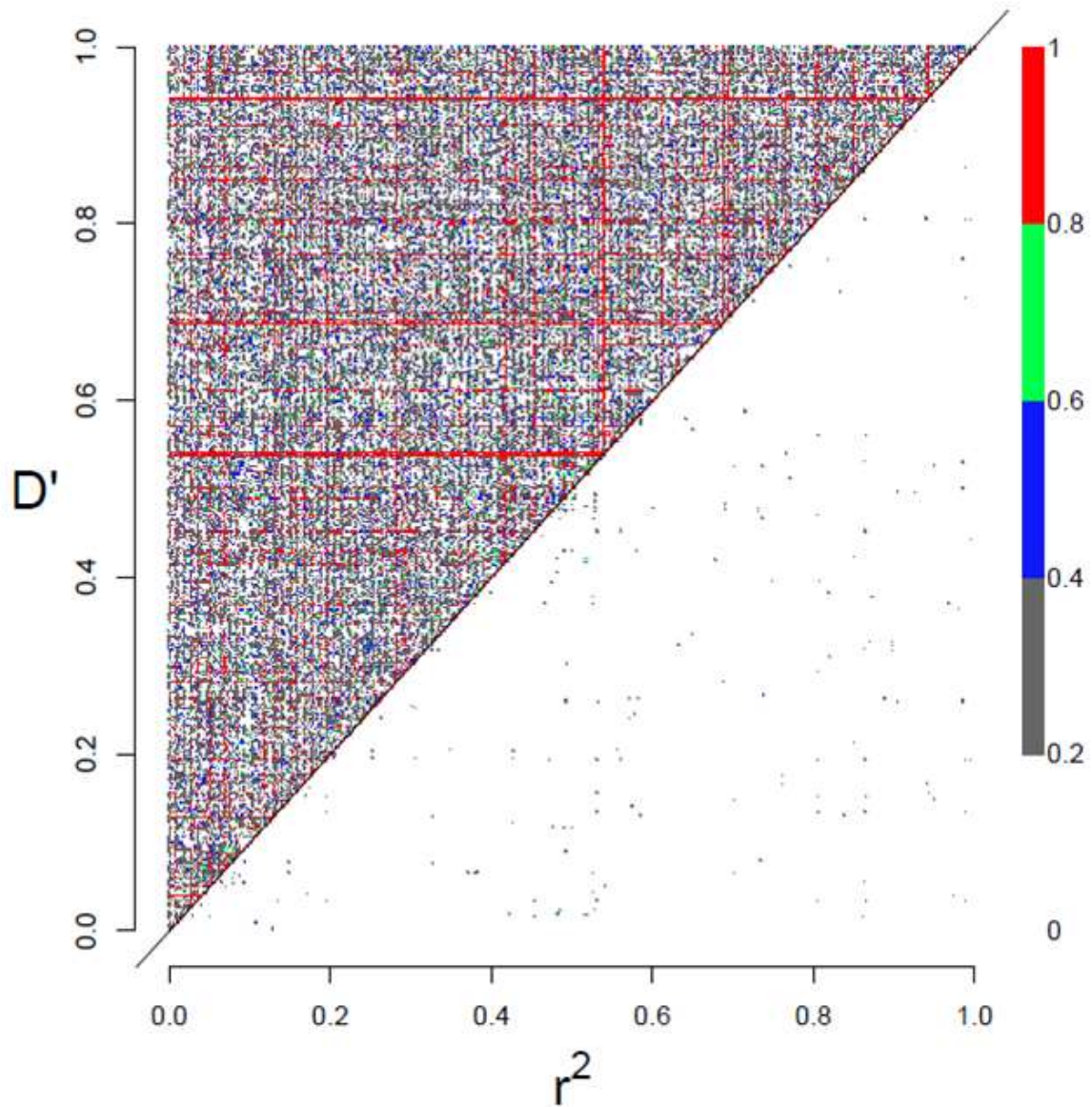
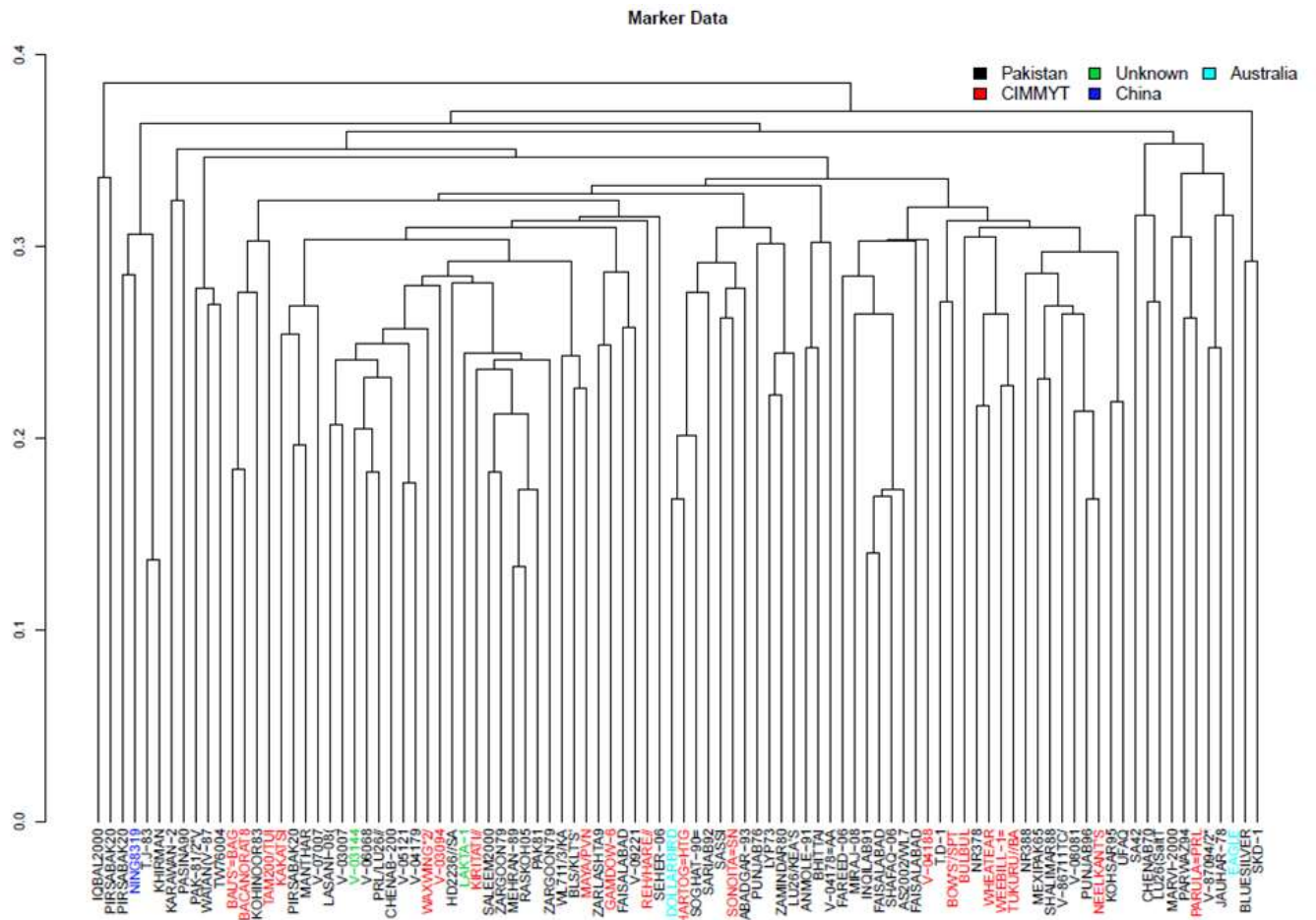


Appendix A List of 94 genotypes selected for association mapping and their Origin

S. NO	NAMES OF GENOTYPES	Origin	S. NO	NAMES OF GENOTYPES	Origin
1	FAISALABAD-08 (V-04189)	Pakistan	48	WATAN (V-87094)	Pakistan
2	V-04178 = AARI-10	Pakistan	49	BAU'S' = BAGULA	CIMMYT
3	SKD-1	Pakistan	50	SONOITA=SNI	CIMMYT
4	FAREED-06	Pakistan	51	LAKTA-1	Unknown
5	UFAQ	Pakistan	52	V-04188	CIMMYT
6	SOGHAT-90=PVN	Pakistan	53	NING 8319	China
7	INQILAB 91	Pakistan	54	NEELKANT'S'	CIMMYT
8	ABADGAR-93	Pakistan	55	BACANORA T88=BCN	CIMMYT
9	SASSI	Pakistan	56	V-03007	Pakistan
10	KOHSAR 95	Pakistan	57	MAYA/PVN	CIMMYT
11	ANMOLE-91	Pakistan	58	BULBUL	CIMMYT
12	T.J-83	Pakistan	59	HD2236//SA.42/HARRIER'S= V-97088	Pakistan
13	LASANI-08 (V-03138)	Pakistan	60	WL 711/3/KAL/BB//ALD = V-85054	Pakistan
14	BHITTAI	Pakistan	61	EAGLE	Australia
15	T.D-1	Pakistan	62	WEEBILL-1 = V-3158	CIMMYT
