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Stability Analysis of Bottle gourd (*Lagenaria siceraria* (Mol.) Standl.) in Southern Plains of Rajasthan (India)

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ABSTRACT

Fifty-eight genotypes of bottle gourd were evaluated for stability in a Completely Randomized Block Design over three different environments in Rajasthan during summer and late *Kharif* 2021 (E2 & E3). According to the Eberhart and Russell model for stability analysis, P_3 x P_6 for days to first harvest, P_2 x P_9, P_3 x P_6, P_3 x P_9, P_4 x P_7, P_3 x P_7, P_1 x P_3 for fruit length, P_4 x P_{10}, P_2 x P_5, P_1 x P_6 forrind thickness, P_1 x P_6 , P_6 x P_8, P_9 x P_{10} for flesh thickness, P_6 x P_8, P_3 x P_9, P_1 x P_6, P_8 x P_9, P_8 x P_{10}, P_4 x P_6 for stem girth, P_8 x P_9, P_6 x P_8, P_4 x P_8, P_8 x P_{10} for vine length at final harvest, P_4 x P_5 and P_5 x P_6 for yield per vine, P_1 x P_5 and P_1 x P_3 for total sugar and P_5 x P_{10}, P_5 x P_9, P_9 x P_{10}, P_1 x P_2, P_1 x P_3, P_1 x P_6 and P_4 x P_7 for non-reducing sugar were exhibited non-significant deviation from regression (S^2d_i) and regression coefficient (b_i<1) along with mean value lower than the population mean. It indicates that these hybrids would stable in unfavorable environment. The hybrids P_4 x P_5 and P_6 x P_7 for days to first harvest, P_5 x P_9 and P_3 x P_5 for fruit length, P_7 x P_{10}, P_6 x P_7, P_6 x P_9, P_1 x P_5 and P_3 x P_8 rind thickness, P_2 x P_8, P_6 x P_9, P_6 x P_{10} and P_4 x P_9 flesh thickness, P_3 x P_8, P_7 x P_{10}, P_5 x P_7, P_6 x P_{10}, P_1 x P_2 for stem girth, P_1 x P_{10}, P_3 x P_6 and P_5 x P_6 for vine length at final harvest, P_5 x P_8, P_8 x P_{10}, P_7 x P_9, P_1 x P_9, P_4 x P_{10}, P_1 x P_6 and P_6 x P_9 for yield per vine, P_7 x P_9 and P_7 x P_{10} for total sugar, P_1 x P_3 for reducing sugar and P_8 x P_9, P_6 x P_{10}, P_3 x P7, P3 x P_9, P_2 x P_3 and P_1 x P_8 for non-reducing sugar were exhibited non-significant deviation from regression (S^2d_i) and regression coefficient (b_i>1) along with mean value higher than the population mean. It indicates that these hybrids would stablein favorable environment. The hybrid P_8 x P_{10} and P_9 x P_{10} for rind thickness and the hybrid P_4 x P_9 yield per vine were exhibited non-significant deviation from regression (S^2d_i) and regression coefficient nearly equal to a unit (b_i=1) along with mean value greater than the population mean, thereby indicated its average stability under different environment.

***Key words** : Bottle gourd, G x EInteraction, Stability, Non-significant deviation, Regression coefficient*

Introduction

Vegetable is the most important component of a balanced hunman diet and also the main constituent in accomplishing nutritional security through providing vitamins, minerals, nutrient and nutraceutical compounds. Among the vegetables family cucurbitaceous forms, the largest group. All together there are 2 well defined sub-families, 8 tribes about 118 genera and 825 spices out of these, approximately 20 species belonging 9 genera are under cultivation (Jeffery 1990). Bottle gourd [*Lagenaria siceraria* (Mol.) Standl.] is one of the important cucurbits in world as well as in India. The genus

Lagenaria that is derived from "Greek" word "lagena" meaning "bottle". It is also called white-flowered gourd or calabash gourd belongs to the gourd family *i.e. Cucurbitaceae*. According to Cutler and Whitaker (1961), this plant is probably indigenous to tropical Africa. According to De Candolle (1882), bottle gourd has been found in wild form in South Africa and India.Bottle gourd is a monoecious species with male and female flowers found on the same plant's leaf axils (Morimoto *et al*. (2004) and Singh, 2008). In bottle gourd, the monoecious sex expression predominates and andro-monoecious genetic stock (Andromon 6) was discovered to be recessive to monoecious by a single gene (Singh *et al.* 1996). Though monoecious, bottle gourd is a highly cross-pollinating crop (Tiwari and Ram, 2009). Yield stability has always been considered as an important topic in plant breeding but will be made more important by the continued variation in climatic conditions. The phenotype of an individual is a mixture of both genotype (G) and environmental factors (E). As a consequence of G × E interaction, crop varieties may not show uniform performance across different environments. The term "genotype" refers to the genetic makeup of an organism, while "environment" refers to biophysical factors that have an effect on the growth and development of a genotype. The G × E study is especially important in countries with various agro-ecologies. Significant G × E interaction is a consequence of variations in the extent of differences among genotypes in diverse environments or variations in the comparative ranking of the genotypes.

Experimental Materials and Methods

The experimental material comprised of 10 inbred lines *viz.,* DVBD-1 (P_1), VRBD-5 (P_2), VRBG-1 (P_3), DR-2017(Long) (P_4), VRBG-2-1-1 (P_5), VRBG-34 (P_6), VRBG-27-1 (P_7), VRBG-11-1 (P_8), VRBG-59 (P_9), IC-594545 (P_{10}), 45 F_1s and 3 checks *viz.,* Parag, Prince and Mahy Warad. All the ten parental lines were received for Indian Institute of Vegetable Research, Varanasi.These 45 F_1s were obtained by crossing 10 inbred lines were crossed in diallel mating design (excluding reciprocal) design to develop a total forty-five hybrids in rainy season (July to February) of 2019-2020. Geographically Hi-tech unit, Department of Horticulture, Rajasthan College of Agriculture, Maharana Pratap University of Agriculture and Technology, Udaipur is situated at 24^0 35′ N latitude, 24^0 42′ E longitudes and an altitude of 579.5 meter above mean sea level. While, Krishi Vigyan Kendra, Chittorgarh is situated at 24^0 85′ N latitude, 74^0 58′ E longitudes and an altitude of 394.6 meter above mean sea level. The region falls under agro-climatic zone IVA "Sub-humid Southern Plain and Aravalli Hills of Rajasthan''.

