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Supplementary Table 1: Allelic variations at *Glu-A1*, *Glu-B1*, *Glu-D1*, *Glu-A3*, *Glu-B3* and distribution of 1B·1R translocation in 718 wheat cultivars and advanced lines

Code	Origin	Genotype	Cultivar (Line)	HMW-GS			LMW-GS	
				<i>Ax2</i> *	<i>Glu-B1</i>	<i>Dx5</i>	<i>Glu-A3</i>	<i>Glu-B3</i>
1	Argentina	S	26.443	-	-	-	c	i
2	Argentina	S	205	-	By16	-	+	e
3	Argentina	S	3327	-	By8	-	-	i
4	Argentina	S	Aca303	+	By8	-	+	h
5	Argentina	S	Aca601	+	By8	-	+	b
6	Argentina	S	Aca801	+	By9	-	+	g
7	Argentina	S	Amalia	+	-	-	-	i
8	Argentina	S	Americano	+	-	-	-	f
9	Argentina	S	Barrukan M.A.	-	By9	-	+	i
10	Argentina	S	Barrukan M.A.	+	-	-	-	d
11	Argentina	S	Benvenuto Inca	-	By9	-	+	i
12	Argentina	S	Buck Mejorpan	+	By8	-	+	b
13	Argentina	S	Favorito	+	-	-	+	/
14	Argentina	S	IF 1052	-	-	-	-	i
15	Argentina	S	Klein Capricornio	+	By8	Bx7 ^{OE}	+	h

16	Argentina	S	Klein Chaja	+	-	-	+	c	h
17	Argentina	S	Klein Colon	-	By9	-	+	e	i
18	Argentina	S	Klein Flecha	+	By8	Bx7 ^{OE}	+	c	h
19	Argentina	S	Klein Jabal 1	+	-	-	+	d	g
20	Argentina	S	Klein Lucero	+	-	-	+	e	i
21	Argentina	S	Klein Martillo	+	By9	-	+	e	j
22	Argentina	S	Klein Proteo	-	By9	-	+	g	g
23	Argentina	S	LA Prevision 25	+	By9	-	-	c	h
24	Argentina	S	Lein C	+	By8	-	-	e	a
25	Argentina	S	Lin Calel M.A.	-	-	-	+	e	g
26	Argentina	S	Nidera Baguette 20	-	By8	-	+	f	g
27	Argentina	S	Pelon 1	+	-	-	-	g	i
28	Argentina	S	ProINTA Amanecer	-	-	-	+	f	j
29	Argentina	S	ProINTA Colibr 1	-	By8	Bx7 ^{OE}	+	d	b
30	Argentina	S	ProINTA Redomon	-	By8	Bx7 ^{OE}	+	c	h
31	Argentina	S	Thomas Nevada	+	By9	-	+	c	j
32	Argentina	S	Universal II	+	-	-	-	e	i
33	Argentina	S	Willian Som	+	-	-	-	/	i
34	Australia	S	Amery	-	-	-	-	b	h
35	Australia	S	Annuello	-	By8	-	+	d	b
36	Australia	S	Arrino	+	-	-	-	c	b
37	Australia	S	Avocet	-	By8	-	+	c	b
38	Australia	S	Banks	-	-	-	-	d	h
39	Australia	S	Baxter	-	By16	-	-	b	h
40	Australia	S	Binnu	+	-	-	-	c	b

41	Australia	S	Bowerbird	-	By9	-	+	b	h
42	Australia	S	Bullet	+	By9	Bx7 ^{OE}	-	d	h
43	Australia	S	Cadoux	+	-	-	+	b	b
44	Australia	S	Calingiri	-	By16	-	-	d	f
45	Australia	S	Camm	-	-	-	-	b	b
46	Australia	S	Carinya	-	By8	-	+	b	b
47	Australia	S	Carnamah	+	By9	-	-	c	i
48	Australia	S	Cascades	-	-	-	-	c	b
49	Australia	S	Chara	+	-	-	-	c	b
50	Australia	S	Cook	-	By8	-	-	b	b
51	Australia	S	Crusades	-	-	-	+	b	h
52	Australia	S	Cunderdin	+	-	-	-	c	i
53	Australia	S	Cunningham	-	-	-	-	c	b
54	Australia	S	Dakota	+	By8	-	-	b	b
55	Australia	S	Diamondbird	-	-	-	+	b	h
56	Australia	S	Drysdale	-	-	-	+	b	b
57	Australia	S	Ega Bonnie Rock	+	-	-	+	c	b
58	Australia	S	Ega Gregory	-	By8	-	-	c	b
59	Australia	S	Ega Hume	-	By8	-	-	c	b
60	Australia	S	Ega Wedgetorn	-	-	-	+	c	h
61	Australia	S	Ega Wylie	-	By16	-	-	b	h
62	Australia	S	Ellison	-	-	-	+	d	h
63	Australia	S	Excalibur	-	-	-	+	c	b
64	Australia	S	Gabo	+	-	-	-	b	b
65	Australia	S	Giles	-	By9	-	-	b	b

66	Australia	S	Janz	-	By8	-	-	b	b
67	Australia	S	Kellalac	+	-	-	+	c	b
68	Australia	S	Kennedy	-	By9	-	+	b	h
69	Australia	S	Krichauff	-	-	-	-	e	h
70	Australia	S	Kukri	-	-	Bx7 ^{OE}	+	d	h
71	Australia	S	Lang	-	By8	-	+	c	b
72	Australia	S	Leichhardt	+	-	-	-	c	h
73	Australia	S	Lincolia	+	-	Bx7 ^{OE}	-	d	b
74	Australia	S	Lorikeet	+	By8	-	+	b	b
75	Australia	S	Meering	+	-	-	-	c	b
76	Australia	S	Millewa	-	-	-	-	c	g
77	Australia	S	Pelsart	-	By8	-	-	b	b
78	Australia	S	Perenjori	+	-	-	+	d	f
79	Australia	S	Petrie	-	By8	-	-	b	b
80	Australia	S	Frame	-	By8	-	-	c	h
81	Australia	S	Rosella	+	By8	-	+	c	b
82	Australia	S	Rubric	+	-	-	-	d	i
83	Australia	S	Ruby	+	-	-	+	c	h
84	Australia	S	Sapphire	-	By8	-	+	b	b
85	Australia	S	Silverstar	-	By8	-	-	c	i
86	Australia	S	Spear	-	By9	-	+	e	h
87	Australia	S	Sunbri	-	By8	-	-	b	b
88	Australia	S	Sunbrook	-	-	-	+	b	h
89	Australia	S	Suneca	-	-	-	+	d	h
90	Australia	S	Suneco	-	By8	-	-	b	h

91	Australia	S	Sunfield	+	By8	-	-	c	b
92	Australia	S	Sunland	-	By8	-	-	c	b
93	Australia	S	Sunlin	+	-	-	-	d	b
94	Australia	S	Sunmist	-	-	-	-	b	b
95	Australia	S	Sunsoft 98	+	By8	-	-	b	b
96	Australia	S	Sunstate	-	-	-	+	e	b
97	Australia	S	Sunvale	-	By8	-	-	b	b
98	Australia	S	Tailorbird	+	-	-	+	b	h
99	Australia	S	Tammarin Rock	+	By8	-	-	f	b
100	Australia	S	Tasman	+	By8	-	+	b	i
101	Australia	S	Ventura	-	-	-	+	b	h
102	Australia	S	Westonia	+	-	-	-	c	h
103	Australia	S	Whistler	+	By8	-	-	c	b
104	Australia	S	Wilgoyne	+	-	-	+	d	h
105	Australia	S	Wyalkatchen	-	-	-	-	c	h
106	Australia	S	Wylah	+	By8	-	-	c	b
107	Austria	W	Balaton	-	By9	-	-	c	g
108	Austria	W	Bitop	-	By9	-	+	c	e
109	Austria	W	Cornelius	-	By9	-	+	c	e
110	Austria	W	Philipp	-	By9	-	+	c	g
111	Austria	W	Stetanus	-	By9	-	+	c	g
112	Bulgaria	W	2477-2/Slaveya	-	By8	-	+	c	b
113	Bulgaria	W	BG6045-04	+	By9	-	+	c	j
114	Bulgaria	W	Eryt. 10071/Prysma	-	By16	-	+	e	d
115	Bulgaria	W	GP 2558-128/2* Pliska	+	By9	-	+	c	b

116	Bulgaria	W	GP 2558-128/Pliska	+	By9	-	+	c	h
117	Bulgaria	W	Katia	-	-	-	-	c	e
118	Bulgaria	W	Mv 16-85 / Sturdy // Prysma	-	By9	-	+	c	g
119	Bulgaria	W	Obrii / Lut. 2834 h 145-4	-	By9	-	+	c	j
120	Bulgaria	W	Obrii / Mironovskaya 61	+	By8	-	+	c	b
121	Bulgaria	W	PP346/Novazvezda	-	By8	-	+	a	b
122	Bulgaria	W	PP476/Hrabretc	+	By9	-	-	c	g
123	Bulgaria	W	PP688/Vihar	+	By9	-	-	c	g
124	Bulgaria	W	PP808/Pavlinka	+	By8	-	+	a	j
125	Bulgaria	W	Prysma / F 2076 W2-11	-	By9	-	+	c	h
126	Bulgaria	W	Una / Flamura 85	+	By8	-	+	b	b
127	Canada	S	AC Domain	+	By9	-	+	f	/
128	Canada	S	Ac.Vista	-	By8	Bx7 ^{OE}	-	e	i
129	Canada	S	Amazon	+	-	-	+	g	g
130	Canada	S	Barui	+	-	-	+	e	h
131	Canada	S	BlueSky	+	By8	Bx7 ^{OE}	+	g	g
132	Canada	S	Glenlea	+	By8	Bx7 ^{OE}	+	g	g
133	Canada	S	Jiachun 3	+	By9	-	+	c	g
134	Canada	S	Jiusanyin 411	+	By8	-	-	f	/
135	Canada	S	Jiusanyin 05H-2	+	By9	-	+	f	h
136	Canada	S	Jiusanyin 413	+	By8	-	-	c	h
137	Canada	S	K38	+	By9	-	+	c	g
138	Canada	S	Katpewa	+	By9	-	+	e	h
139	Canada	S	Lieba 83	+	By9	-	+	c	b
140	Canada	S	Lieba 95	+	-	-	+	c	f

141	Canada	S	Lieba 97	+	-	-	+	e	h
142	Canada	S	Lieba 98	+	By9	-	+	f	h
143	Canada	S	Lieba 99	+	By9	-	+	f	i
144	Canada	S	Luobulin	+	-	Bx7 ^{OE}	+	f	h
145	Canada	S	Marquis	-	By9	-	+	e	b
146	Canada	S	Neepawa	+	By9	-	+	e	h
147	Canada	S	PS-125	+	By9	-	+	f	h
148	Canada	S	PS-133	-	By9	-	+	c	j
149	Canada	S	Splendor	-	By8	Bx7 ^{OE}	+	e	g
150	Canada	S	Wildcat	+	By8	Bx7 ^{OE}	+	c	f
151	Chile	S	06 Chile Introduction 1, unknown name	-	By8	-	-	c	g
152	Chile	S	06 Chile Introduction 3, unknown name	-	By9	-	+	c	h
153	Chile	S	06 Chile Introduction 4, unknown name	+	By8	-	-	d	i
154	Chile	S	06 Chile Introduction 5, unknown name	-	-	-	+	c	b
155	Chile	S	06 Chile Introduction 6, unknown name	-	By16	-	+	c	h
156	Chile	S	06 Chile Introduction 7, unknown name	-	-	-	-	c	h
157	Chile	S	06 Chile Introduction 8, unknown name	+	-	-	+	c	h
158	Chile	S	06 Chile Introduction 10, unknown name	-	-	-	+	f	j
159	Chile	S	06 Chile Introduction 11, unknown name	-	By16	-	-	g	f
160	Chile	S	06 Chile Introduction 12, unknown name	-	By9	-	+	f	h
161	Chile	S	06 Chile Introduction 14, unknown name	-	-	-	-	b	j
162	Chile	S	06 Chile Introduction 15, unknown name	+	By16	-	-	d	i
163	Chile	S	06 Chile Introduction 16, unknown name	+	By16	-	-	g	h
164	Chile	S	06 Chile Introduction 17, unknown name	-	-	-	+	c	j
165	Chile	S	06 Chile Introduction 18, unknown name	-	-	-	+	d	i

