

## SUPPLEMENTARY MATERIALS

to the article by B.N. Doszhanova, A.K. Zatybekov, S.V. Didorenko, T. Suzuki, Y. Yamashita, Y. Turuspekov  
 "Identification of quantitative trait loci of pod dehiscence in soybean collection  
 grown in the southeast of Kazakhstan"

**Supplementary Material 1.** The world soybean collection used in the research, results of genotyping and field screening by pod dehiscence trait, and identified significant SNPs

Nº	Name	Country	Origin	<i>pdh1</i> genotyping	Field 2019	Field 2021	Gm16_29681065	Gm10_47774781	Gm13_6207590
1	Yaselda	Belarus	Eastern Europe	<i>S</i>	4–5*	4–5*	GG	CC	AA
2	Pripyat	Belarus	Eastern Europe	<i>R</i>	4–5*	0	TT	TT	GG
3	OAC Vision	Canada	Northern America	<i>R</i>	0	0	TT	TT	GG
4	Maple Presto	Canada	Northern America	<i>R</i>	0	0	TT	CC	GG
5	Emerson	Canada	Northern America	<i>R</i>	0	0	TT	TT	GG
6	P-73-3	Canada	Northern America	<i>R</i>	0	0	TT	TT	GG
7	Supra	Canada	Northern America	<i>R</i>	0	0	TT	TT	GG
8	Maple Ridge	Canada	Northern America	<i>R</i>	0	0	TT	TT	GG
9	Maple Arrow	Canada	Northern America	<i>H</i>	0	0	TT	CC	GG
10	Maple Glen	Canada	Northern America	<i>R</i>	0	0	TT	CC	GG
11	Maple Amber	Canada	Northern America	<i>R</i>	4–5*	0	TT	TT	GG
12	Gaillard	Canada	Northern America	<i>R</i>	0	0	TT	TT	GG
13	KG 20	Canada	Northern America	<i>S</i>	0	4–5*	GG	TT	GG
14	Accord	Canada	Northern America	<i>R</i>	4–5*	4–5*	TT	CC	AA
15	AC Brant	Canada	Northern America	<i>R</i>	0	0	TT	TT	GG
16	Kharbin	China	East Asia	<i>H</i>	0	0	TT	TT	GG
17	Kheikhek14	China	East Asia	<i>S</i>	0	0	GG	TT	GG
18	LMF	Poland	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
19	Chabem Wekoju	Poland	Eastern Europe	<i>R</i>	0	0	TT	TT	AA
20	Arctic	Poland	Eastern Europe	<i>S</i>	4–5*	4–5*	GG	CC	AA
21	Kollekcyina	Poland	Eastern Europe	<i>S</i>	4–5*	4–5*	GG	CC	GG
22	Nawiko	Poland	Eastern Europe	<i>S</i>	4–5*	4–5*	GG	CC	GG
23	Warsawska	Poland	Eastern Europe	<i>S</i>	4–5*	0	GG	TT	GG
24	Kasatka	Russia	Eastern Europe	<i>H</i>	0	0	TT	TT	GG
25	Severnaya5	Russia	Eastern Europe	<i>R</i>	0	0	TT	CC	GG
26	Smena	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
27	Rassvet	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
28	Amurskaya 401	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
29	Soer3491	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
30	Omskaya4	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
31	Soer-3	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG

Supplementary Material 1 (continued)

