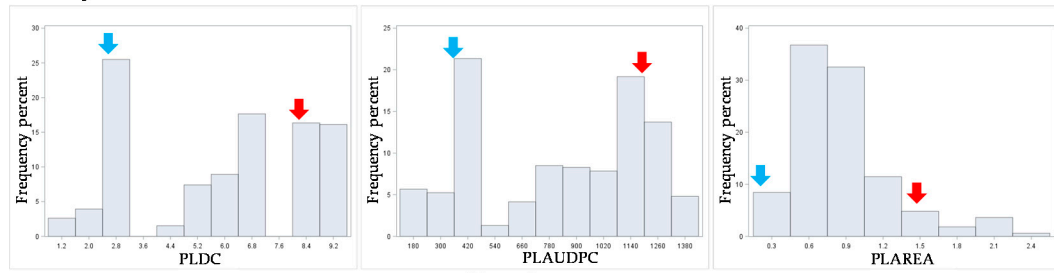


Gene Name	Chromosome	Gene Start...End (bp)	Description Phytozoms	Arabidopsis Homolog	Description TAIR
Pvul010G045300	Chr10	695455...699456	Pentatricopeptide repeat family (PTPR)	ATG02150	Tetratricopeptide repeat (TPR)-like protein
Pvul010G045700	Chr10	6990250...6992727	Pentatricopeptide repeat family (PTPR)	ATUG1460	Tetratricopeptide repeat (TPR)-like protein
Pvul010G045800	Chr10	6996557...6999087	Pentatricopeptide repeat family (PTPR)	ATUG08070	Tetratricopeptide repeat (TPR)-like protein
Pvul010G046000	Chr10	7006433...7010083	Pentatricopeptide repeat family (PTPR)	ATUG33170	Tetratricopeptide repeat (TPR)-like protein
Pvul010G046200	Chr10	7033427...7036656	Pentatricopeptide repeat family (PTPR)	ATUG15510	Tetratricopeptide repeat (TPR)-like protein
Pvul010G046500	Chr10	7159295...7165959	WRKY TF	ATG44745	WRKY transcription factor
Pvul010G047800	Chr10	744862...7447256	Lipase	ATG26260	Phospholipase A 2A
Pvul010G048300	Chr10	72322924...7232542	Pentatricopeptide repeat family (PTPR)	ATG32530	Pentatricopeptide repeat (TPR) protein
Pvul010G048900	Chr10	7616766...7663028	Lipase	ATG34810	alpha/beta-Hydrolase protein
Pvul010G050000	Chr10	7748995...7773515	Serine/Threonine protein kinase	ATG244830	Protein kinase protein
Pvul010G050200	Chr10	7793087...7795080	Zinc finger C3HC4 type	ATG219380	RNA recognition motif (RRM)-containing protein
Pvul010G050300	Chr10	7847042...7847695	Ethylene responsive TF	ATG244840	Ethylene-responsive element binding factor 13
Pvul010G050600	Chr10	7874160...7874875	Ethylene responsive TF	ATG244840	Ethylene-responsive element binding factor 13
Pvul010G050700	Chr10	7910189...7910824	Ethylene responsive TF	ATG244840	Ethylene-responsive element binding factor 13
Pvul010G050800	Chr10	7914489...7915589	Ethylene responsive TF	ATG244840	Ethylene-responsive element binding factor 13
Pvul010G051700	Chr10	8027254...8027691	Glucosaminyl transferase	ATG32105	Beta-1,3-N-Acetylglucosaminyltransferase protein
Pvul010G052200	Chr10	8066744...8071643	NL-like protein	ATG34495	Hemoglobin-leucine zipper protein 4
Pvul010G053300	Chr10	8219823...8221642	Glycosyl transferase	ATUG01070	UDP-Glycosyltransferase protein
Pvul010G053700	Chr10	8263334...8265065	Glycosyl transferase	ATUG01070	UDP-Glycosyltransferase protein
Pvul010G054000	Chr10	8315153...8316384	Ethylene responsive TF	ATG34490	Integrase-type DNA-binding protein
Pvul010G054300	Chr10	8409164...8410227	NL-like protein	ATG36930	Disease resistance protein (TIR-NBS-LRR class)
Pvul010G054400	Chr10	8413737...8415563	NL-like protein	ATG66900	Disease resistance protein (TIR-NBS-LRR class)
Pvul010G054900	Chr10	8426454...8429005	NL-like protein	ATG17680	Disease resistance protein (TIR-NBS-LRR class), putative
Pvul010G054700	Chr10	8437692...8435380	NL-like protein	ATG17680	Disease resistance protein (TIR-NBS-LRR class)
