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Research Article

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Introduction

Sweet pepper is a versatile crop; it is mainly used in preparation of various products such as soups, stews, sausage, cheese, snacks, salad dressing, sauces, pizza, confectionaries, beverages etc. and to a limited extent canned, pickled or consumed as a fermented product which make it a major commodity in culinary industry. e consumption of sweet pepper is on the increase all over the world. It has become a multibillion dollar industry, as well as a part time hobby for home gardeners. Moreover the coloured bells command a higher market price and provide an alternate channel for this crop.

e genotype × environmental (G × E) interactions are major concern to plant breeders for developing improved cultivars. For a cultivar to be commercially successful, it must perform well across a

Table 1: Mean squares of pooled environments for maturity and yield attributing traits in Coloured Capsicum (*Capsicumannuum* L. var. *grossum* Sendt.).

Source of variation	d.f	Days to frst fowering	Days to frst fruit set	Days to frst harvest	Number of fruits plant^{-1}	Average fruit Weight (g)	Average fruit yield plant^{-1} (kg)	Average fruit yield plot^{-1} (kg)
Genotypes	14	27.832**	22.506**	21.077**	20.758**	908.508*	0.214**	21.755**
Environments	2	3.968*	36.192**	32.742**	171.540**	3712.613**	1.176**	119.460**
Genotype × Env.	28	2.855*	2.178*	3.610*	2.275*	373.908*	0.093*	7.390*
Error	112	1.235	1.260	1.277	1.779	206.528	0.058	5.952

Table 2: Environmental indices for various maturity and yield attributing traits in Coloured Capsicum (*Capsicum annuum* L. var. *grossum* Sendt.).

Character	Environmental index		
	E_1	E_2	E_3
Days to frst fowering	-0.895	-0.544	1.439
Days to frst fruit set	-0.339	-0.859	1.196
Days to frst harvest	-0.908	-0.362	1.269
Number of fruits plant^{-1}	0.731	0.018	-0.749
Average fruit weight (g)	3.325	0.030	-3.355
Average fruit yield plant^{-1} (kg)	0.090	0.009	-0.099
Average fruit yield plot^{-1} (kg)	0.913	0.092	-1.005

Table 3a: Mean squares of stability analysis for maturity and yield attributing traits in Coloured Capsicum (*Capsicun annuum* L. var. *grossum* Sendt.).

Source of variation	d.f	Days to frst fowering	Days to frst fruit set	Days to frst fruit harvest
Rep within Env.	6	0.814**	0.206	0.234
Genotypes	14	10.056**	9.988**	12.902**
Environment+ (genotype× Env.)	30	1.933**	1.270**	1.618**
Environments	2	23.742**	17.123**	19.243**
Genotype× Env.	28	0.375*	0.138*	0.359*
Environments (L)	1	47.485**	34.246**	38.486**
Genotype × Env. (L)	14	0.571*	0.143*	0.411*
Pooled Deviation	15	0.167	0.124	0.287*
Pooled Error	84	0.278	0.184	0.158
Total	44	4.518	4.044	5.208
***** and ****** signifcant at 5% and 1% respectively				

Table 3b: Mean squares of stability analysis for maturity and yield attributing traits in Coloured Capsicum (*Capsicum annuum* L. var. *grossum* Sendt.).

Source of variation	d.f	Number of fruits plant^{-1}	Average fruit weight (g)	Average fruit yield plant^{-1} (kg)	Average fruit yield plot^{-1} (kg)
Rep within Env.	6	0.454*	0.854	0.002	0.219
Genotypes	14	24.949**	1759.933**	0.304**	30.748**
Environment+ (genotype× Env.)	30	0.895**	17.096**	0.012**	1.221**
Environments	2	8.218**	167.355**	0.135**	13.893**
Genotype× Env.	28	0.372**	6.364*	0.003**	0.316**
Environments (L)	1	16.435**	334.710**	0.271**	27.785**
Genotype × Env. (L)	14	0.608**	7.117*	0.005**	0.487**
Pooled Deviation	15	0.128	5.236**	0.001	0.135
Pooled Error	84	0.243	1.157	0.001	0.128
Total	44	8.549	571.637	0.105	10.616
*and ** signifcant at 5% and 1% respectively					

among genotypes for all traits indicating the presence of large amount of variability in the material chosen for study. e mean sum of squares due to environments were signi cant for all traits indicating that environments selected to conduct the study were variable and in uenced the expression of traits. Similar results have been reported by Tembhurne and Rao, Ummayiah et al., Spaldon et al. etc [2-4].

Environments (linear) component of variance was signi cant for all traits indicating that environmental e ects were predictable. ese results agree with the ndings of Jyothi et al., Tembhurne and Rao, Ummiayah et al and Spaldon et al. [2-5]. e linear component of genotype × environment was also signi cant for all traits indicating the signi cant linear response of genotype to environmental changes for these traits. Non-signi cant e ect of genotype × environment (linear) for rest of the traits indicated that the di erent genotypes did not di er genetically in their response to di erent environments.

e linear component was found to be greater in magnitude than the corresponding non-linear component for almost all the traits suggesting that the performance of genotypes across environments could be predicted with greater precision for these traits. e pooled deviation was signi cant for days to rst fruit harvest and average fruit weight indicating the important contribution of non-predictable component in respect of these traits. Similar results have been reported by Srividhya and Ponnuswami, Tembhurne and Rao, Ummyiah et al., Spaldon et al. [2-4,6].

e genotypes exhibiting stability for di erent traits are given in Table 4a and 4b. In the present study, the estimates of regression coe cients for een genotypes ranged from 0.46 to 2.16 for days to rst owering, 0.56 to 1.43 for days to rst fruit set, 0.18 to 1.76 for days to rst harvest, -0.26 to 3.05 for number of fruits plant^{-1}, 0.24 to 1.91 for average fruit weight, 0.24 to 2.15 for average fruit yield plant^{-1} and 0.23 to 2.13 for fruit yield plot^{-1}indicating that the genotypes possess di erent set of alleles for adaptation across environments.

Since early owering is a desirable character in sweet pepper, the genotypes requiring less number of days to owering as compared to the population mean would be desirable. Early owering together with non-signi cant regression coe cient and non-signi cant deviation from regression indicating average stability were identi ed as SH-SP-2, SH-SP-4, SH-SP-5, SH-SP-14, SH-SP-15, SH-SP-16 and Nishat-1. e genotypes requiring less number of days for rst owering as compared with general mean together with signi cant but less than one regression coe cient together with non-signi cant deviation from regression would indicate above average stability. None of the genotypes exhibited above average stability. SH-SP-11 with regression coe cient value signi cantly greater than unity along with non-signi cant deviation from regression showed belowgni4.

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