

Supplementary Table 1 List of studied material with pedigree details

Genotype	Gbs Line	Gid	Pedigree	Genotype	Gbs Line	Gid	Pedigree
1	2	7933009	DOY1/AE.SQUARROSA (488)//BAJ #1/3/SUP152	25	28	7933135	H-1311/3/FRET2*2/SHAMA//KACHU/4/HUW234+LR34/PRINIA*2//KIRITATI
2	3	7933013	DOY1/AE.SQUARROSA (488)//BAJ #1/3/SUP152	26	29	7933138	H-1311/3/FRET2*2/SHAMA//KACHU/4/HUW234+LR34/PRINIA*2//KIRITATI
3	4	7933014	DOY1/AE.SQUARROSA (488)//BAJ #1/3/SUP152	27	30	7933141	H-1311/3/FRET2*2/SHAMA//KACHU/4/HUW234+LR34/PRINIA*2//KIRITATI
4	5	7933017	DVERD_2/AE.SQUARROSA (333)//BAJ #1/3/SUP152	28	31	7933150	H-1311/3/FRET2*2/SHAMA//KACHU/4/HUW234+LR34/PRINIA*2//KIRITATI
5	7	7933023	DVERD_2/AE.SQUARROSA (333)//BAJ #1/3/SUP152	29	32	7933170	68.111/RGB-U//WARD RESEL/3/STIL/4/AE.SQUARROSA (390)/7/SHA7/VEE#5/5/VEE#8//JUP/BJY/3/F3.71/TRM/4/2*WEAVER/6/SKAUZ//PARUS//PARUS/8/CNDO/R143//ENTE/MEXI_2/3/AEGILOPS SQUARROSA (TAUS)/4/WEAVER/5/PICUS/6/TROST/7/TACUPETO F2001
6	8	7933024	DVERD_2/AE.SQUARROSA (333)//BAJ #1/3/SUP152	30	33	7933202	INDIA-223/7/SHA7/VEE#5/5/VEE#8//JUP/BJY/3/F3.71/TRM/4/2*WEAVER/6/SKAUZ//PARUS//PARUS/8/CNDO/R143//ENTE/MEXI_2/3/AEGILOPS SQUARROSA (TAUS)/4/WEAVER/5/PICUS/6/TROST/7/TACUPETO F2001
7	9	7933025	DVERD_2/AE.SQUARROSA (333)//BAJ #1/3/SUP152	31	34	7933205	INDIA-223/7/SHA7/VEE#5/5/VEE#8//JUP/BJY/3/F3.71/TRM/4/2*WEAVER/6/SKAUZ//PARUS//PARUS/8/CNDO/R143//ENTE/MEXI_2/3/AEGILOPS SQUARROSA (TAUS)/4/WEAVER/5/PICUS/6/TROST/7/TACUPETO F2001
8	10	7933029	DVERD_2/AE.SQUARROSA (333)//BAJ #1/3/SUP152	32	35	7933214	INDIA-223/7/SHA7/VEE#5/5/VEE#8//JUP/BJY/3/F3.71/TRM/4/2*WEAVER/6/SKAUZ//PARUS//PARUS/8/CNDO/R143//ENTE/MEXI_2/3/AEGILOPS SQUARROSA (TAUS)/4/WEAVER/5/PICUS/6/TROST/7/TACUPETO F2001
9	11	7933031	DVERD_2/AE.SQUARROSA (333)//BAJ #1/3/SUP152	33	37	7933229	CHIH95.4.6/7/SHA7/VEE#5/5/VEE#8//JUP/BJY/3/F3.71/TRM/4/2*WEAVER/6/SKAUZ//PARUS//PARUS/8/CNDO/R143//ENTE/MEXI_2/3/AEGILOPS SQUARROSA (TAUS)/4/WEAVER/5/PICUS/6/TROST/7/TACUPETO F2001
10	12	7933034	DVERD_2/AE.SQUARROSA (333)//BAJ #1/3/SUP152				
11	13	7933035	DVERD_2/AE.SQUARROSA (333)//BAJ #1/3/SUP152				
12	14	7933045	D67.2/PARANA 66.270//AE.SQUARROSA (677)/3/BAJ #1/4/SUP152				
13	15	7933057	D67.2/PARANA 66.270//AE.SQUARROSA (677)/3/BAJ #1/4/SUP152				
14	16	7933070	GARZA/BOY//AE.SQUARROSA (695)/3/BAJ #1/4/SUP152				
15	17	7933077	IG 42134/BAJ #1//SUP152				
16	18	7933091	H-1624/BAJ #1//SUP152				
17	19	7933093	H-1624/BAJ #1//SUP152				
18	20	7933094	H-1624/BAJ #1//SUP152				
19	21	7933096	H-1624/BAJ #1//SUP152				
20	22	7933099	H-1624/BAJ #1//SUP152				
21	23	7933105	H-1624/BAJ #1//SUP152				
22	24	7933108	INDIA-101/3/FRET2*2/SHAMA//KACHU/4/HUW234+LR34/PRINIA*2//KIRITATI				
23	25	7933111	INDIA-101/3/FRET2*2/SHAMA//KACHU/4/HUW234+LR34/PRINIA*2//KIRITATI				
24	26	7933122	INDIA-101/3/FRET2*2/SHAMA//KACHU/4/HUW234+LR34/PRINIA*2//KIRITATI				

