

<https://doi.org/10.17221/103/2025-CJGPB>

Evaluating the discriminatory ability and informativeness of DArTseq markers in a comprehensive set of contemporary European potato varieties

PETR SEDLÁK¹ , VLADIMÍRA SEDLÁKOVÁ¹ , JAKUB VAŠEK¹ , ERVÍN HAUSVATER²,
DANIELA ČÍLOVÁ¹ , MARTINA MELOUNOVÁ¹ , JIŘÍ PTÁČEK³, PETR DOLEŽAL² 

¹Department of Genetics and Breeding, Faculty of Agrobiolgy, Food and Natural Resources, Czech University of Life Sciences Prague, Prague, Czech Republic

²Department of Potato Protection, Potato Research Institute Havlíčkův Brod, Ltd., Havlíčkův Brod, Czech Republic

³Department of Genetic Resources, Potato Research Institute Havlíčkův Brod, Ltd., Havlíčkův Brod, Czech Republic

Electronic Supplementary Material (ESM)

The authors are fully responsible for both the content and the formal aspects of the electronic supplementary material. No editorial adjustments were made.

Table S1. List of characteristics of varieties in evaluated collection

ID	Region	Breeder	Earliness	Utilisation	Pedigree
ST001	GER	Norika	VR	A	unk.
ST010	GER	Europlant	VR	A	unk.
ST011	NED	HZPC	R	AB	Svenja × Vivi
ST012	GER	Europlant	VR	AB	52/72/2206 × Biranco
ST002	GER	Europlant	VR	AB	Leyla × Marabel
ST003	NED	Stet	VR	A	Climax × Avenir
ST004	GER	Europlant	VR	B	L 6132/5 × Vineta
ST005	NED	HZPC	VR	AB	Allard × Concurrent
ST006	GER	Europlant	VR	A	232/77/2610 × Margit
ST007	NED	HZPC	VR	AB	Carrera × Agata
ST008	GER	Europlant	VR	B	unk.
ST009	GER	Europlant	VR	BA	Colette × Leyla
ST013	NED	Stet	VR	B	Nicola × Impala
ST022	GER	Europlant	VR	Cr	Niska × P 97/27
ST023	CZE	Sativa	VR	B	Red Anna × V 114/9
ST024	GER	Norika	VR	B	unk.
ST014	CZE	Vesa	VR	B	Everest × Bellarosa
ST015	CZE	Sativa	VR	B	P 188/27 × Bo 20/89
ST016	GER	Saka	VR	A	Wega × Valetta
ST017	CZE	Vesa	VR	AB	E 399/1 × Ausonia
ST018	CZE	Vesa	VR	BA	Mirato × Rosara
ST019	GER	Saka	VR	A	Verona × Alegria
ST020	DEN	Danespo	VR	AB	Merida × 96-BYM-8
ST21	CZE	Vesa	VR	B	Krasa × Velox
ST034	CZE	Vesa	VR	AB	KE 300/43 × Colette
ST035	unk.	unk.	R	unk.	unk.
ST036	unk.	unk.	R	unk.	unk.
ST026	NED	HZPC	VR	A	Carrera × Agata
ST027	CZE	Vesa	VR	AB	VE F 10/12
ST028	GER	Europlant	VR	B	L 546/89 × E 93/477
ST029	GER	Saka	VR	AB	Secura × ESH 2605/77
ST030	GER	Europlant	VR	B	unk.
ST031	NED	HZPC	VR	B	Marabel × Carrera
ST032	NED	HZPC	VR	A	Anuschka × HZD-99-1007
ST033	GER	Saka	VR	B	unk.
ST037	CZE	Pacov	R	B	Zlata × HR 8/50
ST046	CZE	Sativa	R	B	Princess × P44/24
ST047	NED	HZPC	R	AB	Sierra × Monalisa
ST048	CZE	Vesa	R	AB	Bolesta × X 76/2
ST038	CZE	Vesa	R	B	Agria × 892018
ST039	NED	HZPC	R	A	Nicola × Monalisa
ST040	CZE	VUB	VR	AB	Lady Rosetta × Rustica
ST041	GER	Saka	R	A	Belana × SA 03-012-4
ST042	DEN	Danespo	R	AB	Agria × Obelix