Nº	Name	Country	Origin	<i>pdh1</i> genotyping	Field 2019	Field 2021	Gm16_29681065	Gm10_47774781	Gm13_6207590
32	Bryanskaya	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
33	Nadejda	Russia	Eastern Europe	<i>H</i>	0	0	TT	TT	GG
34	Lidiya	Russia	Eastern Europe	<i>R</i>	4–5*	0	TT	CC	GG
35	VNIIS 1	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
36	Luhezarnaya	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
37	PEP27	Russia	Eastern Europe	<i>S</i>	4–5*	4–5*	GG	CC	GG
38	Sibniik 315	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
39	VNIIS 2	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
40	Soer4	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	AA
41	Bara	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
42	Zolotistaya	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
43	Zlata	Russia	Eastern Europe	<i>R</i>	0	0	TT	NN	GG
44	Mageva	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	NN
45	Soer 5	Russia	Eastern Europe	<i>R</i>	0	0	TT	NN	NN
46	Okskaya	Russia	Eastern Europe	<i>R</i>	4–5*	0	TT	TT	NN
47	Svetlaya	Russia	Eastern Europe	<i>R</i>	0	0	TT	NN	GG
48	Maleta	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
49	Vega	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	AA
50	Luch nadezhdy	Russia	Eastern Europe	<i>H</i>	0	4–5*	TT	TT	AA
51	Sonata	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
52	Zakat	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
53	Svapa	Russia	Eastern Europe	<i>R</i>	0	0	TT	NN	NN
54	Lancetnaya	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	NN
55	Zernica	Russia	Eastern Europe	<i>R</i>	0	0	TT	CC	GG
56	Niva 70	Russia	Eastern Europe	<i>H</i>	0	0	TT	NN	NN
57	Sibiryachka	Russia	Eastern Europe	<i>R</i>	0	0	TT	NN	NN
58	Eldorado	Russia	Eastern Europe	<i>R</i>	0	0	TT	NN	NN
59	Garmoniya	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	AA
60	Romantika	Russia	Eastern Europe	<i>H</i>	0	0	TT	TT	GG
61	Belgorodskaya 6	Russia	Eastern Europe	<i>R</i>	0	0	TT	CC	GG
62	Veidelevskaya 17	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
63	Yantarnaya	Russia	Eastern Europe	<i>H</i>	0	0	TT	TT	GG
64	Altom	Russia	Eastern Europe	<i>S</i>	4–5*	4–5*	GG	CC	AA

Supplementary Material 1 (continued)

№	Name	Country	Origin	<i>pdh1</i> genotyping	Field 2019	Field 2021	Gm16_29681065	Gm10_47774781	Gm13_6207590
65	SibNIISKHOZ 6	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	AA
66	PEP26	Russia	Eastern Europe	<i>R</i>	4–5*	0	GG	TT	GG
67	Belor	Russia	Eastern Europe	<i>R</i>	4–5*	4–5*	TT	CC	AA
68	Soer345	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
69	Gribskaya	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
70	Krasivaya mechta	Russia	Eastern Europe	<i>R</i>	0	0	TT	CC	GG
71	Carola	USA	Northern America	<i>S</i>	4–5*	4–5*	GG	TT	GG
72	Daksoy	USA	Northern America	<i>R</i>	0	0	TT	NN	GG
73	Dawson	USA	Northern America	<i>R</i>	0	0	TT	TT	GG
74	USKHI 6	Ukraine	Eastern Europe	<i>R</i>	0	4–5*	TT	TT	GG
75	Prikarpatskaya 81	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
76	Chernovickaya7	Ukraine	Eastern Europe	<i>H</i>	0	0	TT	TT	GG
77	Spritna	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
78	Terek	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
79	Ustyа	Ukraine	Eastern Europe	<i>H</i>	0	0	TT	TT	GG
80	Khorol	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
81	Yug30	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
82	Estophita	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
83	Podyaka	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
84	Victorina	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
85	Annushka	Ukraine	Eastern Europe	<i>H</i>	0	0	TT	TT	GG
86	Amour	France	Western Europe	<i>R</i>	0	0	TT	TT	GG
87	Kalmit	France	Western Europe	<i>R</i>	0	4–5*	TT	CC	GG
88	Sepia	France	Western Europe	<i>S</i>	4–5*	0	GG	TT	GG
89	Amphor	France	Western Europe	<i>R</i>	0	0	TT	TT	GG
90	Toury	Czech Republic	Eastern Europe	<i>H</i>	4–5*	4–5*	TT	TT	GG
91	Rana	Czech Republic	Eastern Europe	<i>R</i>	4–5*	0	TT	TT	GG
92	Turijskaja	Czech Republic	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
93	Fiskeby5	Sweden	Western Europe	<i>H</i>	4–5*	0	GG	CC	AA
94	Fiskeby3	Sweden	Western Europe	<i>R</i>	0	0	TT	TT	GG
95	Oyachi2	Japan	East Asia	<i>R</i>	0	4–5*	TT	TT	GG
96	308/1	Kazakhstan	Central Asia	<i>R</i>	4–5*	0	TT	TT	AA
97	422/1	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	AA