Genotype	Gbs Line	Gid	Pedigree	Genotype	Gbs Line	Gid	Pedigree
34	38	7933239	CHIH95.4.6/7/SHA7/VEE#5/5/ VEE#8//JUP/BJY/3/F3.71/ TRM/4/2*WEAVER/6/SKAUZ/ PARUS//PARUS/8/CNDO/R143// ENTE/MEXI_2/3/AEGILOPS SQUARROSA (TAUS)/4/ WEAVER/5/PICUS/6/TROST/7/ TACUPETO F2001	41	46	7933344	H-1357/8/CNDO/R143// ENTE/MEXI_2/3/AEGILOPS SQUARROSA (TAUS)/4/ WEAVER/5/PICUS/6/TROST/7/ TACUPETO F2001/9/KAUZ// ALTAR 84/AOS/3/PASTOR/4/ MILAN/CUPE//SW89.3064/5/ KIRITATI
35	39	7933257	CHIH95.4.6/7/SHA7/VEE#5/5/ VEE#8//JUP/BJY/3/F3.71/ TRM/4/2*WEAVER/6/SKAUZ/ PARUS//PARUS/8/CNDO/R143// ENTE/MEXI_2/3/AEGILOPS SQUARROSA (TAUS)/4/ WEAVER/5/PICUS/6/TROST/7/ TACUPETO F2001	42	48	7933377	IG 42152/6/KAUZ//ALTAR 84/AOS/3/PASTOR/4/ MILAN/CUPE//SW89.3064/5/ KIRITATI/7/SW89.5277/ BORL95//SKAUZ/3/ PRL/2*PASTOR/4/HEILO
36	41	7933333	H-1357/8/CNDO/R143// ENTE/MEXI_2/3/AEGILOPS SQUARROSA (TAUS)/4/ WEAVER/5/PICUS/6/TROST/7/ TACUPETO F2001/9/KAUZ// ALTAR 84/AOS/3/PASTOR/4/ MILAN/CUPE//SW89.3064/5/ KIRITATI	43	49	7933413	DOY1/AE.SQUARROSA (447)/4/ PRL/2*PASTOR//PBW343*2/ KUKUNA/3/ROLF07/5/NELOKI
37	42	7933334	H-1357/8/CNDO/R143// ENTE/MEXI_2/3/AEGILOPS SQUARROSA (TAUS)/4/ WEAVER/5/PICUS/6/TROST/7/ TACUPETO F2001/9/KAUZ// ALTAR 84/AOS/3/PASTOR/4/ MILAN/CUPE//SW89.3064/5/ KIRITATI	44	50	7933473	CETA/AE.SQUARROSA (391)/4/ PRL/2*PASTOR//PBW343*2/ KUKUNA/3/ROLF07/5/NELOKI
38	43	7933337	H-1357/8/CNDO/R143// ENTE/MEXI_2/3/AEGILOPS SQUARROSA (TAUS)/4/ WEAVER/5/PICUS/6/TROST/7/ TACUPETO F2001/9/KAUZ// ALTAR 84/AOS/3/PASTOR/4/ MILAN/CUPE//SW89.3064/5/ KIRITATI	45	51	7933482	IG 41489/4/PRL/2*PASTOR// PBW343*2/KUKUNA/3/ ROLF07/5/NELOKI
39	44	7933338	H-1357/8/CNDO/R143// ENTE/MEXI_2/3/AEGILOPS SQUARROSA (TAUS)/4/ WEAVER/5/PICUS/6/TROST/7/ TACUPETO F2001/9/KAUZ// ALTAR 84/AOS/3/PASTOR/4/ MILAN/CUPE//SW89.3064/5/ KIRITATI	46	52	7933496	IG 41489/4/PRL/2*PASTOR// PBW343*2/KUKUNA/3/ ROLF07/5/NELOKI
40	45	7933343	H-1357/8/CNDO/R143// ENTE/MEXI_2/3/AEGILOPS SQUARROSA (TAUS)/4/ WEAVER/5/PICUS/6/TROST/7/ TACUPETO F2001/9/KAUZ// ALTAR 84/AOS/3/PASTOR/4/ MILAN/CUPE//SW89.3064/5/ KIRITATI	47	53	7933503	IG 41505/4/PRL/2*PASTOR// PBW343*2/KUKUNA/3/ ROLF07/5/NELOKI
				48	54	7933506	IG 41505/4/PRL/2*PASTOR// PBW343*2/KUKUNA/3/ ROLF07/5/NELOKI
				49	55	7933509	IG 41505/4/PRL/2*PASTOR// PBW343*2/KUKUNA/3/ ROLF07/5/NELOKI
				50	56	7933539	IG 122145/4/PRL/2*PASTOR// PBW343*2/KUKUNA/3/ ROLF07/5/NELOKI
				51	57	7933541	IG 122145/4/PRL/2*PASTOR// PBW343*2/KUKUNA/3/ ROLF07/5/NELOKI
				52	58	7933556	IG 122146/4/PRL/2*PASTOR// PBW343*2/KUKUNA/3/ ROLF07/5/NELOKI
				53	59	7933559	IG 122146/4/PRL/2*PASTOR// PBW343*2/KUKUNA/3/ ROLF07/5/NELOKI
				54	60	7933656	IG 122193/4/PRL/2*PASTOR// PBW343*2/KUKUNA/3/ ROLF07/5/NELOKI
				55	62	7933660	IG 122193/4/PRL/2*PASTOR// PBW343*2/KUKUNA/3/ ROLF07/5/NELOKI