Pvul010G055100	Chr10	8512688...8516389	NL-like protein	ATG17680	Disease resistance protein (TIR-NBS-LRR class), putative
Pvul010G055200	Chr10	8600902...8606805	NL-like protein	ATG17680	Disease resistance protein (TIR-NBS-LRR class), putative
Pvul010G055300	Chr10	8665818...8668931	TIR-NL protein	ATG17680	Disease resistance protein (TIR-NBS-LRR class), putative
Pvul010G055600	Chr10	8824768...8827571	Pentatricopeptide repeat family (PTPR)	ATG22860	Disease resistance protein (TIR-NBS-LRR class)
Pvul010G057000	Chr10	9042493...9045581	Serine/Threonine protein kinase	ATG21930	Tetratricopeptide repeat (TPR)-like protein
Pvul010G057200	Chr10	9004360...9007411	Serine/Threonine protein kinase	ATG21930	S-b locus lectin protein kinase protein
Pvul010G057300	Chr10	9015723...9018613	Serine/Threonine protein kinase	ATG21930	S-b locus lectin protein kinase protein
Pvul010G057500	Chr10	9078880...9081697	Serine/Threonine protein kinase	ATG21930	S-b locus lectin protein kinase protein
Pvul010G057600	Chr10	9119023...9121966	Serine/Threonine protein kinase	ATG21930	S-b locus lectin protein kinase protein
Pvul010G057900	Chr10	917866...9149355	WRKY TF	ATG36640	WRKY DNA-binding protein 70
Pvul010G058150	Chr10	9178648...9190498	Serine/Threonine protein kinase	ATG501920	Protein kinase protein
Pvul010G060800	Chr10	9503176...9505775	Serine/Threonine protein kinase	ATG501550	Lectin receptor kinase a4.1
Pvul010G061333	Chr10	9858787...9857412	NL-like protein	ATG16890	Disease resistance protein (TIR-NBS-LRR class), putative
Pvul010G062400	Chr10	11021883...11026822	NL-like protein	ATG501720	RND-like superfamily protein
Pvul010G062500	Chr10	11197346...11201046	WRKY TF	ATG38470	WRKY DNA-binding protein 33
Pvul010G063000	Chr10	11340502...11346267	NL-like protein	ATG14470	NB-ARC domain-containing disease resistance protein
Pvul010G063100	Chr10	11364027...11368326	NL-like protein	ATG14470	NB-ARC domain-containing disease resistance protein
Pvul010G063700	Chr10	11792600...11808472	NL-like protein	ATG14470	NB-ARC domain-containing disease resistance protein
Pvul010G064300	Chr10	1222615...12226616	NL-like protein	ATG33170	Indoleacetic acid receptor-like kinase 2
Pvul010G064700	Chr10	12257527...12260383	TIR-NL protein	ATG33170	Indoleacetic acid receptor-like kinase 2
Pvul010G064800	Chr10	12309957...12316026	TIR-NL protein	ATG41750	Disease resistance protein (TIR-NBS-LRR class)
Pvul010G064900	Chr10	12409800...12414655	NL-like protein	ATG67150	Leucine-rich repeat protein kinase protein
Pvul010G066600	Chr10	32855403...32858889	Peroxidase	ATG50340	Peroxidase protein
Pvul010G066700	Chr10	19262794...19265022	Peroxidase	ATG50340	Peroxidase protein
Pvul010G066700	Chr10	19262794...19265022	Peroxidase	ATG50340	Peroxidase protein
Pvul010G066900	Chr10	14957070...14959781	Peroxidase	ATG50340	Peroxidase protein