Supplementary Material 1 (continued)

Nº	Name	Country	Origin	<i>pdh1</i> genotyping	Field 2019	Field 2021	Gm16_29681065	Gm10_47774781	Gm13_6207590
98	186/1	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG
99	173/1	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG
100	126/1	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG
101	209/1	Kazakhstan	Central Asia	<i>R</i>	0	0	GG	TT	GG
102	261/1	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG
103	350/1	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	AA
104	362/2	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG
105	371/2	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	NN	GG
106	407/2	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG
107	404/2	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG
108	370/2	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG
109	Zara	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG
110	Roza	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG
111	Misula	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG
112	Almaty	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG
113	Zhalpaksai	Kazakhstan	Central Asia	<i>R</i>	0	4–5*	TT	TT	GG
114	Agassiz	USA	Northern America	<i>R</i>	0	0	TT	TT	GG
115	Evans	USA	Northern America	<i>R</i>	0	0	TT	TT	AA
116	Lambert	USA	Northern America	<i>R</i>	0	0	TT	TT	GG
117	Mc call	USA	Northern America	<i>R</i>	0	0	TT	TT	GG
118	Parker	USA	Northern America	<i>R</i>	0	0	TT	TT	GG
119	Dekabig	USA	Northern America	<i>R</i>	0	0	TT	TT	GG
120	Jachynes 74 Brond	USA	Northern America	<i>R</i>	0	0	TT	TT	GG
121	Wilstar 194	USA	Northern America	<i>R</i>	0	0	TT	TT	GG
122	Lara	Serbia	Western Europe	<i>R</i>	0	0	TT	TT	GG
123	Elgin 141	USA	Northern America	<i>R</i>	0	0	TT	TT	GG
124	Cobb 266	USA	Northern America	<i>R</i>	0	0	TT	TT	GG
125	OAOWallace	Canada	Northern America	<i>R</i>	0	0	TT	TT	AA
126	GEO	Canada	Northern America	<i>H</i>	0	0	TT	TT	GG
127	Buster	Canada	Northern America	<i>R</i>	0	0	TT	TT	AA
128	SL 01 26	Canada	Northern America	<i>R</i>	0	0	TT	CC	GG
129	SI 02 25	Canada	Northern America	<i>R</i>	0	0	TT	TT	GG
130	RCAT Persian	Canada	Northern America	<i>R</i>	0	0	TT	TT	GG

Supplementary Material 1 (continued)

№	Name	Country	Origin	<i>pdh1</i> genotyping	Field 2019	Field 2021	Gm16_29681065	Gm10_47774781	Gm13_6207590
131	Enterprise	Canada	Northern America	<i>R</i>	0	0	TT	TT	GG
132	Voevodzhanka	Serbia	Western Europe	<i>R</i>	0	0	TT	TT	GG
133	Ana	Serbia	Western Europe	<i>R</i>	0	0	TT	TT	GG
134	Nikko	Serbia	Western Europe	<i>R</i>	0	0	TT	TT	GG
135	Sava	Serbia	Western Europe	<i>R</i>	0	0	TT	TT	GG
136	Venera	Serbia	Western Europe	<i>R</i>	0	0	TT	TT	GG
137	Zen	Switzerland	Western Europe	<i>R</i>	0	0	TT	TT	GG
138	Protina	France	Western Europe	<i>R</i>	0	0	TT	TT	GG
139	Sponsor	France	Western Europe	<i>R</i>	0	0	TT	TT	GG
140	Isidor	France	Western Europe	<i>R</i>	0	0	TT	TT	GG
141	Shama	France	Western Europe	<i>R</i>	0	0	TT	TT	GG
142	Safrfna	France	Western Europe	<i>R</i>	0	0	TT	TT	GG
143	Santana	France	Western Europe	<i>R</i>	0	0	TT	TT	GG
144	Lada	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
145	Lira	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	AA
146	Bystrica 2	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	AA
147	Vesta	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
148	Renta	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
149	Vilana	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
150	Del'ta	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
151	Lan'	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
152	Runa	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
153	Astra	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
154	Slaviya	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
155	Bukuriya	Moldova	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
156	Biser 291	Bulgaria	Western Europe	<i>R</i>	0	0	TT	TT	GG
157	Zispida 641	Belgium	Western Europe	<i>R</i>	0	0	TT	TT	GG
158	Iskra	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	AA
159	Perizat	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG
160	Zhansaya	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG
161	Vita	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG
162	Bolashak	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG
163	Danaya	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG

Supplementary Material 1 (continued)

Nº	Name	Country	Origin	<i>pdh1</i> genotyping	Field 2019	Field 2021	Gm16_29681065	Gm10_47774781	Gm13_6207590
164	Sabira	Kazakhstan	Central Asia	R	0	0	TT	TT	GG
165	Pamyat' YuGK	Kazakhstan	Central Asia	R	0	0	TT	TT	GG
166	Evrika	Kazakhstan	Central Asia	R	0	0	TT	TT	GG
167	Lastochka	Kazakhstan	Central Asia	R	0	0	TT	TT	GG
168	Sulamit	Kazakhstan	Central Asia	R	0	0	TT	TT	GG
169	Kazakhstanskaya 2309	Kazakhstan	Central Asia	R	0	0	TT	TT	GG
170	Akku	Kazakhstan	Central Asia	R	0	0	TT	TT	GG
171	Radost'	Kazakhstan	Central Asia	R	0	0	TT	TT	GG
172	Nadezhda	Kazakhstan	Central Asia	R	0	0	TT	TT	GG
173	Xinjiang a don 1	China	East Asia	R	0	0	TT	TT	AA
174	Xinjiang heihe 38	China	East Asia	R	0	0	TT	TT	AA
175	Xinjiang D09-676	China	East Asia	R	0	0	TT	TT	AA
176	Xinjiang D10-51	China	East Asia	R	0	0	TT	TT	AA
177	Xinjiang D10-130	China	East Asia	R	0	0	TT	TT	GG
178	Xinjiang D10-135	China	East Asia	R	0	0	TT	TT	GG
179	Xinjiang D11-252	China	East Asia	R	0	0	TT	TT	GG
180	Лыбидь	Ukraine	Eastern Europe	R	0	0	TT	TT	GG
181	Cheremosh	Ukraine	Eastern Europe	R	0	0	TT	TT	GG
182	Korsak	Ukraine	Eastern Europe	R	0	0	TT	TT	GG
183	Tanais	Ukraine	Eastern Europe	R	0	0	TT	TT	GG
184	Desna	Ukraine	Eastern Europe	R	0	0	TT	CC	GG
185	1054	Korea	East Asia	R	0	0	TT	TT	GG
186	1031	Korea	East Asia	R	0	0	TT	TT	AA
187	1070	Korea	East Asia	R	0	0	TT	TT	GG
188	1034	Korea	East Asia	R	0	0	TT	CC	GG
189	1076	Korea	East Asia	R	0	0	TT	TT	GG
190	1065	Korea	East Asia	R	0	0	TT	CC	GG
191	1017	Korea	East Asia	R	0	0	TT	TT	GG
192	1044	Korea	East Asia	R	0	0	TT	CC	GG
193	1069	Korea	East Asia	R	0	0	TT	TT	GG
194	1082	Korea	East Asia	R	0	0	TT	TT	GG
195	1028	Korea	East Asia	R	0	0	TT	TT	GG
196	1055	Korea	East Asia	R	0	0	TT	TT	GG

Supplementary Material 1 (continued)