Genotype	Gbs Line	Gid	Pedigree	Genotype	Gbs Line	Gid	Pedigree
56	63	7933675	IG 122196/4/PRL/2*PASTOR// P B W 3 4 3 * 2 / K U K U N A / 3 / ROLF07/5/NELOKI	79	92	7933837	INDIA-38/3/ATTILA*2/PBW65// MURGA/4/BORL14
57	64	7933683	IG 122196/4/PRL/2*PASTOR// P B W 3 4 3 * 2 / K U K U N A / 3 / ROLF07/5/NELOKI	80	94	7933841	INDIA-38/3/ATTILA*2/PBW65// MURGA/4/BORL14
58	65	7933720	IG 122795/4/PRL/2*PASTOR// P B W 3 4 3 * 2 / K U K U N A / 3 / ROLF07/5/NELOKI	81	97	7933845	INDIA-50/3/ATTILA*2/PBW65// MURGA/4/BORL14
59	66	7933728	68.111/RGB-U//WARD/3/FGO/4/ R A B I / 5 / A E . S Q U A R R O S A (890)/6/NELOKI/7/ATTILA*2/ PBW65//MURGA	82	98	7933846	INDIA-50/3/ATTILA*2/PBW65// MURGA/4/BORL14
60	67	7933741	H-1546/NELOKI/3/ATTILA*2/ PBW65//MURGA	83	102	7933852	INDIA-50/3/ATTILA*2/PBW65// MURGA/4/BORL14
61	68	7933744	H-1546/NELOKI/3/ATTILA*2/ PBW65//MURGA	84	104	7933866	TXL92.8.1/3/ATTILA*2/PBW65// MURGA/4/BORL14
62	70	7933749	H-1546/NELOKI/3/ATTILA*2/ PBW65//MURGA	85	105	7933881	LOCAL RED/AE.SQUARROSA (223)//BORL14/3/COPIO
63	71	7933751	H-1546/NELOKI/3/ATTILA*2/ PBW65//MURGA	86	106	7933882	LOCAL RED/AE.SQUARROSA (223)//BORL14/3/COPIO
64	72	7933762	H-1546/NELOKI/3/ATTILA*2/ PBW65//MURGA	87	108	7933897	LOCAL RED/AE.SQUARROSA (223)//BORL14/3/COPIO
65	73	7933764	H-1546/NELOKI/3/ATTILA*2/ PBW65//MURGA	88	110	7933904	LOCAL RED/AE.SQUARROSA (223)//BORL14/3/COPIO
66	74	7933767	H-1546/NELOKI/3/ATTILA*2/ PBW65//MURGA	89	113	7933939	68.111/RGB-U//WARD RESEL/3/ STIL/4/AE.SQUARROSA (628)/5/ BORL14/6/COPIO
67	76	7933773	H-1694/NELOKI/3/ATTILA*2/ PBW65//MURGA	90	114	7933940	68.111/RGB-U//WARD RESEL/3/ STIL/4/AE.SQUARROSA (628)/5/ BORL14/6/COPIO
68	77	7933776	H-1694/NELOKI/3/ATTILA*2/ PBW65//MURGA	91	115	7933941	68.111/RGB-U//WARD RESEL/3/ STIL/4/AE.SQUARROSA (628)/5/ BORL14/6/COPIO
69	78	7933785	H-1694/NELOKI/3/ATTILA*2/ PBW65//MURGA	92	116	7933945	68.111/RGB-U//WARD RESEL/3/ STIL/4/AE.SQUARROSA (628)/5/ BORL14/6/COPIO
70	79	7933786	H-1694/NELOKI/3/ATTILA*2/ PBW65//MURGA	93	117	7933947	68.111/RGB-U//WARD RESEL/3/ STIL/4/AE.SQUARROSA (628)/5/ BORL14/6/COPIO
71	80	7933792	H-1694/NELOKI/3/ATTILA*2/ PBW65//MURGA	94	118	7933957	68.111/RGB-U//WARD RESEL/3/ STIL/4/AE.SQUARROSA (630)/5/ BORL14/6/COPIO
72	81	7933794	H-1699/NELOKI/3/ATTILA*2/ PBW65//MURGA	95	119	7933958	68.111/RGB-U//WARD RESEL/3/ STIL/4/AE.SQUARROSA (630)/5/ BORL14/6/COPIO
73	82	7933797	H-1699/NELOKI/3/ATTILA*2/ PBW65//MURGA	96	120	7933960	68.111/RGB-U//WARD RESEL/3/ STIL/4/AE.SQUARROSA (630)/5/ BORL14/6/COPIO
74	84	7933801	H-1699/NELOKI/3/ATTILA*2/ PBW65//MURGA	97	122	7933963	68.111/RGB-U//WARD RESEL/3/ STIL/4/AE.SQUARROSA (630)/5/ BORL14/6/COPIO
75	85	7933807	IG 131672/3/ATTILA*2/PBW65// MURGA/4/BORL14	98	123	7933964	68.111/RGB-U//WARD RESEL/3/ STIL/4/AE.SQUARROSA (630)/5/ BORL14/6/COPIO
76	86	7933816	IG 131672/3/ATTILA*2/PBW65// MURGA/4/BORL14	99	124	7933966	68.111/RGB-U//WARD RESEL/3/ STIL/4/AE.SQUARROSA (630)/5/ BORL14/6/COPIO
77	88	7933827	IG 131672/3/ATTILA*2/PBW65// MURGA/4/BORL14				
78	90	7933831	INDIA-38/3/ATTILA*2/PBW65// MURGA/4/BORL14				