16	MANTHAR	Pakistan	63	BLS/KLT'S'	Pakistan
17	KHIRMAN	Pakistan	64	HARTOG=HTG.(PAVON)	CIMMYT
18	SALEEM 2000	Pakistan	65	LU26/KEA'S'	Pakistan
19	MIRAJ-08	Pakistan	66	V-03094	CIMMYT
20	MARVI-2000	Pakistan	67	KAKATSI	CIMMYT
21	PIRSABAK 2004	Pakistan	68	BOW'S/SPT'S'	CIMMYT
22	SHAFQA-06	Pakistan	69	V-04179	Pakistan
23	MEHRAN-89	Pakistan	70	PARULA=PRL	CIMMYT
24	PIRSABAK 2005	Pakistan	71	GAMDOW-6	CIMMYT
25	ZARGOON 79	Pakistan	72	TAM200/TUI	CIMMYT
26	FAISALABAD 85	Pakistan	73	REH/HARE//2*BCN/3/CROC-1/AE.SQ(213)//	CIMMYT
27	PAK 81	Pakistan	74	V-05121	Pakistan
28	ZARLASHTA 99	Pakistan	75	PRL/LU26//TRAP/LU26	Pakistan
29	IQBAL2000	Pakistan	76	V-09221	Pakistan
30	PARWAZ 94	Pakistan	77	V-06068	Pakistan
31	RASKOH 05	Pakistan	78	V-86711TC/SH-88//CROW	Pakistan
32	JAUHAR-78	Pakistan	79	V-08081	Pakistan
33	PASINA 90	Pakistan	80	WAXWING*2/KRITATI = V-7194	CIMMYT
34	SARIAB 92	Pakistan	81	PAK-81/2*V-87094	Pakistan
35	KARAWAN-2	Pakistan	82	NR 388	Pakistan