<https://doi.org/10.17221/103/2025-CJGPB>

Table S1 to be continued

ID	Region	Breeder	Earliness	Utilisation	Pedigree
ST043	GER	Europlant	R	A	Milva × E 87/66
ST044	NED	Stet	R	AB	El Mundo × Orchestra
ST045	NED	Stet	R	AB	Rosara × RZ 97-6139
ST049	CZE	Sativa	R	B	Baccara × Judita
ST058	NED	HZPC	R	B	Opal × VR-808
ST059	CZE	Vesa	R	B	S 6/69 × K 3419
ST060	CZE	Sativa	R	B	94/577/35 × BAZ 6.063.029-87CH
ST050	GER	Europlant	R	B	L 176/89/233 × Filea
ST051	NED	HZPC	R	A	Allians × Cezanne
ST052	POL	PRI Bonin	R	BC	Heidrun × Koral
ST053	CZE	Vesa	R	A	D 5/7 × D 6/4
ST054	GER	Norika	R	B	2.6 720-86 × Leyla
ST055	NED	Stet	R	AB	Sylvana × Carrera
ST056	GER	Norika	R	A	Andante × Agila
ST057	AUT	NOS	R	A	unk.
ST061	GER	Norika	R	Cr	unk.
ST070	NED	Kramer	R	AB	Desiree × VK 69-491
ST071	DEN	Danespo	R	AB	unk.
ST072	GER	Saka	R	AB	Dunja × Arnika
ST062	NED	HZPC	R	A	VDZ99-276 × Annabelle
ST063	GER	Europlant	R	B	unk.
ST064	NED	Mansholt	R	Cr	Pirol × L 95/561/867
ST065	CZE	Pacov	R	BA	Nancy × HR 2/21
ST066	NED	Mansholt	R	B	Nena × MA 75-364
ST067	NED	HZPC	R	AB	Janine × Carrera
ST068	NED	HZPC	R	AB	RZD-95-1618 × Victoria
ST069	NED	IJSEEL	R	AB	VR 98-72 × Solist
ST073	GER	Europlant	R	Cr	Industrie × Parnassia
ST082	CZE	Vesa	R	B	Heidi × D/6/4
ST083	NED	STET	R	A	VR 95-98 × Miriam
ST074	GER	Saka	R	AB	SA 99-002-44 × Gala
ST075	GER	Saka	R	B	1505/70 × Culpa
ST076	GER	Saka	R	Cr	unk.
ST077	CZE	Pacov	R	B	197 × HR52/3
ST078	CZE	VUB	R	B	Valfi × VÚB 125/27
ST079	CZE	VUB	R	B	Evelin × Svela
ST080	CZE	VUB	R	BC	unk.
ST081	CZE	VUB	R	AB	Orchestra × Agila
ST084	CZE	Vesa	R	AB	Lolita × A 138/2
ST093	CZE	Vesa	R	BA	Milva × VE 58/5
ST094	NED	HZPC	PLR	AB	Piccolo Star × VZD-00-343
ST085	GER	Norika	R	B	Marabel × Gala
ST086	unk.	unk.	PLR	unk.	unk.
ST087	GER	Europlant	PLR	AB	Allians × Belana