Genotype	Gbs Line	Gid	Pedigree	Genotype	Gbs Line	Gid	Pedigree
100	125	7933967	68.111/RGB-U//WARD RESEL/3/ STIL/4/AE.SQUARROSA (630)/5/ BORL14/6/COPIO	120	155	7934091	IG 41620/COPIO/3/KACHU #1/ KIRITATI//KACHU
101	126	7933971	68.111/RGB-U//WARD RESEL/3/ STIL/4/AE.SQUARROSA (630)/5/ BORL14/6/COPIO	121	156	7934105	IG 41620/COPIO/3/KACHU #1/ KIRITATI//KACHU
102	128	7933973	68.111/RGB-U//WARD RESEL/3/ STIL/4/AE.SQUARROSA (630)/5/ BORL14/6/COPIO	122	158	7934117	PERSIA-7/COPIO/3/KACHU #1/ KIRITATI//KACHU
103	129	7933975	68.111/RGB-U//WARD RESEL/3/ STIL/4/AE.SQUARROSA (630)/5/ BORL14/6/COPIO	123	159	7934120	PERSIA-7/COPIO/3/KACHU #1/ KIRITATI//KACHU
104	130	7933977	68.111/RGB-U//WARD RESEL/3/ STIL/4/AE.SQUARROSA (630)/5/ BORL14/6/COPIO	124	160	7934122	PERSIA-7/COPIO/3/KACHU #1/ KIRITATI//KACHU
105	132	7933990	D67.2/PARANA 66.270// AE.SQUARROSA (1085)/3/ BORL14/4/COPIO	125	161	5410961	EMPTY PLOT
106	133	7933992	D67.2/PARANA 66.270// AE.SQUARROSA (1085)/3/ BORL14/4/COPIO	126	162	7934124	PERSIA-7/COPIO/3/KACHU #1/ KIRITATI//KACHU
107	135	7933999	IWA8612416/BORL14//COPIO	127	163	7934127	PERSIA-7/COPIO/3/KACHU #1/ KIRITATI//KACHU
108	136	7934004	IWA8612416/BORL14//COPIO	128	165	7934130	PERSIA-7/COPIO/3/KACHU #1/ KIRITATI//KACHU
109	139	7934013	IWA8612416/BORL14//COPIO	129	166	7934132	PERSIA-7/COPIO/3/KACHU #1/ KIRITATI//KACHU
110	140	7934014	IWA8612416/BORL14//COPIO	130	167	7934141	PERSIA-21/COPIO/3/KACHU #1/KIRITATI//KACHU
111	141	7934022	IWA8611400/BORL14//COPIO	131	168	7934142	PERSIA-21/COPIO/3/KACHU #1/KIRITATI//KACHU
112	142	7934036	IWA8611400/BORL14//COPIO	132	169	7934144	PERSIA-21/COPIO/3/KACHU #1/KIRITATI//KACHU
113	143	7934042	IWA8611400/BORL14//COPIO	133	170	7934148	PERSIA-21/COPIO/3/KACHU #1/KIRITATI//KACHU
114	145	7934047	T.DICOCCON PI94624/ AE.SQUARROSA (454)// COPIO/3/KACHU #1/KIRITATI// KACHU	134	172	7934156	CETA/AE.SQUARROSA (850)/3/KACHU #1/KIRITATI// KACHU / 4 / P B W 3 4 3 * 2 / KUKUNA*2//FRTL/PIFED
115	146	7934061	T.DICOCCON PI94624/ AE.SQUARROSA (454)// COPIO/3/KACHU #1/KIRITATI// KACHU	135	173	7934161	CETA/AE.SQUARROSA (850)/3/KACHU #1/KIRITATI// KACHU / 4 / P B W 3 4 3 * 2 / KUKUNA*2//FRTL/PIFED
116	147	7934062	T.DICOCCON PI94624/ AE.SQUARROSA (454)// COPIO/3/KACHU #1/KIRITATI// KACHU	136	174	7934180	CETA/AE.SQUARROSA (872)/3/KACHU #1/KIRITATI// KACHU / 4 / P B W 3 4 3 * 2 / KUKUNA*2//FRTL/PIFED
117	150	7934078	T.DICOCCON PI94625/ AE.SQUARROSA (372)// COPIO/3/KACHU #1/KIRITATI// KACHU	137	175	7934186	CETA/AE.SQUARROSA (872)/3/KACHU #1/KIRITATI// KACHU / 4 / P B W 3 4 3 * 2 / KUKUNA*2//FRTL/PIFED
118	151	7934079	T.DICOCCON PI94625/ AE.SQUARROSA (372)// COPIO/3/KACHU #1/KIRITATI// KACHU	138	176	7934191	CETA/AE.SQUARROSA (895)/3/KACHU #1/KIRITATI// KACHU / 4 / P B W 3 4 3 * 2 / KUKUNA*2//FRTL/PIFED
119	154	7934085	T.DICOCCON PI94625/ AE.SQUARROSA (372)// COPIO/3/KACHU #1/KIRITATI// KACHU	139	178	7934201	CETA/AE.SQUARROSA (895)/3/KACHU #1/KIRITATI// KACHU / 4 / P B W 3 4 3 * 2 / KUKUNA*2//FRTL/PIFED