166	Chile	S	06 Chile Introduction 19, unknown name	-	-	-	+	c	h
167	Chile	S	06 Chile Introduction 20, unknown name	+	By8	-	+	d	b
168	Chile	S	06 Chile Introduction 22, unknown name	-	-	-	+	c	j
169	Chile	S	06 Chile Introduction 23, unknown name	+	By8	-	+	d	h
170	Chile	S	06 Chile Introduction 24, unknown name	-	By8	-	+	e	j
171	Chile	S	06 Chile Introduction 26, unknown name	+	By9	-	+	d	h
172	Chile	S	06 Chile Introduction 27, unknown name	-	By9	-	+	c	h
173	Chile	S	06 Chile Introduction 28, unknown name	-	-	-	+	f	j
174	Chile	S	07 Chile Introduction S-1, unknown name	-	By9	-	-	c	g
175	Chile	S	07 Chile Introduction S-2, unknown name	+	-	-	-	c	h
176	Chile	S	07 Chile Introduction S-3, unknown name	+	By16	-	-	d	i
177	Chile	S	07 Chile Introduction S-6, unknown name	-	-	-	-	c	h
178	Chile	S	07 Chile Introduction S-8, unknown name	-	-	-	-	f	h
179	Chile	S	07 Chile Introduction S-11, unknown name	-	-	-	+	f	j
180	Chile	S	07 Chile Introduction S-12, unknown name	-	By16	-	+	d	b
181	Chile	S	07 Chile Introduction S-13, unknown name	-	By9	-	+	c	b
182	Chile	S	07 Chile Introduction S-14, unknown name	-	By8	-	+	c	b
183	Chile	S	07 Chile Introduction S-15, unknown name	-	By16	-	+	c	h
184	Chile	S	07 Chile Introduction S-16, unknown name	-	By8	-	+	f	j
185	Chile	S	07 Chile Introduction S-17, unknown name	-	By8	-	+	c	h
186	Chile	S	07 Chile Introduction S-18, unknown name	-	By8	-	+	c	j
187	Chile	S	07 Chile Introduction S-19, unknown name	-	By16	-	+	f	i
188	Chile	S	07 Chile Introduction S-20, unknown name	-	-	-	-	b	j
189	Chile	S	07 Chile Introduction S-22, unknown name	-	-	-	+	c	h
190	Chile	S	07 Chile Introduction S-25, unknown name	-	By8	-	+	d	g

191	Chile	S	07 Chile Introduction S-28, unknown name	-	-	-	+	c	j
192	China	W	Aikang 58	-	By8	-	-	d	j
193	China	W	Bainong 64	-	By9	-	-	a	d
194	China	W	Beijing 0045	-	-	-	-	d	h
195	China	W	Hengguan 33	+	By9	-	-	e	g
196	China	W	Jimai 19	-	By8	-	-	c	f
197	China	W	Jimai 20	-	By16	-	-	d	b
198	China	W	Jimai 22	-	By8	-	-	c	f
199	China	W	Jingdong 17	+	By9	-	-	c	j
200	China	W	Jingdong 8	-	By9	-	-	c	j
201	China	W	Jishi 02-1	-	By9	-	+	g	g
202	China	S	Kefeng 12	-	By9	-	+	c	g
203	China	S	Kehan 16	-	By9	-	-	c	g
204	China	S	Kenjiu 10	+	By9	-	-	c	g
205	China	W	Liangxing 66	-	By8	-	-	c	f
206	China	W	Liangxing 99	-	By8	-	-	c	g
207	China	S	Longchun 23	-	By9	-	+	c	j
208	China	S	Longchun 26	-	By9	-	+	c	j
209	China	S	Longchun 27	-	By9	-	-	c	j
210	China	S	Longfumai 12	+	By9	-	+	f	h
211	China	S	Longmai 26	+	By9	-	+	f	g
212	China	S	Longmai 33	+	By9	-	+	c	g
213	China	W	Lunxuan 987	-	-	-	-	c	j
214	China	S	Ningchun 4	-	-	-	-	e	f
215	China	S	Ningmai 13	-	By8	-	-	c	g

216	China	S	Ningmai 14	-	-	-	-	c	g
217	China	W	Nongda 211	+	-	-	-	c	h
218	China	W	Shannong 2149	-	-	-	+	c	h
219	China	W	Shi 15	-	By9	-	-	a	j
220	China	W	Shi 4185	-	By9	-	-	a	j
221	China	W	Shijiazhuang 8	-	By9	-	-	a	j
222	China	W	Shixin 733	-	By8	-	-	e	d
223	China	W	Shixin 828	-	By8	-	-	e	d
224	China	W	Wennong 14	-	By8	-	-	c	f
225	China	W	Xin 18	-	By9	-	+	c	d
226	China	S	Xinchun 2	+	By8	-	-	c	h
227	China	S	Xinchun 23	+	-	-	-	b	h
228	China	S	Xinchun 6	+	By9	-	-	e	f
229	China	S	Xinchun 9	-	By8	-	+	c	j
230	China	W	Yan 4110	-	-	-	-	c	d
231	China	S	Yangmai 11	-	-	-	-	c	g
232	China	S	Yangmai 13	-	By8	-	-	c	g
233	China	S	Yangmai 15	-	By8	-	-	d	g
234	China	S	Yangmai 16	-	By9	-	-	c	f
235	China	W	Yannong 19	-	-	-	+	a	h
236	China	W	Zhengmai 366	-	-	-	+	a	d
237	China	W	Zhong 16	-	By9	-	-	c	j
238	China	W	Zhongmai 175	-	-	-	-	c	h
239	China	W	Zhou 18	-	By9	-	-	c	j
240	China	W	Zhou 98165	-	By9	-	+	d	j

241	France	W	Aligre	-	By9	-	+	f	g
242	France	W	Antti	-	By9	-	+	f	d
243	France	W	Aztec	-	-	-	+	d	g
244	France	W	Azulon	-	-	-	-	c	g
245	France	W	Brando	-	-	-	+	f	d
246	France	W	Bruta	-	-	-	+	d	g
247	France	W	Cardos	-	-	-	-	f	/
248	France	W	Carimulti	-	By9	-	-	c	g
249	France	W	Ceganne	-	By9	-	-	c	i
250	France	W	Emma	-	By9	-	-	/	g
251	France	W	Erytr2549-93	+	-	-	+	c	f
252	France	W	Fr03701	+	By9	-	-	d	g
253	France	W	Fr03707	-	-	-	+	d	g
254	France	W	Fr03711	-	-	-	+	f	g
255	France	W	Fr03713	-	By8	-	+	f	g
256	France	W	Fr03724	-	-	-	+	d	g
257	France	W	Fr03725	-	By9	-	-	f	g
258	France	W	Fr03732	-	-	-	-	c	/
259	France	W	Fr03736	-	By9	-	+	d	g
260	France	W	Fr03737	-	By8	-	+	d	g
261	France	W	Fr03738	-	By16	-	+	d	g
262	France	W	Fr03740	-	By8	-	-	c	g
263	France	W	Fr03745	-	-	-	+	d	f
264	France	W	Fr03746	-	By9	-	+	d	g
265	France	W	Fr03748	-	-	-	+	d	g

266	France	W	Fr03749	-	-	-	+	f	g
267	France	W	French Bread Wheat	-	-	-	-	d	g
268	France	W	Fro3717	-	By8	-	+	f	g
269	France	W	Hybride de Bersee	-	By9	-	-	c	d
270	France	W	Lasen	+	By9	-	+	c	j
271	France	W	Market	-	-	-	-	c	g
272	France	W	Mesofold	+	By9	-	+	c	j
273	France	W	NSA06-3758	-	By9	-	+	d	g
274	France	W	NSA07-3601	-	-	-	-	f	f
275	France	W	NSA07-3674	+	By8	-	+	c	g
276	France	W	NSA08-3043	+	By9	-	+	c	j
277	France	W	NSA08-3045	+	By9	-	+	c	j
278	France	W	NSA08-3073	-	By8	-	-	c	i
279	France	W	NSA08-3299	+	By8	-	+	c	h
280	France	W	NSA08-3369	-	By8	-	+	c	g
281	France	W	NSA08-3423	-	By9	-	+	d	g
282	France	W	NSA08-3660	-	By8	-	-	c	g
283	France	W	NSA08-3662	-	By9	-	-	c	g
284	France	W	NSA08-3663	-	By8	-	-	c	g
285	France	W	NSA08-3707	+	-	-	+	d	g
286	France	W	NSA08-3708	+	By9	-	+	c	g
287	France	W	NSA08-3710	-	By9	-	+	d	g
288	France	W	NSA08-3759	+	-	-	+	d	j
289	France	W	NSA08-3768	+	By9	-	-	d	g
290	France	W	NSA09-3611	-	By8	-	+	c	h

291	France	W	NSA09-3613	+	By8	-	-	c	h
292	France	W	NSA09-3618	-	By8	-	+	c	g
293	France	W	NSA09-3621	-	By8	-	+	c	g
294	France	W	NSA09-3622	-	By8	-	+	c	g
295	France	W	NSA09-3623	-	By8	-	+	c	g
296	France	W	NSA09-3633	-	-	-	+	c	g
297	France	W	NSA09-3634	-	By9	-	+	c	g
298	France	W	NSA09-3635	-	-	-	+	c	g
299	France	W	NSA09-3638	-	By8	-	-	c	j
300	France	W	NSA09-3639	-	By8	-	-	c	g
301	France	W	NSA09-3640	-	-	-	+	c	g
302	France	W	NSA09-3641	-	-	-	-	c	g
303	France	W	NSA09-3644	+	-	-	+	c	g
304	France	W	NSA09-3645	+	-	-	+	c	g
305	France	W	NSA09-3650	+	By9	-	+	g	j
306	France	W	NSA09-3651	-	-	-	+	c	/
307	France	W	NSA09-3652	+	By8	-	+	c	j
308	France	W	NSA09-3653	+	By8	-	+	g	/
309	France	W	NSA09-3654	+	By8	-	+	c	j
310	France	W	NSA09-3656	+	By9	-	+	c	j
311	France	W	NSA09-3657	+	By9	-	-	c	/
312	France	W	NSA09-3658	+	By9	-	+	g	j
313	France	W	NSA09-3659	+	By9	-	+	g	j
314	France	W	NSA09-3660	+	-	-	+	c	j
315	France	W	NSA09-3661	+	By9	-	+	g	j

316	France	W	NSA09-3662	+	-	-	+	g	j
317	France	W	NSA09-3663	+	By9	-	+	g	j
318	France	W	NSA98-0420	-	-	-	+	c	g
319	France	W	NSA98-0753	-	By9	-	+	c	g
320	France	W	NSA98-1433	-	By16	-	+	d	g
321	France	W	NSA98-2143	-	-	-	+	d	g
322	France	W	NSA99-0303	-	By8	-	+	f	f
323	France	W	NSA99-0431	-	By9	-	+	f	g
324	France	W	NSA99-0779	-	By9	-	+	c	g
325	France	W	NSA99-1107	+	-	-	+	d	g
326	France	W	NSA99-2212	-	-	-	+	c	i
327	France	W	Orpic	-	By9	-	-	c	g
328	France	W	Panter	-	-	-	-	c	g
329	France	W	Pegaso	-	By9	-	+	c	i
330	France	W	Recital	+	-	-	+	d	g
331	France	W	Ribeiro Inerme	-	-	-	-	e	i
332	France	W	Roztocka	-	-	-	+	c	/
333	France	W	Soissons	+	By8	-	+	c	b
334	France	W	Virtuose	-	By8	-	+	d	b
335	Germany	W	Actros	-	By9	-	-	d	d
336	Germany	W	Adler	-	By9	-	+	c	g
337	Germany	W	Akratos	-	By9	-	+	c	g
338	Germany	W	Alitis	-	By9	-	+	d	g
339	Germany	W	Altos	-	By8	-	+	a	g
340	Germany	W	Astron	-	By9	-	+	d	g

