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ESTIMATION OF GENETIC PARAMETERS OF VARIABILITY FOR YIELD AND ITS ATTRIBUTING TRAITS IN NIGER [*GUIZOTIA ABYSSINICA* (L.F.) CASS.]

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Abstract

The study was conducted with the aim of evaluating genetic parameters of variability in twenty five pre released high yielding niger genotypes at JNKVV, Zonal Agricultural Research Station, Chhindwara (M.P.), India during *Kharif* 2015. High value of genotypic (29.70) and phenotypic (30.80) coefficient of variance was recorded for seed yield. The highest heritability (92.9) coupled with high genetic advance (380.3) was observed for seed yield. While moderate heritability with low genetic advance were recorded for 1000 seed weight (89.5, 0.45), number of branches/plant (83.9, 3.37), number of seeds/capitulum (84.7, 7.85).

Key words : Niger [*Guizotia abyssinica* (L.f.) Cass.], genetic parameters, sowing time, seed yield, genetic advance.

Introduction

In India, niger is mainly grown in *Kharif* but it can be successfully grown in semi rabi and late *Kharif* season with limited irrigation (Ranganatha *et al*., 2011c). It has great elasticity for adaptation under various stresses. It is winter loving crop and high yield can be obtained in semi rabi season with protective irrigation. The optimum sowing time is middle of July to early August for *Kharif* crop and September for semi rabi crop (Ranganatha *et al*., 2014). In minimum output & cultural practices, a high net income may be earned. In the present study, genetic variability for seed yield and its attributing traits in niger has been studied.

Materials and Methods

The field experiment was conducted at AICRP on Niger, Zonal Agricultural Research Station, Chhindwara, M. P. (India), during the *Kharif* season of 2015 utilizing 25 pre-release high yielding genotype in randomized block design with four replications, providing full package of practices. Observation were recorded for days to 50% flowering, days to maturity, plant height (cm), number of branches/plant, number of capitula/plant, number of seeds/capitulum, 1000 seed weight (g) and seed yield on ten randomly selected plants from each plot. The data was subjected to statistical analysis for genetic parameters. GCV and PCV were calculated by the method suggested by Burton (1952), heritability in broad sence formula suggested by Hanson *et al*. (1956) and expected genetic advance given by Johnson *et al*. (1955).

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Results and Discussion

Mean performance for different characters

The degree of dispersion for days to 50% flowering ranged from 30.75 to 40.25 with an average performance 40.28, days to maturity recorded a minimum value of 80.0 and maximum of 98.75 with a mean 94.38, whereas plant height ranged from 62.0 to 114.5 cm with a mean performance of 92.35. The number of branches/plant ranged from 6.75 to 15.0 with a mean 10.84. Number of capitula per plant recorded a minimum value of 25.0 to 47.5 with mean value 36.11. Number of seeds per capitulum ranged from 20.25 to 36.25 with mean performance 28.55, 1000 seed weight recorded minimum value 4.0 and maximum value 4.85 with mean value of 4.34 and seed yield/plot had a mean value of 651.5 with a minimum value of 227.5 and maximum value of 962.5g.

Genotypic and phenotypic coefficient of variance

Genotypic and phenotypic coefficient of variance for yield and yield attributing characters are summarized in table 1. The PCV was higher in magnitude than that of

Table 1 : Genetic parameters for seed yield and its components in niger.

Character	Mean ±SEm	Range		PCV %	GCV %	H(bs) %	GA*
		Max	Min				
Days to 50% flowering	40.28 0.38	40.25	30.75	5.27	5.18	96	4.19
Days to maturity	94.38 0.45	98.75	80.0	3.91	3.88	98.4	7.47
Plant height (cm)	92.35 3.53	114.5	62.0	13.34	12.78	91.7	23.27
No. of branches/plant	10.84 0.78	15.0	6.75	18.01	16.42	83.9	3.37
No. of capitulum/plant	36.11 2.60	47.5	25.0	18.11	16.63	84.1	11.31
No. of seeds/capitulum	28.55 1.77	36.25	20.25	15.90	14.64	84.7	7.85
1000 Seed weight (g)	4.34 0.07	4.85	4.0	5.70	5.40	89.5	0.45
Seed yield/plot (g)	651.5	962.5	227.5	30.8	29.70	92.9	380.3

GCV = Genotypic coefficients of variance; PCV = Phenotypic coefficients of variance.
H_{BS} = Heritability in broad sense; GA = Genetic advance.

GCV for all the characters studied. The highest PCV and GCV recorded for seed yield/plot (30.8 and 29.70) (Channarayappa, 1987), while it was moderate for number of capitulum per plant (18.11 and 16.63), number of branches per plant (18.01 and 16.42), number of seeds per capitulum (15.90 and 14.64) and plant height (13.34 and 12.78), whereas 1000 seed weight (5.70 and 5.40), days to 50% flowering (5.27 and 5.18) and days to maturity (3.19 and 3.88) exhibited low variation.

Heritability in broad sense

Heritability in broad sense was highest for days to maturity (98.4%) followed by days to 50% flowering (96%), seed yield (92.9%) and plant height (91.7%). High heritability coupled with high genetic advance was observed for seed yield/plot and plant height indicating the predominance of additive gene action for these two characters (Patil, 2000 and Channarayappa, 1987). For days to maturity and days to 50% flowering high heritability coupled with low genetic advance revealed predominance of non additive gene action. Moderate heritability with low genetic advance was observed for 1000 seed weight, number of branches per plant and number of seeds per capitulum suggesting that environment played major role in character expression (Borole and Patil, 1997).

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