Genotype	Gbs Line	Gid	Pedigree	Genotype	Gbs Line	Gid	Pedigree
140	180	7934240	YAV79//DACK/RABI/3/ SNIPE/4/AE.SUARROSA (460)/5/KACHU #1/KIRITATI// KACHU/6/PBW343*2/ KUKUNA*2//FRTL/PIFED	160	204	7934502	MEX94.30.10/NAVJ07//KACHU
				161	205	7934506	MEX94.30.10/NAVJ07//KACHU
				162	206	7934516	ARLIN/AE.SUARROSA (283)// KACHU/3/BAJ #1
141	181	7934242	YAV79//DACK/RABI/3/ SNIPE/4/AE.SUARROSA (460)/5/KACHU #1/KIRITATI// KACHU/6/PBW343*2/ KUKUNA*2//FRTL/PIFED	163	207	7934531	ARLIN/AE.SUARROSA (283)// KACHU/3/BAJ #1
				164	208	7934557	CROC_1/AE.SUARROSA (436)//KACHU/3/BAJ #1
				165	209	7934567	CROC_1/AE.SUARROSA (436)//KACHU/3/BAJ #1
142	182	7934243	YAV79//DACK/RABI/3/ SNIPE/4/AE.SUARROSA (460)/5/KACHU #1/KIRITATI// KACHU/6/PBW343*2/ KUKUNA*2//FRTL/PIFED	166	211	7934579	CROC_1/AE.SUARROSA (436)//KACHU/3/BAJ #1
				167	213	7934585	CROC_1/AE.SUARROSA (436)//KACHU/3/BAJ #1
143	184	7934265	YAV79//DACK/RABI/3/ SNIPE/4/AE.SUARROSA (477)/5/KACHU #1/KIRITATI// KACHU/6/PBW343*2/ KUKUNA*2//FRTL/PIFED	168	214	7934587	CROC_1/AE.SUARROSA (436)//KACHU/3/BAJ #1
				169	215	7934593	CROC_1/AE.SUARROSA (436)//KACHU/3/BAJ #1
144	185	7934269	YAV79//DACK/RABI/3/ SNIPE/4/AE.SUARROSA (477)/5/KACHU #1/KIRITATI// KACHU/6/PBW343*2/ KUKUNA*2//FRTL/PIFED	170	217	7934601	CROC_1/AE.SUARROSA (436)//KACHU/3/BAJ #1
				171	219	7934627	CROC_1/AE.SUARROSA (176)//KACHU/3/BAJ #1
				172	220	7934632	CROC_1/AE.SUARROSA (176)//KACHU/3/BAJ #1
145	186	7934275	YAV79//DACK/RABI/3/ SNIPE/4/AE.SUARROSA (477)/5/KACHU #1/KIRITATI// KACHU/6/PBW343*2/ KUKUNA*2//FRTL/PIFED	173	221	7934640	CROC_1/AE.SUARROSA (176)//KACHU/3/BAJ #1
				174	222	7934658	GAN/AE.SUARROSA (206)// KACHU/3/BAJ #1
146	187	7934294	GARZA/BOY//AE.SUARROSA (278)/3/PBW343*2/KUKUNA*2// FRTL/PIFED/4/QUAIU #1	175	223	7934663	GAN/AE.SUARROSA (206)// KACHU/3/BAJ #1
147	188	7934321	GARZA/BOY//AE.SUARROSA (281)/3/PBW343*2/KUKUNA*2// FRTL/PIFED/4/QUAIU #1	176	224	7934683	GAN/AE.SUARROSA (206)// KACHU/3/BAJ #1
				177	225	7934687	GAN/AE.SUARROSA (206)// KACHU/3/BAJ #1
148	190	7934353	DOY1/AE.SUARROSA (415)/3/ PBW343*2/KUKUNA*2//FRTL/ PIFED/4/QUAIU #1	178	227	7934725	D67.2/PARANA 66.270// AE.SUARROSA (506)/3/ KACHU/4/BAJ #1
149	191	7934377	LOCAL RED/AE.SUARROSA (220)/3/PBW343*2/KUKUNA*2// FRTL/PIFED/4/QUAIU #1	179	228	7934760	INDIA-59/KACHU//BAJ #1
				180	229	7934766	INDIA-59/KACHU//BAJ #1
150	192	7934385	LOCAL RED/AE.SUARROSA (220)/3/PBW343*2/KUKUNA*2// FRTL/PIFED/4/QUAIU #1	181	230	7934778	INDIA-59/KACHU//BAJ #1
				182	231	7934788	INDIA-107/KACHU//BAJ #1
151	194	7934395	JAL95.4.3/VORB//ROLF07	183	232	7934802	INDIA-107/KACHU//BAJ #1
152	195	7934408	H-1491/ROLF07//NAVJ07	184	233	7934804	INDIA-107/KACHU//BAJ #1
153	196	7934409	H-1491/ROLF07//NAVJ07	185	234	7934809	INDIA-107/KACHU//BAJ #1
154	197	7934428	H-1491/ROLF07//NAVJ07	186	236	7934841	IG 41474/NAVJ07//KACHU
155	198	7934429	H-1491/ROLF07//NAVJ07	187	237	7934846	IG 41506/3/PBW343*2/ KUKUNA*2//FRTL/PIFED/4/ QUAIU #1
156	199	7934440	IG 41243/NAVJ07//KACHU				
157	200	7934446	IG 41243/NAVJ07//KACHU	188	238	7934847	IG 41506/3/PBW343*2/ KUKUNA*2//FRTL/PIFED/4/ QUAIU #1
158	201	7934479	H-1601/NAVJ07//KACHU				
159	202	7934483	H-1601/NAVJ07//KACHU				



