Indian J. Genet., **49**(1): 141–143 (1989)

STABILITY ANALYSIS IN BREADWHEAT (*TRITICUM AESTIVUM* L.)

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(Received: May 13, 1986; accepted: June 1, 1988)

ABSTRACT

Out of the 19 varieties of breadwheat (*Triticum aestivum* Linn.) evaluated in tarai soils of West Bengal under four different environments, variety HD 2270 showed average stability for four traits including yield. Further, varieties HD 2314, HW 135 and HD 2329 were found suitable for highly favourable environment.

Key words: Stability, breadwheat, grain yield.

The soil of tarai region is generally light with high organic matter content. Due to the light texture of soil and high rainfall (above 300 cm/annum) in this area, different micronutrients like boron, zinc etc. are leached down to the lower layer. As a result, deficiency of these micronutrients is very prominent in the soils of this region. Possibly due to this, the wheat varieties recommended for West Bengal like Janak, UP 115 etc. do not perform well in this region. Some breadwheat varieties were studied for their relative stability for yield and three other yield components in different environments in tarai soils of West Bengal. Nineteen varieties, viz., CPAN 1798, K 7906, Sonalika; UP 115, HW 135, BR 2094, HD 2285, HUW 1009, HP 1376, HUW 190, HD 2214, HD 2314, HD 2329, CPAN 1823, HD 2233, K 7903, HD 2270, HP 1467 and HI 784, were selected from the Coordinated Trials of Wheat Improvement Project at the Cooch Behar (West Bengal) centre. They were grown during rabi seasons of 1982-83 and 1983-84 at two different locations, giving four different environments in randomised block designs with three replications, effective plot size 5.0 × 1.38 m, and row-to-row distance 23 cm. Ten plants were selected at random from each plot for recording the data on yield/plant, 100-grain weight, and plant height (cm); days to 50% maturity was recorded on plot basis. The analysis of stability was done following Eberhart and Russell [1].

The data on yield/plant, 100-grain weight, days to 50% maturity and plant height were analysed separately for partitioning the explainable parts of the genotype × environment (G × E) interaction. In each case, the G × E interaction was highly

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Table 1. Stability analysis of variance

Source	d.f.	Mean sum of squares			
		yield per plant	100-gr. wt.	days to 50% maturity	plant height
Genotypes (G)	18	0.32*	0.25	37.22*	90.9*
Environments (E)	3	2.16*	7.01*	90.49*	1785.0*
G × E	54	9.10*	0.19	9.72*	18.3*
Linear regression on environment E(L)	1	6.47*	19.68*	231.82	5038.4*
G × E(L)	18	0.21	0.15	15.96	18.9
Pooled deviation	38	0.14	0.23*	7.30	25.4*
Pooled error	144	0.10	0.07	2.14	6.0

*Significant at 5% level.

significant. The stability analysis of variance (Table 1) indicated significant differences among genotypes (G), environments (E), the linear component E(L) and also G × E interaction for all the traits under consideration, except 100-grain weight. In particular, the nonlinear component of G × E interaction was significant for almost all the traits. Although the linear component of G × E interaction was not significant by F test for yield/plant, 100-grain weight, and plant height, yet a few genotypes with significant regression coefficients ($b > 1$ and $b < 1$) were identified for these

Table 2. Stability parameters for three best varieties of wheat

Genotype	Yield/plant (g)			100-grain weight			Days to 50 % maturity			Plant height		
	$\bar{y}$	b	S^2_d	$\bar{y}$	b	S^2_d	$\bar{y}$	b	S^2_d	$\bar{y}$	b	S^2_d
HD 2270	1.3	1.2	0.03	3.8	0.9	0.09	107.5	0.6	2.44	83.4	0.7	4.03
HD 2285	1.0	0.9	0.04	3.7	1.1	0.03	108.7	0.5	1.82	78.1	0.9	29.80*
HI 784	0.9	0.6	0.01	3.3	0.9	−0.01	112.2	−0.2*	9.69*	84.6	1.0	−1.11
Mean (m)	1.0			3.6			108.4			84.4		
SE(m)	0.2			0.3			2.0			2.9		
SE(b)		0.6			0.4			0.7			0.3	

*b Significantly different from unity; S^2_d significantly different from zero.

attributes (Table 2; see also [2, 3]). Further for all the four attributes, HD 2270 had regression coefficient (b) equal to unity, mean yield $\bar{y}$ was either greater than m+ SE(m) or within m ± SE(m) with S^2_d- values not significantly different from 0, where m was the grand mean and SE(m) the standard error of mean. HD 2285 and HI 784 were other such varieties. In addition, varieties HD 2314, HD 2329 and HW 135 were found to be suitable for high yielding environment for yield/plant only.

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