Statistical Analysis

The method of random sampling was adopted for recording the observations of various characters of bottle gourd. The observations for quantitative and biochemical characters were recorded on five plants per treatment in each replication. Data of five plants were averaged replication wise and mean data was used for statistical analysis. Separately environment wise analysis of variance for each character and each genotype was subjected to pooled analysis of variance (Panse and Sukhatme, 1985). The data collected from these separate sites was submitted to a stability analysis using Eberhart and Russell's model (1966). It's simply based on regression. The basic

Table 1. Analysis of variance Eberhart and Russel (1966)

S. No.	Characters	Genotype [57]	E+(G x E) [116]	E (L) [1]	G x E (L) [57]	Pool dev. [58]	Pool Err [342]
1	Days to first harvest	20.95**	1.86**	0.00	2.46**	1.32**	0.50
2	Fruit length (cm)	199.82**	0.58**	0.00	0.73**	0.44	0.35
3	Rind thickness (mm)	0.30**	0.01**	0.00	0.01**	0.00	0.00
4	Flesh thickness (mm)	950.77**	2.22**	0.00	1.44	3.03**	1.53
5	Stem girth (mm)	4.56**	0.34**	0.00	0.28**	0.42**	0.12
6	Vine length at final harvest (m)	1.59**	0.10**	0.00	0.18**	0.03	0.07
7	Yield per vine (kg)	4.24**	0.12**	0.00	0.22**	0.03	0.06
8	Total sugar (%)	0.05**	0.00**	0.00	0.00**	0.00**	0.00
9	Reducing sugar (%)	0.02**	0.00**	0.00	0.00**	0.00**	0.00
10	Non-reducing sugar (%)	0.02**	0.00**	0.00	0.00**	0.00**	0.00

*, ** Significant at 5% and 1% respectively

model employed is as follows: $Y_{ij} = \beta_{0i} + \beta_i I_j + \beta_{ij}$ where Y_{ij} is repercussion of i[th] of variety in j[th] locations, β_{0i} is respond of genotype i, β_i is regression coefficient of i[th] variety to varying environments indices. Ij is the coded environmental index; $ä_{ij}$ is the regression deviation and three additional parameters were calculated namely mean (μ_i), regression coefficient (b_i) and non-significant variation (S^2d_i) from regression line.

Stability analysis through Eberhart and Russell model (1966)

Because of its versatility, performance stability is one of the most desired characteristics of any genotype. Stability measures, such as mean performance across environments, regression coefficient (b_i), and deviation from linear regression (S^2d_i), were calculated for all attributes under consideration of The Eberhart-Russell model (1966) (Table 3).

These stability criteria, as well as the mean value of characters influence a genotype's desirability. The linear regression coefficient (bi) was used to assess responsiveness of genotype. The high b_i value indicates that the genotype is more responsive; such genotypes may thus be chosen for highly favorable environments (Below average stability). The fact that the regression coefficient (b_i) is close to one implies that it is more adaptable (Absolute stability). If, on the other hand, the regression coefficient (b_i) is low, the genotype can only be cultivated in poor environmental conditions (Above average stability). The deviation from regression (S^2d_i) was used to assess stability. If S^2d_i deviates significantly from zero, the linear prediction is invalidated, whereas non-significant S^2d_i indicates that the performance of a genotype in a particular environment may be predicted.

Results

For days to first harvest, one hybrids P_3 x P_6 (0.88) showed non-significant S^2d_i and regression coefficient was less than a unit (b_i<1) with lower mean values than the population mean, indicated their stability for this character in unfavorable environment, two hybrids P_4 x P_5 (1.30) and P_6 x P_7 (1.71) registered non-significant deviation from regression (S^2d_i) and regression coefficient was higher to unit (b_i>1) along with mean value lower than the population mean, thereby indicated good stability under different environment for days to first harvest. For fruit length, six hybrids *viz*. P_2 x P_9 (0.93), P_3 x P_6 (0.70), P_3 x P_9 (0.63), P_4 x P_7 (0.49), P_3 x P_7 (0.22) and P_1 x P_3 (0.21) expressed non-significant S^2d_i and regression coefficient less than a unit (b_i<1) along with mean value higher than the population mean, thereby indicated their stability and suitability for higher fruit length under unfavorableenvironment, two hybrids P_5 x P_9 (1.71) and P_3 x P_5 (1.86) showed non-significant deviation from regression (S^2d_i) and regression coefficient greater than a unit (b_i>1) with higher mean value than the population mean value. These hybrids were therefore, identified as stable under favorable environment for longer fruit.

In case of rind thickness, hybrids P_7 x P_{10} (1.07), P_6 x P_7 (1.32), P_6 x P_9 (1.33), P_1 x P_5 (1.33) and P_3 x P_8 (1.98) showed non-significant deviation from regression (S^2d_i) and regression coefficient greater than unity (b_i>1) with higher mean values than the population mean, these hybrids were considered stable and suitable for favorable environment. Three hybrids *viz*. P_4 x P_{10}(0.92), P_2 x P_5 (0.79) and P_1 x P_6 (0.74) expressed non-significant deviation from regression (S^2d_i) and regression coefficient lesser than a unit (b_i<1) with higher mean than the population mean, these hybrids expressed stability for unfavorable environment,two hybrid P_8 x P_{10} and P_9 x P_{10}exhibited non-significant deviation from regression (S^2d_i) and regression coefficient nearly equal to a unit (b_i=1) along with mean value greater than the population mean, thereby indicated its average stability under different environment for rind thickness. For flesh thickness, four hybrids *viz*. P_2 x P_8 (1.06), P_6 x P_9 (1.07), P_6 x P_{10} (1.13) and P_4 x P_9 (1.77) registered non-significant deviation from regression (S^2d_i) and regression coefficient greater than a unit (b_i>1) with higher mean values than the population mean, these genotypes were considered stable in good environment. Hybrids *viz*. P_1 x P_6 (0.95), P_6 x P_8 (0.37) and P_9 x P_{10} (0.22) expressed non-significant deviation from regression (S^2d_i) and regression coefficient lesser than a unit (b_i<1) with higher mean than the population mean, these hybrids thus exhibited stability for poor environment for flesh thickness.