Genotype	Gbs Line	Gid	Pedigree	Genotype	Gbs Line	Gid	Pedigree
189	239	7934848	IG 41506/3/PBW343*2/ KUKUNA*2//FRTL/PIFED/4/ QUAIU #1	206	257	7935021	IG 122738/3/PBW343*2/ KUKUNA*2//FRTL/PIFED/4/ QUAIU #1
190	240	7934851	IG 41506/3/PBW343*2/ KUKUNA*2//FRTL/PIFED/4/ QUAIU #1	207	258	7935026	IG 122738/3/PBW343*2/ KUKUNA*2//FRTL/PIFED/4/ QUAIU #1
191	241	7934852	IG 41506/3/PBW343*2/ KUKUNA*2//FRTL/PIFED/4/ QUAIU #1	208	259	7935040	IG 122740/3/PBW343*2/ KUKUNA*2//FRTL/PIFED/4/ QUAIU #1
192	242	7934855	IG 41506/3/PBW343*2/ KUKUNA*2//FRTL/PIFED/4/ QUAIU #1	209	260	7935047	IG 122740/3/PBW343*2/ KUKUNA*2//FRTL/PIFED/4/ QUAIU #1
193	243	#N/A	#N/A	210	261	7935051	IG 122741/NAVJ07//KACHU
194	244	#N/A	#N/A	211	262	7935056	IG 122741/NAVJ07//KACHU
195	245	7934894	IG 41735/NAVJ07//KACHU	212	263	7935057	IG 122741/NAVJ07//KACHU
196	246	7934904	IG 41735/NAVJ07//KACHU	213	264	7935064	IG 122743/NAVJ07//KACHU
197	247	7934909	IG 43238/NAVJ07//KACHU	214	265	7935072	PERSIA-88/3/PBW343*2/ KUKUNA*2//FRTL/PIFED/4/ QUAIU #1
198	248	7934939	IG 107128/4/PRL/2*PASTOR// PBW343*2/KUKUNA/3/ ROLF07/5/NELOKI	215	266	7935090	PERSIA-88/3/PBW343*2/ KUKUNA*2//FRTL/PIFED/4/ QUAIU #1
199	250	7934982	IG 122139/NAVJ07//KACHU	216	270	7935151	IWA 8602098/NAVJ07//KACHU
200	251	7934986	IG 122139/NAVJ07//KACHU	217	271	7935164	IWA8612134/NAVJ07//KACHU
201	252	7934992	IG 122627/6/KAUZ//ALTAR 84/AOS/3/PASTOR/4/ MILAN/CUPE//SW89.3064/5/ KIRITATI/7/SW89.5277/ BORL95//SKAUZ/3/ PRL/2*PASTOR/4/HEILO	218	273	7935184	IWA8614378/NAVJ07//KACHU
202	253	7934995	IG 122627/6/KAUZ//ALTAR 84/AOS/3/PASTOR/4/ MILAN/CUPE//SW89.3064/5/ KIRITATI/7/SW89.5277/ BORL95//SKAUZ/3/ PRL/2*PASTOR/4/HEILO	219	274	7935186	IWA8614378/NAVJ07//KACHU
203	254	7934996	IG 122627/6/KAUZ//ALTAR 84/AOS/3/PASTOR/4/ MILAN/CUPE//SW89.3064/5/ KIRITATI/7/SW89.5277/ BORL95//SKAUZ/3/ PRL/2*PASTOR/4/HEILO	220	275	7935188	IWA8614378/NAVJ07//KACHU
204	255	7934999	IG 122627/6/KAUZ//ALTAR 84/AOS/3/PASTOR/4/ MILAN/CUPE//SW89.3064/5/ KIRITATI/7/SW89.5277/ BORL95//SKAUZ/3/ PRL/2*PASTOR/4/HEILO	221	276	7935190	IWA8614378/NAVJ07//KACHU
205	256	7935001	IG 122627/6/KAUZ//ALTAR 84/AOS/3/PASTOR/4/ MILAN/CUPE//SW89.3064/5/ KIRITATI/7/SW89.5277/ BORL95//SKAUZ/3/ PRL/2*PASTOR/4/HEILO	HD3249			
				HD2967			
				DBW14			RAJ3765/PBW343
				DBW187			NAC/TH.AC//3*PVN/3/MIRLO/ BUC/4/2*PASTOR/5/KACHU/6/ KACHU