Pvul010G066900	Chr10	14121133...14122639	Serine/Threonine protein kinase	ATG50340	SCS3-interacting protein 1
Pvul010G067600	Chr10	20990610...20994291	Serine/Threonine protein kinase	ATG58380	with no lysine (K) kinase 5
Pvul010G067900	Chr10	29571197...29576345	Serine/Threonine protein kinase	ATG51630	Protein kinase protein
Pvul010G068300	Chr10	29966746...29973813	Serine/Threonine protein kinase	ATG501850	Glycolipid transfer protein 1
Pvul010G068692	Chr10	15261477...15267370	Lipid transfer protein (LTP)	ATG233470	HS12-like 1
Pvul010G070200	Chr10	30953527...30961609	Zinc finger C3HC4 type	ATG32010	Leucine-rich repeat protein kinase protein
Pvul010G070400	Chr10	31287211...31290338	NL-like protein	ATG56570	C2H2-type zinc finger family protein
Pvul010G071100	Chr10	31840220...31842480	Zinc finger C3HC4 type	ATG02400	C2H2-type zinc finger family protein
Pvul010G071300	Chr10	31949277...31951593	Zinc finger C3HC4 type	ATG6080	Glycosyl hydrolase with C2H2-type zinc finger domain
Pvul010G071500	Chr10	31987135...31992290	Zinc finger C3HC4 type	ATG6190	Receptor like protein 6
Pvul010G073300	Chr10	16500398...16505167	Peroxidase	ATG45616	Peroxidase protein
Pvul010G074100	Chr10	19868917...19869329	Serine/Threonine protein kinase	ATG03540	Protein kinase IB
Pvul010G074300	Chr10	19622641...19626126	Glutathione transferase	ATG28890	Glutathione S-transferase TAU 8
Pvul010G074600	Chr10	19605209...19606645	Glutathione transferase	ATG09270	Glutathione S-transferase TAU 8
Pvul010G074700	Chr10	28553623...28554138	Glutathione transferase	ATG09270	Glutathione S-transferase TAU 8
Pvul010G074900	Chr10	16794900...16979827	Pentatricopeptide repeat family (PTPR)	ATG18520	Pentatricopeptide repeat (TPR) protein
Pvul010G075300	Chr10	28343715...28347915	Pentatricopeptide repeat family (PTPR)	ATG54030	Protein kinase protein with tetratricopeptide repeat domain
Pvul010G075400	Chr10	28378018...28379158	Glutathione transferase	ATG09270	Glutathione S-transferase TAU 8
Pvul010G076200	Chr10	28037674...28041059	Fatty acid desaturase	ATG05580	Fatty acid desaturase 8
Pvul010G076901	Chr10	28584021...28584657	ABC transporter family member	ATG15520	Phloretin drug resistance 12
Pvul010G077300	Chr10	17403315...17404616	Oxidoreductase	ATG15520	2-oxoglutarate (2OG) and Fe(II)-dependent oxygenase protein
Pvul010G077900	Chr10	29351953...29354818	CRR like protein	ATG36020	Phosphatidylcholine transfer protein 8
Pvul010G080600	Chr10	14425210...14425866	Esterase	ATG00880	Plant invertase/pectin methylesterase inhibitor protein
Pvul010G080700	Chr10	14437448...14438107	Esterase	ATG00880	Plant invertase/pectin methylesterase inhibitor protein
Pvul010G081100	Chr10	14516011...14518257	Pentatricopeptide repeat family (PTPR)	ATG02750	Tetratricopeptide repeat (TPR)-like protein
Pvul010G081200	Chr10	14519345...14520220	Lipase	ATG35790	Phospholipase D delta