Table S1 to be continued

ID	Region	Breeder	Earliness	Utilisation	Pedigree
ST088	GER	Norika	PLR	BC	unk.
ST089	GER	Norika	PLR	B	unk.
ST090	GER	Norika	PLR	B	unk.
ST091	CZE	Vesa	PLR	B	S 6/69 × Rosara
ST092	GER	Europlant	PLR	AB	unk.
ST095	CZE	Vesa	PLR	B	Colorado × A138-2
ST104	GER	Europlant	PLR	B	unk.
ST105	NED	IJSEEL	PLR	A	Madeleine × Jelly
ST106	GER	Europlant	PLR	B	L 96/225/309 × E 96/22/53
ST096	GER	Europlant	PLR	B	B1019/2/95 × Jelly
ST097	GER	Europlant	PLR	B	unk.
ST098	CZE	Vesa	PLR	S	Dorett × Geza
ST099	AUT	NOS	PLR	AB	Bintje × Quarta
ST100	CZE	Vesa	PLR	A	A 54/1 × A 138/2
ST101	GER	Europlant	PLR	Fr	L 96/739/677 × E 00/414/487
ST102	GER	Europlant	PLR	S	unk.
ST103	GER	Europlant	PLR	B	unk.
ST107	GER	Norika	PLR	S	unk.
ST116	GER	Saka	PLR	BC	Gunda × Satina
ST117	GER	Norika	PLR	Fr	unk.
ST118	NED	HZPC	PLR	AB	Vivaldi × Carrera
ST108	GER	Saka	R	A	Vitara × Baltica
ST109	NED	HZPC	PLR	unk.	unk.
ST110	AUT	NOS	PLR	B	unk.
ST111	GER	Norika	PLR	Fr	unk.
ST112	NED	HZPC	PLR	Fr	Shepody × RZ-84-2580
ST113	GER	Europlant	P	B	Marabel × L 173/87/4476
ST114	GER	Saka	PLR	A	Allians × Soraya
ST115	GER	Europlant	PLR	B	Resella × L 6140/12
ST119	GER	Saka	PLR	S	unk.
ST128	GER	Saka	PLR	Cr	Omega × SA 03-901-1
ST129	GER	Norika	PLR	S	unk.
ST130	GER	Saka	PLR	A	Marabel × SA 04-057-5
ST120	NED	Mansholt	PLR	BA	unk.
ST121	GER	Europlant	PLR	B	unk.
ST122	GER	Europlant	PLR	BA	Nena × Dunja
ST123	NED	Mencke	PLR	AB	Producent × AM 78-4102
ST124	NED	HZPC	PLR	B	Cecila × VF4RED-1
ST125	NED	Cebeco	PLR	B	W 72-22-489 × VK 69-491
ST126	GER	Saka	PLR	Cr	Diana × Hermes
ST127	GER	Europlant	PLR	B	Red Desire × VR 95-98
ST131	GER	Norika	PLR	Fr	unk.
ST140	GER	Europlant	PLR	AB	unk.
ST141	GER	Norika	PLR	B	Marabel × 1.307 120-93

<https://doi.org/10.17221/103/2025-CJGPB>

Table S1 to be continued

ID	Region	Breeder	Earliness	Utilisation	Pedigree
ST142	GER	Norika	PLR	S	unk.
ST132	FR	Germicopa	PLR	Cr	Dolly × Chipie
ST133	CZE	Vesa	PLR	AB	unk.
ST134	CZE	Vesa	PLR	BA	Rosella × Pamir
ST135	GER	Europlant	PLR	B	Laura × Miriam
ST136	CZE	Vesa	PLR	S	Starkeprofi × Sofista
ST137	GER	Europlant	PLR	B	unk.
ST138	DEN	Danespo	PLR	A	Allians × Rafaela
ST139	NED	Stet	PLR	Cr	Omega × VR 808
ST143	FR	Germicopa	PLR	C	Gunda × Jenny
ST152	NED	HZPC	PLR	AB	VG3CAE-5 × Charmante
ST153	GER	Norika	PLR	B	1.742 102-95 × Gala
ST154	GER	Europlant	PLR	S	unk.
ST144	NED	HZPC	PLR	BC	Crisps4all × Opal
ST145	AUT	NOS	PLR	A	Vienna × NO 00-0205
ST146	CZE	Vesa	PLR	Cr	unk.
ST147	CZE	Vesa	PLR	AB	H62/12 × H99/387
ST148	CZE	Vesa	PLR	B	B 99/1 × C 118/2
ST150	CZE	Vesa	PLR	S	S 24/24 × Ornella
ST151	NED	HZPC	PLR	B	Agria × ROP-J-861
ST155	NED	BIE	PLR	B	BIE 91-217 × Vitelotte Noire
ST165	AUT	NOS	P	B	unk.
ST166	NED	HZPC	P	B	Aziza × Victoria
ST156	GER	Norika	P	S	unk.
ST157	CZE	Vesa	P	S	Starkeprofi × G104-15
ST158	CZE	Vesa	P	S	Amylex × Calgary
ST159	FR	Germicopa	P	S	unk.
ST160	GER	Europlant	P	S	unk.
ST161	GER	Europlant	P	S	unk.
ST162	GER	Europlant	P	S	unk.
ST163	GER	Europlant	P	S	unk.
ST167	DEN	Danespo	P	BC	unk.
ST176	FR	Germicopa	P	S	Epona × Dinamo
ST177	GER	Norika	P	S	5214 × 453-209-02
ST168	GER	Saka	P	S	unk.
ST169	FR	Germicopa	P	S	Hinga × Senator
ST170	NED	Stet	P	AB	Impala × POS 97-1
ST171	GER	Saka	P	AB	Belmonda × Laura
ST172	GER	Saka	P	Cr	SA 05-506-2 × Opal
ST173	NED	Smeenge	P	AB	Laura × Rodeo
ST174	CZE	Pacov	P	A	47 × 32
ST175	GER	Saka	P	S	unk.
ST178	NED	Plantera	PLR	B	Michelle × KWS 06-165
ST235	GER	Europlant	VR	B	unk.