№	Name	Country	Origin	<i>pdh1</i> genotyping	Field 2019	Field 2021	Gm16_29681065	Gm10_47774781	Gm13_6207590
197	1095	Korea	East Asia	<i>R</i>	0	0	NN	CC	NN
198	1026	Korea	East Asia	<i>R</i>	0	0	TT	TT	GG
199	1071	Korea	East Asia	<i>R</i>	0	0	TT	TT	GG
200	1003	Korea	East Asia	<i>R</i>	0	0	TT	TT	GG
201	1022	Korea	East Asia	<i>R</i>	0	0	TT	TT	AA
202	1033	Korea	East Asia	<i>R</i>	0	0	TT	TT	GG
203	1049	Korea	East Asia	<i>R</i>	0	0	TT	TT	GG
204	Hei lun 48	China	East Asia	<i>R</i>	0	0	TT	TT	GG
205	Hua i doe 1	China	East Asia	<i>R</i>	0	0	TT	TT	GG
206	Xu nong 35	China	East Asia	<i>R</i>	0	0	TT	TT	GG
207	Xu nong 26	China	East Asia	<i>R</i>	0	0	TT	TT	GG
208	Bey jiang 91	China	East Asia	<i>R</i>	0	0	TT	TT	GG
209	Dong doe 641	China	East Asia	<i>S</i>	0	0	TT	TT	GG
210	Jin nong 62	China	East Asia	<i>R</i>	4–5*	0	TT	TT	AA
211	Dong doe 1	China	East Asia	<i>R</i>	0	0	TT	TT	AA
212	Ken lun 8	China	East Asia	<i>R</i>	0	0	TT	TT	AA
213	Jin yuan 55	China	East Asia	<i>R</i>	0	0	TT	TT	GG
214	Ken feng 20	China	East Asia	<i>S</i>	0	0	TT	TT	GG
215	551	China	East Asia	<i>R</i>	0	0	TT	TT	NN
216	Dong doe 29	China	East Asia	<i>R</i>	0	0	TT	TT	GG
217	Jing xin 2	China	East Asia	<i>R</i>	0	0	TT	TT	AA
218	Dong doe 339	China	East Asia	<i>R</i>	0	0	TT	TT	GG
219	Heihe 47	China	East Asia	<i>R</i>	0	0	TT	TT	GG
220	Hei feng 50	China	East Asia	<i>R</i>	0	0	TT	TT	AA
221	Dong doe 027	China	East Asia	<i>R</i>	0	0	TT	TT	GG
222	Mei feng 18	China	East Asia	<i>R</i>	0	0	TT	TT	AA
223	Xu Xiong 1	China	East Asia	<i>R</i>	0	0	TT	TT	GG
224	Klaxxon	France	Western Europe	<i>R</i>	0	0	TT	CC	GG
225	Major	France	Western Europe	<i>R</i>	0	4–5*	TT	CC	GG
226	Versiya	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
227	Dina	Russia	Eastern Europe	<i>R</i>	0	4–5*	TT	TT	AA
228	Picket K6298	USA	Northern America	<i>R</i>	0	0	TT	CC	GG
229	L 129-08	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG

Supplementary Material 1 (continued)

Nº	Name	Country	Origin	<i>pdh1</i> genotyping	Field 2019	Field 2021	Gm16_29681065	Gm10_47774781	Gm13_6207590
230	Mriya	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
231	K 9961	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
232	Ros'	Belarus	Eastern Europe	<i>S</i>	0	0	TT	TT	GG
233	Spritna	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
234	Fora	Russia	Eastern Europe	<i>R</i>	4–5*	4–5*	GG	CC	GG
235	Mal'vina	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
236	OAC Erin	Canada	Northern America	<i>R</i>	0	0	TT	TT	GG
237	Femida	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
238	10991	Canada	Northern America	<i>R</i>	0	0	TT	CC	GG
239	Vatra	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
240	Feya	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
241	Odesskaya150	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
242	9224	Hungary	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
243	Darika	Moldova	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
244	Osobliva	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
245	VNIIS 1	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
246	ISZ 13	Hungary	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
247	Rainer 58	Moldova	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
248	Oktyabr' 70	Russia	Eastern Europe	<i>R</i>	4–5*	4–5*	TT	TT	GG
249	Selekta 301	Russia	Eastern Europe	<i>R</i>	0	0	TT	CC	GG
250	Majesta	Canada	Northern America	<i>R</i>	0	4–5*	TT	TT	GG
251	Poltava	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
252	Don'ka	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
253	Skleya	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
254	K2132	China	East Asia	<i>R</i>	0	0	TT	TT	GG
255	Kuban'	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
256	1674	China	East Asia	<i>R</i>	0	0	TT	TT	GG
257	Shelby	USA	Northern America	<i>R</i>	0	0	TT	TT	GG
258	Maurau	Czech Republic	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
259	Bellemondeau	Canada	Northern America	<i>R</i>	0	0	GG	TT	GG
260	Ussurisskaya 267	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
261	Primorskaya 495	Russia	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
262	Crystal	Canada	Northern America	<i>R</i>	0	0	TT	TT	GG



