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Screening of chickpea germplasm lines for drought tolerance based on Relative Water Content (RWC) and Membrane Stability Index (MSI) under rainfed condition

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Abstract

Chickpea is one of the most important legume crop in India. Biotic and abiotic stresses are the major constraints in chickpea production. Among them drought stress is one of the major limiting factor in chickpea production. In present study comprised five hundred germplasm lines of chickpea along with four checks were evaluated under moisture stress in Augmented Design at Pulses Improvement Project, MPKV, Rahuri-413 722, Dist.: Ahmednagar, India during *Rabi* 2021-22. The observations on Relative Water Content (%), Membrane Stability Index (%), Canopy Temperature (°C), Days to 50% flowering, Days to maturity, Number of pods per plant, 100 seed weight (g) and Harvest index (%) were recorded. The germplasm lines having the higher RWC and MSI values reflecting the higher capability to tolerate the drought stress. From the present investigation the germplasm lines ICC 181, ICC 595, ICC 1016, ICC 5929, ICC 6363, ICC 6367, ICC 6372, ICC 6395 and ICC 6788 exhibited higher values of Relative Water Content Membrane Stability Index which are drought tolerant. Therefore molecular analysis of these germplasm lines should be done to confirm drought tolerance and these line can be used in crossing programme so as to develop drought tolerant varieties as well as can be screened one more year and the lines which having common over the years can be identified and registered as a drought tolerant donor.

Keywords: Chickpea germplasm lines, RWC, MSI

Introduction

Chickpea is the most important legume crop and a source of nutrition to millions of people globally due to its richness in protein, fiber and minerals. It also re-mediates the soil by its ability to fix nitrogen in a symbiotic relationship with rhizobacteria upon nodulation. It is mostly grown under rainfed condition. Availability of water in rainfed regions is either in form of stored soil moisture in subtropical environment with summer-prevalent rainfall or only at the time of seasonal rainfall. Under such situation there is serious yield losses due to terminal drought stress (Toker *et al.* 2007, Yadav *et al.* 2006.a. and Yadav *et al.* 2006b.)^[7, 11, 12] Drought stress is one of the major constraint for chickpea, which causes up to 50% yield losses (Varshney *et al.* 2014)^[10]. High relative water content (RWC) and Membrane Stability Index (MSI) was related to drought resistance (Araghi *et al.* 1998)^[2].

Materials and Methods

Five hundred germplasm lines of chickpea along with four checks were evaluated under moisture stress in Augmented Design at Pulses Improvement Project, MPKV, Rahuri-413 722, Dist.: Ahmednagar (M.S.), India during *Rabi* 2021-22. The four checks was sown after every twenty germplasm lines with the spacing of 30 x 10 cm. and plot size of 2.5 × 0.30 m² (Single Row). Only one irrigation was given to trial at the time of sowing for good germination. Soil moisture was measure at 30, 60 and 90 cm depth after 30 DAS, at flowering, podding and harvesting stage of crop (Table 1).

The observations on Relative Water Content (RWC) (%), Membrane Stability Index (MSI) (%), Canopy Temperature (°C), Days to 50% flowering, Days to maturity, Number of pods per plant, 100 seed weight (g) and Harvest index (%) were recorded.

The relative water content (RWC) was estimated from the turgid weight (TW) of fresh leaf samples (fresh weight FW) after being kept in water for 4 h, followed by drying in hot air oven till constant mass (dry weight, DM) was achieved (Weatherley 1950)^[11]. It was calculated as:

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$$RWC = [(FM - DM)/(TM - DM)] \times 100.$$

Membrane Stability Index (MSI) was estimated according to Sairam *et al.* (1997) [8]. For MSI estimation, 100 mg of leaf material, in two sets, was taken in test tubes containing 10 ml of double distilled water. One set was heated at 40 °C for 30 min in a water bath, and the electrical conductivity of the solution was recorded on a conductivity bridge (C1). Another sample was boiled at 100°C on a boiling water bath for 10 min, then its conductivity was measured on a conductivity bridge (C2). MSI was calculated as:

$$MSI = [1 - (C1/C2)] \times 100.$$

Harvest index was worked out by formula given by Donald and Hamblin

$$\text{Harvest index (\%)} = (\text{Grain yield} / \text{Biological yield}) \times 100$$

The data for all the characters was analyzed as per Augmented design.

Table 1: Moisture content at different growth stages of Chickpea Trial 2021-22

Growth stages	Moisture percentage at soil depth (cm)		
	30	60	90
At 30 DAS	39.45	40.63	37.58
At Flowering	32.33	38.90	37.18
At Pod development	23.85	27.78	18.30
At Harvesting	22.73	13.38	7.65

Result and Discussion

The analysis of variance for eight characters is presented in Table 2. From the analysis of variance revealed significant differences among Checks vs. Varieties which indicated the presence of substantial genetic variability among the germplasm lines and checks for all the traits under study.

Out of 500 lines 122 lines were observed wilt susceptible. Mean data of remaining 378 germplasm lines along with four checks for grain yield and yield contributing characters are presented in Table 3.

The germplasm lines recorded high Relative Water Content (RWC) viz: ICC 739 (92.08%), ICC 1319 (89.54%), ICC 3533 (89.38%), ICC 1214 (89.33%), ICC 5004 (89.17%), ICC 181 (89.05%), ICC 2993 (88.82%), ICC 2810 (87.83%), ICC 1441 (87.55%), ICC 5929 (87.19%), ICC 1450 (85.87%) and

ICC 6679 (85.15%) than the ICC 4958 (79.01%). Out of 378 lines 39 lines, were at par over the check ICC 4958. Mean values for RWC varies from 52.15 to 92.08%.

Similarly for the character Membrane Stability Index (MSI), mean values varies from 45.43 to 91.59%, and the germplasm lines viz. ICC 2835 (91.59%), ICC 3259 (91.49%), ICC 5682 (91.31%), ICC 6382(90.84%), ICC 4348 (90.11%), ICC 6037 (90.02%), ICC 6386 (89.95%), ICC 6457 (89.68%), ICC 6876 (89.64%), ICC 6756 (88.22%), ICC 6077 (87.87%), ICC 6379 (87.83%), ICC 6751 (87.53%), ICC 6411 (87.52%), ICC 2812 (87.15%), ICC 3534 (87.13%), ICC 3457 (87.11%) and ICC 6039 (86.55%) were at par over the superior universal drought tolerant check ICC 4958 (86.81%).