Table S1 to be continued

ID	Region	Breeder	Earliness	Utilisation	Pedigree
ST236	NED	HZPC	VR	B	Alcmaria × Ropta P 365
ST179	CZE	Vesa	P	S	Krepka × G 33/75
ST180	GER	Norika	VR	A	unk.
ST181	CZE	Pacov	VR	AB	HR 10/4 × 102
ST182	GER	Bavaria	VR	B	unk.
ST183	CZE	Sativa	VR	B	Presto × E 96.22.53
ST184	NED	Meijer	VR	BA	CMK 93-042-005 × Lady Christl
ST233	NED	Weibull	VR	BA	52/72/2206 × Sirco
ST234	GER	Saka	VR	B	SA 92-017-1 × SA 90-210-81
ST329	GER	Hufenberg	R	BC	Interspec. hybrid × Hindenburg
ST209	DEN	Danespo	PLR	AB	unk.
ST217	NED	Meijer	PLR	BC	VE 74-45 × W 72-22-496
ST225	CZE	VUB	PLR	B	Valfi × Olivia
ST369	GER	BRBD	PLR	BA	Seedling 1 × Seedling 17 (adg.dms)
ST185	GER	Saka	VR	AB	Zhukovsky Ranny × Merida
ST193	GER	Europlant	R	B	Bodenkraft × Mara
ST201	NED	Agrico	R	AB	Arielle × Sofia
ST210	NED	Smeenge	PLR	B	Laura × Romanze
ST218	FR	Germicopa	PLR	AB	G90TT032.003 × Caesar
ST226	GER	Bavaria	P	S	unk.
ST370	NED	HZPC	P	B	Urgenta × Depesche
ST186	AUT	NOS	VR	A	unk.
ST194	GER	Norika	R	B	unk.
ST202	NED	Agrico	R	AB	Marabel × Amorosa
ST211	FR	Germicopa	PLR	B	Melody × seedling
ST219	USA	unk.	PLR	A	unk.
ST227	NED	Smeenge	P	B	Laura × Rodeo
ST371	GER	von Kameke	P	BA	Ismene × Jubel
ST187	CZE	Sativa	VR	AB	unk.
ST195	CZE	Sativa	R	B	E05/266/226 × E07/276/355
ST203	NED	Meijer	PLR	B	Orchestra × DOB1997-507-015
ST212	FR	Germicopa	PLR	AB	unk.
ST220	NED	Meijer	PLR	A	Maradonna × Cupido
ST228	NED	Jansen	P	unk.	VE 96-21 × VE 99-216
ST372	GER	Saka	P	BC	1521 57 × 1144 56
ST188	NED	Agrico	VR	AB	AR 93-033-79 × AR 95-0319
ST196	GER	Norika	R	A	unk.
ST204	AUT	NOS	PLR	B	unk.
ST213	AUT	NOS	PLR	B	unk.
ST221	GER	Norika	PLR	B	unk.
ST229	GER	Norika	P	B	unk.
ST373	CZE	Pacov	P	S	290/40 × Aquilla
ST189	NED	HZPC	R	AB	Spunta × Monalisa
ST197	GER	Norika	R	Cr	unk.