341	Germany	W	Atlantis	-	-	-	-	c	j
342	Germany	W	Boomer	-	-	-	+	c	g
343	Germany	W	Brilliant	-	By9	-	+	c	j
344	Germany	W	Buteo	-	-	-	+	c	g
345	Germany	W	Campari	-	-	-	+	f	j
346	Germany	W	Capnor	-	By9	-	+	f	g
347	Germany	W	Carenius	-	-	-	-	f	j
348	Germany	W	Certo	-	-	-	+	c	j
349	Germany	W	Chevalier	-	-	-	+	f	g
350	Germany	W	Complet	-	-	-	+	c	g
351	Germany	W	Compliment	-	By9	-	+	f	g
352	Germany	W	Contra	-	-	-	-	f	f
353	Germany	W	Crtus	-	By9	-	+	c	g
354	Germany	W	Discus	-	-	-	+	c	b
355	Germany	W	Elegant	-	-	-	+	c	g
356	Germany	W	Ellvis	-	By9	-	-	c	g
357	Germany	W	Enorm	-	By16	-	+	c	f
358	Germany	W	Ephoros	-	By9	-	+	c	g
359	Germany	W	Flair	-	-	-	+	e	g
360	Germany	W	Gecko	-	By8	-	+	c	g
361	Germany	W	Greif	-	By16	-	+	c	g
362	Germany	W	Hattrick	-	By16	-	-	c	g
363	Germany	W	Hybnos 1	-	-	-	-	c	g
364	Germany	W	Impression	-	-	-	+	d	g
365	Germany	W	Inspiration	-	By9	-	+	c	g

366	Germany	W	JB Asano	-	By9	-	+	c	f
367	Germany	W	Jenga	-	-	-	+	c	g
368	Germany	W	Julius	-	By9	-	-	c	g
369	Germany	W	Korund	-	By9	-	+	c	g
370	Germany	W	Kranich	-	By9	-	+	f	g
371	Germany	W	Lahertis	-	-	-	+	c	g
372	Germany	W	Limes	-	By16	-	+	c	g
373	Germany	W	Ludwig	-	-	-	+	d	g
374	Germany	W	Madrid	+	-	-	-	c	g
375	Germany	W	Magister	-	-	-	+	d	g
376	Germany	W	Magnus	-	By9	-	+	f	g
377	Germany	W	Maltop	-	By9	-	-	d	f
378	Germany	W	Manager	-	-	-	-	f	g
379	Germany	W	Manhattan	-	-	-	-	a	g
380	Germany	W	Maverick	-	-	-	+	f	g
381	Germany	W	Meteor	-	-	-	+	f	j
382	Germany	W	Mulan	-	-	-	-	f	d
383	Germany	W	Mythos	-	-	-	-	f	g
384	Germany	W	Noah	-	By9	-	+	c	g
385	Germany	W	Olivin	-	By9	-	+	c	g
386	Germany	W	Pamier	-	By9	-	+	f	j
387	Germany	W	Paroli	-	-	-	+	c	g
388	Germany	W	Pegassos	-	By9	-	+	c	g
389	Germany	W	Petrus	-	By9	-	-	d	j
390	Germany	W	Potenzial	-	-	-	+	f	g

391	Germany	W	Privileg	-	By9	-	+	c	g
392	Germany	W	Profilus	-	-	-	+	f	j
393	Germany	W	Ritmo	-	-	-	-	f	g
394	Germany	W	Romanus	-	-	-	+	c	g
395	Germany	W	Schamane	-	By9	-	+	d	d
396	Germany	W	Skalmeje	-	By8	-	-	c	g
397	Germany	W	Skater	-	-	-	-	c	g
398	Germany	W	Sokrates	-	-	-	+	d	g
399	Germany	W	Sophytra	-	By16	-	+	c	g
400	Germany	W	Striker	-	-	-	+	d	g
401	Germany	W	SW MAXi	-	By8	-	+	d	g
402	Germany	W	SW Tataros	-	By9	-	+	f	d
403	Germany	W	SW Topper	-	-	-	+	d	d
404	Germany	W	Tarso	-	-	-	+	c	j
405	Germany	W	Tiger	-	-	-	+	d	f
406	Germany	W	Tommi	-	-	-	-	d	g
407	Germany	W	Toras	-	By9	-	+	c	j
408	Germany	W	Toronto	-	By9	-	+	f	j
409	Germany	W	Zentos	-	By9	-	-	f	g
410	Hungary	W	MV Laura	-	By8	-	+	c	b
411	Hungary	W	MV Lucia	+	By9	-	+	d	/
412	Hungary	W	MV Zelma	-	By8	-	+	c	b
413	Hungary	W	MV05-08	-	By8	-	+	f	b
414	Hungary	W	MV12-08	+	By9	-	+	b	b
415	Hungary	W	MV132-07	+	By9	-	+	c	j

416	Hungary	W	MV134-07	+	By8	-	+	c	b
417	Hungary	W	MV233-05	+	By9	-	+	g	j
418	Hungary	W	MV27-07	-	By9	-	-	f	j
419	Hungary	W	MV-Beres	+	By9	-	+	g	j
420	Iran	W	1-72-92/Gascogne//Zarrin	-	-	-	-	b	f
421	Iran	W	Alamoot//Ww33/Vee"s"	+	By16	-	-	c	b
422	Iran	W	Alamoot/Gaspard	-	By9	-	-	e	b
423	Iran	W	Alvd//Aldan/Ias*2/3/Gaspard	+	By8	Bx7 ^{OE}	-	c	b
424	Iran	W	Alvd//Aldan/Ias58/3/Col.No.3625/4/Alamoot	+	By8	Bx7 ^{OE}	-	c	b
425	Iran	W	Alvd//Aldan/Ias58/3/Col.No.3625/4/Alamoot	+	By8	Bx7 ^{OE}	-	c	b
426	Iran	W	Alvd//Aldan/Ias58/3/Col.No.3625/4/Alamoot	+	By8	Bx7 ^{OE}	-	c	b
427	Iran	W	Alvd//Aldan/Ias58/3/ColNo.3617	-	By9	-	-	c	b
428	Iran	W	Basswood/MV17	-	By8	-	+	c	b
429	Iran	W	Bloudan/3/Bb/7C*2//Y50E/3*Kal/4/MV 17	+	By8	-	-	b	i
430	Iran	W	Bloyka	-	By8	-	-	b	i
431	Iran	W	Gascogne//Rsh*2/10120/3/Alvd//Aldan/Ias58	-	By8	Bx7 ^{OE}	-	c	b
432	Iran	W	Gascogne/4/Kal/Bb//Cj/3/Hork"s"	-	By8	-	-	f	h
433	Iran	W	Gascogne/Col No.3617//Zarrin	+	By16	-	-	c	g
434	Iran	W	Kvz/Cut 75/3/YMH//....,ICWH 850032.../4/Alamoot	-	By9	-	-	e	b
435	Iran	W	Milan cm75118/Ka Cm75118//Tajan	+	By9	-	+	c	i
436	Iran	W	Mv17//Attila/Bcn	-	-	-	-	e	b
437	Iran	W	Mv17/Zrn	-	By9	-	-	d	j
438	Iran	W	Owl 85256*-30H-*O-*EOH/4/Spn/Mcd//Cama/3/Nzr	+	By8	Bx7 ^{OE}	-	c	b
439	Iran	W	Owl/4/Gv/D630//Ald"s"/3/Azd	+	By8	-	+	a	h
440	Iran	W	Owl/Col No.3193//Mv17	-	By9	-	-	c	h

441	Iran	W	Owl/Col No.3625//Soissons	+	By9	-	-	c	b
442	Iran	W	Owl/Col No.3625//Soissons	-	By9	-	-	b	h
443	Iran	W	Owl/Col No.3625//Soissons	-	By9	-	-	a	h
444	Iran	W	Rsh2*/10120//Zagros	-	-	-	+	f	i
445	Iran	W	Soissons/M-73-4//Owl 852524-*3H-*O-*HOH	+	By8	-	+	d	h
446	Iran	W	Spb"s"//K134(60)/Vee"s"/6/1-66-31/5/Anza/3/Pi/Nar//Hys/4/Snb" s"	-	By8	-	+	c	h
447	Iran	W	TX62A4793/CB809/5/Gds/4/Anza/3/Pi/Nar//Hys/6/Passarinho/7/ Alamoot	-	By9	-	-	e	h
448	Iran	W	Ymh/Tob//Mcd/3/Lira/4/Gascogne/5/Alamoot	+	-	-	+	b	b
449	Iran	W	Ymh/Tob//Mcd/3/Lira/4/Gascogne/5/Zarrin	+	By8	-	+	c	b
450	Japan	S	Aoba-Komugi	-	By8	Bx7 ^{OE}	-	e	b
451	Japan	S	Eshimashinriki	-	By8	-	-	c	d
452	Japan	S	Haruyutaka	-	-	-	-	c	h
453	Japan	S	Kanto 107	-	By9	-	-	c	g
454	Japan	S	Kitanokaori	-	By9	-	+	f	j
455	Japan	S	Nanbu-komugi	-	By8	Bx7 ^{OE}	-	d	b
456	Japan	S	Norin 61	-	By8	-	-	d	i
457	Japan	S	Norin 67	-	By9	-	-	c	g
458	Japan	S	Shinchunaga	-	By8	Bx7 ^{OE}	-	c	i
459	Japan	S	Shirane-Komugi	-	By8	-	-	e	i
460	Mexico	S	Attila	+	-	-	+	c	h
461	Mexico	S	Opata 85	+	By16	-	-	b	d
462	Mexico	S	Pastor	-	-	-	+	c	g
463	Mexico	S	Pavon 76	+	-	-	+	b	h

464	Mexico	S	Seri 82	-	By9	-	+	c	j
465	Mexico	W	SKAUZ/2*STAR	+	By8	-	+	a	b
466	Mexico	W	W462//VEE/KOEL/3/PEG//MRL/BUC	+	By9	-	+	c	j
467	Norway	W	Arina	-	By8	-	-	c	g
468	Norway	W	Avle	+	By9	-	+	c	g
469	Norway	W	Bastian	+	By9	-	+	c	i
470	Norway	W	Bjarne	+	-	-	+	c	b
471	Norway	W	Bjorke	+	By9	-	+	c	g
472	Norway	W	Folke	+	-	-	-	c	g
473	Norway	W	Magnifik	+	-	-	-	c	g
474	Norway	W	Mjolner	+	-	-	+	f	g
475	Norway	W	Naxos	-	By9	-	+	f	g
476	Norway	W	Nk03029	-	By9	-	+	c	g
477	Norway	W	Nk93602	+	-	-	+	c	i
478	Norway	W	Olivin	-	By9	-	+	c	g
479	Norway	W	Paros	-	By16	-	+	f	g
480	Norway	W	Paros/Nk93602	+	-	-	+	c	i
481	Norway	W	Paros/T9040	-	By9	-	+	f	g
482	Norway	W	Prins	+	By9	-	-	d	g
483	Norway	W	RE714	-	-	-	-	d	g
484	Norway	W	Starke II	+	-	-	-	c	g
485	Norway	W	T9040	-	By9	-	+	f	g
486	Norway	W	T9040/Paros	-	-	-	+	f	g
487	Norway	W	Tjalve	+	By9	-	+	c	g