Pvul010G081900	Chr10	22683268...22685718	Pentatricopeptide repeat family (PTPR)	ATG22410	SLOW GROWTH 1
Pvul010G082400	Chr10	22576447...22579476	NL-like protein	ATG08860	Leucine-rich repeat receptor-like protein kinase protein
Pvul010G082800	Chr10	2321606...23215697	NL-like protein	ATG08860	Leucine-rich repeat receptor-like protein kinase protein
Pvul010G083100	Chr10	23397181...23398293	Zinc finger C3HC4 type	ATG37150	RING/U-box protein
Pvul010G083200	Chr10	34943184...34943938	Zinc finger C3HC4 type	ATG35070	RING/U-box protein
Pvul010G084000	Chr10	24308342...24311754	Zinc finger C3HC4 type	ATG01580	Zinc finger (CCCH-type/C3HC4-type RING finger) protein
Pvul010G086300	Chr10	33162791...33164000	Esterase	ATG45600	Alpha/beta-Hydrolases superfamily protein
Pvul010G086600	Chr10	33223272...33225200	Serine/Threonine protein kinase	ATG45600	Protein kinase protein
Pvul010G086700	Chr10	33493179...33501898	Galacturonosyl transferase	ATG61130	Galacturonosyltransferase 1
Pvul010G088200	Chr10	33784293...33794256	Lysophospholipid acyltransferase 2	ATG45670	Calcineurin B subunit-related
Pvul010G088500	Chr10	33837336...33840656	NL-like protein	ATG45616	Receptor like protein 6
Pvul010G088600	Chr10	33895412...33896416	Zinc finger C3HC4 type	ATG47610	RING/U-box protein
Pvul010G088800	Chr10	33900669...33904636	Lipase	ATG42010	Phospholipase D beta 1
Pvul010G088900	Chr10	34007433...34017964	Lipase	ATG42010	Phospholipase D beta 1
Pvul010G091000	Chr10	34475362...34492105	NL-like protein	ATG2780	NB-ARC domain-containing disease resistance protein
Pvul010G091200	Chr10	34504191...34515966	NL-like protein	ATG2720	NB-ARC domain-containing disease resistance protein
Pvul010G091500	Chr10	34613095...34624959	NL-like protein	ATG2720	NB-ARC domain-containing disease resistance protein
Pvul010G091600	Chr10	34713367...34715677	NL-like protein	ATG2720	NB-ARC domain-containing disease resistance protein
Pvul010G091800	Chr10	34744680...34749984	NL-like protein	ATG2720	NB-ARC domain-containing disease resistance protein
Pvul010G091900	Chr10	35306140...35310341	NL-like protein	ATG2720	NB-ARC domain-containing disease resistance protein
Pvul010G092400	Chr10	35444535...35445330	Glucosyl transferase	ATG4490	Xyloglucan endo-transglycosylase-related 8
Pvul010G092500	Chr10	35448547...35449788	Zinc finger C3HC4 type	ATG4060	RING/U-box protein
Pvul010G093000	Chr10	35170241...35171749	Pentatricopeptide repeat family (PTPR)	ATG36730	Pentatricopeptide repeat (TPR) protein
Pvul010G093100	Chr10	35179332...35182651	NL-like protein	ATG3890	RAP
Pvul010G093200	Chr10	35202013...35204462	Pentatricopeptide repeat family (PTPR)	ATG3890	Pentatricopeptide repeat (TPR) protein
Pvul010G093700	Chr10	35683732...35686441	Esterase	ATG61200	Thioesterase protein
Pvul010G095100	Chr10	35849633...35851405	Cellulase	ATG26130	Cellulase (glycosyl hydrolase family 5) protein