Stability for stem girth, five hybrids P_3 x P_8 (1.23), P_7 x P_{10} (1.28), P_5 x P_7 (1.35), P_6 x P_{10} (1.74) P_1 x P_2 (1.92) and one checks "Prince" (1.51) registered non-significant S^2d_i and regression coefficient (b_i>1) with lower mean value than the population mean, which indicating their stability under favorable environment for stem girth. Hybrids P_6 x P_8 (0.99), P_3 x P_9

Table 2. Stability parameters days to first harvest and fruit length (cm)Eberhart and Russel (1966)

Sl. No.	Genotype	Days to first harvest			Fruit length (cm)		
		μ_i	b_i	S^2d_i	μ_i	b_i	S^2d_i
1	P_1	71.53	2.00	0.870	31.84	1.44	-0.352
2	P_2	68.89	-0.72	-0.389	32.72	6.40	1.342*
3	P_3	71.48	-0.28	-0.492	34.45	2.79	-0.325
4	P_4	69.92	-5.60	0.180	32.66	-0.11	-0.130
5	P_5	71.80	0.93	-0.272	27.48	1.60	0.315
6	P_6	68.63	-0.10	-0.462	12.55	-0.28	-0.295
7	P_7	71.02	-2.35	-0.096	13.26	1.69	-0.294
8	P_8	75.22	4.71	-0.332	14.35	0.66	-0.266
9	P_9	77.23	5.50	0.497	13.61	-2.39	0.345
10	P_{10}	77.72	1.33	-0.411	13.51	-1.47	-0.153
11	P_1 x P_2	70.60	2.70	-0.008	33.90	-3.57	-0.202
12	P_1 x P_3	70.57	-0.40	-0.480	38.63	0.21	-0.094
13	P_1 x P_4	69.94	-5.25	-0.352	29.63	4.38	0.298
14	P_1 x P_5	71.14	4.30	1.686*	30.55	-1.89	-0.158
15	P_1 x P_6	67.90	4.26	-0.434	27.96	-0.59	-0.048
16	P_1 x P_7	70.88	-1.61	0.004	28.66	2.13	-0.310
17	P_1 x P_8	72.42	2.40	0.485	29.00	9.49**++	-0.353
18	P_1 x P_9	75.70	6.10	2.036*	29.51	3.40	-0.247
19	P_1 x P_{10}	73.90	0.96	-0.402	32.24	3.59	-0.256
20	P_2 x P_3	68.66	-3.13	-0.486	33.69	5.40	0.378
21	P_2 x P_4	68.63	-2.72*+	-0.500	33.35	7.40	1.423*
22	P_2 x P_5	70.03	-2.90+	-0.494	33.06	4.48	-0.015
23	P_2 x P_6	68.82	-3.03	-0.120	32.46	3.05	-0.245
24	P_2 x P_7	70.30	-3.81	-0.070	29.64	2.83	-0.340
25	P_2 x P_8	71.19	-4.64	1.152	33.42	3.91	-0.168
26	P_2 x P_9	73.42	8.20	-0.131	29.42	0.93	-0.295
27	P_2 x P_{10}	74.92	1.07	-0.063	33.88	-3.14	-0.292
28	P_3 x P_4	70.30	-1.13	2.733*	35.47	-0.87	0.231
29	P_3 x P_5	70.77	-5.14	-0.330	31.28	1.86	0.716
30	P_3 x P_6	69.71	0.88	5.217**	30.44	0.70	-0.347
31	P_3 x P_7	71.34	-0.89	2.044*	31.46	0.22	-0.071
32	P_3 x P_8	70.18	3.55	3.952**	30.60	-9.83	5.655**
33	P_3 x P_9	71.77	3.18	-0.103	31.51	0.63	-0.030
34	P_3 x P_{10}	72.92	-5.41	-0.420	32.54	7.50	0.942
35	P_4 x P_5	70.66	1.30	-0.348	36.17	-2.90	-0.332
36	P_4 x P_6	67.28	-0.40	-0.037	31.54	-1.90	2.397**
37	P_4 x P_7	71.04	-5.67	-0.392	30.19	0.49	-0.351
38	P_4 x P_8	72.84	-2.09	-0.299	31.97	-5.17	0.399
39	P_4 x P_9	74.76	2.43	0.188	28.49	-2.87	-0.346
40	P_4 x P_{10}	77.70	9.09*+	-0.486	29.49	3.04	-0.235
41	P_5 x P_6	70.72	3.72	2.554*	31.00	5.99	0.202
42	P_5 x P_7	70.99	-4.04	4.021**	35.36	3.72*	-0.350
43	P_5 x P_8	73.71	3.34	4.329**	29.76	7.03	0.908
44	P_5 x P_9	74.16	-1.05	-0.382	31.29	1.71	-0.336
45	P_5 x P_{10}	75.57	4.14**++	-0.503	30.71	3.87	-0.346
46	P_6 x P_7	69.23	1.71	15.169**	13.20	1.74	-0.257
47	P_6 x P_8	71.93	-3.90	-0.399	13.43	-1.15	-0.338
48	P_6 x P_9	74.71	3.72	0.145	13.56	-0.93	-0.340
49	P_6 x P_{10}	74.46	7.36	0.219	13.01	-1.78	-0.340
50	P_7 x P_8	72.56	1.45	5.641**	13.55	-0.58	-0.348
51	P_7 x P_9	74.43	0.94	2.859**	15.09	2.79	-0.322
52	P_7 x P_{10}	76.28	5.45	0.541	14.80	-0.26	-0.352

Table 2. *Continued ...*

Sl. No.	Genotype	Days to first harvest			Fruit length (cm)		
		μ_i	b_i	S^2d_i	μ_i	b_i	S^2d_i
53	P_8 x P_9	76.12	4.11	-0.348	16.09	1.09	-0.336
54	P_8 x P_{10}	77.01	8.00	-0.014	13.82	2.42	-0.318
55	P_9 x P_{10}	75.97	8.15	0.685	15.08	-1.85	-0.257
56	Check 1	72.19	5.97	0.111	35.12	-6.40	1.057*
57	Check 2	71.80	1.09	-0.214	31.61	-1.58	-0.346
58	Check 3	71.03	0.23	0.091	32.91	-1.05	-0.328

*, ** Significant at 5% and 1% respectively; +, ++ Significant deviation from unity at 5% and 1% respectively