### Supplementary Material 1 (end)

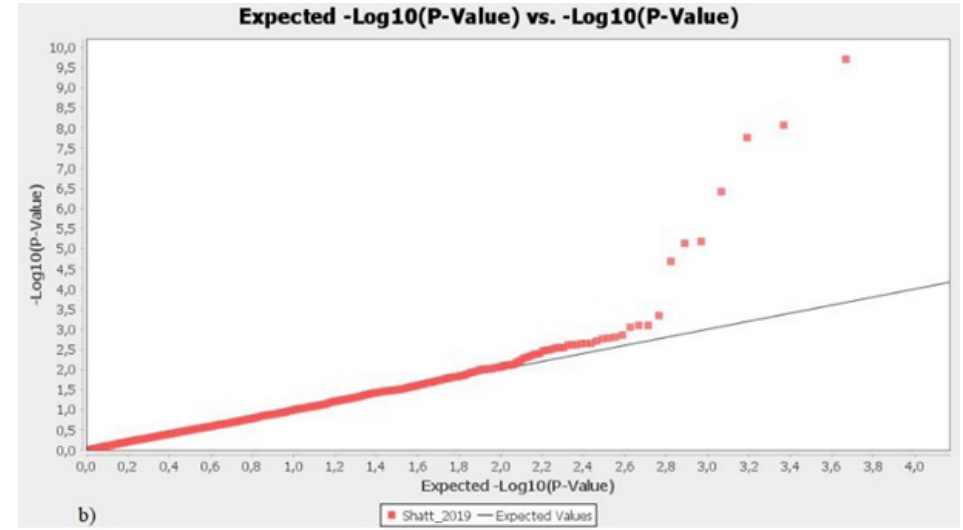
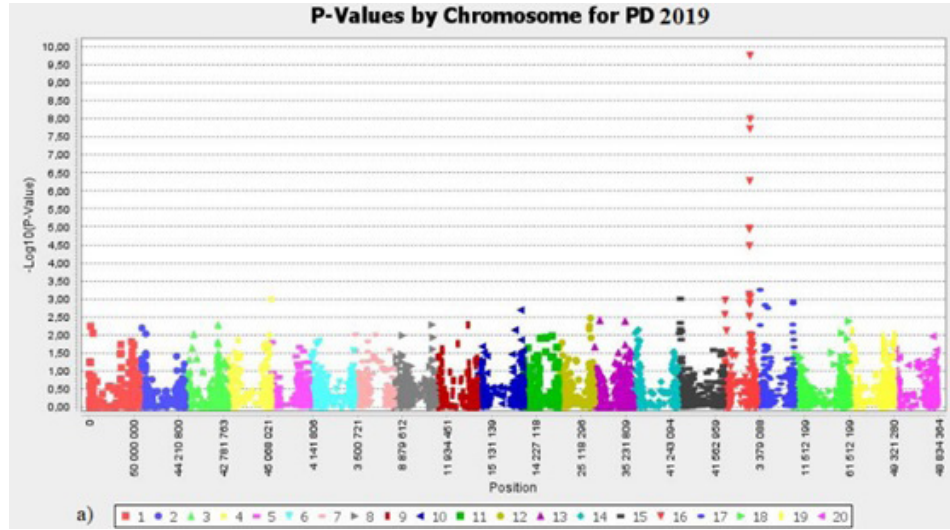
№	Name	Country	Origin	<i>pdh1</i> genotyping	Field 2019	Field 2021	Gm16_29681065	Gm10_47774781	Gm13_6207590
263	RCAT Bobcat	Canada	Northern America	<i>R</i>	0	0	TT	TT	GG
264	6877	Philippines	East Asia	<i>R</i>	0	0	TT	TT	GG
265	Morsoy	USA	Northern America	<i>R</i>	0	0	TT	TT	GG
266	391	Kazakhstan	Central Asia	<i>R</i>	0	0	TT	TT	GG
267	Colby	Canada	Northern America	<i>R</i>	0	0	TT	TT	GG
268	Khersonskaya 840	Ukraine	Eastern Europe	<i>R</i>	0	0	GG	TT	GG
269	Linkoln	USA	Northern America	<i>H</i>	0	0	TT	TT	GG
270	Viktoriya	Ukraine	Eastern Europe	<i>R</i>	0	0	TT	TT	GG
271	K1889	China	East Asia	<i>R</i>	0	0	TT	TT	AA
272	Harrow Manuchu	China	East Asia	<i>R</i>	0	0	TT	TT	GG
273	Nhat 11	Vietnam	East Asia	<i>R</i>	0	0	TT	TT	GG