The mean values for canopy temperature varies from 7.04 to 44.1 °C. The germplasm lines ICC 1012 (8.76 °C), ICC 2862 (9.77 °C), ICC 3072 (9.93 °C), ICC 3075 (7.04 °C), ICC 3076 (9.54 °C), ICC 3095 (9.76 °C), ICC 3219 (9.54 °C), ICC 4374 (8.34 °C), ICC 6570 (9.54 °C) were found significant over the superior check ICC 4958 (13.65 °C) for the character canopy temperature. Out of 378 lines 57 lines wear at par over the check ICC 4958.

Out of 378 germplasm lines, 54 germplasm lines were superior over the check ICC-4958 (53.54). Among the 54 lines, ICC-6437 recorded 127.23 highest pods per plant followed by ICC-1984 (124.69), ICC-2484 (110.51), ICC-519 (108.45). Mean values for number of pods per plants was from 52.15 to 92.08%.

The 100 seed weight mean values of germplasm varies between 6.72 to 21.52 g. The ICC 6235 (21.52 g), ICC 2931 (21.00 g), ICC 6250 (20.99 g), ICC 2278 (20.84 g), ICC 6633 (20.68 g), ICC 6633 (20.63 g) and ICC 5680 (20.30 g) lines were at par over second superior check BGM-10-216 (19.05 g) for 100 seed weight.

Among the 378 germplasm lines 31 germplasm lines recorded highest harvest index among which ICC-519 (59.98%), ICC-3537 (53.69%) and ICC-3531 (52.50%) recorded highest harvest index over the superior check Vijay (42.60%). Mean values for harvest index was varies from 3.99 to 59.98%. There were 24 germplasm lines which were at par over superior check Vijay for the said character.

Ali *et al.* (2011) [1], Bajji *et al.* (2002) [3], Ceyhan *et al.* (2012) [4], Dhanda and Sethi (2002) [5], and Farooq and Azam (2002) [7] reported that higher RWC and MSI values were reflecting the higher capability to tolerate the drought stress.

Table 2: Analysis of variance for eight characters of chickpea

Sources of variation	D.f.	Mean sum of squares							
		RWC (%)	MSI (%)	Canopy temp. (°C)	Days to 50% flowering	Days to maturity	No. of pods per plant	100 seed wt. (g)	Harvest Index (%)
Block (Ignoring Treatments)	20	38.11**	139.14**	69.24**	115.36**	73.75**	911.33**	10.89**	137.28**
Treatment (eliminating Blocks)	381	47.31**	73.04**	28.63**	105.24**	32.58**	446.06**	16.52**	102.03**
Checks	3	620.68**	1354.17**	133.78**	145.11**	203.76**	1672.67**	112.20**	243.64**
Checks + Var vs. Var.	378	42.76**	62.87**	27.79**	104.93**	31.23**	436.33**	15.76**	100.90**
Error	60	6.08	10.10	3.31	6.08	1.18	33.98	2.96	2.96
Block (eliminating Check+Var.)	20	3.51	9.70	0.69	3.93	2.21*	50.50	1.53	2.88
Entries (ignoring Blocks)	381	49.12**	79.83**	32.23**	111.09**	36.34**	491.25**	17.01**	109.08**
Checks	3	620.68**	1354.17**	133.78**	145.11**	203.76**	1672.67**	112.20**	243.64**
Varieties	377	43.16**	64.43**	31.23**	55.31**	27.47**	480.79**	5.27**	98.01**
Checks vs. Varieties	1	581.78**	2063.32**	102.58**	2104.136**	2877.79**	889.85**	4158.42**	3879.83**
Error	60	6.08	10.10	3.31	6.08	1.18	33.98	2.96	2.96
Ci - Cj	1	1.52	1.96	1.12	1.52	0.67	3.60	1.06	1.06
BiVi - BiVj	1	6.98	8.99	5.15	6.97	3.07	16.49	4.87	4.86
BiVi - BjVj	1	7.80	10.05	5.76	7.80	3.43	18.44	5.44	5.44
Ci - Vi	1	5.75	7.41	4.25	5.75	2.53	13.60	4.01	4.01

*, ** Significant at 5 and 1 per cent level respectively.