488	Norway	W	Zebra	+	By9	-	+	c	b
489	Romania	W	96062G5-101	+	By9	-	+	f	b
490	Romania	W	98039G5-103	+	By8	-	-	e	j
491	Romania	W	Avint	+	By8	-	+	e	c
492	Romania	W	BELCEANCA3/DNESTREANCA//FUNDULEA4/ALBATROS	+	By9	-	+	f	b
493	Romania	W	DBDI	+	By8	-	+	c	b
494	Romania	W	DUMBRAVITA/ALBATROS	+	By9	-	+	c	j
495	Romania	W	DUMBRAVITA/ALBATROS	+	By9	-	+	c	h
496	Romania	W	DUMBRAVITA/SPELTA2	+	By9	-	+	c	h
497	Romania	W	F1502W252/IV-16//ALBATROS/OD.-267	+	By8	-	+	c	j
498	Romania	W	F498U1-1021/BOEMA	+	By8	-	+	f	b
499	Romania	W	F498U1-1021/BOEMA	+	By8	-	+	c	b
500	Romania	W	F92080G1-1/F93042G2-1	+	By8	-	+	c	b
501	Romania	W	F94578G3-1/BUCUR//DELABRAD	+	By8	-	+	c	b
502	Romania	W	F98047G14-2INC	+	By8	-	+	c	b
503	Romania	W	Fundulea4	-	-	-	+	e	g
504	Romania	W	Glosa	+	By8	-	+	c	b
505	Romania	W	Gruia	+	By8	-	+	c	b
506	Romania	W	Liman	+	By8	-	+	e	b
507	Romania	W	Litera	+	By8	-	+	c	b
508	Romania	W	Livada	+	By8	-	+	c	b
509	Romania	W	Loial	+	By9	-	+	f	b
510	Romania	W	LOVRIN41/PORADA	+	By8	-	+	e	c
511	Romania	W	OBRII/DNESTREANCA25//ILICIOVCA/OD.CRASNOCOLOS	-	By9	-	+	c	b
512	Romania	W	SPELTA/OD.-267//PORADA	+	By9	-	+	c	h

513	Russia	W	Batjko	+	By8	-	+	b	b
514	Russia	W	Bezostaya 1	+	By9	-	+	c	b
515	Russia	W	Bulava	+	By9	-	+	c	b
516	Russia	W	Deya	-	By9	-	+	c	j
517	Russia	W	Donski-93	-	By9	-	+	c	b
518	Russia	W	Esaul	-	By8	-	+	f	b
519	Russia	W	Iren	+	-	-	-	c	i
520	Russia	W	Kniish 122	+	By9	-	+	c	j
521	Russia	W	Kniish 46	+	By9	-	+	c	b
522	Russia	W	Krasnodarskaya 99	+	By8	-	+	b	b
523	Russia	W	Kavkaz	+	By9	-	-	c	h
524	Russia	W	Lira	+	By9	-	+	c	b
525	Russia	W	Mironovskaya 808	-	By9	-	+	f	/
526	Russia	W	Palpich	-	By8	-	+	c	h
527	Russia	W	Russa	+	By9	-	+	c	h
528	Russia	W	Selyanka	+	By9	-	+	c	j
529	Russia	W	Starshina	+	By9	-	+	c	b
530	Russia	W	Wumang 1	+	By9	-	+	c	j
531	Serbia	W	Arija	-	By8	-	+	c	g
532	Serbia	W	Dragana	-	By9	-	-	c	b
533	Serbia	W	Etida	-	By9	-	+	c	g
534	Serbia	W	NS 27/03	-	By9	-	+	c	g
535	Serbia	W	NS 83/07	+	By9	-	+	c	g
536	Serbia	W	NS 84/07	-	By9	-	+	e	h
537	Serbia	W	Novo Zvesda	-	By8	-	+	e	b

538	Serbia	W	Pannonia	+	By8	-	+	c	b
539	Serbia	W	Simonida	-	By9	-	-	c	g
540	Serbia	W	Vojvodina	+	By9	-	+	c	g
541	Serbia	W	Zvezdana	-	By9	-	-	c	g
542	Turkey	W	130L1.11/TAM200//JI5418/3/HK229	-	By8	-	+	f	i
543	Turkey	W	58.182/DRC//SPN/3/KATIA/4/BJNC47/5/87-333 a 111-4-21	+	By9	-	-	d	b
544	Turkey	W	6720.11//MDA38/WRM/3/69.148/YMH//HYS/4/ASP/BLT/5/91- 288 a 134	+	By9	-	+	a	b
545	Turkey	W	91-142 a 61/3/F35.70/MO73//1D13.1/MLT/6/PI/MZ//CNO67/3/LFN/4/AN T/5/ATTILA	+	By9	-	+	a	e
546	Turkey	W	AGRI/BJY//VEE/3/BUL6687.12/4/F6038W12.1	-	By8	-	+	c	b
547	Turkey	W	AGRI/BJY//VEE/3/BUL6687.12/4/F6038W12.1	+	By8	-	+	c	b
548	Turkey	W	AGRI/BJY//VEE/3/BUL6687.12/4/F6038W12.1	-	By8	-	+	c	b
549	Turkey	W	AGRI/NAC//MLT/5/KAUZ*3/4/FG/ATO//HUI/3/ROK/6/F6038 W12.1	+	By9	-	+	c	b
550	Turkey	W	Alpu	+	By8	-	+	d	j
551	Turkey	W	Altay	-	-	-	+	c	g
552	Turkey	W	ARG/R16//BEZ*2/3/AGRI/KSK/5/TRK13/6/HK89	-	-	-	-	c	b
553	Turkey	W	ARG/R16//BEZ*2/3/AGRI/KSK/5/TRK13/6/HK89	-	By9	-	+	c	g
554	Turkey	W	BATAVIA//CA8055/GRK/3/130L1.11/GUN91//KINACI97	-	By9	-	-	d	b
555	Turkey	W	Bayraktar	+	By8	-	+	e	b

556	Turkey	W	BEZ/SDV1/5/338-K1-1//TJB368.251/BUC/4/YMH/TOB//MCD/3/LIRA/6/VEE/TSI//GRK/3/NS55.03/5/C126.15/COFN/3/N10B/P14//P101/4/KRC67	-	By9	-	-	a	b
557	Turkey	W	Bul5052-1//Pyn/Vorona	-	By8	-	-	c	j
558	Turkey	W	Centinel	+	By9	-	-	c	h
559	Turkey	W	CH94878/BLOYKA/3/TX81V6614//SERI*3/BUC	-	By9	-	+	c	i
560	Turkey	W	CH94947/HK92	+	-	-	-	e	b
561	Turkey	W	CUPRA-1/3/CROC1/AE.SQUARROSA (224)//2*OPATA/4/PANTHEON	-	By9	-	+	f	h
562	Turkey	W	CUPRA-1/3/CROC1/AE.SQUARROSA (224)//2*OPATA/4/PANTHEON	-	By9	-	-	f	e
563	Turkey	W	CUPRA-1/3/CROC1/AE.SQUARROSA (224)//2*OPATA/4/PANTHEON	-	By8	-	+	f	h
564	Turkey	W	CUPRA-1/3/CROC1/AE.SQUARROSA (224)//2*OPATA/4/PANTHEON	+	By9	-	+	f	h
565	Turkey	W	CUPRA-1/3/CROC1/AE.SQUARROSA (224)//2*OPATA/4/PANTHEON	-	-	-	+	f	h
566	Turkey	W	DAGDAS	+	-	-	+	c	g
567	Turkey	W	Ekiz	-	By9	-	-	c	b
568	Turkey	W	ERYT26221/BLUEGIL-6	+	By8	-	-	c	g
569	Turkey	W	F474S10.1/SUBEN-1//TAM200/JI5418	-	By9	-	+	d	h
570	Turkey	W	Gerek 79	+	By8	-	-	c	e
571	Turkey	W	GkKalsz/7/Cbr/5133//Mt/3/Kkç/4/Lfn//ND/2*P101/5/No57/Pex/6/Krmn/Lov29	-	By9	-	-	c	g

572	Turkey	W	GkKalsz/7/Cbr/5133//Mt/3/Kkç/4/Lfn//ND/2*P101/5/No57/Pex/6 /Krmn/Lov29	-	By8	-	-	c	g
573	Turkey	W	GkKlzs/7/Cbr/5133//Mt/3/Kkç/4/Lfn//Nd/2*P101/5/No57/Pex/6/ Krmn/Lov29	-	By9	-	-	c	g
574	Turkey	W	GRK/KAUZ//PYN/BAU/3/KIRGIZ95	+	By8	-	+	c	j
575	Turkey	W	HK1/6/NVSR3/5/BEZ/TVR/5/CFN/BEZ//SU92/CI13645/3NAI6 0	+	By8	-	+	c	b
576	Turkey	W	HK1/6/NVSR3/5/BEZ/TVR/5/CFN/BEZ//SU92/CI13645/3NAI6 0	+	By8	-	+	c	b
577	Turkey	W	HK1/6/NVSR3/5/BEZ/TVR/5/CFN/BEZ//SU92/CI13645/3NAI6 0	+	By8	-	+	c	b
578	Turkey	W	HK1/6/NVSR3/5/BEZ/TVR/5/CFN/BEZ//SU92/CI13645/3NAI6 0	-	By8	-	+	c	b
579	Turkey	W	HK130/5/OR F1.158/FDL//BLO/3/CA8055/4/KS82W409/SPN	+	By8	-	-	d	e
580	Turkey	W	HK144/5/OR F1.158/FDL//BLO/3/CA8055/4/KS82W409/SPN	+	By9	-	+	c	i
581	Turkey	W	HK204//TAM200/JI5418	+	By9	-	-	c	j
582	Turkey	W	HK209/PEHLIVAN	+	By9	-	-	c	f
583	Turkey	W	HK51/90-1004 a 31	-	-	-	+	e	i
584	Turkey	W	JAGGER 'SIB'/90-1004 a 31	+	By8	-	+	c	e
585	Turkey	W	Karahan	+	By8	-	+	f	b

586	Turkey	W	KASYON/GENARO81//TSI/VEE/3/W2440/W9488A//2163	+	By8	-	+	c	b
587	Turkey	W	Kinaci 97	-	By8	-	+	f	b
588	Turkey	W	Konya	+	By8	-	-	f	b
589	Turkey	W	LD*6/KVZ//LD*6/AGE/3/LD*6/KVZ//LD*6/WTP/4/IAS63/AL DAN/5/YACO/6/PASTOR	-	By8	-	+	c	b
590	Turkey	W	LOV26//LFN/SDY(ES84-24)/3/SERI/4/FDL494/5/LCR/SERI/3/ MEX-DW/BACA/VONA	+	By9	-	+	e	H
591	Turkey	W	MV.OPTIMA/4/1D13.1/MLT//WEAVER	+	By9	-	+	c	J
592	Turkey	W	ORATORIO/KATIA1	-	-	-	-	c	J
593	Turkey	W	PEHLIVAN/5/JUP/4/CLLF/3/II14.53/ODIN//CI13431/WA00477	-	By16	-	+	c	F
594	Turkey	W	PEHLIVAN/5/JUP/4/CLLF/3/II14.53/ODIN//CI13431/WA00477	-	-	-	-	c	E
595	Turkey	W	PEHLIVAN/5/JUP/4/CLLF/3/II14.53/ODIN//CI13431/WA00477	-	By16	-	-	c	G
596	Turkey	W	PEHLIVAN/5/JUP/4/CLLF/3/II14.53/ODIN//CI13431/WA00477	+	By9	-	+	c	H
597	Turkey	W	PEHLIVAN/JAGGER	+	By9	-	-	c	E
598	Turkey	W	PEHLIVAN/JAGGER	+	By9	-	-	c	E

599	Turkey	W	POLOVCHANKA/5/C126-15/COFN/3/N10B/P14//P101/4/KRC6 6(ES93-12)/6/90ZHONG65	+	By8	-	+	c	B
600	Turkey	W	POLOVCHANKA/5/C126-15/COFN/3/N10B/P14//P101/4/KRC6 6(ES93-12)/6/HK208	+	By8	-	+	c	B
601	Turkey	W	Presl/6/Trak/Knr79/4/Dnv1/3/Bez/Era/Loh1/Dirk/5/Mrtl	-	By8	-	-	c	J
602	Turkey	W	PYN/BAU//F474S10.1/3/ADMIS	-	By9	-	+	c	B
603	Turkey	W	PYN/BAU//F474S10.1/5/KS82W409/SPN/4/YMH/TOB//MCD/3 /LIRA	-	By8	-	+	f	B
604	Turkey	W	PYN/BAU//LAGOS-19/3/ID800994.W/VEE	-	By9	-	+	c	H
605	Turkey	W	RAN/NE701136//CI13449/CTK/3/CUPE/4/SXL/VEE/5/1D13.1/ MLT//TRK13/3/PK470/LIRA	-	By9	-	+	c	H
606	Turkey	W	SARDARI-HD35/5/DMN//SUT/AG(ES86-7)/3/KAUZ/4/TX71A 374-4/TX71A1039-V1/6/HK208	+	-	-	+	f	D
607	Turkey	W	Sonmez	-	-	-	-	e	E