(0.96), P_1 x P_6 (0.94), P_8 x P_9 (0.86), P_8 x P_{10} (0.21) and P_4 x P_6 (0.07) expressed non-significant deviation from regression (S^2d_i) and regression coefficient (b_i<1) along with mean value lower than the population mean value, it indicates that these genotypes would express stem girth in unfavorable environment for stem girth. For vine length at final harvest, four hybrid P_8 x P_9 (0.85), P_6 x P_8 (0.76) P_4 x P_8 (0.42) and P_8 x P_{10} (0.21) expressed non-significant deviation from regression (S^2d_i) and regression coefficient lesser than a unit (b_i<1) with higher mean values than the population mean, thereby indicated their suitability and stability under unfavorable environment. Three hybrids *viz*. P_1 x P_{10} (1.74), P_3 x P_6 (1.79) and P_5 x P_6 (1.91) registerednon-significant deviation from regression (S^2d_i) and regression coefficient greater than a unit (b_i>1) with higher mean values that of the population mean. These hybrids were therefore considered suitable and stable in favorable environment for lengthof vine. Stability for yield per vine, two hybrids P_4 x P_5 (0.70) and P_5 x P_6 (0.46) showed non-significant deviation from regression (S^2d_i) and regression coefficient lower than a unit (b_i<1) along with mean value higher than the population mean, thus indicated their stability under unfavorable environment. Seven hybrids P_5 x P_8 (1.39) and P_8 x P_{10}(1.55)P_7 x P_9 (2.34), P_1 x P_9 (2.61), P_4 x P_{10} (2.66), P1 x P6 (2.74) and P_6 x P_9 (2.89) showed non-significant deviation from regression (S^2d_i) and regression coefficient more than a unit (b_i>1) with higher mean value than the population mean, this indicates that these hybrids were stable in favorable environment for fruit yield per vine. One hybrid P_4 x P_9exhibited non-significant deviation from regression (S^2d_i) and regression coefficient equal to a unit (b_i=1) along with mean value greater than the population mean, thereby indicated its average stability under different environment for yield per vine.

In case of total sugar content, two hybrids P_1 x P_5 (0.95) and P_1 x P_3 (0.26) registered non-significant deviation from regression (S^2d_i) and regression coefficient less than a unit (b_i<1) along with mean value higher than the population mean value, thereby indicated their stability under unfavorable environment and suitability for higher total sugars, whereastwo hybrids P_7 x P_9 (1.02) and P_7 x P_{10} (1.82) expressed non-significant deviation from regression (S^2d_i) and regression coefficient greater than a unit (b_i>1) with higher mean value than the population mean, indicates their stability under favorable environment forhigher total sugars. Stability for reducing sugar only one hybrid P_1 x P_3 (1.16) registered non-significant deviation from regression (S^2d_i) and regression coefficient greater than a unit (b_i>1) with higher mean values that of the population mean, these hybrids were therefore considered suitable and stable in favorable environment. In case of non-reducing sugar, six hybrids *viz*. P_8 x P_9 (1.02), P_6 x P_{10} (1.05), P_3 x P_7 (1.12), P_3 x P_9 (1.28), P_2 x P_3 (1.31) and P_1 x P_8 (1.43) registered non-significant deviation from regression (S^2d_i) and regression coefficient greater than a unit (b_i>1) with higher mean values than the population mean, these genotypes were considered stable in favorable environment. Seven hybrids *viz*. P_5 x P_{10}(0.80), P_5 x P_9 (0.63), P_9 x P_{10} (0.45), P_1 x P_2 (0.35), P_1 x P_3 (0.32), P_1 x P_6 (0.30) and P_4 x P_7 (0.20) expressed non-significant deviation from regression (S^2d_i) and regression coefficient lesser than a unit (b_i<1) with higher mean than the population mean, these hybrids thus exhibited stability for unfavorable environment for non- reducing sugar.

Discussion

For days to first harvest, one hybrids P_3 x P_6 (0.88) showedstability in unfavorable environment, two hybrids P_4 x P_5 (1.30) and P_6 x P_7 (1.71)were expressed good stability under different environment.

Table 3. Stability parameters rind thickness (mm) and flesh thickness (mm)Eberhart and Russel (1966)

Sl. No.	Genotype	Rind thickness (mm)			Flesh thickness (mm)		
		μ_i	b_i	S^2d_i	μ_i	b_i	S^2d_i
1	P_1	3.16	1.92	0.006	48.93	2.44	1.689
2	P_2	3.03	-2.04	0.001	48.40	-0.74	-1.412
3	P_3	2.68	7.43	-0.003	52.89	1.14	-1.520
4	P_4	2.75	0.57	-0.003	48.81	-1.22	-0.459
5	P_5	3.48	0.74	-0.001	45.98	1.69	-1.431
6	P_6	3.25	6.24*	-0.004	89.44	-0.68	-1.269
7	P_7	3.19	-0.00	-0.003	89.04	2.29	-0.306
8	P_8	2.55	-0.40	-0.004	98.75	1.87	-0.848
9	P_9	2.88	0.88	0.001	98.68	2.90	-1.392
10	P_{10}	2.70	0.58	-0.004	96.55	0.75	-1.058
11	$P_1 x P_2$	3.17	3.04	-0.004	57.48	0.37	1.093
12	$P_1 x P_3$	2.40	-0.65	-0.004	58.36	-0.13	-0.578
13	$P_1 x P_4$	2.87	-1.44	-0.004	51.57	-0.01	1.276
14	$P_1 x P_5$	3.21	1.33	-0.002	48.65	0.19+	-1.531
15	$P_1 x P_6$	3.54	0.74	-0.003	69.66	0.95	-1.294
16	$P_1 x P_7$	2.80	0.38	0.004	61.90	2.56	-1.141
17	$P_1 x P_8$	3.47	2.47	0.002	48.87	2.06	-0.025
18	$P_1 x P_9$	3.66	-14.73	0.001	59.09	5.24	0.032
19	$P_1 x P_{10}$	2.89	-0.69	-0.004	58.57	0.25	-0.300
20	$P_2 x P_3$	3.22	27.05	0.019*	59.55	-5.15*+	-1.506
21	$P_2 x P_4$	2.88	-2.02	-0.000	50.29	2.18	0.036
22	$P_2 x P_5$	3.21	0.79	-0.002	53.68	1.88	3.959
23	$P_2 x P_6$	2.49	2.43	-0.004	60.20	1.57	-0.844
24	$P_2 x P_7$	3.26	-1.98	-0.002	59.51	1.42	-1.525
25	$P_2 x P_8$	3.22	-0.96	-0.004	67.04	1.06	0.538
26	$P_2 x P_9$	3.48	-1.66	-0.003	57.23	-3.87	13.083**
27	$P_2 x P_{10}$	2.88	2.45	-0.003	56.82	2.89	-1.041
28	$P_3 x P_4$	2.73	1.25	-0.004	54.19	1.07	-0.992
29	$P_3 x P_5$	3.18	-1.84	0.067**	46.14	1.34	6.698*
30	$P_3 x P_6$	2.80	-1.77	-0.004	60.96	2.18	2.992
31	$P_3 x P_7$	2.90	1.19	-0.003	61.00	-1.76	-1.012
32	$P_3 x P_8$	3.14	1.98	0.002	60.06	4.93	0.048
33	$P_3 x P_9$	2.79	-0.59	0.001	59.79	4.81	10.911**
34	$P_3 x P_{10}$	3.19	-1.00	-0.004	57.59	5.06	-1.449
35	$P_4 x P_5$	3.38	3.02	-0.004	49.72	2.62	-0.822
36	$P_4 x P_6$	3.51	3.17	-0.003	57.66	-2.20+	-1.521
37	$P_4 x P_7$	2.90	1.34	-0.004	58.26	3.36	3.577
38	$P_4 x P_8$	2.84	0.56	-0.004	57.23	3.33	-1.470
39	$P_4 x P_9$	2.92	-1.37	-0.004	69.44	1.77	-1.425
40	$P_4 x P_{10}$	3.26	0.92	-0.003	56.86	0.32	14.870**
41	$P_5 x P_6$	2.77	1.89	-0.004	57.28	1.26	-0.546
42	$P_5 x P_7$	2.84	1.13	-0.004	60.49	-1.76	-1.479
43	$P_5 x P_8$	2.88	-0.65	-0.004	61.22	2.26	7.230*
44	$P_5 x P_9$	3.13	2.78	0.004	60.96	1.82	-1.508
45	$P_5 x P_{10}$	2.82	2.95	-0.004	60.22	-1.33	0.249
46	$P_6 x P_7$	3.20	1.32	-0.004	88.17	2.60	26.989**
47	$P_6 x P_8$	2.22	0.86	-0.004	91.06	0.37	11.534**
48	$P_6 x P_9$	3.40	1.33	-0.004	99.55	1.07	-0.645
49	$P_6 x P_{10}$	3.16	-0.42	-0.000	89.66	1.13	-1.258
50	$P_7 x P_8$	2.89	0.06	-0.004	89.71	-6.45	13.728**
51	$P_7 x P_9$	2.80	1.14	-0.004	99.07	4.64	4.129
52	$P_7 x P_{10}$	3.21	1.07	-0.004	108.92	5.69	-0.738

