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Short Communication

SCREENING GENOTYPES BASED ON STABILITY OF PANICLE CHARACTERS IN PEARL MILLET

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Pearlmillet genotypes did not show stability for grain yield. However, they were stable for some panicle characters. Correlation of grain yield with panicle number and panicle width was positively significant. MH 544 showed not only stability of performance for panicle number and panicle width but also recorded the highest grain yield. Identification of genotypes based on stability of panicle characters rather than grain yield stability might be more useful for crop improvement in pearlmillet.

Key words : Pearlmillet, screening, stability, panicle characters

Nine genotypes of pearlmillet were grown during three *kharif* seasons of 1992, 1993 and 1994 at Agricultural Research Station, Anantapur in rainfed alfisols. The genotypes were planted in randomised block design with three replications. Row-to-row spacing of 50 cm and plant-to-plant spacing of 10 cm was adopted. Crop was fertilized with N, P_2O_5 and K_2O @ 40:20:0 kg ha^{-1} respectively. Nitrogen was applied in two equal splits; one as basal and the other at 30 DAS. Observations on plot basis on threshing percentage, panicle number, panicle weight, test weight and grain yield, and on ten randomly chosen plants on panicle length and panicle width were recorded. G × E interaction and phenotypic stability analysis (Eberhart and Russell, 1966) for all the characters and correlation (Singh and Chaudhary, 1985) of all the traits with grain yield were worked out.

Mean performance and environmental indices indicated that kharif season of 1994 was highly favourable for expression of panicle number, panicle weight, panicle length, panicle width and grain yield. Whereas performance of genotypes for threshing percentage and test weight was better during kharif seasons of 1992 and 1993 respectively. Mean squares due to genotypes and environments for all the characters were significant (Table 1), indicating the presence of variation among genotypes and environments. Predominent effect of varying environments was observed as indicated by high differences in environmental indices and significant mean squares due to environment (linear).

Genotype × environment interaction for panicle length when tested against pooled error was non-significant. It suggested that the genotypes did not exhibited variable response to varying environments for this character. G × E interactions were found to be significant for all the other characters, indicating considerable interaction of the genotypes with the environments in the expression of these characters. Pooled deviation when tested against pooled error was significant for panicle number, panicle weight, test weight, panicle width and grain yield. Therefore, mean sum of squares due to other sources of variation

Table 1. Pooled analysis of variance (M.S.S) for different characters in pearlmillet

Source of variation	DF	Grain yield	Panicle No.	Panicle weight	Test weight	Panicle width	Threshing %
Genotype	8	26.3374**	0.1668**	66.4626**	3.3669**	0.3664++	22.5729++
Env + (G × E)	18	30.9810**	0.6001**	63.8790**	3.8099**	0.2046++	23.6520++
E (linear)	1	244.5700**	7.3583**	613.5630**	26.8598**	3.3210++	32.9230++
G × E (linear)	8	28.6578**	0.3164**	42.8465**	1.5168**	0.0424++	31.8348++
Pooled deviation	9	9.3127**	0.1014**	21.4990**	3.2870**	0.0026	15.3444
Pooled error	54	2.0342	0.0420	4.5886	0.3790	0.1001	7.3495

**Significant at 1% level against pooled deviation
++Significant at 1% level against pooled error

for these characters were tested against pooled deviation. As pooled deviation was non-significant for threshing percentage, the other sources of variation were tested against pooled error. Significant values of pooled deviation for panicle number, panicle weight, panicle width, test weight and grain yield indicated the importance of non-linear components. For threshing percentage, the G × E (linear) was highly significant only when tested against pooled error and not against pooled deviation, indicating a lesser contribution of linear regression and also difficulty in predicting the performance.

The linear and the non-linear components of G × E interaction were important in building up the total G × E interaction (Perkins and Junks, 1968). As the magnitude of linear component was higher than the non-linear component, prediction of genotypes across the environments was possible for panicle number, panicle weight, panicle width and grain yield. However, the prediction became difficult in case of test weight as the magnitude of non-linear component was higher.