608	Turkey	W	SPN//BOW/NKT/3/TAM200/KAUZ	+	By16	-	-	c	H
609	Turkey	W	SPN//BOW/NKT/3/TAM200/KAUZ	+	By16	-	-	c	H
610	Turkey	W	SPN/3/CROC1/AE.SQUARROSA (224)//2*OPATA/6/QT254/RAY66//MXP65/3/GRK/4/YMH/TO B//MCD/3/LIRA/5/F4141W1.13	+	By8	-	+	c	H
611	Turkey	W	Sultan	+	-	-	+	b	B
612	Turkey	W	SWON98-147//494J6.1111/MNCH	+	-	-	-	c	G
613	Turkey	W	SXL/VEE//LAGOS-9/3/DOGU88//TX71A374.4/TX71A	+	By8	-	+	f	B
614	Turkey	W	TAM200/3/SPN/NAC//ATTILA	+	By9	-	+	c	E
615	Turkey	W	TAM200/3/SPN/NAC//ATTILA	+	By9	-	+	c	G
616	Turkey	W	TAST/SPRW//LT176.73/7/SOTY/SUT//LER/4/2*RFN/3/FR//KA D/GR/5/TMP64.../8/BOOUOHOUTH6	-	By9	-	-	c	B
617	Turkey	W	TEKIR-9/5/TX69A509.2//BBY/FOX/3/GRK//NO64/PEX/4/CER/ 6/F6038W12.1	+	By9	-	+	c	B

618	Turkey	W	TRAP#1/YACO/3/KAUZ*2/TRAP//KAUZ/4/KINACI97	-	By8	-	+	f	B
619	Turkey	W	TUI//KASYON/GENARO81/3/KINACI97	+	By8	-	+	c	B
620	Turkey	W	VEE#8//JUP/BJY/3/F3.71/TRM/4/BCN/5/KAUZ/6/163HAMIDI YE//VEE/KOEL/6/TAM200/KAUZ	+	By8	-	-	d	J
621	Turkey	W	VORONA/KAUZ//L 293-91 K 14/3/SPN/NAC//ATTILA	+	By9	-	+	d	J
622	Turkey	W	VORONA/TR810200/5/KS82W409/SPN/4/YMH/TOB//MCD/3/ LIRA	-	By8	-	-	f	B
623	Turkey	W	Yildiz	-	By9	-	+	c	B
624	Turkey	W	YUNA/3/SPN/NAC//ATTILA	+	By9	-	+	a	B
625	Turkey	W	Zargana-6	+	-	-	+	b	D
626	Turkey	W	ZHETYSU/5/RSK/NAC/4/SNB/PCH//KAL/BB/3/CA8055	-	By9	-	+	b	B
627	Ukraine	W	Hboykpanhka 83	-	By9	-	+	e	/
628	Ukraine	W	Hboykpanhka 84	-	By9	-	+	e	/
629	Ukraine	W	Kiria	+	By9	-	+	c	B
630	Ukraine	W	KRUZHINKA/MV IRMA	+	By9	-	+	e	J
631	Ukraine	W	Lanketa	-	By9	-	+	c	A
632	Ukraine	W	Libellulla	-	-	-	-	c	I

633	Ukraine	W	M10	+	By9	-	+	d	G
634	Ukraine	W	Mironovskaya 808	-	By9	-	+	f	B
635	Ukraine	W	SIRENA/BUL854.87.2	+	By8	-	+	d	B
636	Ukraine	W	Streletz	-	By8	-	+	c	G
637	Ukraine	W	Wuliyangnuofu	-	By8	-	+	c	A
638	Ukraine	W	Znakhidka	-	By8	-	+	c	B
639	Ukraine	W	ZOLOTAVA/DAR ZERNOGRADA	-	By9	-	+	c	H
640	USA	W	#575(LYFENKO)/JAGGER/4/KARL*2//PI355520/	+	By9	-	+	c	J
641	USA	W	CO960691/CO970655	-	By9	-	+	e	H
642	USA	W	Goetze	+	-	-	-	d	F
643	USA	W	HYS/YY/63-112-66-4/3/OR87065,H-281/4/FRENCH LINE E81FR	+	-	-	-	d	F
644	USA	W	ID#870303/5/OR7946/HILL//HILL/6/OR7946/HILL//HILL	+	-	-	-	e	H
645	USA	W	IVORY/N96L1226/3/TJB368.251/BUC//WEAVER	+	By9	-	+	c	H
646	USA	W	IVORY/N96L1226/3/TJB368.251/BUC//WEAVER	+	By9	-	+	c	H
647	USA	W	IVORY/N96L1226/3/TJB368.251/BUC//WEAVER	+	By9	-	-	c	H
648	USA	W	Jagger	-	By9	-	+	c	I
649	USA	W	Jagger/W94-244-132	-	By9	-	+	c	J
650	USA	W	Jerry	-	-	-	+	c	J
651	USA	W	Kar1 92	-	-	-	+	c	/

652	USA	W	KS04HW47-3-4	+	By8	-	+	c	G
653	USA	W	KS84273BB-10/KSSB110-9//KS831374-141B/YE1110/3/KS82 W418/SPN	-	-	-	+	c	G
654	USA	W	KS89180B-2-1-1/CMSW89Y267//X921025-A-3-2	-	By9	-	+	c	J
655	USA	W	KS91H184/ARLIN SIB//KS91HW29/3/NE91631 (=NE82761/REDLAND)/4/VBFO168	-	By9	-	+	c	G
656	USA	W	KS920709B-5-2/2137//KS920709B5-2	+	By8	-	+	e	G
657	USA	W	KS920709B-5-2/Stanof//KS920709B5-2	+	By9	-	-	a	B
658	USA	W	KS92H363-2/COUGAR SIB(=NE85707/TBIRD) X NE94632(=ABILENE/NORKAN//RAWHIDE)	-	-	-	+	c	G
659	USA	W	KS96WGRC39/Jagger	-	-	-	+	c	B
660	USA	W	KS96WGRC39/Jagger	+	By9	-	+	c	B
661	USA	W	KSSB-192-3/NE89529/4/MRS/CI14482//YMH/HYS/3/RONDEZ VOUS	+	By8	-	+	c	E

662	USA	W	MADSEN/MALCOLM/3/REMAN//MADSEN/MALCOLM	+	-	-	-	c	H
663	USA	W	MADSEN/MALCOLM/3/ROSSINI/1/YSATIS/2/ORACLE//WE ATHERFORD	+	-	-	-	f	G
664	USA	W	MADSEN/MALCOLM/6/HILL/3/CER/YMH/HYS/4/CER/YMH /HYS/5/ROSSINI/1/YSATIS/2/ORACLE	+	By9	-	-	f	G
665	USA	W	MASON/JAGGER	-	By9	-	+	c	B
666	USA	W	MO8/NE94406 (=NE86582//84MC29/NE82583)//KS91H184/3*RIO BLANCO	+	By9	-	+	c	B
667	USA	W	Mukhrani	+	By9	-	-	c	G
668	USA	W	N566/OK94P597	-	By9	-	+	f	G
669	USA	W	NE04424	+	-	-	+	c	J
670	USA	W	NE96644(=ODESSKAYA P./CODY)/PAVON/*3SCOUT66 X NE94653(=ARAPAHOE/ABILENE//ARAPAHOE)	+	By8	-	+	c	J
671	USA	W	NI05714	+	By9	-	+	f	J

672	USA	W	NUWEST/4/D887-74/PEW/3/LNCR//CARSTEN/GIGANT/5/M RS/CI14482//YMH/HYS/3/RONDEZVOUS	+	By8	-	-	d	H
673	USA	W	NUWEST/4/D887-74/PEW/3/LNCR//CARSTEN/GIGANT/5/M RS/CI14482//YMH/HYS/3/RONDEZVOUS	+	By8	-	-	d	H
674	USA	W	NUWEST/4/D887-74/PEW/3/LNCR//CARSTEN/GIGANT/5/M RS/CI14482//YMH/HYS/3/RONDEZVOUS	+	By8	-	-	d	H
675	USA	W	NUWEST/4/D887-74/PEW/3/LNCR//CARSTEN/GIGANT/5/M RS/CI14482//YMH/HYS/3/RONDEZVOUS	+	By8	-	-	a	H
676	USA	W	OR2040726	+	By16	-	-	d	H
677	USA	W	OR2050293	+	By16	-	-	f	H
678	USA	W	OR2050301	+	By16	-	-	f	I
679	USA	W	OR2050853	+	-	-	+	f	G
680	USA	W	OR2050910	+	By16	-	-	d	H
681	USA	W	OR2060181	+	By16	-	-	c	H
682	USA	W	OR2060324	+	By16	-	-	c	H
683	USA	W	OR2060395	+	-	-	-	c	H
684	USA	W	OR2060431	+	-	-	-	f	H

685	USA	W	OR2060916	-	By16	-	+	c	H
686	USA	W	OR2060926	+	By16	-	-	f	I
687	USA	W	OR2070093H	+	-	-	-	d	H
688	USA	W	OR2070136H	+	By16	-	-	c	H
689	USA	W	OR2070138H	+	By16	-	-	c	H
690	USA	W	OR2070139H	+	By16	-	+	c	H
691	USA	W	OR2070142H	+	By16	-	+	c	H
692	USA	W	OR2070182H	-	-	-	-	c	H
693	USA	W	ORSS-1757	+	By16	-	-	c	H
694	USA	W	SD05004	-	By9	-	-	c	J
695	USA	W	SD05W030	+	By9	-	+	c	J
696	USA	W	SD05W140	+	By9	-	+	c	J
697	USA	W	SD93528/Culver	+	By9	-	+	f	F
698	USA	W	SD96240-3-1	+	-	-	+	c	B
699	USA	W	SD98W175-1	+	By9	-	-	c	G
700	USA	W	Skiles	+	By9	-	-	f	H
701	USA	W	SPN/MADSEN/3/WA 7163 SISTER/SA 463 - GBR//STEPHENS	+	-	-	-	d	H
702	USA	W	SPN/MADSEN/3/WA 7163 SISTER/SA 463 - GBR//STEPHENS	+	-	-	-	d	H
703	USA	W	T67/X84W063-9-45//K92/3/SNF/4/X86509-1-1/X84W063-9-39-2//K93	+	By8	-	-	c	H

704	USA	W	TJB368.251/BUC//WEAVER/3/SIERRA/WI88-052	+	By9	-	+	b	H
705	USA	W	TJB368.251/BUC//WEAVER/3/SIERRA/WI88-052	+	By9	-	+	b	H
706	USA	W	Tubbs	+	By16	-	-	c	H
707	USA	W	Tubbs//OR9800924 (Rossini/Ysatis//Oracle)/OR9900549	+	-	-	-	c	G
708	USA	W	Tubbs-06	+	By16	-	-	f	H
709	USA	W	TX01V5136RC	+	By9	-	+	e	I
710	USA	W	TX03A0148	-	By8	-	+	f	B
711	USA	W	TX03M1096	+	By9	-	+	c	I
712	USA	W	TX04M410068	-	By9	-	+	b	H
713	USA	W	TX90V6313//TX94V3724(TAM-200 BC41254-1-8-1-1/TX86V1405	-	By8	-	+	c	I
714	USA	W	TX93D2385//2137/VERDE	-	By9	-	-	a	B
715	USA	W	VARDZIA/BEZOSTAIA	+	-	-	-	c	G
716	USA	W	WGRC10/3/KS93U69 sib/TA2455//KS93U69/4/JAGGER	-	By8	-	+	c	J
717	USA	W	X96V107/OGALLALA	-	By9	-	+	a	B
718	USA	W	Yumar/Arlin	-	By8	-	+	c	I

Glu-B3j = 1B•1R translocation; + and - indicate the presence and absence of the corresponding subunits, respectively.

/ indicates no PCR product amplified

Note: The code is consistent in the Supplementary Table 1 and Supplementary Table 2.