Table 3. *Continued ...*

Sl. No.	Genotype	Rind thickness (mm)			Flesh thickness (mm)		
		μ_i	b_i	S^2d_i	μ_i	b_i	S^2d_i
52	$P_7 \times P_{10}$	3.21	1.07	-0.004	108.92	5.69	-0.738
53	$P_8 \times P_9$	2.35	4.18	-0.001	106.70	-7.96	1.308
54	$P_8 \times P_{10}$	3.58	1.00	-0.004	89.22	6.40	-1.238
55	$P_9 \times P_{10}$	3.16	1.00	-0.004	89.17	0.22	-0.430
56	Check 1	2.81	0.94	-0.004	57.30	-4.42*+	-1.529
57	Check 2	3.10	-1.61	-0.004	57.43	2.17	-1.494
58	Check 3	2.81	-0.03	-0.004	58.37	-0.39	-0.126

*, ** Significant at 5% and 1% respectively; +, ++ Significant deviation from unity at 5% and 1% respectively

Table 4. Stability parameters stem girth (mm) and vine length at final harvest (m)Eberhart and Russel (1966)

Sl. No.	Genotype	Stem girth (mm)			Vine length at final harvest (m)		
		μ_i	b_i	S^2d_i	μ_i	b_i	S^2d_i
1	P_1	12.71	-1.01	0.084	5.49	-0.04	-0.037
2	P_2	13.03	-5.54	0.839**	5.99	-1.91	-0.061
3	P_3	13.40	0.48	-0.100	5.22	4.15	0.146
4	P_4	15.47	5.03*	-0.120	5.94	2.81	-0.065
5	P_5	14.55	5.51	0.047	6.31	1.40	-0.067
6	P_6	13.37	4.40	-0.058	6.49	7.23	-0.046
7	P_7	13.31	-1.37	0.252	6.44	-7.98	-0.045
8	P_8	13.88	-5.62	1.470**	5.47	5.56	-0.056
9	P_9	16.00	3.20	-0.050	4.38	0.58	-0.052
10	P_{10}	14.49	4.99	0.919**	6.24	2.27	-0.057
11	$P_1 \times P_2$	14.44	1.92	0.546*	4.97	0.61	-0.064
12	$P_1 \times P_3$	12.68	-2.65	-0.089	6.29	2.54	-0.063
13	$P_1 \times P_4$	12.78	-2.10	0.755**	5.58	5.63	-0.016
14	$P_1 \times P_5$	13.75	-0.66	1.018**	5.39	-1.89	0.033
15	$P_1 \times P_6$	14.60	0.94	0.413*	6.05	-0.63	-0.018
16	$P_1 \times P_7$	16.35	3.40	0.008	6.29	-2.45	0.007
17	$P_1 \times P_8$	15.78	5.65	-0.102	6.29	2.69	-0.026
18	$P_1 \times P_9$	13.89	2.60	0.453*	5.27	2.18	-0.036
19	$P_1 \times P_{10}$	13.15	-0.54	-0.090	6.06	1.74	0.052
20	$P_2 \times P_3$	11.72	-0.29	0.010	5.05	11.22	0.029
21	$P_2 \times P_4$	12.02	-3.20	1.338**	5.79	7.22*	-0.063
22	$P_2 \times P_5$	12.82	0.89	-0.033	4.75	4.32	-0.001
23	$P_2 \times P_6$	13.65	1.85	0.124	5.90	5.26	-0.042
24	$P_2 \times P_7$	11.94	-0.76	-0.114	5.41	-0.71	-0.064
25	$P_2 \times P_8$	12.24	1.87	0.023	4.93	0.53	-0.063
26	$P_2 \times P_9$	13.81	-3.29	0.057	5.02	3.58	-0.055
27	$P_2 \times P_{10}$	13.15	1.92	0.384*	5.08	-3.18	-0.037
28	$P_3 \times P_4$	13.46	2.63	-0.119	5.68	1.97	-0.023
29	$P_3 \times P_5$	12.81	-1.49	-0.122	6.17	-1.59	-0.062
30	$P_3 \times P_6$	13.10	-0.40	0.100	6.61	1.79	-0.059
31	$P_3 \times P_7$	13.88	5.30	-0.087	5.26	4.99	-0.067
32	$P_3 \times P_8$	15.26	1.23	1.200**	5.16	-7.06*++	-0.067
33	$P_3 \times P_9$	14.80	0.96	-0.063	4.47	1.68	0.191*
34	$P_3 \times P_{10}$	12.90	1.06	-0.116	4.65	1.06*	-0.067
35	$P_4 \times P_5$	14.17	-3.38	-0.071	6.32	-4.02+	-0.066
36	$P_4 \times P_6$	15.40	0.07	-0.074	7.28	2.56	-0.063
37	$P_4 \times P_7$	15.34	2.71	-0.014	6.90	2.35	-0.062
38	$P_4 \times P_8$	14.78	4.02	-0.072	6.38	0.42	-0.064