<https://doi.org/10.17221/103/2025-CJGPB>

Table S1 to be continued

ID	Region	Breeder	Earliness	Utilisation	Pedigree
ST205	GER	Norika	PLR	Fr	unk.
ST214	GER	Bavaria	PLR	B	BS 3/82 × Quint
ST222	NED	Meijer	PLR	B	Mondial × CMK 03-707-003
ST230	GER	Bavaria	P	B	537.01 × Granola
ST374	CZE	Sativa	PLR	B	K 5 47 × Reneta
ST190	DEN	Danespo	R	A	unk.
ST198	NED	HZPC	R	B	Opal × VR-808
ST206	GER	Bavaria	PLR	BC	1125/1526 × Quarta
ST215	AUT	NOS	PLR	B	unk.
ST223	NED	Stet	PLR	Fr	unk.
ST375	HUN	Sarpo	P	B	76.PO.12.14.268 × D187
ST191	GER	Norika	R	Cr	unk.
ST199	NED	Agrico	R	B	Rodeo × Valor
ST207	NED	Agrico	PLR	BC	Agria (mutant)
ST216	GER	Norika	PLR	AB	unk.
ST224	NED	Stet	PLR	Cr	unk.
ST368	NED	De Vries	PLR	BC	Munstersen × Jaune D'OR
ST376	GER	von Moreau	P	BC	seedling × Biene
ST192	NED	Agrico	R	AB	Laura × Rodeo
ST200	GER	Bavaria	R	B	Assia × W 8290/582
ST208	NED	Solana	PLR	Cr	unk.
ST231	GER	Bavaria	P	B	Juwel × Laura
ST307	AUT	NOS	PLR	B	unk.
ST315	NED	HZPC	PLR	AB	VDZ 87-38 × Casanova
ST323	GER	Saka	PLR	B	Puntila × H 99/73
ST243	CZE	Sativa	VR	BC	6.462.229.77 × Ausonia
ST251	GER	Saka	VR	B	Prelude × Velox
ST259	GER	Europlant	R	Cr	Marena (Marlen?) × Albatros
ST267	CZE	Sativa	R	BA	Rita × Hera
ST275	CZE	Vesa	R	S	unk.
ST283	NED	Agrico	R	B	Agria × AM 70-2166
ST291	GER	Europlant	R	AB	B 165/95/82 × P93-388W
ST299	GER	Norika	PLR	B	Exempla × Laura
ST232	GER	Bavaria	P	A	unk.
ST308	GER	Europlant	PLR	BA	Cinja × E 77/330
ST316	CZE	Sativa	PLR	B	N 326.29 × K230.25
ST324	GER	Europlant	PLR	B	Heidrun × Ebstorf 75/75
ST244	CZE	Sativa	VR	B	KE Q 66/7 × Anosta
ST252	GER	Norika	R	unk.	unk.
ST260	CZE	Pacov	R	S	Fecuva × Pepo
ST268	NED	HZPC	R	A	Nicola × JDB 83- 53
ST276	GER	Saka	R	unk.	Prelude × Velox
ST284	GER	Saka	R	S	Panda × ND 860-2
ST292	GER	Europlant	R	B	2-75.1349 N × Solina

Table S1 to be continued

ID	Region	Breeder	Earliness	Utilisation	Pedigree
ST300	GER	Saka	PLR	Cr	SA 2952/78 × SA 92-352-6
ST237	NED	Stet	VR	AB	Spunta × Maradonna
ST309	NED	Agrico	PLR	Fr	Agria × AR 76-034-03
ST317	CZE	Sativa	PLR	BA	Višňovské rohlíčky × Parnassia
ST325	NED	HZPC	PLR	B	Fabula × Xantia
ST245	NED	IJSEEL	VR	BC	Adora × Lido
ST253	NED	Agrico	R	AB	BM 77-2102 × AR 80-031-20
ST261	NED	Agrico	R	unk.	Amorosa × AR 89-1204
ST269	GER	Saka	R	Fr	Diana × Innovator
ST277	CZE	Pacov	R	S	Krumlov / HR 31/5
ST285	GER	Europlant	R	unk.	unk.
ST293	CZE	VUB	PLR	BC	Krumlov × Juvena
ST301	NED	HZPC	PLR	A	Lady Roseta × HZ 81 H 202
ST238	GER	SaKa	VR	B	Lido × Velox
ST310	NED	HZPC	PLR	A	Nicola × Arca
ST318	GER	Norika	PLR	unk.	Grandifolia × 3.169 010-85
ST326	FR	SRCN	P	S	52.83.2 × Orion
ST246	CZE	Sativa	VR	B	L 203/81 × H 17/23
ST254	CZE	Pacov	R	S	unk.
ST262	GER	Saka	R	unk.	Nicola × Filea
ST270	NED	Mansholt	R	AB	Leyla × Konst 85-1002
ST278	GER	Uniplanta	R	B	Rote Heidelberger × Wilhelm Korn
ST286	GER	Europlant	R	S	unk.
ST294	GER	Europlant	PLR	B	Quarta × Semlo
ST302	FR	SRCN	PLR	Cr	Chipie × Hertha
ST239	GER	Saka	VR	Fr	Agria × Innovator
ST311	GER	Saka	PLR	Cr	Darwina × 2026/86
ST319	NED	Krijthe	PLR	C	Bydand × Caesar
ST327	CZE	Pacov	P	B	Sante × Zlata
ST247	NED	Boerhave	VR	AB	Minerva × Alcmaria
ST255	NED	Agrico	R	AB	Obelix × AR 76-168-1
ST263	GER	Saka	R	B	Marabel × SA 95-012-4
ST271	NED	Agrico	R	BA	Bie 91-217 × Vitlotte Noire
ST279	NED	Stet	R	Fr	Agria × VK 69-491
ST287	GER	Norika	R	S	ST 155 × Taiga
ST295	NED	Agrico	PLR	unk.	Adora × Quinta
ST303	NED	HZPC	PLR	BC	RZ-85-238 × RZ-87-44
ST240	GER	Norika	VR	A	Salome × Gala
ST312	GER	Saka	PLR	B	3333/60 × 267.04
ST320	GER	Pohl	PLR	S	155/83/3670 × VE 79-113
ST328	CZE	VUB	P	BC	Britisch Columbia Blue (clone)
ST248	NED	HZPC	VR	B	Agria × Gallia
ST256	GER	Nordkartofel	R	BA	unk.
ST264	FR	Bretagne	R	AB	Charlotte × Estima