Table 3: Mean performance of germplasm for different characters in Chickpea

Sr. No.	Germplasm	RWC (%)	MSI (%)	Canopy temp. (°C)	Days to 50% flowering	Days to maturity	No. of pods per plant	100 seed wt. (g)	Harvest Index (%)
1	ICC 43	65.19	56.22	15.20	68.18	108.04	49.14	9.82	34.01
2	ICC 121	70.37	75.41	16.92	64.18	104.04	39.47	11.32	38.62
3	ICC 154	64.69	77.65	19.64	70.18	109.04	38.14	10.07	38.07
4	ICC 181	89.05**	80.93	27.42	70.18	110.04	27.47	15.85	23.41
5	ICC 182	61.50	72.72	14.36	67.18	106.04	46.80	12.07	29.32
6	ICC 202	69.36	77.17	13.48	57.18	100.04	81.80**	10.49	32.49
7	ICC 209	67.35	72.48	34.09	60.18	98.04	39.47	13.91	33.32
8	ICC 216	71.13	77.83	14.70	57.18	96.04	41.14	11.59	39.78
9	ICC 240	66.73	77.01	15.56	60.18	101.04	83.80**	11.71	52.00**
10	ICC 250	65.19	77.01	13.53	63.18	102.04	30.47	10.94	33.35
11	ICC 267	70.16	72.96	14.53	59.18	99.04	69.47**	10.56	35.48
12	ICC 268	61.87	76.03	14.25	60.18	100.04	44.47	11.37	34.71
13	ICC 301	72.73	68.27	14.36	59.18	98.04	50.47	12.56	42.85
14	ICC 391	63.94	77.59	13.42	65.18	104.04	31.80	11.35	35.76
15	ICC 434	66.18	78.75	14.42	61.18	102.04	6.14	12.65	37.24
16	ICC 438	74.01	75.44	13.53	67.18	105.04	61.14	9.31	48.19**
17	ICC 444	71.18	68.20	14.48	56.18	95.04	63.14	11.09	43.74
18	ICC 449	79.91	59.00	13.42	65.18	106.04	18.14	11.72	33.34
19	ICC 460	66.08	68.92	29.61	70.18	109.04	64.78	9.38	30.12
20	ICC 461	64.68	65.32	26.33	65.18	103.04	36.78	10.24	24.25
21	ICC 478	69.64	76.82	16.50	65.18	104.04	30.78	10.48	41.01
22	ICC 516	68.05	68.46	13.72	62.18	103.04	70.78**	10.34	31.94
23	ICC 519	65.79	72.59	14.39	62.18	101.04	108.45**	10.99	59.98**
24	ICC 535	70.79	83.09	25.78	73.18	111.04	33.45	9.67	18.12
25	ICC 537	65.56	83.88	15.22	67.18	108.04	43.78	9.58	30.00
26	ICC 554	67.28	77.61	15.05	57.18	98.04	42.78	15.80	25.68
27	ICC 573	71.48	85.65	15.22	59.18	97.04	19.45	13.94	28.95
28	ICC 585	71.23	77.22	14.50	64.18	103.04	17.12	10.69	30.43
29	ICC 594	84.55	61.77	14.39	66.18	110.04	50.12	11.93	39.03
30	ICC 595	83.24	83.40	15.17	57.18	95.04	53.78	13.55	24.81
31	ICC 599	67.56	80.74	32.55	72.18	112.04	77.78**	10.21	48.68**
32	ICC 609	80.97	76.60	36.89	82.18	115.04	37.78	10.16	38.18
33	ICC 610	73.50	83.38	30.55	78.18	112.04	23.45	10.52	16.07
34	ICC 613	82.07	73.45	27.05	79.18	111.04	48.78	10.68	21.04
35	ICC 621	76.56	60.63	19.28	64.18	105.04	36.78	14.04	16.10
36	ICC 645	77.38	72.34	24.55	80.18	95.04	13.78	10.96	17.38
37	ICC 647	73.22	80.63	15.27	61.93	102.79	48.91	10.09	26.05
38	ICC 657	75.81	74.55	13.93	55.93	94.79	32.91	11.31	42.41
39	ICC 658	83.36	64.48	17.32	71.93	107.79	28.91	11.52	41.18
40	ICC 665	67.70	70.10	17.82	71.93	108.79	29.24	9.54	9.38
41	ICC 739	92.08**	78.56	20.27	70.93	108.79	52.91	9.23	26.63
42	ICC 758	73.19	79.45	13.71	66.93	103.79	43.57	10.31	23.56
43	ICC 773	76.63	70.31	25.38	70.93	109.79	43.24	9.80	27.04
44	ICC 780	73.84	78.43	14.88	57.93	101.79	38.57	15.46	26.61
45	ICC 781	80.65	76.68	29.88	70.93	112.79	22.91	10.10	13.80
46	ICC 801	54.44	76.70	14.77	68.93	107.79	36.24	11.26	35.70
47	ICC 805	69.89	70.83	13.60	66.93	104.79	42.57	14.93	26.06
48	ICC 816	57.29	74.19	13.82	67.93	104.79	47.24	12.57	28.29
49	ICC 843	64.42	74.75	35.65	48.93	95.79	35.91	9.80	30.98
50	ICC 857	72.77	67.07	15.82	70.93	111.79	88.57**	11.93	27.20
51	ICC 858	69.13	75.49	14.32	60.93	102.79	63.57	10.84	39.66
52	ICC 859	71.26	74.87	16.60	62.93	103.79	65.24	13.10	26.31
53	ICC 860	78.98	75.45	34.71	72.93	114.79	36.91	9.67	41.64
54	ICC 884	76.37	67.12	29.99	70.93	108.79	26.57	10.19	37.07
55	ICC 903	79.49	79.89	42.54	72.93	102.54	18.20	13.67	37.73
56	ICC 904	71.61	77.92	29.82	77.93	110.54	19.20	8.67	23.59
57	ICC 922	64.83	81.90	13.93	58.93	104.54	50.86	10.52	34.94
58	ICC 927	67.83	58.66	15.20	59.93	100.54	53.53	11.84	24.42
59	ICC 933	70.61	78.25	13.20	64.93	103.54	44.53	10.34	29.92
60	ICC 959	77.88	65.47	14.70	56.93	101.54	76.86**	10.28	44.20
61	ICC 967	68.73	70.41	14.37	59.93	100.54	93.53**	12.23	31.78
62	ICC 999	64.87	80.43	13.98	61.93	102.54	42.86	11.89	30.75
63	ICC 1003	71.89	80.09	13.65	76.93	113.54	35.86	10.54	42.76
64	ICC 1005	76.64	70.10	18.15	70.93	111.54	26.20	11.35	37.03