Table 4. *Continued ...*

Sl. No.	Genotype	Stem girth (mm)			Vine length at final harvest (m)		
		μ_i	b_i	S^2d_i	μ_i	b_i	S^2d_i
40	$P_4 \times P_{10}$	16.07	3.75	-0.117	7.40	-1.54	-0.064
41	$P_5 \times P_6$	15.32	-0.83	0.984**	6.48	1.91	-0.041
42	$P_5 \times P_7$	15.58	1.35	-0.037	5.73	5.44	-0.046
43	$P_5 \times P_8$	14.93	2.71	0.147	5.69	6.08	-0.067
44	$P_5 \times P_9$	15.26	-1.70	-0.116	6.40	-2.06	-0.056
45	$P_5 \times P_{10}$	16.39	2.42	0.080	6.50	2.24	-0.062
46	$P_6 \times P_7$	14.28	2.82	0.117	6.76	4.53	-0.051
47	$P_6 \times P_8$	14.10	0.99	0.442*	6.29	0.76	-0.059
48	$P_6 \times P_9$	14.48	3.55	-0.029	6.43	4.66*+	-0.067
49	$P_6 \times P_{10}$	14.90	1.74	0.665*	5.29	-4.37	-0.058
50	$P_7 \times P_8$	15.14	-4.68	-0.043	6.15	-2.75	-0.058
51	$P_7 \times P_9$	14.85	2.51	-0.031	6.46	-1.10	-0.065
52	$P_7 \times P_{10}$	15.52	1.28	0.156	5.52	-1.23	-0.060
53	$P_8 \times P_9$	15.73	0.86	0.307	7.39	0.85	-0.065
54	$P_8 \times P_{10}$	15.97	0.21	0.026	7.08	0.21	0.026
55	$P_9 \times P_{10}$	16.01	4.93	0.388*	6.45	-0.41	-0.065
56	Check 1	14.63	-0.01	1.883**	6.42	-3.84	-0.060
57	Check 2	15.32	1.51	-0.114	6.49	-1.19	-0.064
58	Check 3	14.17	-1.45	-0.094	5.97	-1.45	0.014

*, ** Significant at 5% and 1% respectively; +, ++ Significant deviation from unity at 5% and 1% respectively

Stability for earliness has also been earlier reported by Samadia (2007), Shaikh *et al.* (2012) and Balat *et al.* (2021) in bottle gourd. For fruit length, six hybrids viz. $P_2 \times P_9$ (0.93), $P_3 \times P_6$ (0.70), $P_3 \times P_9$ (0.63), $P_4 \times P_7$ (0.49), $P_3 \times P_7$ (0.22) and $P_1 \times P_3$ (0.21) expressed stability and suitability under unfavorable environment, two hybrids $P_5 \times P_9$ (1.71) and $P_3 \times P_5$ (1.86) showed stable under favorable environment for longer fruit. Varalakshmi *et al*. (2018) have been also reported stable genotypes for fruit length in bottle gourd. In case of rind thickness, hybrids $P_7 \times P_{10}$ (1.07), $P_6 \times P_7$ (1.32), $P_6 \times P_9$ (1.33), $P_1 \times P_5$ (1.33) and $P_3 \times P_8$ (1.98) showed stable and suitable for favorable environment. Three hybrids viz. $P_4 \times P_{10}$ (0.92), $P_2 \times P_5$ (0.79) and $P_1 \times P_6$ (0.74) expressed stability for unfavorable environment and two hybrid $P_8 \times P_{10}$ and $P_9 \times P_{10}$ exhibited stability under different environment for rind thickness. For flesh thickness, four hybrids viz. $P_2 \times P_8$ (1.06), $P_6 \times P_9$ (1.07), $P_6 \times P_{10}$ (1.13) and $P_4 \times P_9$ (1.77) registered genotypes were considered stable in good environment. Hybrids viz. $P_1 \times P_6$ (0.95), $P_6 \times P_8$ (0.37) and $P_9 \times P_{10}$ (0.22) expressed stability for poor environment for flesh thickness. Stable genotypes were reported by Dhakare and More (2008) for flesh thickness in muskmelon. Stability for stem girth, five hybrids $P_3 \times P_8$ (1.23), $P_7 \times P_{10}$ (1.28), $P_5 \times P_7$ (1.35), $P_6 \times P_{10}$ (1.74) $P_1 \times P_2$ (1.92) and one checks "Prince" (1.51) registered stability under favorable environment for stem girth. Hybrids $P_6 \times P_8$ (0.99), $P_3 \times P_9$ (0.96), $P_1 \times P_6$ (0.94), $P_8 \times P_9$ (0.86), $P_8 \times P_{10}$ (0.21) and $P_4 \times P_6$ (0.07) expressed for stem girth in unfavorable environment for stem girth. For vine length at final harvest, four hybrid $P_8 \times P_9$ (0.85), $P_6 \times P_8$ (0.76) $P_4 \times P_8$ (0.42) and $P_8 \times P_{10}$ (0.21) expressed stability under unfavorable environment, three hybrids viz. $P_1 \times P_{10}$ (1.74), $P_3 \times P_6$ (1.79) and $P_5 \times P_6$ (1.91) stable in favorable environment for length of vine. Stable genotypes for vine length was also reported by Varalakshmi *et al*. (2018) while working with bottle gourd. Stability for yield per vine, two hybrids $P_4 \times P_5$ (0.70) and P5 x P_6 (0.46) showed stability under unfavorable environment. Seven hybrids $P_5 \times P_8$ (1.39) and $P_8 \times P_{10}$ (1.55) P7 x P9 (2.34), $P_1 \times P_9$ (2.61), $P_4 \times P_{10}$ (2.66), $P_1 \times P_6$ (2.74) and $P_6 \times P_9$ (2.89) expressed stability in favorable environment for fruit yield per vine. One hybrid $P_4 \times P_9$ exhibited average stability under different environment for yield per vine. Stable genotypes for yield per vine have also been earlier reported by Samadia (2007), Varalakshmi *et al*. (2018) and Balat *et al*. (2021) in bottle gourd. In case of total sugar content, two hybrids $P_1 \times P_5$ (0.95) and $P_1 \times P_3$ (0.26) registered stability under unfavorable environment and suitability for higher total sugars, whereas two hy-