<https://doi.org/10.17221/103/2025-CJGPB>

Table S1 to be continued

ID	Region	Breeder	Earliness	Utilisation	Pedigree
ST272	AUT	NOS	R	B	unk.
ST280	CZE	Vesa	R	S	Roeslau × G 33.75
ST288	AUT	NOS	R	A	Marabel × AR 85-1703
ST296	GER	Saka	PLR	A	1391.02 × File
ST304	GER	Europlant	PLR	B	L 619/87/4796 × Marabel
ST241	GER	Bavaria	VR	B	BS 857/58 × Flora
ST313	AUT	NOS	PLR	BA	Signal × BM 4115/12
ST321	GER	Norika	PLR	B	3.14 104-90 × Rasant
ST249	GER	Saka	VR	B	SA 88-012-2 × SA 402/87
ST257	GER	Europlant	R	Fr	L 82/2137 × AM 82-3167
ST265	NED	HZPC	R	unk.	unk.
ST273	NED	HZPC	R	AB	Nicola × Pomfine
ST281	NED	Agrico	R	B	Laura × Miriam
ST289	NED	HZPC	R	A	Marabel × Rianta
ST297	GER	Lange	PLR	BA	290/76 × Granola
ST305	AUT	NOS	PLR	A	Agria × SW 80-175
ST242	GER	Norika	VR	C	unk.
ST314	NED	HZPC	PLR	AB	Vivaldi × Carrera
ST322	GER	Europlant	PLR	C	Bolesta × Mira
ST250	GER	Saka	VR	B	2680/77 × H 99/73
ST258	GER	Saka	R	A	SA 95-003-1 × Filea
ST266	CZE	Vesa	R	B	M 22.12 × Bonita
ST274	GER	Saka	R	B	Marabel × SA 91-050-4
ST282	NED	Weibull	R	A	WL 88-875 × Concorde
ST290	CZE	Vesa	R	BA	Rosella/Paola
ST298	CZE	Pacov	PLR	S	Stet × HR 31.5
ST306	NED	Agrico	PLR	BC	Lady Olympia × Red One

Earliness: VR – very early, R – early, PLR – medium early, P – medium late to late; utilisation mode: Cr – crisps, Fr – French fries, S – starch, A – C the table quality, unk – unknown utilisation mode; regions: AUT – Austria, CZE – Czechia, DEN – Denmark, FR – France, GER – Germany, HUN – Hungary, NED – Netherlands, POL – Poland, USA – United States of America, unk. – unknown region

Table S2. Chromosomal localisation of top 50 SNPs contributing to three the most effective principal components detected by DAPC for evaluated factors