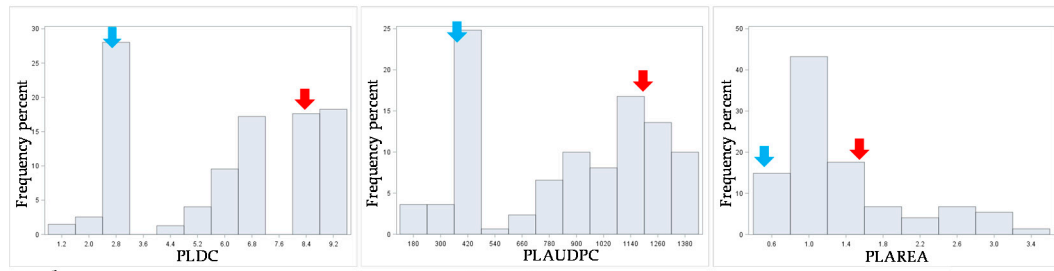
**Table S4.** Continued.

Gene Name	Chromosome	Gene Start...End (bp)	Description Phytozone	Arabidopsis Homolog	Description TAIR
<i>Phvul.010G098200</i>	Chr10	36365007...36376239	Esterase	<i>AT1G01710</i>	Acyl-CoA thioesterase family protein
<i>Phvul.010G098400</i>	Chr10	36393060...36394219	Oxidoreductase	<i>AT4G23340</i>	2-oxoglutarate (2OG) and Fe(II)-dependent oxygenase protein
<i>Phvul.010G099700</i>	Chr10	36675257...36679613	Glycerol transferase	<i>AT1G01610</i>	Glycerol-3-phosphate acyltransferase 4
<i>Phvul.010G100400</i>	Chr10	36793713...36796196	Serine/Threonine protein kinase	<i>AT4G00340</i>	RLK4
<i>Phvul.010G100500</i>	Chr10	36801234...36804309	Zinc finger C3HC4 type	<i>AT4G00335</i>	RING-H2 finger B1A
<i>Phvul.010G100600</i>	Chr10	36814429...36816452	Pentatricopeptide repeat family (PPR)	<i>AT2G46050</i>	Pentatricopeptide repeat (PPR-like) protein
<i>Phvul.010G101100</i>	Chr10	36971142...36973192	Zinc finger C3HC4 type	<i>AT3G61460</i>	Brassinosteroid-responsive RING-H2
<i>Phvul.010G101600</i>	Chr10	37068692...37070667	Glucosyl transferase	<i>AT4G34131</i>	UDP-glucosyl transferase 73B3
<i>Phvul.010G101800</i>	Chr10	37085644...37087392	Glucosyl transferase	<i>AT4G34138</i>	UDP-glucosyl transferase 73B1
<i>Phvul.010G103100</i>	Chr10	37208438...37212085	Lipase	<i>AT1G01540</i>	Protein kinase protein
<i>Phvul.010G104200</i>	Chr10	37414116...37415803	WRKY TF	<i>AT4G01250</i>	WRKY TF
<i>Phvul.010G104300</i>	Chr10	37472766...37482584	NL-like protein	<i>AT4G27190</i>	NB-ARC domain-containing disease resistance protein
<i>Phvul.010G104700</i>	Chr10	37598402...37599637	WRKY TF	<i>AT1G64000</i>	WRKY DNA-binding protein 56
<i>Phvul.010G105200</i>	Chr10	37619151...37619723	Zinc finger C3HC4 type	<i>AT3G61550</i>	RING/U-box protein
<i>Phvul.010G105900</i>	Chr10	37677298...37683724	Glycosyl transferase	<i>AT4G01210</i>	Glycosyl transferase
<i>Phvul.010G108000</i>	Chr10	38056509...38057171	Lipase	<i>AT1G17420</i>	Lipoxygenase 3
<i>Phvul.010G108700</i>	Chr10	38146639...38149457	Zinc finger C3HC4 type	<i>AT4G01130</i>	GD5L-like Lipase/Acylhydrolase superfamily protein
<i>Phvul.010G110500</i>	Chr10	38414889...38418585	Natural Resistance Associated Macrophage protein (NRAMP)	<i>AT1G47240</i>	NRAMP metal ion transporter 2
<i>Phvul.010G110600</i>	Chr10	38420816...38422570	Serine/Threonine protein kinase	<i>AT5G56760</i>	Serine acetyltransferase 1;1
<i>Phvul.010G111000</i>	Chr10	38509109...38512009	Serine/Threonine protein kinase	<i>AT1G64300</i>	Protein kinase protein
<i>Phvul.010G111900</i>	Chr10	38679128...38681765	WRKY TF	<i>AT4G23810</i>	WRKY family transcription factor
<i>Phvul.010G112400</i>	Chr10	38745119...38748532	Pentatricopeptide repeat family (PPR)	<i>AT4G01030</i>	Pentatricopeptide (PPR) repeat-containing protein
<i>Phvul.010G113700</i>	Chr10	38995279...38997358	Zinc finger C3HC4 type	<i>AT2G46495</i>	RING/U-box protein
<i>Phvul.010G114100</i>	Chr10	39045743...39062551	Pentatricopeptide repeat family (PPR)	<i>AT1G01320</i>	Tetratricopeptide repeat (TPR)-like protein
<i>Phvul.010G114900</i>	Chr10	39188392...39189333	Ethylene responsive TF	<i>AT1G01250</i>	Integrase-type DNA-binding protein
<i>Phvul.010G115600</i>	Chr10	39320406...39322691	Zinc finger C3HC4 type	<i>AT3G61850</i>	Dof-type zinc finger DNA-binding family protein
<i>Phvul.010G115800</i>	Chr10	39349541...39353600	Serine/Threonine protein kinase	<i>AT1G49160</i>	Protein kinase protein
<i>Phvul.010G116300</i>	Chr10	39389924...39392040	Pentatricopeptide repeat family (PPR)	<i>AT5G08510</i>	Pentatricopeptide repeat (PPR-like) protein
<i>Phvul.010G117600</i>	Chr10	39660323...39667705	Serine/Threonine protein kinase	<i>AT2G46700</i>	CDPK-related kinase 3
<i>Phvul.010G118300</i>	Chr10	39752572...39758271	Serine/Threonine protein kinase	<i>AT1G01140</i>	CBL-interacting protein kinase 9
<i>Phvul.010G119400</i>	Chr10	39958684...39970905	Zinc finger C3HC4 type	<i>AT4G00800</i>	Transducin protein