Table 5. Stability parameters yield per vine (kg) and non-reducing sugar (%)Eberhart and Russel (1966)

Sl. No.	Genotype	Yield per vine (kg)			Non-reducing sugar (%)		
		μ_i	b_i	S^2d_i	μ_i	b_i	S^2d_i
1	P_1	4.33	-3.37	-0.062	0.32	1.32	-0.000
2	P_2	5.42	-7.46	0.049	0.43	1.76	0.000
3	P_3	3.54	-0.47	-0.060	0.37	1.38	-0.000
4	P_4	5.34	6.48	-0.052	0.51	1.60	0.000
5	P_5	4.29	2.16	-0.064	0.61	1.86	0.000
6	P_6	4.62	3.15*	-0.064	0.41	1.24	-0.000
7	P_7	5.27	-5.53	-0.039	0.46	-0.22	0.001*
8	P_8	5.79	-2.44	-0.041	0.33	2.03	0.001*
9	P_9	5.09	13.34	0.224*	0.51	0.91	0.000
10	P_{10}	6.36	1.39	-0.054	0.53	0.16	-0.000
11	P_1 x P_2	4.64	3.37	0.004	0.56	0.35	-0.000
12	P_1 x P_3	4.27	-4.44	-0.048	0.52	0.32	0.000
13	P_1 x P_4	6.57	-3.97	0.016	0.45	-0.01	-0.000
14	P_1 x P_5	5.33	5.11**+	-0.064	0.55	3.38	-0.000
15	P_1 x P_6	4.35	2.74	-0.008	0.59	0.30	0.000
16	P_1 x P_7	6.27	9.76	0.036	0.55	1.99	0.001*
17	P_1 x P_8	5.41	12.36	0.071	0.59	1.43	-0.000
18	P_1 x P_9	5.26	2.61	-0.024	0.60	2.06	0.000
19	P_1 x P_{10}	5.49	-5.73	-0.037	0.47	0.28	-0.000
20	P_2 x P_3	4.17	-2.52	-0.032	0.53	1.31	-0.000
21	P_2 x P_4	3.67	-5.66	0.020	0.31	0.43	-0.000
22	P_2 x P_5	4.70	-2.84	-0.022	0.33	1.56	-0.000
23	P_2 x P_6	4.21	4.02**++	-0.064	0.54	2.27	-0.000
24	P_2 x P_7	4.07	-4.26	-0.049	0.58	2.44	0.000
25	P_2 x P_8	3.97	-2.40	-0.034	0.61	-0.88	-0.000
26	P_2 x P_9	4.16	-3.90	-0.061	0.45	-0.49	0.000
27	P_2 x P_{10}	3.11	1.95	-0.035	0.68	-0.62	-0.000
28	P_3 x P_4	4.10	2.71*	-0.064	0.49	-0.88+	-0.000
29	P_3 x P_5	4.35	-5.52	-0.054	0.51	-0.06	-0.000
30	P_3 x P_6	3.88	-2.34	-0.036	0.52	-0.32	-0.000
31	P_3 x P_7	3.62	3.48*+	-0.064	0.54	1.12	-0.000
32	P_3 x P_8	2.99	8.87	0.040	0.51	9.33	0.005**
33	P_3 x P_9	3.41	3.23**+	-0.064	0.54	1.28	-0.000
34	P_3 x P_{10}	3.60	-4.38	-0.035	0.30	1.62	-0.000
35	P_4 x P_5	5.72	0.70	-0.045	0.44	1.38	0.001**
36	P_4 x P_6	6.33	14.47	-0.039	0.60	-0.18	0.000
37	P_4 x P_7	7.28	4.25	-0.055	0.58	0.20	0.000
38	P_4 x P_8	6.13	7.62	0.049	0.63	2.98	0.001**
39	P_4 x P_9	5.92	1.00	-0.002	0.57	-0.38	0.002**
40	P_4 x P_{10}	7.28	2.66	-0.046	0.55	3.86	-0.000
41	P_5 x P_6	5.49	0.46	-0.031	0.42	1.19	0.000
42	P_5 x P_7	5.81	3.73**++	-0.064	0.52	-1.52	-0.000
43	P_5 x P_8	6.22	1.39	-0.020	0.49	1.18	0.002**
44	P_5 x P_9	5.93	-5.14	-0.058	0.51	0.63	0.000
45	P_5 x P_{10}	5.75	3.64	-0.060	0.53	0.80	-0.000
46	P_6 x P_7	4.58	1.80	-0.046	0.44	2.09	-0.000
47	P_6 x P_8	7.54	-5.44*+	-0.064	0.44	1.24*	-0.000
48	P_6 x P_9	7.61	2.89	-0.062	0.49	-4.16	-0.000
49	P_6 x P_{10}	4.95	-1.13	-0.057	0.54	1.05	0.000
50	P_7 x P_8	7.74	-6.01*+	-0.063	0.47	2.29	0.002**
51	P_7 x P_9	4.33	2.34	-0.061	0.56	-1.65	-0.000
52	P_7 x P_{10}	6.36	2.92	-0.054	0.59	-0.61	0.000

Table 5. *Continued ...*

Sl. No.	Genotype	Yield per vine (kg)			Non-reducing sugar (%)		
		μ_i	b_i	S^2d_i	μ_i	b_i	S^2d_i
53	$P_8 \times P_9$	6.42	4.17	-0.064	0.49	1.02*	-0.000
54	$P_8 \times P_{10}$	6.94	1.55	-0.009	0.55	-0.74	-0.000
55	$P_9 \times P_{10}$	5.86	4.41	-0.055	0.57	0.45	-0.000
56	Check 1	5.56	-2.35	0.027	0.46	-0.08	0.000
57	Check 2	5.00	2.80**++	-0.064	0.28	3.58	0.001
58	Check 3	5.38	-4.18*+	-0.064	0.53	3.54	0.001*

*, ** Significant at 5% and 1% respectively; +, ++ Significant deviation from unity at 5% and 1% respectively

Table 6. Stability parameters total sugar (%) and reducing sugar (%)Eberhart and Russel (1966)