Supplementary Table 2 Distribution of the 225 wheat genotypes based on Mahalanobis D² values

Cluster	Genotypes	Genotypic number
Cluster I	36	31, 56, 57, 61, 64, 65, 66, 68, 69, 72, 73, 78, 87, 91, 122, 125, 144, 145, 148, 150, 151, 156, 159, 160, 162, 163, 164, 165, 16, 171, 173, 175, 186, 193, 199, 207
Cluster II	36	54, 74, 75, 76, 102, 108, 109, 110, 111, 116, 117, 118, 120, 121, 135, 139, 141, 146, 147, 149, 153, 158, 174, 176, 178, 203, 205, 212, 213, 214, 215, 217, 219, 221, HD3249, HD2967
Cluster III	11	21, 23, 25, 32, 37, 38, 39, 40, 192, 209, 211
Cluster IV	21	50, 51, 52, 53, 55, 58, 60, 77, 127, 131, 142, 167, 182, 183, 188, 189, 190, 191, 194, 195, DBW187
Cluster V	51	30, 41, 42, 46, 47, 59, 62, 63, 92, 100, 101, 103, 104, 105, 106, 107, 113, 114, 115, 119, 123, 124, 126, 128, 130, 132, 133, 134, 136, 137, 138, 140, 143, 155, 157, 161, 169, 170, 196, 197, 198, 200, 201, 202, 204, 206, 208, 210, 216, 220, DBW14
Cluster VI	44	11, 12, 13, 14, 15, 17, 18, 19, 20, 22, 24, 26, 27, 28, 29, 33, 34, 35, 36, 43, 44, 48, 49, 67, 70, 79, 82, 86, 88, 89, 90, 112, 129, 152, 154, 168, 172, 177, 180, 181, 184, 185, 187, 218
Cluster VII	26	1, 2, 3, 45, 6, 7, 8, 9, 10, 16, 45, 71, 80, 81, 83, 84, 85, 93, 94, 95, 96, 97, 98, 99, 179

Supplementary Table 3 Cluster-wise average value of studied traits

Cluster	DF	DPM	DA	GFD	FLA	NDVI (ZS45)	NDVI (ZS75)	CT (ZS45)	CT (ZS75)	CCI (ZS45)	CCI (ZS75)	PH	SPL	PDL	TGW	YPPT
I	68.03	108.13	77.18	30.95	23.06	0.82	0.36	21.18	32.82	23.98	16.49	84.95	9.41	28.95	20.03	107.03
II	55.33	96.33	64	32.33	25.38	0.8	0.22	20.33	34.73	22.63	14.97	100.0	10.33	37.67	33.33	283.33
III	65.87	105.3	75	30.3	38.37	0.84	0.45	19.85	34.14	29.77	22.62	93.8	10.43	30.7	28.0	198.67
IV	60.58	100.33	70	30.33	29.09	0.82	0.28	19.99	34.68	23.6	15.87	92.46	9.29	34.54	27.67	193.13
V	68.93	109.18	77.75	31.43	26.67	0.82	0.44	21.1	32.59	24.44	18.1	96.68	10.71	32.71	24.75	160.86
VI	61.55	101.55	70.74	30.81	26.72	0.81	0.3	21	33.39	24.45	15.87	85.74	9.76	29.88	23.62	143.14
VII	65.64	105.53	74.78	30.75	25.96	0.83	0.36	20.32	33.43	23	16.92	93.08	9.44	30.61	28.2	194.8

*DF, Days to 50% flowering; DA, Days to anthesis; DPM, Days to physiological maturity; GFD, Grain filling duration; NDVI, Normalized difference vegetation index; CT, Canopy temperature; CCI, Chlorophyll content index at ZS45 and ZS75; ZS, Zadoks Scale; ZS45, Late booting; ZS75, Medium milking; FLA, Flag leaf area (cm²); PH, Plant height (cm); SPL, Spike length (cm); PDL, Peduncle length (cm); TGW, 1000-grain weight (g); YPPT, Yield/plot.