Supplementary Table 2: Composition of HMW-GS and LMW-GS in 240 cultivars (lines) detected by SDS-PAGE and molecular markers

Code	Origin	Genotype	Cultivar(Line)	Subunits tested by SDS-PAGE					Alleles detected by molecular markers					
				Glu-A	Glu-B	Glu-D	Glu-A	Glu-B	Glu-A	Glu-B1		Glu-D	Glu-A	Glu-B
				1	1	1	3	3	1	Glu-B1		1	3	3
107	Austria	W	BALATON	0	7+9	2+12	c	g	-	By9	-	-	c	g
108	Austria	W	BITOP	1	7+9	5+10	c	e	-	By9	-	+	c	e
109	Austria	W	CORNELIUS	1	7+9	5+10	c	e	-	By9	-	+	c	e
110	Austria	W	PHILIPP	0	7+9	5+10	c	g	-	By9	-	+	c	g
111	Austria	W	STETANUS	1	7+9	5+10	c	g	-	By9	-	+	c	g
112	Bulgaria	W	2477-2/Slaveya	1	7+8	5+10	c	b	-	By8	-	+	c	b
113	Bulgaria	W	BG6045-04	2*	7+9	5+10	c	j	+	By9	-	+	c	j
114	Bulgaria	W	Eryt. 10071/Pryspa	1	7	5+10	e	d	-	By1			e	d

115	Bulgaria	W	GP 2558-128/2* Pliska	2*	7+9	5+10	c	b	+	By9	-	+	c	b
116	Bulgaria	W	GP 2558-128/Pliska	2*	7+9	5+10	c	b	+	By9	-	+	c	h
117	Bulgaria	W	KATIA	1	7*	2+12	c	e	-	-	-	-	c	e
118	Bulgaria	W	Mv 16-85 / Sturdy // Pryspa	0	7+9	5+10	c	g	-	By9	-	+	c	g
119	Bulgaria	W	Obrii / Lut. 2834 h 145-4	1	7+9	5+10	c	j	-	By9	-	+	c	j
120	Bulgaria	W	Obrii / Mironovskaya 61	0	7+8	5+10	c	b	+	By8	-	+	c	b
121	Bulgaria	W	PP346/NOVAZVEZDA	1	7+8	5+10	a	b	-	By8	-	+	a	b
122	Bulgaria	W	PP476/HRABRETC	2*	7+9	2+12	c	g	+	By9	-	-	c	g
123	Bulgaria	W	PP688/VIHAR	2*	7+9	2+12	c	g	+	By9	-	-	c	g
124	Bulgaria	W	PP808/PAVLINKA	2*	7+8	5+10	a	j	+	By8	-	+	a	j
125	Bulgaria	W	Pryspa / F 2076 W2-11	0	7+9	5+10	c	h	-	By9	-	+	c	h
126	Bulgaria	W	Una / Flamura 85	2*	7+8	5+10	b	b	+	By8	-	+	b	b
410	Hungary	W	MV LAURA	1	7+8	5+10	c	b	-	By8	-	+	c	b

412	Hungary	W	MV ZELMA	0	7*+8	5+10	c	b	-	By8	-	+	c	b
413	Hungary	W	MV05-08	1	7+8	5+10	e	b	-	By8	-	+	f	b
414	Hungary	W	MV12-08	2*	7+9	5+10	b	b	+	By9	-	+	b	b
415	Hungary	W	MV132-07	2*	7+9	5+10	c	j	+	By9	-	+	c	j
416	Hungary	W	MV134-07	2*	7+8	5+10	c	b	+	By8	-	+	c	b
417	Hungary	W	MV233-05	2*	7+9	5+10	e	j	+	By9	-	+	g	j
418	Hungary	W	MV27-07	0	7+9	2+12	e	j	-	By9	-	-	f	j
419	Hungary	W	MV-BERES	2*	7+9	5+10	e	j	+	By9	-	+	g	j
420	Iran	W	1-72-92/Gascogne//Zarrin	0	17+18	2+12	b	g	-	-	-	-	b	f
421	Iran	W	Alamoot//Ww33/Vee"s"	2*	13+16	2+12	c	b	+	By1			c	b
422	Iran	W	Alamoot/Gaspard	0	7+9	2+12	e	b	-	By9	-	-	e	b
423	Iran	W	Alvd//Aldan/la's*2/3/Gaspard	2*	7+8	2+12	c	b	+	By8	Bx7 ^O	-	c	b

												E			
424	Iran	W	Alvd//Aldan/ias58/3/Col.No.3625/ 4/Alamoot	2*	7+8	2+12	c	b	+	By8	Bx7 ^O E	-	c	b	
425	Iran	W	Alvd//Aldan/ias58/3/Col.No.3625/ 4/Alamoot	2*	7+8	2+12	c	b	+	By8	Bx7 ^O E	-	c	b	
426	Iran	W	Alvd//Aldan/ias58/3/Col.No.3625/ 4/Alamoot	2*	7+8	2+12	c	b	+	By8	Bx7 ^O E	-	c	b	
427	Iran	W	Alvd//Aldan/ias58/3/ColNo.3617	0	7+9	2+12	c	b	-	By9	-	-	c	b	
428	Iran	W	Basswood/MV17	0	7+8	2+12	c	b	-	By8	-	+	c	b	
429	Iran	W	Bloudan/3/Bb/7C*2//Y50E/3*Kal/ 4/MV 17	2*	7*+8	2+12	b	i	+	By8	-	-	b	i	
431	Iran	W	Gascogne//Rsh*2/10120/3/Alvd// Aldan/ias58	0	7+8	2+12	c	b	-	By8	Bx7 ^O E	-	c	b	

432	Iran	W	Gascogne/4/Kal/Bb//Cj/3/Hork"s"	0	6+8	2+12	e	h	-	By8	-	-	-	f	h
433	Iran	W	Gascogne/Col No.3617//Zarrin	2*	7*	2+12	c	g	+	By1				c	g
			Kvz/Cut 75/3/YMH//...,ICWH												
434	Iran	W	850032.../4/Alamoot	0	7+9	2+12	e	b	-	By9	-	-	-	e	b
			Milan cm75118/Ka												
435	Iran	W	Cm75118/Tajan	2*	7+9	5+10	c	d	+	By9	-	+	+	c	i
436	Iran	W	Mv17//Attila/Bcn	1	17+18	2+12	e	b	-	-	-	-	-	e	b
437	Iran	W	Mv17/Zrn	1	7+9	2+12	d	j	-	By9	-	-	-	d	j
			OWL												
			85256*-30H-*O-*EOH/4/Spn/Mcd												
438	Iran	W	//Cama/3/Nzr	2*	7*+8	3+12	c	b	+	By8	Bx7 ^O _E	-	c	b	
439	Iran	W	Owl/4/Gv/D630//Ald"s"/3/Azd	2*	7+8	5+10	a	h	+	By8	-	+	+	a	h

440	Iran	W	Owl/Col No.3193//Mv17	0	7+9	2+12	c	b	-	By9	-	-	-	c	h
441	Iran	W	Owl/Col No.3625//Soissons	2*	7+9	2+12	c	b	+	By9	-	-	-	c	b
442	Iran	W	Owl/Col No.3625//Soissons	0	7+9	2+12	b	h	-	By9	-	-	-	b	h
443	Iran	W	Owl/Col No.3625//Soissons	0	7+9	2+12	a	h	-	By9	-	-	-	a	h
444	Iran	W	Rsh2*/10120//Zagros	0	17+18	5+10	e	d	-	-	-	-	-	f	i
445	Iran	W	Soissons/M-73-4//Owl 852524-*3H-*O-*HOH	2*	7+8	5+10	d	h	+	By8	-	-	-	d	h
446	Iran	W	Spb"s"//K134(60)/Vee"s"/6/1-66- 31/5/Anza/3/Pi/Nar//Hys/4/Snb"s"	1	7+8	5+10	c	h	-	By8	-	-	-	c	h
447	Iran	W	TX62A4793/CB809/5/Gds/4/Anz a/3/Pi/Nar//Hys/6/Passarinho/7/Al amoot	0	7+9	2+12	e	h	-	By9	-	-	-	e	h
448	Iran	W	Ymh/Tob//Mcd/3/Lira/4/Gascogn	2*	17+18	5+10	b	b	+	-	-	-	-	b	b

			e/5/Alamoot											
449	Iran	W	Ymh/Tob//Mcd/3/Lira/4/Gascogn e/5/Zarrin	2*	7+8	2+12	c	b	+	By8	-	+	c	b
464	Mexico	S	Seri	1	7+9	5+10	c	j	-	By9	-	+	c	j
465	Mexico	W	SKAUZ/2*STAR	2*	7*+8	5+10	a	b	+	By8	-	+	a	b
466	Mexico	W	W462//VEE/KOEL/3/PEG//MRL/ BUC	2*	7+9	5+10	c	j	+	By9	-	+	c	j
489	Roumani a	W	96062G5-101	2*	7+9	5+10	e	b	+	By9	-	+	f	b
490	Roumani a	W	98039G5-103	2*	7*+8	2+12	e	b	+	By8	-	-	e	j
491	Roumani a	W	AVINT	2*	7*+8	5+10	e	c	+	By8	-	+	e	c

	Roumani		BELCEANCA3/DNESTREANCA/											
492	a	W	/FUNDULEA4/ALBATROS	2*	7+9	5+10	e	b	+	By9	-	+	f	b
493	Roumani		DBDI	2*	7*+8	5+10	c	b	+	By8	-	+	c	b
494	Roumani		DUMBRAVITA/ALBATROS	2*	7+9	5+10	c	h	+	By9	-	+	c	j
495	Roumani		DUMBRAVITA/ALBATROS	2*	7+9	5+10	c	h	+	By9	-	+	c	h
496	Roumani		DUMBRAVITA/SPELTA2	2*	7+9	5+10	c	h	+	By9	-	+	c	h
497	Roumani		F1502W252/IV-16//ALBATROS/ OD.-267	2*	7+8	5+10	c	j	+	By8	-	+	c	j
498	Roumani	W	F498U1-1021/BOEMA	2*	7*+8	5+10	e	b	+	By8	-	+	f	b

	a													
499	Roumani a	W	F498U1-1021/BOEMA	2*	7+8	5+10	c	b	+	By8	-	+	c	b
500	Roumani a	W	F92080G1-1/F93042G2-1	2*	7*+8	5+10	c	b	+	By8	-	+	c	b
501	Roumani a	W	F94578G3-1/BUCUR//DELABRA D	2*	7+8	5+10	c	b	+	By8	-	+	c	b
502	Roumani a	W	F98047G14-2INC	2*	7*+8	5+10	c	b	+	By8	-	+	c	b
504	Roumani a	W	GLOSA	2*	7*+8	5+10	c	b	+	By8	-	+	c	b
505	Roumani a	W	GRUIA	2*	7*+8	5+10	c	b	+	By8	-	+	c	b

	Roumani													
506	a	W	LIMAN	2*	7*+8	5+10	e	b	+	By8	-	+	e	b
507	Roumani			2*	7*+8	5+10	c	b	+	By8	-	+	c	b
508	a	W	LIVADA	2*	7*+8	5+10	c	b	+	By8	-	+	c	b
509	Roumani			2*	7+9	5+10	e	b	+	By9	-	+	f	b
510	a	W	LOIAL	2*	7*+8	5+10	e	b	+	By9	-	+	e	c
511	Roumani		LOVRIN41/PORADA	2*	7*+8	5+10	e	c	+	By8	-	+	e	c
512	a	W	OBRII/DNESTREANCA25//ILICI	1	7+9	5+10	c	b	-	By9	-	+	c	b
	Roumani		OVCA/OD.CRASNOCOLOS											
			SPELTA/OD.-267//PORADA	2*	7+9	5+10	c	h	+	By9	-	+	c	h

	a													
513	Russia	W	BATJKO	2*	7+8	5+10	b	b	+	By8	-	+	b	b
514	Russia	W	BEZOSTAYA	2*	7+9	5+10	c	b	+	By9	-	+	c	b
515	Russia	W	Bulava	2*	7+9	5+10	c	b	+	By9	-	+	c	b
516	Russia	W	DEYA	2*	7+9	5+10	c	j	-	By9	-	+	c	j
517	Russia	W	DONSKI-93	1	7+9	5+10	c	b	-	By9	-	+	c	b
518	Russia	W	ESAUL	1	7+8	5+10	e	b	-	By8	-	+	f	b
520	Russia	W	KNIISH 122	2*	7+9	5+10	c	j	+	By9	-	+	c	j
521	Russia	W	KNIISH 46	2*	7+9	5+10	c	h	+	By9	-	+	c	b
522	Russia	W	KRASNODARSKAYA 99	2*	7+8	5+10	b	b	+	By8	-	+	b	b
524	Russia	W	LIRA	2*	7+9	5+10	c	b	+	By9	-	+	c	b
526	Russia	W	PALPICH	2*	7+8	5+10	c	h	-	By8	-	+	c	h
527	Russia	W	RUSSA	2*	7+9	5+10	c	h	+	By9	-	+	c	h