Sl. No.	Genotype	Total sugar (%)			Reducing sugar (%)		
		μ_i	b_i	S^2d_i	μ_i	b_i	S^2d_i
1	P_1	1.56	0.15	-0.000	1.24	0.81	0.000
2	P_2	1.71	2.44	-0.000	1.28	-2.23	0.000
3	P_3	1.62	2.33	0.000	1.25	-2.79	0.000
4	P_4	1.87	2.62	0.001*	1.35	0.35	0.001*
5	P_5	1.96	2.15	-0.000	1.35	1.85	-0.000
6	P_6	1.81	-0.99	-0.000	1.39	-6.16	0.000
7	P_7	1.70	-0.70	0.001	1.24	-1.22	-0.000
8	P_8	1.58	0.77	-0.000	1.25	-4.30	0.000
9	P_9	1.92	-1.53	0.002*	1.41	-7.34	-0.000
10	P_{10}	1.77	0.77	-0.000	1.24	0.03	-0.000
11	$P_1 \times P_2$	1.92	2.59*	-0.000	1.36	3.75	0.001
12	$P_1 \times P_3$	1.85	0.26	0.001	1.33	1.16	-0.000
13	$P_1 \times P_4$	1.69	-0.98	-0.000	1.24	-1.17	-0.000
14	$P_1 \times P_5$	1.98	0.95	-0.000	1.43	-4.17	0.000
15	$P_1 \times P_6$	1.90	4.59	0.000	1.32	-0.48	0.005**
16	$P_1 \times P_7$	1.86	-1.31	-0.000	1.32	0.97	0.001**
17	$P_1 \times P_8$	1.98	-1.82	0.000	1.39	1.36	0.002**
18	$P_1 \times P_9$	2.05	2.70	0.000	1.45	2.90	-0.000
19	$P_1 \times P_{10}$	1.78	-3.24	0.000	1.32	-4.38	0.002**
20	$P_2 \times P_3$	1.78	-0.80	0.000	1.25	3.91	0.001**
21	$P_2 \times P_4$	1.55	-0.22	-0.000	1.24	1.15	-0.000
22	$P_2 \times P_5$	1.58	-2.30	-0.000	1.25	-4.21	0.002**
23	$P_2 \times P_6$	1.79	2.44	-0.000	1.25	0.03	-0.000
24	$P_2 \times P_7$	1.74	1.42	0.001	1.16	1.53	0.000
25	$P_2 \times P_8$	1.87	-0.47	-0.000	1.25	1.84	-0.000
26	$P_2 \times P_9$	1.69	-0.18	0.000	1.24	1.50	-0.000
27	$P_2 \times P_{10}$	2.00	2.92	0.001	1.32	11.01	0.000
28	$P_3 \times P_4$	1.73	-0.69	-0.000	1.24	2.12	-0.000
29	$P_3 \times P_5$	1.78	-3.17	0.001	1.27	-2.06	0.002**
30	$P_3 \times P_6$	1.75	-1.09	-0.000	1.23	1.26	0.000
31	$P_3 \times P_7$	1.86	5.90	0.001	1.32	3.90	0.005**
32	$P_3 \times P_8$	1.88	4.59	0.007**	1.36	-0.49	0.001
33	$P_3 \times P_9$	1.79	-2.37	-0.000	1.25	-5.74	0.002**
34	$P_3 \times P_{10}$	1.59	4.52	0.001	1.30	10.21	0.000
35	$P_4 \times P_5$	1.73	5.11	0.012**	1.28	21.65	-0.000
36	$P_4 \times P_6$	1.94	-0.88	0.000	1.33	-1.10	-0.000
37	$P_4 \times P_7$	1.85	2.88*	-0.000	1.27	0.85	0.001*
38	$P_4 \times P_8$	1.97	2.44	0.001*	1.34	2.82	-0.000
39	$P_4 \times P_9$	1.98	-2.74	-0.000	1.40	2.57	0.001*

Table 6. *Continued ..*

Sl. No.	Genotype	Total sugar (%)			Reducing sugar (%)		
		μ_i	b_i	S^2d_i	μ_i	b_i	S^2d_i
40	P_4 x P_{10}	1.81	-1.13	-0.000	1.26	-0.76	0.004**
41	P_5 x P_6	1.68	0.11	-0.000	1.26	-1.52	0.000
42	P_5 x P_7	1.91	2.33	-0.000	1.39	1.90	0.003**
43	P_5 x P_8	2.07	8.20	0.000	1.58	-0.64	0.012**
44	P_5 x P_9	1.98	-1.02	0.001	1.48	1.33	0.001*
45	P_5 x P_{10}	1.89	5.32	0.000	1.35	3.56	0.005**
46	P_6 x P_7	1.81	8.96	0.003**	1.37	5.69	0.012**
47	P_6 x P_8	1.74	-1.71	0.002*	1.30	5.32	0.004**
48	P_6 x P_9	1.77	-0.62	0.000	1.28	8.85	0.000
49	P_6 x P_{10}	2.04	-1.90	-0.000	1.50	0.36	0.001**
50	P_7 x P_8	1.72	4.12	0.000	1.25	0.44	0.000
51	P_7 x P_9	1.83	1.02	-0.000	1.27	0.40	0.001**
52	P_7 x P_{10}	1.87	1.82	0.000	1.27	-3.28	0.002**
53	P_8 x P_9	1.72	0.47	-0.000	1.23	0.25	-0.000
54	P_8 x P_{10}	1.80	-1.49	0.000	1.26	0.64	0.000
55	P_9 x P_{10}	1.97	3.86	0.000	1.40	2.98	0.002**
56	Check 1	1.80	-1.24	0.000	1.34	-0.99	-0.000
57	Check 2	1.56	2.88*+	-0.000	1.28	8.87	0.000
58	Check 3	1.91	-1.06	-0.000	1.38	1.47	0.003**

*, ** Significant at 5% and 1% respectively; +, ++ Significant deviation from unity at 5% and 1% respectively

brids P_7 x P_9 (1.02) and P_7 x P_{10} (1.82) expressed stability under favorable environment for higher total sugars. Stability for reducing sugar only one hybrid P_1 x P_3 (1.16) registered suitable and stable in favorable environment. In case of non- reducing sugar, six hybrids viz. P_8 x P_9 (1.02), P_6 x P_{10} (1.05), P_3 x P_7 (1.12), P_3 x P_9 (1.28), P_2 x P_3 (1.31) and P_1 x P_8(1.43) registered stable in favorable environment. Seven hybrids viz. P_5 x P_{10} (0.80), P_5 x P_9 (0.63), P_9 x P_{10} (0.45), P_1 x P_2 (0.35), P_1 x P_3 (0.32), P_1 x P_6 (0.30) and P_4 x P_7 (0.20) expressed stability for unfavorable environment for non- reducing sugar.

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