## Primary leaf

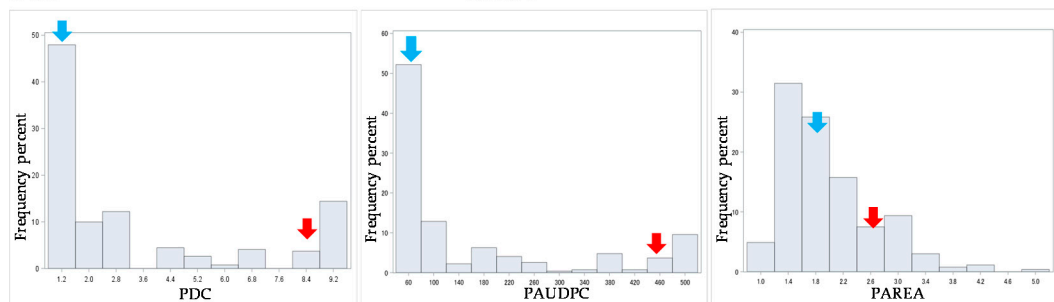


## Race 5

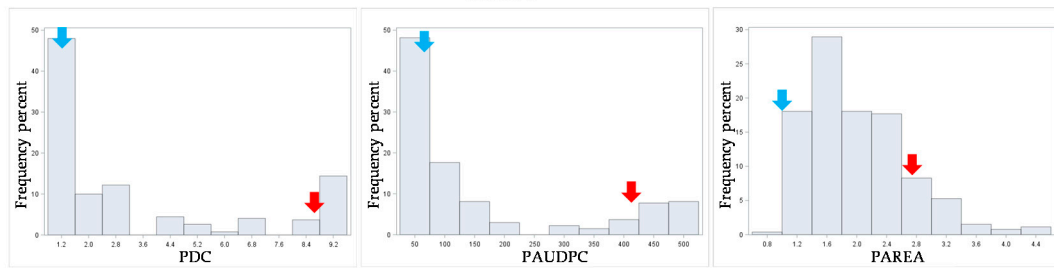


## Pod

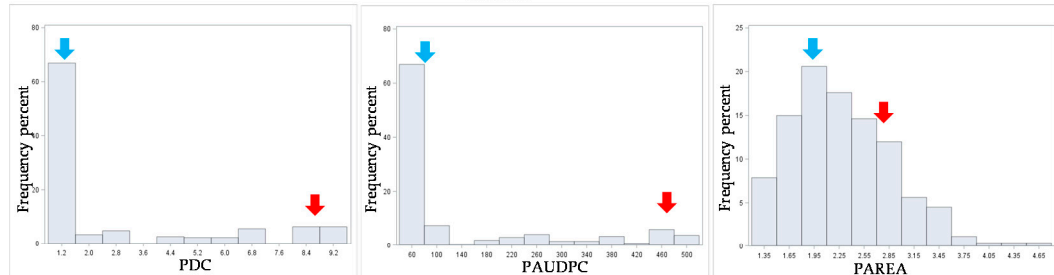
## Race 9



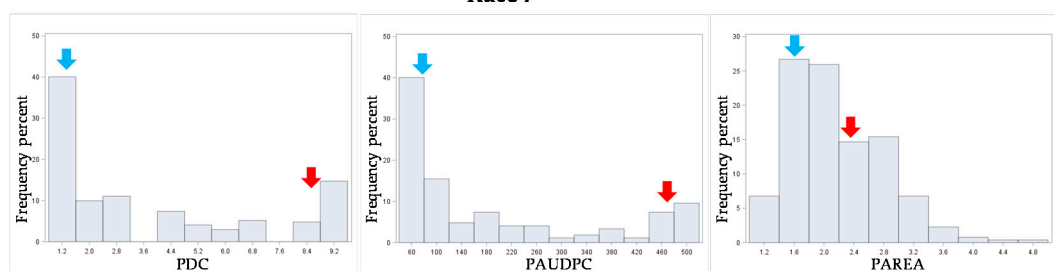
## Race 1



## Race 5



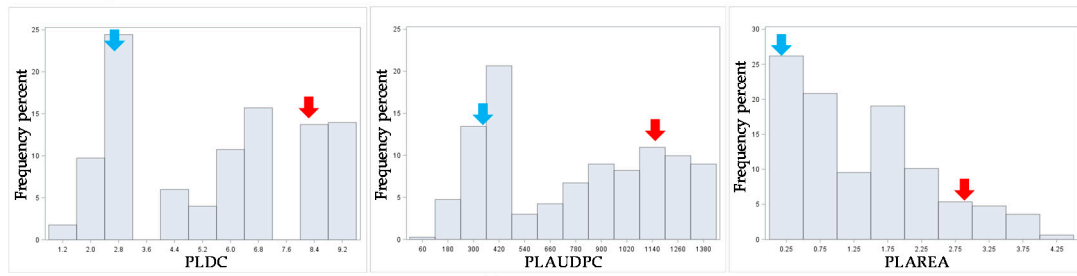
## Race 7



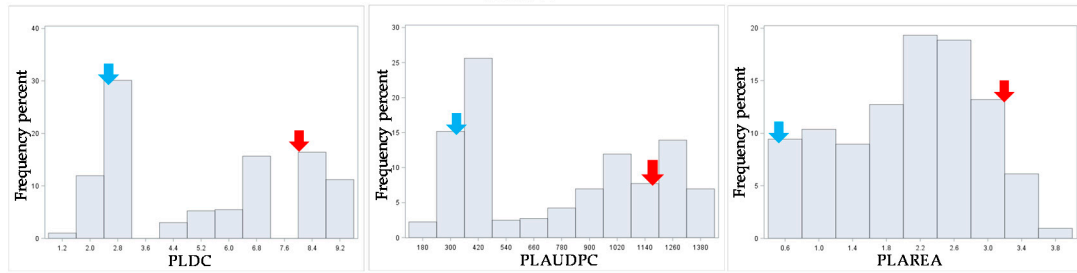
## Race 9

**Figure S1.** Frequency distribution for disease score (DC), area under the disease progress curve (AUDPC) and lesion (AREA) for primary leaf and pod resistance to halo blight races 1, 5, 7 and 9 of the F<sub>2</sub> UI3T population. Estimates of the two parents are indicated by blue (UI3) and red (Tendergreen) arrows. PDC = pod disease score; PAUDPC = pod area under the disease progress curve; PAREA = size of the lesion on pods; PLDC = primary leaf disease score; PLAUDPC = primary leaf area under the disease progress curve; PLAREA = size of the lesion on primary leaves. The two primary (unifoliate) leaves of bean plants were inoculated with races 5 and 9.