36	PUNJAB 76	Pakistan	83	V-07007	Pakistan
37	BLUE SILVER = SONALIKA	Pakistan	84	V-03144	Unknown
38	KOHINOOR 83	Pakistan	85	NR 378	Pakistan
39	PUNJAB 96	Pakistan	86	KIRITATI//2*SERI/RAYON	CIMMYT
40	CHENAB 70	Pakistan	87	V-87094/2*ERA/3/PAK-81/2*V-87094/4/SHAFQA	Pakistan
41	LU 26 (Salt Tolerant)	Pakistan	88	TW 76004	Pakistan
42	SA 42	Pakistan	89	WHEATEAR	CIMMYT
43	CHENAB-2000	Pakistan	90	AS2002/WL711//SHAFQA	Pakistan
44	LYP 73	Pakistan	91	SEHER-06	Pakistan
45	SHALIMAR 88	Pakistan	92	DOLLARBIRD	Australia
46	FAISALABAD 83	Pakistan	93	TUKURU//BAV92/RAYON*3/3/T.SPELTAP1348449	CIMMYT
47	MEXIPAK 65	Pakistan	94	ZAMINDAR 80	Pakistan



Appendix B Optimised dendrogram for 94 genotypes based on SSR markers using 1-Czekanowski similarity measure. (Adopted from Muhammad et al. 2018 *Int. J. Agric. Biol.*, 20: 2387–2394).



Appendix C The SSR data based cluster analysis of the Association panel used in this study.