65	ICC 1012	74.37	80.45	8.76**	72.93	111.54	55.53	8.67	32.10
66	ICC 1016	81.35	82.64	21.98	77.93	115.54	48.53	10.19	37.36
67	ICC 1017	66.59	78.03	15.20	78.93	114.54	22.86	10.31	33.88
68	ICC 1019	73.14	79.30	14.82	71.93	107.54	14.53	11.13	13.59
69	ICC 1023	73.87	78.21	31.87	72.93	107.54	38.86	12.15	7.70
70	ICC 1038	64.99	75.01	13.37	62.93	100.54	51.20	11.05	34.96
71	ICC 1039	64.28	74.50	13.87	56.93	97.54	66.53	12.51	41.94
72	ICC 1101	77.24	78.38	27.54	77.93	114.54	22.20	9.06	18.81
73	ICC 1129	80.17	74.15	15.08	55.68	98.29	60.30	13.03	42.48
74	ICC 1132	68.25	76.12	15.13	57.68	99.29	60.63	12.64	42.38
75	ICC 1155	76.32	63.39	16.30	63.68	101.29	27.30	16.84	23.63
76	ICC 1179	71.96	69.70	21.85	83.68	116.29	20.96	8.11	11.40
77	ICC 1202	72.01	67.17	16.74	62.68	103.29	71.30**	12.03	31.22
78	ICC 1209	68.71	71.29	15.19	62.68	101.29	44.63	9.67	25.90
79	ICC 1212	67.93	75.30	12.46	78.68	114.29	22.63	8.83	8.66
80	ICC 1214	89.33**	70.92	16.30	61.68	103.29	25.63	13.11	21.49
81	ICC 1234	68.64	76.89	15.63	64.68	104.29	22.63	10.27	32.68
82	ICC 1270	74.58	72.34	17.80	70.68	108.29	21.30	11.31	7.61
83	ICC 1271	58.29	78.20	14.13	64.68	103.29	40.30	12.30	32.12
84	ICC 1279	73.34	75.02	15.13	62.68	100.29	63.63	11.45	35.91
85	ICC 1283	64.83	77.97	14.52	62.68	102.29	35.30	13.57	36.80
86	ICC 1292	75.13	75.94	15.08	56.68	97.29	59.96	10.50	44.03
87	ICC 1294	72.52	45.44	14.85	63.68	101.29	42.63	15.79	42.43
88	ICC 1298	65.69	62.57	15.08	60.68	98.29	53.63	10.03	34.43
89	ICC 1314	70.40	79.11	14.08	64.68	103.29	63.30	11.66	30.54
90	ICC 1316	81.13	76.86	15.63	66.68	105.29	63.63	11.14	35.29
91	ICC 1317	79.64	71.22	16.24	70.18	108.04	20.97	9.63	10.56
92	ICC 1319	89.54**	70.70	18.18	71.18	107.04	15.97	12.93	40.36
93	ICC 1393	77.64	86.26	17.24	65.18	103.04	32.64	13.08	37.92
94	ICC 1403	69.73	67.37	12.91	60.18	99.04	47.30	10.75	34.00
95	ICC 1434	66.38	81.80	14.07	65.18	103.04	55.30	11.50	47.83**
96	ICC 1435	71.38	84.93	13.91	58.18	99.04	86.30**	12.17	40.90
97	ICC 1437	66.40	76.29	13.80	61.18	102.04	34.97	11.50	35.13
98	ICC 1441	87.55**	56.28	14.41	66.18	105.04	48.64	11.45	37.31
99	ICC 1450	85.87**	75.83	15.57	67.18	105.04	60.30	9.93	44.26
100	ICC 1451	73.16	71.92	14.30	66.18	104.04	90.64**	9.65	39.91
101	ICC 1477	74.36	78.89	23.13	71.18	111.04	27.64	16.30	24.42
102	ICC 1491	72.59	76.16	17.07	72.18	110.04	21.97	13.21	30.41
103	ICC 1525	77.16	67.09	16.02	71.18	108.04	18.97	12.13	10.98
104	ICC 1567	83.52	53.43	26.18	70.18	100.04	46.97	9.86	31.35
105	ICC 1583	74.25	64.46	13.74	78.18	111.04	23.64	10.20	27.18
106	ICC 1587	68.20	74.57	16.13	69.18	108.04	58.97	10.42	29.23
107	ICC 1597	71.23	67.94	13.80	62.18	101.04	45.30	13.99	25.79
108	ICC 1607	71.75	79.42	17.74	63.18	104.04	27.97	15.17	14.48
109	ICC 1649	74.82	64.59	17.67	66.18	105.04	36.40	16.29	27.46
110	ICC 1664	71.55	81.58	13.67	66.18	107.04	32.40	10.60	21.89
111	ICC 1669	72.31	82.36	13.79	72.18	111.04	37.74	10.92	21.87
112	ICC 1712	65.80	73.22	12.29	71.18	109.04	55.07	11.27	10.67
113	ICC 1716	67.46	66.87	13.84	58.18	99.04	54.74	10.08	20.07
114	ICC 1718	76.91	65.75	27.06	72.18	107.04	33.40	9.81	24.52
115	ICC 1719	63.77	66.21	14.34	69.18	106.04	24.07	9.94	35.08
116	ICC 1723	68.28	74.93	13.29	69.18	105.04	33.40	10.88	24.52
117	ICC 1731	70.27	65.47	17.51	71.18	108.04	23.07	11.36	24.82
118	ICC 1749	75.02	76.65	18.62	72.18	109.04	37.40	12.10	16.84
119	ICC 1753	68.34	82.52	12.29	62.18	102.04	58.74	11.98	37.87
120	ICC 1755	81.30	77.99	13.23	54.18	97.04	71.40**	12.16	30.92
121	ICC 1758	69.48	83.02	14.01	62.18	101.04	62.07	11.29	34.26
122	ICC 1795	78.04	56.95	15.62	73.18	109.04	53.07	9.86	32.35
123	ICC 1809	76.19	71.22	15.17	72.18	108.04	49.40	9.97	43.64
124	ICC 1820	64.67	74.11	15.29	73.18	108.04	31.07	10.23	45.63**
125	ICC 1826	80.70	69.63	23.40	73.18	109.04	31.40	10.61	26.55
126	ICC 1827	76.65	78.20	14.17	78.18	114.04	23.74	9.55	34.85
127	ICC 1828	70.14	66.17	33.53	49.18	94.79	20.02	10.51	26.02
128	ICC 1870	67.96	55.27	39.20	66.18	104.79	37.69	9.75	34.41
129	ICC 1881	78.95	57.65	27.14	71.18	108.79	25.36	10.09	29.89
130	ICC 1899	83.87	71.62	21.31	70.18	107.79	38.69	10.22	36.71
131	ICC 1901	70.24	76.31	13.53	60.18	99.79	79.02**	9.94	35.22

