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PHENOTYPIC STABILITY FOR SEED YIELD IN BLACK GRAM

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ABSTRACT

Eight black gram genotypes were studied during five seasons for their stable performance for seed yield. The results indicated that varieties Vamban 1, LBG 17 and Co 5 were stable. Vamban 1 recorded below average responsiveness to environment and Co 5 as average responsiveness to environment. Genotypes VBG 20, Vamban 1, VBG 11 and T 9 recorded high mean seed yield. Hence, the variety Vamban 1 may be recommended to all environment because of its low responsiveness to environment with high seed yield.

KEY WORDS : Black gram, stability, G X E interaction, yield

Black gram (*Vigna mungo* L.) is one of the main pulse crops grown in India. Identification of stable genotypes is important to increase the productivity of the crop. In the present study, an attempt has been made to understand the stability for seed yield for eight genotypes of black gram.

MATERIALS AND METHODS

Eight genotypes were evaluated during *kharif* 1992, 93 and '95, and *rabi* 1992, '93 at the National Pulses Research Centre, Vamban, Tamil Nadu. The trials was conducted in randomised block design with two replications in each environment with a plot size of 10 m^2. The spacing adopted was 30 x 10 cm. Normal cultural practices were followed throughout the crop period. Seed yield (kg/ha) was recorded on plot basis. The data obtained and mean performance of varieties were subjected to analysis of variance within environments followed by pooled analysis over five environments. The pooled analysis revealed the presence of significant genotype X environment interaction. The data were, therefore, analysed for stability using the model suggested by Eberhart and Russel (1966). Each regression coefficient of genotypes was tested for whether it is significantly deviating from unity and zero by 't' test using the standard error of the corresponding 'b' value.

RESULTS AND DISCUSSION

Analysis of variance of stability for seed yield (Table 1) showed significant difference among the environments and the genotypes used in the present study. Environment + Genotype X environment interaction was significant when tested against pooled error which satisfied the requirement of stability analysis. The genotype x environment (linear) interaction was non-significant and the environment (linear) was significant when tested against pooled error indicating the similarity of genotypes for the linear response to environments (b values) and significant differences among the genotypes for non-linear response to environments (stability). Significant genotype X environment (linear) and pooled deviation was also reported for seed yield in different pulses Singh *et al.*, 1993). Tyagi and Agarwal, 1995 ; Manivannan *et al.*, 1996; Viswanathan and Nadarajan, 1996. The genotype x environment (linear) was significant when tested against pooled deviation indicating the preponderance of linear components as compared to non linear components for seed yield.

An ideal variety is the one with high mean performance, average responsiveness to environment (b=1) and high stability (S^2 d=0). According to Eberhart and Russel (1966), if S^2d is non-significant, the performance of a genotype for a given environment may be predictable. Among

Table 1. Analysis of variance for phenotypic stability for seed yield in blackgram

Source	df	Mean squares
Genotypes	7	22991.86 *
Environments + G X E	32	18716.13 *
Environment (linear)	1	328562.00 *
G X (linear)	7	3811.13 ns +
Pooled deviation	24	869.88 *
Error (Pooled)	35	2377.60

* Significant against pooled error at 5% level
\+ Significant against pooled deviation at 5% level

Table 2. Stability parameters for seed yield in black gram

Genotypes	Mean (kg/ha)	bi	S^2d
VBG 3	403	1.45	14501.87 *
VBG 11	470	1.69	13908.52 *
VBG 20	531	1.31	12847.30 *
LBG 17	416	0.69	4619.23
LBG 402	330	0.95	9476.58 *
CO 5	350	1.02 z	4050.21
T 9	450	0.54	9664.55 *
VAMBAN 1	481	0.35 zu	490.78
SE	49.8	0.49	
CD (P=0.05)	102.1		

* significant at 5 % level against pooled error ; z significant at 5 % level from zero ; u significant at 5 % level from unity.

the genotypes, three genotypes *viz.*, Vamban 1, LBG 17 and Co 5 recorded non-significant S^2d values indicating their stable performance over environments for seed yield (Table 2).

Among the genotypes, Vamban 1 recorded the b value of 0.35 which is less than unity. Hence, it may be considered as below average responsiveto environment. The genotype Co 5 recorded the b values of 1.02 which is equal to unity and considered as average responsive to environment. Other six genotypes recorded b values which were non-significantly deviating from zero. These genotypes may be considered as no responsiveness to environment. While considering the mean values, genotypes VBG 20, Vamban 1, VBG 11 and T9 recorded high mean seed yield.

It may be concluded that the genotype Co 5 is stable, average responsive to environment but poor yielder and Vamban 1 is stable, below average responsive to environment and high yielder. Hence, Vamban 1 may be recommended to any environment because of its predictable performance, low responsive to environment and high yield.

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RESIDUAL EFFECT OF GREEN MANURE AND GROWTH REGULATORS ON THE YIELD OF RATOON RICE

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ABSTRACT

Sesbania rostrata applied @ 12.5 $t.ha^{-1}$ as basal for main crop of rice increased the growth parameters, grain yield and straw yield of ratoon crop. Glucose 2% spray on 5th day after harvest of plant crop (DAHP) plus 2% DAP (diammonium Phosphate) spray on 30 DAHP increased the growth parameters and yield of ratoon rice.

KEY WORDS : Green manuring, growth regulators, ratoon rice

Ratooning is one of the practical ways to increase rice production per unit area and per unit time. In areas where adequate water is available for a shorter time after main crop, rice ratooning could be practice. Ratooning and its usefulness has been studied in many countries (Krishnamurthy, 1988). Positive results of green manuring in increasing the rice yields of varying magnitudes were reported by Ladha *et al.*,. (1989).

MATERIALS AND METHODS

Field experiments were conducted during 1991 to study the residual effect of green manure and