## Primary leaf

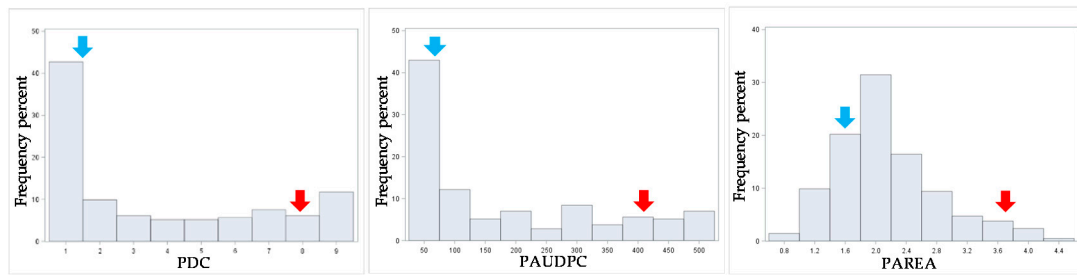


## Race 1

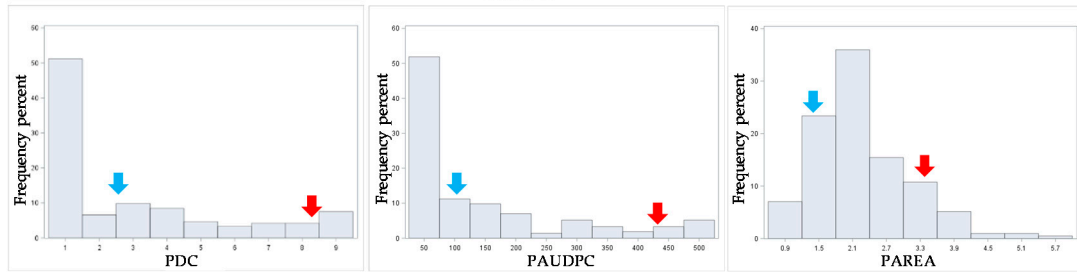


## Race 7

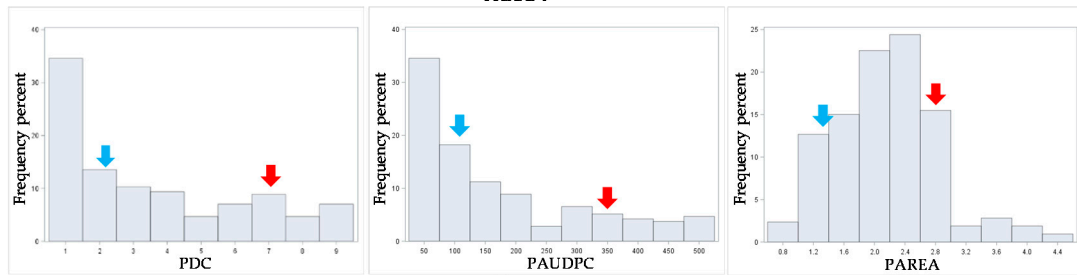
## Pod



## Race 1



## Race 7



## Race 9

**Figure S2.** Frequency distribution for disease score (DC), area under the disease progress curve (AUDPC), and area lesion (AREA) in primary leaf and pod resistance to halo blight races 1, 7 and 9 of the F<sub>2</sub> UI3A52 population. Estimates of the two parents are indicated by blue (UI3) and red (A52) arrows. PDC = pod disease score; PAUDPC = pod area under the disease progress curve; PAREA = size of the lesion on pods; PLDC = primary leaf disease score; PLAUDPC = primary leaf area under the disease progress curve;

PLAREA = size of the lesion on primary leaves. The two primary (unifoliate) leaves of bean plants were inoculated with races 1 and 7.