\* where 4 ≤ 61–80 % and 5 ≤ 81–100 % of dehisced soybean pods in the field condition of Almaty region.

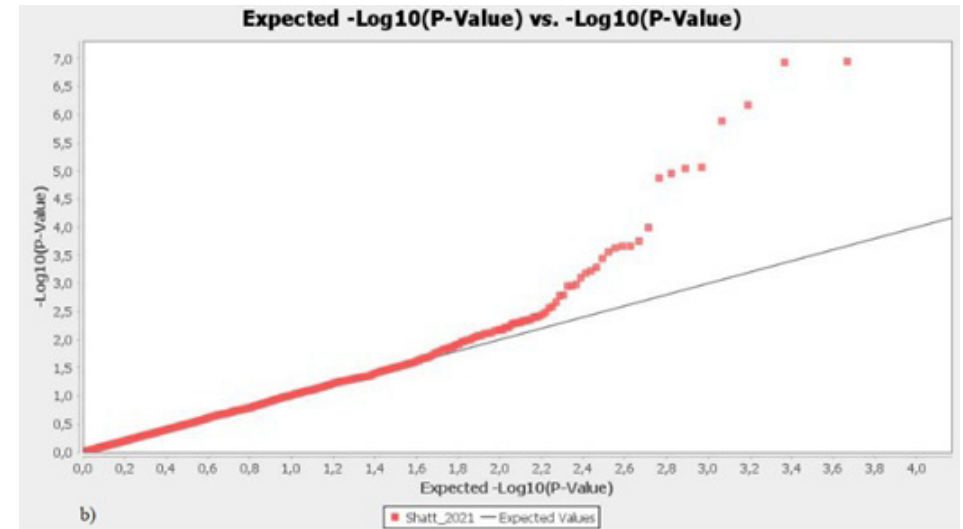
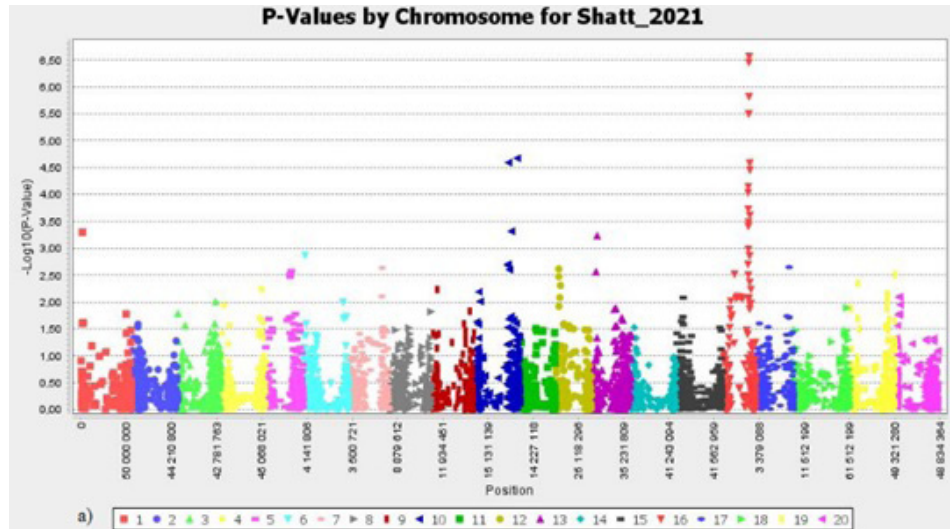
### Supplementary Material 2. The meteorological data in Almaty region of the two years of experiment