132	ICC 1902	71.79	77.74	15.03	59.18	97.79	30.69	12.60	35.09
133	ICC 1910	73.56	65.86	14.25	65.18	102.79	47.36	10.80	24.53
134	ICC 1918	67.81	66.11	16.53	66.18	103.79	47.02	10.65	26.37
135	ICC 1939	68.16	80.14	15.09	59.18	98.79	90.69**	11.23	49.38**
136	ICC 1984	73.28	80.03	12.64	65.18	103.79	124.69**	11.24	35.92
137	ICC 1987	62.79	83.69	13.98	54.18	96.79	81.02**	11.39	39.62
138	ICC 2034	82.92	69.46	32.81	80.18	111.79	24.36	13.88	23.26
139	ICC 2036	77.88	73.47	20.75	72.18	107.79	35.02	8.95	27.17
140	ICC 2037	69.79	64.10	21.70	77.18	108.79	10.69	9.94	14.82
141	ICC 2061	76.37	78.01	14.98	72.18	110.79	45.02	9.61	24.47
142	ICC 2089	60.76	81.14	16.64	66.18	103.79	19.36	9.93	30.04
143	ICC 2156	67.99	71.05	27.42	69.18	105.79	16.02	14.52	21.50
144	ICC 2172	84.23	73.38	15.75	78.18	113.79	14.36	8.80	11.68
145	ICC 2199	71.24	72.44	20.96	78.43	113.04	18.28	15.53	30.01
146	ICC 2217	73.63	71.49	16.52	80.43	115.04	9.28	10.36	29.56
147	ICC 2221	80.00	79.08	14.41	57.43	100.04	43.61	8.99	30.44
148	ICC 2239	76.14	70.75	24.63	71.43	108.04	22.94	11.50	30.88
149	ICC 2243	70.49	66.73	13.80	70.43	109.04	70.61**	10.12	30.11
150	ICC 2246	76.66	74.59	14.85	71.43	108.04	21.28	8.66	36.51
151	ICC 2253	72.26	76.68	14.74	63.43	103.04	29.28	11.50	38.14
152	ICC 2264	73.83	62.42	22.74	71.43	109.04	37.94	11.67	21.58
153	ICC 2278	77.81	79.96	23.74	81.43	116.04	7.61	20.84	15.44
154	ICC 2294	57.34	74.83	14.69	65.43	104.04	34.28	10.77	32.22
155	ICC 2304	78.16	48.88	28.63	71.43	107.04	52.94	9.32	31.79
156	ICC 2311	75.60	61.28	14.24	65.43	105.04	28.28	7.85	23.15
157	ICC 2321	71.55	65.24	22.74	67.43	104.04	27.61	10.45	21.11
158	ICC 2326	74.46	77.30	13.13	68.43	103.04	44.61	7.11	25.56
159	ICC 2337	71.30	74.26	12.63	68.43	104.04	16.28	9.73	25.11
160	ICC 2339	72.16	61.04	24.08	73.43	108.04	20.94	8.86	9.44
161	ICC 2345	67.78	55.53	12.46	71.43	107.04	28.28	8.16	19.00
162	ICC 2350	77.12	67.48	12.08	78.43	111.04	14.94	13.40	19.02
163	ICC 2354	72.44	71.95	12.62	64.43	103.04	46.51	11.85	35.59
164	ICC 2430	72.59	74.18	14.79	78.43	118.04	76.51**	6.72	33.31
165	ICC 2450	64.31	78.06	12.57	58.43	99.04	88.84**	12.53	34.67
166	ICC 2461	67.48	80.66	17.34	67.43	106.04	45.18	9.97	9.96
167	ICC 2463	70.27	68.19	15.79	61.43	101.04	26.51	15.42	43.64
168	ICC 2484	69.63	67.08	13.07	61.43	100.04	110.51**	12.46	33.38
169	ICC 2519	69.47	76.10	16.07	69.43	105.04	80.18**	9.90	37.58
170	ICC 2616	66.72	80.73	15.62	65.43	104.04	35.18	10.73	31.73
171	ICC 2660	70.16	74.38	17.90	57.43	98.04	49.18	13.09	35.49
172	ICC 2774	73.36	63.96	14.40	73.43	108.04	43.18	8.78	22.95
173	ICC 2800	65.86	60.59	15.18	66.43	105.04	34.51	9.75	16.74
174	ICC 2803	59.47	59.37	20.07	67.43	106.04	39.18	7.79	26.91
175	ICC 2810	87.83**	70.51	16.23	54.43	96.04	50.84	10.59	39.99
176	ICC 2812	68.90	87.15	14.84	60.43	98.04	27.84	9.67	38.16
177	ICC 2831	72.05	73.18	14.68	65.43	102.04	61.51	10.75	31.94
178	ICC 2835	72.78	91.59	13.79	53.43	97.04	74.84**	10.94	33.41
179	ICC 2856	56.46	61.17	12.23	73.43	109.04	20.51	10.40	25.64
180	ICC 2858	71.48	82.07	15.68	63.43	102.04	44.51	9.88	34.75
181	ICC 2862	63.55	59.78	9.77**	72.43	109.54	43.02	9.89	36.85
182	ICC 2872	68.41	66.54	13.44	78.43	113.54	12.02	11.18	19.52
183	ICC 2874	68.17	76.11	13.27	59.43	99.54	85.02**	12.46	38.08
184	ICC 2883	66.84	81.70	21.83	57.43	97.54	30.69	11.85	21.59
185	ICC 2896	70.21	69.75	14.05	62.43	100.54	24.02	8.35	15.50
186	ICC 2900	74.35	55.79	31.05	77.43	109.54	21.35	10.48	23.48
187	ICC 2917	80.23	66.01	24.05	77.43	110.54	17.69	9.99	37.11
188	ICC 2922	71.78	60.21	25.22	73.43	108.54	28.35	8.73	47.72**
189	ICC 2931	77.51	78.46	14.11	66.43	102.54	50.35	21.00	17.55
190	ICC 2934	78.98	72.98	34.27	78.43	112.54	12.02	9.58	35.50
191	ICC 2935	68.92	60.39	20.33	78.43	111.54	16.02	8.84	34.84
192	ICC 2950	66.85	77.42	14.11	64.43	101.54	21.69	13.52	38.38
193	ICC 2988	68.00	61.72	28.66	73.43	108.54	25.69	11.92	16.60
194	ICC 2993	88.82**	63.33	15.33	66.43	102.54	9.35	17.64	9.57
195	ICC 2994	72.40	69.15	15.77	67.43	104.54	14.02	16.60	15.11
196	ICC 2996	72.04	69.54	17.99	80.43	113.54	24.69	10.84	26.62
197	ICC 3034	68.90	72.24	14.72	81.43	112.54	18.69	9.75	42.70
198	ICC 3058	64.40	71.86	11.83	81.43	114.54	74.69**	11.62	42.28