No strong relationship between mean performance and stability existed for grain yield and panicle weight. Genotypes with mean performance above the average performance were not stable for these characters. Vijendradas (1990) opined that stability of green fodder in forage pearlmillet could be fixed only to some extent. Data from table 2 revealed that among the genotypes MH 544 for panicle number and panicle width, HHB 60 for test weight, and ICMH 88088 and ICTP 8203 for threshing percentage were highly stable. A good environment would be favourable for the expression of ICMH 88088 for panicle number, ICTP 8203 for test weight and panicle width, and HHB 67 for threshing percentage whereas, HHB 60 for panicle number, and HHB 67 for test weight were responsive to poor environments.

Therefore, it would be more desirable to select genotypes for stability of panicle characters rather than selecting for yield stability alone (Singh and Bakshi, 1984). Among the panicle characters studied, panicle number (0.5513**) and panicle with (0.2361*) were strongly associated with grain yield. Performance of genotypes for these characters was also observed to be predictable. Genetic mechanism controlling the expression of stability of grain yield might be different from that of the panicle characters. Apart from showing stability for panicle width and panicle number, MH 544 exhibited grain yield superiority over rest of the

Table 2. Estimates of stability parameters

Genotype	Grain yield (Kg ha^{-1})			Panicle No. (I ha^{-1})			Panicle weight (Kg ha^{-1})			Test weight (g)			Panicle width (cm)			Threshing percentage		
	Mean	bi	S^2di	Mean	bi	S^2di	Mean	bi	S^2di	Mean	bi	S^2di	Mean	bi	S^2di	Mean	bi	S^2di
MH 544	2532	1.6043	14.2679*	3.49	0.9657	–0.0348	3906	1.1801	19.5176*	11.01	0.8365	8.4259*	2.38	1.0070	–0.0095	64.4	–2.5756*	–1.3152
MH 509	2486	2.2756	16.7364*	3.07	1.2228	0.0844**	3740	1.8987	35.2025*	8.70	1.4121	2.8890*	2.09	0.9607	–0.0060	66.2	0.6548	9.1568*
ICMH 88088	2439	2.1703	3.0060*	3.23	1.6701+	–0.0201	3621	1.9775	8.5633*	9.91	0.9656+	–0.3787	2.13	1.2097+	–0.0070	67.4	0.6179	–5.1160
HHB 60	2264	0.2585	3.9992*	3.63	0.2920+	–0.0295	3442	0.5941	27.6623*	10.64	1.4174	0.2122	1.73	0.8928	0.0013	66.4	3.8688+	–7.3475
RAJ 171	2092	0.9146	18.4055*	2.96	0.6900	0.0162	3286	0.9179	9.8461*	10.29	–0.0835	11.5781*	2.04	1.1385+	–0.0097	63.7	3.2207	26.7154*
ICTP 8203	2040	1.2438	12.3468*	2.94	2.1624+	0.0956*	3004	1.5877	26.2522*	11.75	1.2905+	–0.3711	2.65	1.2378+	–0.0100	68.9	4.2301	4.1755
HHB 68	1898	–0.3683+	–1.3591	3.12	0.3164+	–0.0253	2657	–0.0316+	–4.4549	9.12	1.0051	2.0927*	1.96	1.0815	–0.0082	71.6	1.4889	53.5063*
HHB 67	1837	–0.5449+	–1.9162	3.16	0.5864	0.4421*	2711	–0.2760+	0.4570	10.45	–0.0226+	–0.0976	1.46	0.1704+	–0.0100	67.9	2.9405+	–7.3407
ICMH 88735	1738	1.4460	0.0201	3.04	1.0201	3.04	1.0942	0.0064	2776	1.1516	29.0847*	8.67	2.1789	1.8217*	2.28	1.3016+	–0.0078	62.8
Mean	2147			3.17			3238			10.06						66.6		

+Significantly deviated from unity at 5% level
*Significant at 5% level

genotypes. Hence, it can be selected as a stable genotype for low rainfall alfisols.

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