Id.	SNP-breeder	Chr.	SNP-region	Chr.	SNP-earliness	Chr.	SNP-utilisation	Chr.
1	3714897-9-A/G	7	3709632-17-G/T	NA	3720735-14-T/A	NA	3728270-15-A/G	1
2	3681894-19-G/C	8	3705896-14-T/G	5	3678487-40-A/G	10	5739272-17-C/T	NA
3	3729106-53-T/C	7	3709855-46-G/T	4	3686521-38-A/T	8	5749975-50-G/T	3
4	3701782-9-G/T	4	3704692-33-A/C	4	3708399-43-C/T	4	3706490-36-T/G	4
5	3710408-36-A/G	4	3699530-21-T/G	4	3709409-21-C/T	4	5745241-38-C/A	5
6	3701609-42-G/A	7	3711129-47-T/G	4	3715503-59-T/A	3	3700996-26-T/A	4
7	3709632-17-G/T	NA	3698026-39-A/C	4	3703799-32-T/C	1	3727685-46-T/C	6
8	3703917-64-A/C	5	3709062-12-G/T	5	3728727-19-G/C	4	3696829-64-C/T	2
9	5743244-9-A/T	7	3708002-12-A/C	4	5735790-18-A/C	1	7594178-63-T/C	9
10	3704563-12-A/G	9	3713122-6-G/C	NA	5735532-20-T/A	3	5742749-11-T/C	4
11	3708703-28-C/A	5	5740631-58-G/A	11	3700360-14-T/C	5	3702171-5-T/A	9
12	3713969-29-G/A	5	3695486-39-A/T	3	3713770-25-A/C	4	3713585-16-G/T	3
13	3708002-12-A/C	4	3708258-39-T/C	8	4450881-26-G/A	6	3709643-10-T/C	10
14	3711677-15-C/G	8	3712134-25-A/G	4	3726303-27-G/A	4	3707875-44-T/C	5
15	3713453-6-G/A	10	5740332-10-G/T	4	3711677-15-C/G	8	5735084-24-C/T	9
16	3691907-45-G/A	11	3706299-14-C/G	3	3702741-8-T/C	10	3705826-52-G/A	2
17	3709855-46-G/T	NA	3698648-49-T/C	8	5751448-61-A/G	7	3698974-13-G/A	9
18	3716165-12-T/A	NA	3681108-23-C/G	6	3686016-7-C/A	1	3728041-31-T/C	6
19	3712651-30-G/A	4	3701782-9-G/T	4	7522037-46-A/G	NA	3686016-7-C/A	1
20	3693442-66-T/G	5	3712391-58-C/T	4	3696798-23-T/C	3	5747753-22-C/G	1
21	3709477-20-G/A	4	3686592-38-C/A	3	3704277-6-T/C	1	3704563-12-A/G	9
22	3702547-13-C/G	11	3710408-15-A/G	4	3702631-60-T/C	1	3701401-19-G/A	1
23	3690505-13-C/G	NA	3681894-19-G/C	8	3706136-21-G/A	6	3696951-22-C/A	6
24	3707202-6-A/T	4	3711677-15-C/G	8	5754805-20-T/C	3	12461049-52-A/T	9
25	3712134-25-A/G	4	3690505-13-C/G	NA	3702527-19-C/G	8	3708344-36-A/G	5
Id.	SNP-breeder	chr.	SNP-region	chr.	SNP-earliness	chr.	SNP-utilisation	chr.
26	3696876-17-G/A	12	3699681-42-C/T	2	7590753-58-G/A	7	3704280-33-T/G	5
27	3697629-18-C/T	4	3681387-45-T/C	7	4478069-60-G/A	3	3712590-67-A/G	3
28	7699346-37-G/A	10	3705819-61-C/T	4	3709734-40-A/T	10	4461002-30-G/A	3
29	3704692-33-A/C	4	3710408-36-A/G	4	7688982-59-C/T	8	3727522-9-T/C	9