199	ICC 3072	70.95	71.44	9.93**	58.93	100.29	84.10**	13.02	48.05**
200	ICC 3075	65.80	65.08	7.04**	53.93	98.29	81.10**	15.75	32.41
201	ICC 3076	67.20	74.83	9.54**	57.93	100.29	39.43	15.71	33.85
202	ICC 3095	75.24	84.51	9.76**	60.93	102.29	38.77	14.42	32.95
203	ICC 3099	76.47	75.26	11.71	59.93	102.29	45.77	15.13	28.67
204	ICC 3103	64.97	70.52	16.82	61.93	103.29	42.10	13.42	38.74
205	ICC 3117	69.40	51.34	10.60	61.93	104.29	43.77	14.00	38.14
206	ICC 3133	78.08	68.92	11.76	61.93	104.29	33.10	13.34	34.52
207	ICC 3134	70.37	72.44	18.43	68.93	106.29	23.77	15.08	30.95
208	ICC 3135	80.41	75.98	15.87	61.93	103.29	42.77	13.22	28.91
209	ICC 3141	71.77	66.20	44.10	68.93	106.29	26.10	10.67	10.85
210	ICC 3181	72.46	76.85	13.82	65.93	107.29	25.10	14.36	20.28
211	ICC 3219	72.05	77.83	9.54**	52.93	97.29	63.43	18.09	33.16
212	ICC 3259	62.67	91.49	16.71	50.93	96.29	49.43	12.54	32.97
213	ICC 3273	73.31	58.43	10.93	64.93	103.29	55.77	12.49	33.96
214	ICC 3328	67.67	82.08	19.54	59.93	101.29	74.43**	12.91	34.63
215	ICC 3392	77.15	66.99	11.04	60.93	102.29	30.77	11.06	16.86
216	ICC 3396	67.58	59.17	11.43	60.93	103.29	69.43**	14.67	34.34
217	ICC 3407	71.89	76.71	11.10	61.93	100.29	62.72	11.04	50.97**
218	ICC 3428	74.91	67.54	30.87	81.93	115.29	12.38	14.87	29.28
219	ICC 3448	68.79	66.60	14.15	55.93	96.29	36.72	13.30	38.35
220	ICC 3449	65.55	71.53	16.26	59.93	99.29	18.05	13.41	28.98
221	ICC 3451	67.86	72.07	16.93	56.93	97.29	29.72	13.81	46.08**
222	ICC 3457	60.89	87.11	10.76	62.93	101.29	37.38	9.98	29.04
223	ICC 3463	69.05	73.93	15.82	58.93	98.29	80.38**	9.74	42.44
224	ICC 3470	77.52	67.32	15.37	77.93	112.29	22.05	8.80	34.22
225	ICC 3494	71.60	68.29	11.98	66.93	108.29	47.05	8.60	37.19
226	ICC 3508	69.94	73.46	13.71	65.93	105.29	31.38	10.55	41.71
227	ICC 3528	60.97	63.07	12.87	54.93	96.29	64.05	12.07	44.63**
228	ICC 3531	65.59	73.31	13.87	53.93	95.29	53.05	12.41	52.50**
229	ICC 3533	89.38**	63.46	15.04	65.93	104.29	86.05**	10.14	36.85
230	ICC 3534	70.49	87.13	15.82	58.93	99.29	69.38**	12.19	45.88**
231	ICC 3536	70.66	62.77	13.15	55.93	96.29	60.38	12.21	35.98
232	ICC 3537	68.73	65.07	13.82	55.93	97.29	54.38	13.03	53.69**
233	ICC 3538	77.48	72.05	13.76	55.93	95.29	69.72**	12.81	42.34
234	ICC 3650	69.84	80.70	14.21	53.93	96.29	41.38	10.43	34.89
235	ICC 3935	69.35	83.41	19.89	66.18	104.79	37.85	9.45	31.20
236	ICC 4129	61.71	81.71	12.78	69.18	101.79	75.85**	12.46	32.24
237	ICC 4348	71.73	90.11	16.34	55.18	95.79	54.19	12.19	33.87
238	ICC 4374	75.00	73.47	8.34**	49.18	99.79	34.85	11.52	30.45
239	ICC 4436	67.60	67.61	14.39	59.18	96.79	31.52	13.77	36.57
240	ICC 4454	62.08	78.53	14.34	57.18	102.79	23.19	13.71	33.65
241	ICC 4490	68.09	74.72	16.34	60.18	103.79	66.52	12.98	30.49
242	ICC 4509	69.82	64.82	18.11	66.18	102.79	37.52	10.62	41.34
243	ICC 4519	67.98	78.02	16.45	66.18	104.79	55.52	10.07	27.46
244	ICC 4529	78.44	75.97	14.78	65.18	103.79	32.85	10.65	27.65
245	ICC 4549	61.31	74.93	19.28	54.18	95.79	11.85	12.77	21.22
246	ICC 4640	76.68	66.02	23.22	79.18	110.79	12.52	13.43	32.89
247	ICC 4847	70.39	69.05	17.45	63.18	101.79	48.19	11.13	36.95
248	ICC 4850	68.94	77.01	14.72	60.18	99.79	80.19**	12.26	43.79
249	ICC 4861	62.60	80.42	13.17	67.18	104.79	13.19	14.76	34.99
250	ICC 4919	68.01	62.47	17.06	71.18	108.79	26.19	11.92	46.67**
251	ICC 4920	57.70	80.82	18.67	69.18	107.79	71.85**	14.81	45.53**
252	ICC 4922	70.30	53.49	12.34	73.18	110.79	50.19	15.73	42.19
253	ICC 4925	74.22	62.85	12.78	77.18	110.79	38.27	9.90	36.02
254	ICC 4939	60.25	74.71	13.56	66.18	103.79	35.27	9.28	43.11
255	ICC 4942	78.85	71.65	17.00	72.18	108.79	51.94	9.07	25.31
256	ICC 4952	72.48	71.60	26.28	72.18	109.79	15.94	10.68	24.95
257	ICC 4956	62.34	66.87	38.33	77.18	113.79	20.94	9.50	23.70
258	ICC 4961	65.54	76.48	15.22	59.18	98.79	59.94	12.81	33.98
259	ICC 4974	66.55	76.41	18.83	63.18	101.79	39.60	10.03	17.98
260	ICC 4982	63.54	81.51	16.33	65.18	102.79	43.60	8.75	37.98
261	ICC 5004	89.17**	77.14	16.28	53.18	95.79	50.60	12.33	45.35**
262	ICC 5006	67.46	69.45	35.00	79.18	111.79	21.60	10.09	22.76
263	ICC 5071	76.10	72.87	14.56	63.18	107.79	58.27	10.26	29.45
264	ICC 5103	72.78	70.91	18.50	72.18	94.79	27.94	10.20	3.99
265	ICC 5105	72.19	75.40	14.56	53.18	103.79	51.94	11.60	32.85