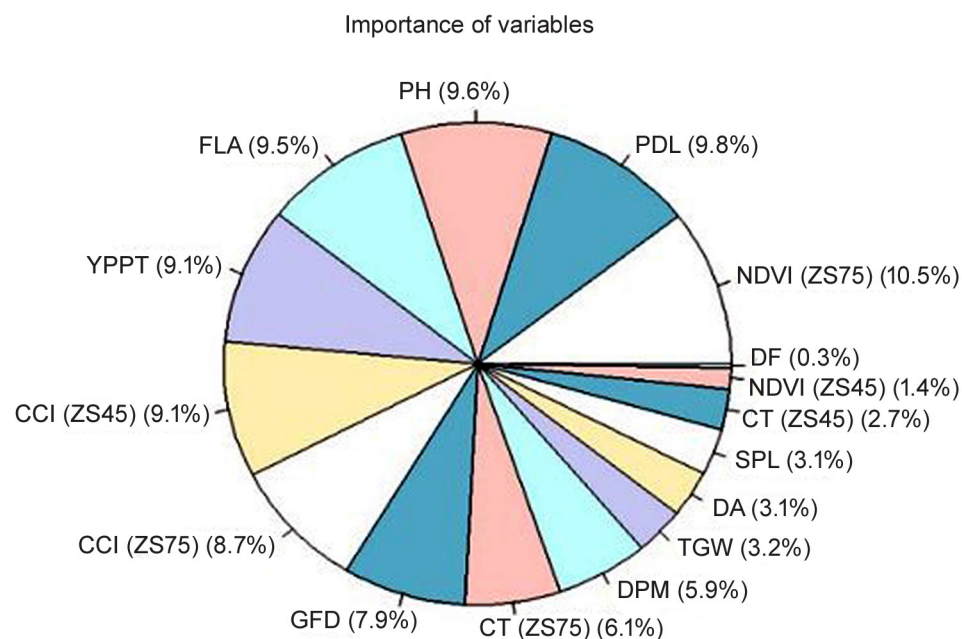
Supplementary Table 4 Intra and inter-cluster distance for studied traits under heat stress condition

	Cluster I	Cluster II	Cluster III	Cluster IV	Cluster V	Cluster VI	Cluster VII
Cluster I	3.152	3.255	6.341	4.875	4.099	4.611	5.215
Cluster II		2.958	4.409	2.997	2.613	2.734	3.940
Cluster III			3.353	3.631	6.499	4.635	6.958
Cluster IV				3.311	4.073	2.607	3.717
Cluster V					2.882	3.366	2.533
Cluster VI						2.358	3.425
Cluster VII							3.049

Supplementary Table 5 Vector loadings and per cent explained variation by the Major six PCs

	PC1	PC2	PC3	PC4	PC5	PC6
DF*	0.977	-0.102	0.011	-0.053	0.011	-0.006
DPM	0.955	-0.106	-0.016	-0.057	0.173	-0.009
DA	0.968	-0.11	0.002	-0.059	-0.086	-0.021
GFD	0.034	0.007	-0.066	0.001	0.985	0.043
FLA	-0.089	0.124	0.527	0.072	-0.102	0.386
NDVI (ZS45)	0.103	0.14	0.073	-0.032	-0.017	0.031
NDVI (ZS75)	0.695	0.07	0.375	0.101	-0.06	0.274
CT (ZS45)	0.021	-0.11	-0.111	-0.221	0.064	0.079
CT (ZS75)	-0.357	0.19	-0.002	-0.172	-0.108	0.045
CCI (ZS45)	-0.028	-0.038	0.926	-0.009	-0.019	0
CCI (ZS75)	0.225	0.166	0.851	0.008	-0.016	0.086
PH	0.189	0.36	0.013	0.595	-0.108	0.46
SPL	0.047	-0.015	0.128	0.001	0.076	0.92
PDL	-0.143	0.028	0.021	0.926	0.035	-0.047
TGW	-0.125	0.947	0.071	0.04	0.013	0.045
YPPT	-0.123	0.953	0.094	0.098	-0.006	0.002
Eigen value	3.99	3.18	1.61	1.31	1.20	0.92
Percentage of variance	24.92	19.90	10.05	8.21	7.52	5.78
Cumulative percentage of variance	24.92	44.82	54.87	63.08	70.60	76.38

*DF, Days to 50% flowering; DA, Days to anthesis; DPM, Days to physiological maturity; GFD, Grain filling duration; NDVI, Normalized difference vegetation index; CT, Canopy temperature; CCI, Chlorophyll content index at ZS45 and ZS75; ZS, Zadoks Scale; ZS45, Late booting; ZS75, Medium milking; FLA, Flag leaf area (cm²); PH, Plant height (cm); SPL, Spike length (cm); PDL, Peduncle length (cm); TGW, 1000-grain weight (g); YPPT, Yield/plot.



Supplementary Fig. 1 Per cent contribution of 16 traits for divergence in wheat genotypes.