Table S2 to be continued

Id.	SNP-breeder	Chr.	SNP-region	Chr.	SNP-earliness	Chr.	SNP-utilisation	Chr.
30	3712839-34-G/A	4	4482889-51-T/C	3	3696238-11-T/C	8	3700947-26-G/T	NA
31	3701993-58-A/T	2	3708475-63-A/T	1	3726143-10-C/T	NA	4480927-19-A/G	9
32	3700231-50-G/A	4	3707468-67-T/A	1	3697771-56-G/A	6	3706884-61-T/A	9
33	3724874-38-T/C	9	3704131-47-A/G	4	3702658-38-C/T	6	5754097-17-G/A	NA
34	3697018-42-A/G	4	5739495-5-C/T	4	3708336-22-C/G	1	3705177-13-G/T	4
35	3718107-34-A/C	9	3701959-41-C/G	12	3706107-20-G/A	1	3702536-17-T/C	7
36	3709062-12-G/T	5	3715893-16-A/G	3	3698733-50-G/T	7	3713910-25-T/A	12
37	3702941-11-G/A	6	7474927-23-A/G	NA	3713985-43-C/T	10	3710749-18-C/G	9
38	5739495-5-C/T	4	3700172-27-G/A	5	7475447-8-C/T	12	3726321-56-T/C	6
39	3705896-14-T/G	5	3723421-8-C/A	9	3701545-17-T/C	1	5746229-22-C/G	NA
40	3701501-13-G/T	5	3706675-44-C/T	2	3703620-7-A/T	1	3704175-6-T/A	8
41	3698928-5-T/G	4	3705947-30-A/G	2	3715537-38-T/C	10	3698614-23-G/C	3
42	3697310-42-T/A	7	3712105-18-T/G	11	3699144-15-G/A	10	3711436-17-C/T	5
43	5731183-23-A/T	12	3708069-18-G/T	7	3683664-14-A/G	2	4473586-9-A/C	10
44	7521737-17-T/C	1	3710722-27-T/A	5	5732793-47-A/T	3	3703763-28-C/A	10
45	3708236-18-A/T	6	3683102-12-A/G	4	3703957-12-C/T	7	68994229-41-G/T	10
46	3712600-60-G/A	11	3697235-27-C/T	2	3718096-50-T/A	9	5739820-15-T/C	10
47	3705819-61-C/T	4	3713629-7-G/A	1	3708232-50-C/A	4	3701501-13-G/T	5
48	3712391-58-C/T	4	3700231-50-G/A	4	3709632-17-G/T	NA	3715638-21-C/T	2
49	3725108-52-T/A	2	3703917-64-A/C	5	3708008-37-C/A	1	3703262-14-T/A	1
50	3699530-21-T/G	4	3713585-16-G/T	3	3714153-29-C/T	1	3714420-23-G/A	9

SNP – single nucleotide polymorphism; DAPC – discriminant analysis of principal components; the table is supplementary to Figure 4; colours used to distinguish SNPs having the highest effect on principal components: PC1 – purple, PC2 – brown, and PC3 – blue

12 Table S3. Chromosomal localisation of the SNPs with the highest discriminant power (Figure 5, Table S2) identified by DAPC for the three most influential discriminant functions (LD1-LD3)

Chromosome	1	2	3	4	5	6	7	8	9	10	11	12	Unk.	Chromosome	1	2	3	4	5	6	7	8	9	10	11	12	Unk.
LD1														LD2													
Breeder				2			4						1	breeder				2	3							1	
Region				4									1	region	1		2	1			1			1	1		2
Earliness			3		1					3			1	earliness	1							2					1
Utilisation				1	2					1			1	utilisation									6				
Chromosome	1	2	3	4	5	6	7	8	9	10	11	12	Unk.	chromosome	1	2	3	4	5	6	7	8	9	10	11	12	unk.
LD3														total													
Breeder					2				1		1	2		breeder				4	5		4		1		1	2	
Region	1		3					1						region	2		5	5			1	1		1	1		
Earliness	1		2			2			1					earliness	2		5		1	2		2	1	3			
Utilisation	3			1	2	2	1							utilisation	3			2	4	2	1			1			

SNP – single nucleotide polymorphism; DAPC – discriminant analysis of principal components; colour intensity reflects the number of markers detected per chromosome

Table S4. Summarised results of quality evaluation for SNP markers detected by DAPC

	Call Rate	OneRatio Ref	OneRatio Snp	FreqHom Ref	FreqHom Snp	Freq Hets	PIC Ref	PIC Snp	PIC Avg	AvgCount Ref	AvgCount Snp	Rep Avg
Breeder	0.941	0.867	0.570	0.430	0.133	0.437	0.199	0.425	0.312	54.931	38.703	0.947
Region	0.939	0.874	0.573	0.427	0.126	0.447	0.201	0.439	0.320	49.651	33.965	0.947
Earliness	0.937	0.860	0.566	0.434	0.140	0.426	0.196	0.396	0.296	48.558	34.459	0.945
Utilization	0.942	0.882	0.548	0.452	0.118	0.429	0.182	0.440	0.311	56.017	37.496	0.951

SNP – single nucleotide polymorphism; DAPC – discriminant analysis of principal components; values represent means for factors breeder, region, earliness, and utilisation mode; One ratio – allele frequency; FreqHom – frequency of homozygotes; FreqHets – frequency of heterozygotes; PIC – polymorphic information content; AvgCount – sequencing depth; RepAvg – reproducibility