266	ICC 5113	75.52	75.11	15.39	66.18	104.79	60.94	10.64	32.55
267	ICC 5126	66.12	72.38	15.39	57.18	100.79	70.60**	14.97	19.51
268	ICC 5186	66.65	78.76	15.17	62.18	110.79	68.27**	12.46	47.79**
269	ICC 5424	69.62	67.08	18.45	72.18	102.79	18.94	11.97	23.17
270	ICC 5465	80.37	66.50	14.17	66.18	110.79	24.94	11.25	38.05
271	ICC 5585	70.21	74.22	15.82	79.18	112.04	19.71	10.77	27.04
272	ICC 5618	69.06	80.73	22.04	63.18	101.04	29.71	12.78	22.83
273	ICC 5682	56.78	91.31	15.60	72.18	110.04	37.38	20.30	27.62
274	ICC 5688	78.10	76.59	12.87	53.18	95.04	35.38	18.63	35.60
275	ICC 5716	62.80	68.07	15.71	53.18	95.04	56.04	9.54	39.92
276	ICC 5864	81.52	82.95	14.65	62.18	101.04	88.04**	9.41	41.66
277	ICC 5929	87.19**	82.53	16.93	58.18	98.04	51.38	13.43	48.90**
278	ICC 6010	70.92	78.68	15.32	65.18	104.04	93.71**	10.48	42.63
279	ICC 6027	77.66	80.75	13.48	54.18	96.04	65.38	12.56	33.12
280	ICC 6037	75.08	90.02	14.76	54.18	98.04	42.38	11.92	44.75**
281	ICC 6039	66.76	86.55	13.65	57.18	98.04	71.04**	11.64	47.64**
282	ICC 6077	65.99	87.87	16.87	66.18	104.04	50.04	10.42	29.67
283	ICC 6081	75.16	77.45	14.98	63.18	101.04	47.04	18.88	16.93
284	ICC 6095	82.25	79.17	16.43	53.18	96.04	52.38	12.21	26.41
285	ICC 6099	68.69	78.28	19.98	59.18	98.04	50.71	10.48	16.81
286	ICC 6235	70.35	75.47	21.65	79.18	110.04	10.04	21.52	9.74
287	ICC 6250	76.40	69.75	15.71	80.18	115.04	42.71	20.99	28.75
288	ICC 6307	77.63	67.54	20.87	76.18	106.04	30.38	15.88	21.17
289	ICC 6320	69.06	78.71	22.14	64.18	103.79	69.29**	8.62	35.43
290	ICC 6350	62.32	69.83	20.92	76.18	107.79	26.62	10.31	28.50
291	ICC 6361	72.08	71.01	18.81	76.18	107.79	15.29	10.77	31.52
292	ICC 6362	70.67	86.07	15.26	71.18	104.79	50.96	10.10	43.51
293	ICC 6363	82.03	81.51	18.81	65.18	101.79	48.62	9.78	36.79
294	ICC 6366	72.01	77.44	13.92	70.18	105.79	28.96	10.42	28.73
295	ICC 6367	80.78	83.90	12.59	66.18	102.79	56.96	8.36	19.23
296	ICC 6372	82.35	86.27	15.87	69.18	103.79	62.96	12.63	35.11
297	ICC 6376	76.28	45.43	20.37	81.18	109.79	9.96	9.60	40.26
298	ICC 6378	83.85	79.02	20.26	66.18	101.79	22.96	8.88	40.43
299	ICC 6379	74.16	87.83	17.87	66.18	100.79	17.96	11.88	14.28
300	ICC 6382	69.75	90.84	18.20	65.18	102.79	67.96**	8.60	50.29**
301	ICC 6383	74.94	86.47	15.92	66.18	102.79	51.96	11.06	44.15
302	ICC 6385	63.47	81.08	17.53	62.18	99.79	67.62**	11.27	12.67
303	ICC 6386	68.86	89.95	15.09	65.18	102.79	55.62	10.96	49.48**
304	ICC 6389	69.80	79.48	13.59	66.18	103.79	33.29	11.39	45.35**
305	ICC 6391	72.67	85.12	14.92	71.18	107.79	36.29	10.70	29.29
306	ICC 6393	58.01	75.99	15.87	59.18	99.79	50.29	11.69	15.19
307	ICC 6395	80.84	82.85	14.77	65.93	102.79	33.23	12.20	33.02
308	ICC 6399	64.41	86.29	16.43	64.93	101.79	45.90	12.25	35.62
309	ICC 6411	76.89	87.52	15.54	63.93	101.79	50.23	11.01	30.10
310	ICC 6421	72.08	82.66	14.38	61.93	99.79	73.23**	11.37	36.71
311	ICC 6427	76.65	69.33	14.43	53.93	95.79	55.57	11.96	45.35**
312	ICC 6437	64.16	69.99	13.88	56.93	97.79	127.23**	12.15	37.27
313	ICC 6440	66.79	81.90	12.43	66.93	103.79	70.23**	10.81	29.90
314	ICC 6444	74.70	71.24	14.38	64.93	102.79	67.90**	8.97	30.80
315	ICC 6446	72.34	78.89	19.38	63.93	101.79	65.90	9.36	24.40
316	ICC 6453	69.85	83.02	16.82	61.93	99.79	46.90	10.90	42.85
317	ICC 6455	69.84	81.65	15.71	60.93	99.79	49.57	10.19	39.28
318	ICC 6456	60.71	81.76	16.04	60.93	99.79	59.23	11.43	37.17
319	ICC 6457	65.60	89.68	15.04	62.93	102.79	48.90	11.84	37.57
320	ICC 6458	67.42	76.59	16.49	63.93	101.79	54.23	11.74	41.97
321	ICC 6459	80.70	79.20	14.88	70.93	107.79	62.90	12.67	22.03
322	ICC 6460	63.98	82.21	15.93	58.93	97.79	84.57**	12.51	38.00
323	ICC 6462	70.20	64.94	11.93	78.93	110.79	24.23	9.54	26.86
324	ICC 6471	67.23	69.71	23.71	72.93	105.79	26.90	17.55	37.46
325	ICC 6472	62.88	65.55	21.04	57.43	101.04	56.31	14.26	34.59
326	ICC 6480	74.57	79.34	14.60	64.43	103.04	39.98	13.81	32.45
327	ICC 6482	69.40	79.47	12.54	62.43	102.04	80.64**	14.11	38.89
328	ICC 6485	57.86	75.83	13.26	61.43	103.04	36.98	9.01	44.56
329	ICC 6487	64.11	83.58	14.93	60.43	102.04	51.98	11.90	39.42
330	ICC 6488	64.11	64.61	14.71	52.43	98.04	76.98**	11.57	39.22
331	ICC 6489	75.63	75.30	15.54	64.43	104.04	34.31	12.48	26.88
332	ICC 6491	69.43	75.33	17.65	65.43	105.04	26.98	11.37	30.84