Month	2019		2021	
	Temperature, °C	Rainfall, mm	Temperature, °C	Rainfall, mm
May	17.00	39.3	19.48	81.6
June	22.26	72.7	22.44	20.9
July	26.96	22.6	26.00	22.8
August	24.88	67.7	24.10	27.2
September	18.55	67.2	20.53	1.6

### Supplementary Material 3



### Supplementary Material 4



**Supplementary Material 5. Identified SNP for PD for 2019, 2021 and average of the two years**

Trait	Marker	Chr	Pos	p2019	FDR	MarkerR2_2019	p2021	FDR	MarkerR2_2021	p_aver	FDR	MarkerR2_aver
PD	Gm10_38147924	10	38147924				2.5569E-5	0.0198202	0.06601	3.5938E-4	0.1044673	0.04752
PD	<b>Gm10_47774781</b>	<b>10</b>	<b>47774781</b>				<b>2.1195E-5</b>	<b>0.0197156</b>	<b>0.06757</b>	<b>3.8127E-5</b>	<b>0.0221661</b>	<b>0.06413</b>
PD	<b>Gm13_6207590</b>	<b>13</b>	<b>6207590</b>				<b>5.89E-4</b>	<b>0.1611435</b>	<b>0.04363</b>	<b>1.0165E-4</b>	<b>0.0363672</b>	<b>0.05917</b>
PD	Gm16_28613278	16	28613278	7.5299E-4	0.38913	0.04351	9.2673E-5	0.0431022	0.05671	7.6469E-5	0.0323325	0.05865
PD	Gm16_28706800	16	28706800	9.1149E-4	0.38539	0.04213	7.1854E-5	0.0371326	0.05855	7.437E-5	0.0345895	0.05886
PD	Gm16_28845819	16	28845819	1.15E-5	0.00891	0.07452	3.9138E-4	0.130022	0.04623	5.1791E-6	0.0040147	0.07808
PD	Gm16_28901653	16	28901653	3.3411E-5	0.0222	0.06862				2.2053E-5	0.0146526	0.07102
PD	Gm16_28961127	16	28961127	1.0941E-5	0.01018	0.07506	3.2898E-4	0.1176989	0.04751	2.8314E-6	0.0026338	0.08284
PD	Gm16_29261393	16	29261393	5.2899E-7	0.00062	0.09857	3.1658E-6	0.003681	0.08124	4.4963E-8	5.23E-05	0.1145
PD	Gm16_29528259	16	29528259	1.9062E-8	3E-05	0.12534	3.5142E-7	0.0008172	0.09785	5.9557E-9	9.233E-06	0.13049
PD	<b>Gm16_29681065</b>	<b>16</b>	<b>29681065</b>	<b>1.7576E-10</b>	<b>8.2E-07</b>	<b>0.1645</b>	<b>1.5159E-6</b>	<b>0.0023502</b>	<b>0.08677</b>	<b>4.7063E-10</b>	<b>2.189E-06</b>	<b>0.15097</b>
PD	Gm16_29720274	16	29720274	1.0179E-8	2.4E-05	0.13049	2.7384E-7	0.0012736	0.09976	1.0486E-9	2.439E-06	0.14446
PD	Gm16_30369809	16	30369809				2.6024E-5	0.0172911	0.06569	9.2947E-5	0.0360247	0.05687
PD	Gm16_30597214	16	30597214				3.5007E-5	0.0203522	0.06352	6.0786E-5	0.0314129	0.05993