528	Russia	W	SELYANKA	2*	7+9	5+10	c	j	+	By9	-	+	c	j
529	Russia	W	STARSHINA	2*	7+9	5+10	c	b	+	By9	-	+	c	b
531	Serbia	W	ARIJA	0	7+8	5+10	c	g	-	By8	-	+	c	g
532	Serbia	W	DRAGANA	0	7+9	2+12	c	b	-	By9	-	-	c	b
533	Serbia	W	ETIDA	0	7+9	5+10	c	g	-	By9	-	+	c	g
534	Serbia	W	NS 27/03	1	7+9	5+10	c	g	-	By9	-	+	c	g
535	Serbia	W	NS 83/07	2*	7+9	5+10	c	g	+	By9	-	+	c	g
536	Serbia	W	NS 84/07	0	7+9	5+10	c	h	-	By9	-	+	e	h
538	Serbia	W	PANNONIA	2*	7+8	5+10	c	b	+	By8	-	+	c	b
539	Serbia	W	SIMONIDA	0	7+9	2+12	c	g	-	By9	-	-	c	g
540	Serbia	W	VOJVODINA	2*	7+9	5+10	c	g	+	By9	-	+	c	g
541	Serbia	W	ZVEZDANA	0	7+9	2+12	c	g	-	By9	-	-	c	g
542	Turkey	W	130L1.11/TAM200//JI5418/3/HK2	0	7+8	5+10	e	i	-	By8	-	+	f	i

			29											
543	Turkey	W	58.182/DRC//SPN/3/KATIA/4/BJ NC47/5/87-333 a 111-4-21	2*	7+9	2+12	d	b	+	By9	-	-	d	b
544	Turkey	W	6720.11//MDA38/WRM/3/69.148/ YMH//HYS/4/ASP/BLT/5/91-288 a 134	2*	7+9	5+10	a	b	+	By9	-	+	a	b
545	Turkey	W	91-142 a 61/3/F35.70/MO73//1D13.1/MLT/ 6/PI/MZ//CNO67/3/LFN/4/ANT/5/ ATTILA	2*	7+9	5+10	a	e	+	By9	-	+	a	e
546	Turkey	W	AGRI/BJY//VEE/3/BUL6687.12/4 /F6038W12.1	2*	7+8	5+10	c	b	-	By8	-	+	c	b
547	Turkey	W	AGRI/BJY//VEE/3/BUL6687.12/4	1	7+8	5+10	c	b	+	By8	-	+	c	b

			/F6038W12.1											
549	Turkey	W	AGRI/NAC//MLT/5/KAUZ*3/4/FG /ATO//HUI/3/ROK/6/F6038W12.1	2*	7+9	5+10	c	b	+	By9	-	+	c	b
550	Turkey	W	ALPU	2*	7*+8	5+10	d	b	+	By8	-	+	d	j
551	Turkey	W	ALTAY	0	17+18	5+10	c	g	-	-	-	+	c	g
552	Turkey	W	ARG/R16//BEZ*2/3/AGRI/KSK/5/ TRK13/6/HK89	1	7*	2+12	c	b	-	-	-	-	c	b
553	Turkey	W	ARG/R16//BEZ*2/3/AGRI/KSK/5/ TRK13/6/HK89	1	7+9	5+10	c	g	-	By9	-	+	c	g
554	Turkey	W	BATAVIA//CA8055/GRK/3/130L1 .11/GUN91//KINACI97	1	7+9	2+12	d	b	-	By9	-	-	d	b
555	Turkey	W	BAYRAKTAR	2*	7*+8	5+10	e	b	+	By8	-	+	e	b
556	Turkey	W	BEZ/SDV1/5/338-K1-1//TJB368.	1	7+9	2+12	a	b	-	By9	-	-	a	b

			251/BUC/4/YMH/TOB//MCD/3/LI RA/6/VEE/TSI//GRK/3/NS55.03/ 5/C126.15/COFN/3/N10B/P14//P 101/4/KRC67											
557	Turkey	W	Bul5052-1//Pyn/Vorona	0	6+8	2+12	c	j	-	By8	-	-	c	j
559	Turkey	W	CH94878/BLOYKA/3/TX81V661 4//SERI*3/BUC	1	7+9	5+10	c	i	-	By9	-	+	c	i
560	Turkey	W	CH94947/HK92	2*	17+18	2+12	e	b	+	-	-	-	e	b
566	Turkey	W	DAGDAS	2*	7+18	5+10	c	g	+	-	-	+	c	g
567	Turkey	W	EKIZ	0	7+9	2	c	b	-	By9	-	-	c	b
568	Turkey	W	ERYT26221/BLUEGIL-6	2*	6+8	2+12	c	g	+	By8	-	-	c	g
569	Turkey	W	F474S10.1/SUBEN-1//TAM200/J	0	7+9	5+10	d	h	-	By9	-	+	d	h

			I5418											
570	Turkey	W	GEREK	2*	7+8	2+12	c	e	+	By8	-	-	c	e
			GkKalsz/7/Cbr/5133//Mt/3/Kkç/4/ Lfn//ND/2*P101/5/No57/Pex/6/Kr											
571	Turkey	W	mn/Lov29	1	7+9	2+12	c	g	-	By9	-	-	c	g
			GkKalsz/7/Cbr/5133//Mt/3/Kkç/4/ Lfn//ND/2*P101/5/No57/Pex/6/Kr											
572	Turkey	W	mn/Lov29	0	7*+8	2+12	c	g	-	By8	-	-	c	g
			GkKlzs/7/Cbr/5133//Mt/3/Kkç/4/Lf n//Nd/2*P101/5/No57/Pex/6/Krm											
573	Turkey	W	n/Lov29	1	7+9	2+12	c	g	-	By9	-	-	c	g
			GRK/KAUZ//PYN/BAU/3/KIRGIZ											
574	Turkey	W	95	2*	7*+8	5+10	c	j	+	By8	-	+	c	j

575	Turkey	W	HK1/6/NVSR3/5/BEZ/TVR/5/CF N/BEZ//SU92/CI13645/3NAI60	2*	7+8	5+10	c	b	+	By8	-	+	c	b
576	Turkey	W	HK1/6/NVSR3/5/BEZ/TVR/5/CF N/BEZ//SU92/CI13645/3NAI60	2*	7+8	5+10	c	b	+	By8	-	+	c	b
577	Turkey	W	HK1/6/NVSR3/5/BEZ/TVR/5/CF N/BEZ//SU92/CI13645/3NAI60	2*	7+8	5+10	c	b	+	By8	-	+	c	b
578	Turkey	W	HK1/6/NVSR3/5/BEZ/TVR/5/CF N/BEZ//SU92/CI13645/3NAI60	2*	7+8	5+10	c	b	-	By8	-	+	c	b
579	Turkey	W	HK130/5/OR F1.158/FDL//BLO/3/CA8055/4/K S82W409/SPN	2*	7+8	4+12	d	e	+	By8	-	-	d	e
580	Turkey	W	HK144/5/OR F1.158/FDL//BLO/3/CA8055/4/K	2*	7+9	5+10	c	i	+	By9	-	+	c	i

			S82W409/SPN											
581	Turkey	W	HK204//TAM200/JI5418	2*	7+9	2+12	c	j	+	By9	-	-	c	j
582	Turkey	W	HK209/PEHLIVAN	2*	7+9	2+12	c	f	+	By9	-	-	c	f
583	Turkey	W	HK51/90-1004 a 31	1	17+18	5+10	e	i	-	-	-	+	e	i
584	Turkey	W	JAGGER 'SIB'/90-1004 a 31	2*	7+8	5+10	c	e	+	By8	-	+	c	e
585	Turkey	W	KARAHAN	2*	7+8	5+10	e	b	+	By8	-	+	f	b
586	Turkey	W	KASYON/GENARO81//TSI/VEE/ 3/W2440/W9488A//2163	2*	7*+8	5+10	c	b	+	By8	-	+	c	b
588	Turkey	W	KONYA	2*	7*+8	2+12	e	b	+	By8	-	-	f	b
589	Turkey	W	LD*6/KVZ//LD*6/AGE/3/LD*6/KV Z//LD*6/WTP/4/IAS63/ALDAN/5/ YACO/6/PASTOR	2*	7*+8	5+10	c	b	-	By8	-	+	c	b
590	Turkey	W	LOV26//LFN/SDY(ES84-24)/3/S	1	7+9	5+10	e	b	+	By9	-	+	e	h

			ERI/4/FDL494/5/LCR/SERI/3/ME X-DW/BACA//VONA											
591	Turkey	W	MV.OPTIMA/4/1D13.1/MLT//WE AVER	2*	7+9	5+10	c	j	+	By9	-	+	c	j
592	Turkey	W	ORATORIO/KATIA1	1	7*	2+12	c	e	-	-	-	-	c	j
597	Turkey	W	PEHLIVAN/JAGGER	2*	7+9	2+12	c	e	+	By9	-	-	c	e
598	Turkey	W	PEHLIVAN/JAGGER	2*	7+9	2+12	c	e	+	By9	-	-	c	e
599	Turkey	W	POLOVCHANKA/5/C126-15/CO FN/3/N10B/P14//P101/4/KRC66(ES93-12)/6/90ZHONG65	2*	7+8	5+10	c	b	+	By8	-	+	c	b
600	Turkey	W	POLOVCHANKA/5/C126-15/CO FN/3/N10B/P14//P101/4/KRC66(ES93-12)/6/HK208	2*	7+8	5+10	c	b	+	By8	-	+	c	b

			Presl/6/Trak/Knr79/4/Dnv1/3/Bez											
601	Turkey	W	/Era//Loh1/Dirk/5/Mrtl	0	6+8	2+12	c	j	-	By8	-	-	c	j
602	Turkey	W	PYN/BAU//F474S10.1/3/ADMIS	1	7+9	5+10	c	b	-	By9	-	+	c	b
			PYN/BAU//F474S10.1/5/KS82W											
			409/SPN/4/YMH/TOB//MCD/3/LI											
603	Turkey	W	RA	0	7*+8	5+10	f	b	-	By8	-	+	f	b
			PYN/BAU//LAGOS-19/3/ID80099											
604	Turkey	W	4.W/VEE	1	7+9	5+10	c	h	-	By9	-	+	c	h
			RAN/NE701136//CI13449/CTK/3/											
			CUPE/4/SXL/VEE/5/1D13.1/MLT											
605	Turkey	W	//TRK13/3/PK470/LIRA	0	7+9	5+10	c	h	-	By9	-	+	c	h
			SARDARI-HD35/5/DMN//SUT/A											
606	Turkey	W	G(ES86-7)/3/KAUZ/4/TX71A374-	2*	7	5+10	f	d	+	-	-	+	f	d

			4/TX71A1039-V1/6/HK208											
607	Turkey	W	SONMEZ	1	7*	2+12	e	e	-	-	-	-	e	e
608	Turkey	W	SPN//BOW/NKT/3/TAM200/KAU Z	2*	13+16	2+12	c	h	+	By1	6	-	-	c
610	Turkey	W	SPN/3/CROC1/AE.SQUARROS A (224)//2*OPATA/6/QT254/RAY66 //MXP65/3/GRK/4/YMH/TOB//M CD/3/LIRA/5/F4141W1.13	2*	7*+8	5+10	c	h	+	By8	-	+	c	h
611	Turkey	W	SULTAN	2*	7*	5+10	b	b	+	-	-	+	b	b
612	Turkey	W	SWON98-147//494J6.1111/MNC H	2*	17+18	2+12	c	g	+	-	-	-	c	g
613	Turkey	W	SXL/VEE//LAGOS-9/3/DOGU88//	2*	7*+8	5+10	e	b	+	By8	-	+	f	b