333	ICC 6494	61.93	67.02	16.32	59.43	102.04	64.98	13.84	46.68**
334	ICC 6501	71.54	73.29	16.26	63.43	105.04	21.31	9.90	41.43
335	ICC 6502	71.21	79.69	16.87	63.43	104.04	49.64	10.70	35.45
336	ICC 6527	68.01	79.62	19.21	58.43	101.04	43.64	12.73	30.49
337	ICC 6535	68.85	67.76	21.21	67.43	97.04	31.64	11.64	38.22
338	ICC 6570	69.46	71.08	9.54**	69.43	110.04	81.31**	13.96	36.34
339	ICC 6588	59.63	81.46	16.26	64.43	106.04	19.31	9.93	40.69
340	ICC 6592	65.74	74.92	13.32	65.43	107.04	26.31	10.10	34.60
341	ICC 6605	79.67	55.95	14.54	70.43	110.04	32.31	11.57	32.23
342	ICC 6620	58.03	70.08	17.43	64.43	105.04	10.98	11.90	25.93
343	ICC 6630	69.34	69.27	11.56	80.18	113.04	18.06	10.33	26.78
344	ICC 6633	65.51	61.01	14.42	50.18	103.04	22.51	20.68	37.44
345	ICC 6636	70.90	71.49	16.28	65.18	104.04	44.06	11.57	41.47
346	ICC 6643	63.27	72.55	13.67	60.18	100.04	33.72	14.14	28.62
347	ICC 6647	82.81	66.04	14.34	54.18	97.04	50.06	13.43	42.37
348	ICC 6666	70.32	79.18	16.84	52.18	96.04	50.39	9.60	31.81
349	ICC 6668	72.33	57.85	16.11	54.18	97.04	35.06	12.14	35.24
350	ICC 6679	85.15**	71.78	19.50	54.18	97.04	27.06	12.89	33.21
351	ICC 6687	60.84	70.20	17.78	67.18	105.04	59.39	9.54	32.64
352	ICC 6697	66.77	72.14	18.06	69.18	107.04	4.72	10.25	44.54
353	ICC 6701	65.09	74.70	18.78	67.18	106.04	36.72	12.61	29.79
354	ICC 6708	63.93	70.36	14.95	80.18	110.04	4.06	10.35	29.60
355	ICC 6718	75.64	61.76	12.06	72.18	108.04	7.39	14.84	21.52
356	ICC 6724	61.53	79.76	18.17	65.18	104.04	74.39**	9.85	24.42
357	ICC 6730	66.74	79.27	16.61	67.18	105.04	33.72	10.12	41.54
358	ICC 6737	81.44	77.01	20.45	67.18	105.04	3.39	12.51	17.58
359	ICC 6741	52.15	75.18	21.00	56.18	98.04	18.72	9.72	46.36**
360	ICC 6743	59.46	74.42	17.11	55.18	96.04	34.72	12.98	34.91
361	ICC 6751	75.28	87.53	18.40	62.18	101.04	12.26	13.24	23.29
362	ICC 6753	79.68	82.56	20.73	65.18	102.04	9.59	9.57	30.41
363	ICC 6756	74.84	88.22	15.46	59.18	98.04	62.93	10.35	50.38**
364	ICC 6761	80.54	72.27	25.62	78.18	118.04	11.93	9.94	18.09
365	ICC 6766	65.48	69.83	21.07	75.18	110.04	13.26	9.74	29.75
366	ICC 6772	77.85	80.05	15.73	67.18	105.04	21.26	10.24	26.30
367	ICC 6774	68.60	71.34	17.29	80.18	113.04	14.26	9.58	25.11
368	ICC 6788	80.41	84.31	12.90	68.18	104.04	23.59	9.45	30.32
369	ICC 6796	76.66	74.73	13.85	80.18	114.04	12.93	13.10	13.13
370	ICC 6803	73.44	69.42	13.12	73.18	107.04	9.26	9.57	21.17
371	ICC 6815	65.85	82.40	17.46	63.18	101.04	101.59**	10.38	49.78**
372	ICC 6817	69.85	81.96	16.07	64.18	101.04	28.93	10.10	49.55**
373	ICC 6819	71.69	67.67	20.01	73.18	108.04	15.26	11.69	38.50
374	ICC 6856	71.09	72.63	14.90	77.18	108.04	11.26	16.62	35.83
375	ICC 6858	69.93	74.08	18.35	79.18	107.04	11.26	7.90	22.33
376	ICC 6876	73.00	89.64	19.51	67.18	103.04	28.93	8.01	31.75
377	ICC 6879	76.25	82.75	19.79	66.18	102.04	5.93	18.78	27.28
378	ICC 6880	71.35	81.82	16.96	45.18	103.04	13.93	9.36	35.20
379	ICC-4958	79.01	86.81	13.65	44.81	93.43	53.54	21.99	42.23
380	BGM-10-216	71.66	76.94	19.51	50.62	98.67	45.81	19.05	36.78
381	Vijay	78.69	84.23	15.65	48.19	98.24	51.13	16.44	42.60
382	JG-11	67.96	68.96	14.93	50.10	100.81	33.52	20.04	36.28
	C.D. 5%	5.75	7.41	4.25	5.75	2.53	13.60	4.01	4.01
	Maxi.	92.08	91.59	44.1	83.68	118.04	127.23	21.52	59.98
	Mini.	52.15	45.43	7.04	45.18	94.79	3.39	6.72	3.99

*, ** Significant at 5 and 1 per cent level respectively.

Table 4: Drought tolerance germplasm lines on the basis of RWC and MSI:

Sr. No.	Name of the Germplasm Lines	RWC (%)	MSI (%)
1	ICC 181	89.05	80.93
2	ICC 595	83.24	83.4
3	ICC 1016	81.35	62.64
4	ICC 5929	87.19	82.53
5	ICC 6363	82.03	81.51
6	ICC 6367	80.78	83.9
7	ICC 6372	82.35	86.27
8	ICC 6395	80.84	82.85
9	ICC 6788	80.41	84.31

Conclusion

From the present investigation it was found that germplasm lines ICC 181, ICC 595, ICC 1016, ICC 5929, ICC 6363, ICC 6367, ICC 6372, ICC 6395 and ICC 6788 exhibited higher values of Relative Water Content (RWC), Membrane Stability Index (MSI). Therefore molecular analysis of these germplasm lines should be done to confirm drought tolerance.

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