			TX71A374.4/TX71A											
614	Turkey	W	TAM200/3/SPN/NAC//ATTILA	2*	7+9	5+10	c	e	+	By9	-	+	c	e
615	Turkey	W	TAM200/3/SPN/NAC//ATTILA	2*	7+9	5+10	c	e	+	By9	-	+	c	g
616	Turkey	W	TAST/SPRW//LT176.73/7/SOTY/ SUT//LER/4/2*RFN/3/FR//KAD/G R/5/TMP64.../8/BOOUUHOUTH6	0	7+9	2+12	c	b	-	By9	-	-	c	b
617	Turkey	W	TEKIR-9/5/TX69A509.2//BBY/FO X/3/GRK//NO64/PEX/4/CER/6/F 6038W12.1	2*	7+9	5+10	c	b	+	By9	-	+	c	b
618	Turkey	W	TRAP#1/YACO/3/KAUZ*2/TRAP/ /KAUZ/4/KINACI97	1	7*+8	5+10	e	b	-	By8	-	+	f	b
619	Turkey	W	TUI//KASYON/GENARO81/3/KIN ACI97	2*	7+8	5+10	c	b	+	By8	-	+	c	b

620	Turkey	W	VEE#8//JUP/BJY/3/F3.71/TRM/4 /BCN/5/KAUZ/6/163HAMIDIYE// VEE/KOEL/6/TAM200/KAUZ	2*	7+8	2+12	d	e	+	By8	-	-	d	j
621	Turkey	W	VORONA/KAUZ//L 293-91 K 14/3/SPN/NAC//ATTILA	2*	7+9	5+10	d	j	+	By9	-	+	d	j
622	Turkey	W	VORONA/TR810200/5/KS82W4 09/SPN/4/YMH/TOB//MCD/3/LIR A	2*	7*+8	2+12	e	b	-	By8	-	-	f	b
624	Turkey	W	YUNA/3/SPN/NAC//ATTILA	2*	7+9	5+10	a	b	+	By9	-	+	a	b
625	Turkey	W	ZARGANA-6	2*	17+18	5+10	b	d	+	-	-	+	b	d
626	Turkey	W	ZHETYSU/5/RSK/NAC/4/SNB/P CH//KAL/BB/3/CA8055	1	7+9	5+10	b	b	-	By9	-	+	b	b
629	Ukraine	W	KIRIA	2*	7+9	5+10	c	b	+	By9	-	+	c	b

630	Ukraine	W	KRUZHINKA/MV IRMA	2*	7+9	5+10	e	j	+	By9	-	+	e	j
634	Ukraine	W	Mironovskaya 808	1	7+9	5+10	c	b	-	By9	-	+	f	b
635	Ukraine	W	SIRENA/BUL854.87.2	2*	7+8	5+10	d	b	+	By8	-	+	d	b
636	Ukraine	W	Streletz	1	7+8	5+10	c	g	-	By8	-	+	c	g
638	Ukraine	W	ZNAKHIDKA	1	7+8	5+10	c	b	-	By8	-	+	c	b
639	Ukraine	W	ZOLOTAVA/DAR ZERNOGRADA	1	7+9	5+10	c	h	-	By9	-	+	c	h
640	USA	W	#575(LYFENKO)/JAGGER/4/KA RL*2//PI355520/	2*	7+9	5+10	c	j	+	By9	-	+	c	j
641	USA	W	CO960691/CO970655	1	7+9	2+12	e	h	-	By9	-	+	e	h
643	USA	W	HYS/YY/63-112-66-4/3/OR87065 ,H-281/4/FRENCH LINE E81FR	2*	7	2+12	d	h	+	-	-	-	d	f
644	USA	W	ID#870303/5/OR7946/HILL//HILL	2*	7	2+12	e	h	+	-	-	-	e	h

			/6/OR7946/HILL//HILL											
645	USA	W	IVORY/N96L1226/3/TJB368.251/ BUC/WEAVER	2*	7+9	5+10	c	h	+	By9	-	+	c	h
646	USA	W	IVORY/N96L1226/3/TJB368.251/ BUC/WEAVER	2*	7+9	5+10	c	h	+	By9	-	+	c	h
647	USA	W	IVORY/N96L1226/3/TJB368.251/ BUC/WEAVER	2*	7+9	5+10	c	h	+	By9	-	-	c	h
649	USA	W	Jagger/W94-244-132	1	7+9	5+10	c	j	-	By9	-	+	c	j
650	USA	W	Jerry	2*	7+9	5+10	c	b	-	-	-	+	c	j
652	USA	W	KS04HW47-3-4	2*	13+19	5+10	c	g	+	By8	-	+	c	g
653	USA	W	KS84273BB-10/KSSB110-9//KS8 31374-141B/YE1110/3/KS82W4 18/SPN	1	13+19	5+10	c	g	-	-	-	+	c	g

654	USA	W	KS89180B-2-1-1/CMSW89Y267//X921025-A-3-2	1	7+9	5+10	c	j	-	By9	-	+	c	j
			KS91H184/ARLIN SIB//KS91HW29/3/NE91631 (=NE82761/REDLAND)/4/VBFO											
655	USA	W	168	0	7+9	5+10	c	g	-	By9	-	+	c	g
656	USA	W	KS920709B-5-2/2137//KS920709 B5-2	2*	6+8	5+10	e	g	+	By8	-	+	e	g
657	USA	W	KS920709B-5-2/Stanof//KS9207 09B5-2	2*	7+9	2+12	a	b	+	By9	-	-	a	b
658	USA	W	KS92H363-2/COUGAR SIB(=NE85707/TBIRD) X NE94632(=ABILENE/NORKAN//	1	17+18	5+10	c	g	-	-	-	+	c	g

			RAWHIDE)											
659	USA	W	KS96WGRC39/Jagger	1	17+18	5+10	c	b	-	-	-	+	c	b
660	USA	W	KS96WGRC39/Jagger	1	17+18	5+10	c	b	+	By9	-	+	c	b
			KSSB-192-3/NE89529/4/MRS/CI 14482//YMH/HYS/3/RONDEZVO											
661	USA	W	US	2*	6+8	5+10	c	e	+	By8	-	+	c	e
662	USA	W	MADSEN/MALCOLM/3/REMAN// MADSEN/MALCOLM	2*	7*	4+12	c	h	+	-	-	-	c	h
			MADSEN/MALCOLM/3/ROSSINI /1/YSATIS/2/ORACLE//WEATHE											
663	USA	W	RFORD	2*	7*	4+12	e	g	+	-	-	-	f	g
			MADSEN/MALCOLM/6/HILL/3/C											
664	USA	W	ER/YMH/HYS/4/CER/YMH/HYS/	2*	7*	4+12	e	g	+	By9	-	-	f	g

			5/ROSSINI/1/YSATIS/2/ORACLE											
665	USA	W	MASON/JAGGER	1	7+9	5+10	c	b	-	By9	-	+	c	b
			MO8/NE94406 (=NE86582//84MC29/NE82583)//											
666	USA	W	KS91H184/3*RIO BLANCO	2*	7+9	5+10	c	b	+	By9	-	+	c	b
667	USA	W	MUKHRANI	2*	7+9	2+12	c	g	+	By9	-	-	c	g
668	USA	W	N566/OK94P597	1	7+9	5+10	e	g	-	By9	-	+	f	g
669	USA	W	NE04424	2*	7+8	5+10	c	j	+	-	-	+	c	j
			NE96644(=ODESSKAYA P./CODY)/PAVON/*3SCOUT66 X NE94653(=ARAPAHOE/ABILEN E//ARAPAHOE)											
670	USA	W	E//ARAPAHOE)	2*	7+8	5+10	c	b	+	By8	-	+	c	j

671	USA	W	NI05714	2*	7+9	5+10	e	j	+	By9	-	+	f	j
			NUWEST/4/D887-74/PEW/3/LN CR//CARSTEN/GIGANT/5/MRS/ CI14482//YMH/HYS/3/RONDEZ											
672	USA	W	VOUS	2*	6+8	4+12	d	b	+	By8	-	-	d	h
			NUWEST/4/D887-74/PEW/3/LN CR//CARSTEN/GIGANT/5/MRS/ CI14482//YMH/HYS/3/RONDEZ											
673	USA	W	VOUS	2*	6+8	4+12	d	b	+	By8	-	-	d	h
			NUWEST/4/D887-74/PEW/3/LN CR//CARSTEN/GIGANT/5/MRS/ CI14482//YMH/HYS/3/RONDEZ											
674	USA	W	VOUS	2*	6+8	4+12	d	b	+	By8	-	-	d	h

			NUWEST/4/D887-74/PEW/3/LN CR//CARSTEN/GIGANT/5/MRS/ CI14482//YMH/HYS/3/RONDEZ											
675	USA	W	VOUS	2*	6+8	4+12	a	b	+	By8	-	-	a	h
694	USA	W	SD05004	2*	7+9	2+12	c	j	-	By9	-	-	c	j
695	USA	W	SD05W030	2*	7+9	5+10	c	j	+	By9	-	+	c	j
696	USA	W	SD05W140	2*	7+9	5+10	c	j	+	By9	-	+	c	j
698	USA	W	SD96240-3-1	2*	17+18	5+10	c	b	+	-	-	+	c	b
699	USA	W	SD98W175-1	2*	7*+8	5+10	c	g	+	By9	-	-	c	g
701	USA	W	SPN/MADSEN/3/WA 7163 SISTER/SA 463 - GBR/STEPHENS	2*	7*	4+12	d	h	+	-	-	-	d	h
702	USA	W	SPN/MADSEN/3/WA 7163	2*	7*	4+12	d	h	+	-	-	-	d	h

			SISTER/SA 463 - GBR//STEPHENS											
703	USA	W	T67/X84W063-9-45//K92/3/SNF/ 4/X86509-1-1/X84W063-9-39-2// K93	2*	7*+8	2+12	c	h	+	By8	-	-	c	h
704	USA	W	TJB368.251/BUC//WEAVER/3/SI ERRA/WI88-052	2*	7+9	5+10	b	h	+	By9	-	+	b	h
705	USA	W	TJB368.251/BUC//WEAVER/3/SI ERRA/WI88-052	2*	7+9	5+10	b	h	+	By9	-	+	b	h
707	USA	W	Tubbs//OR9800924 (Rossini/Ysatis//Oracle)/OR9900 549	2*	7*	2+12	c	g	+	-	-	-	c	g
709	USA	W	TX01V5136RC	2*	7+9	5+10	e	i	+	By9	-	+	e	i

710	USA	W	TX03A0148	1	7*+8	5+10	e	b	-	By8	-	+	f	b
711	USA	W	TX03M1096	2*	7+9	5+10	c	i	+	By9	-	+	c	i
712	USA	W	TX04M410068	1	7+9	5+10	b	h	-	By9	-	+	b	h
			TX90V6313//TX94V3724(TAM-2)											
713	USA	W	00 BC41254-1-8-1-1/TX86V1405	2*	7*+8	5+10	c	i	-	By8	-	+	c	i
714	USA	W	TX93D2385//2137/VERDE	1	7+9	2+12	a	b	-	By9	-	-	a	b
715	USA	W	VARDZIA/BEZOSTAIA	2*	17+18	2+12	c	g	+	-	-	-	c	g
			WGRC10/3/KS93U69 sib/TA2455//KS93U69/4/JAGGE											
716	USA	W	R	1	7+8	5+10	c	g	-	By8	-	+	c	j
717	USA	W	X96V107/OGALLALA	0	7+9	5+10	a	b	-	By9	-	+	a	b
718	USA	W	Yumar/Arlin	1	7+8	5+10	c	i	-	By8	-	+	c	i

Note: The code is consistent in the Supplementary table 1 and Supplementary table 2.