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Research article

GENETIC ANALYSIS OF YIELD AND ITS COMPONENTS IN GROUNDNUT (*Arachis hypogaea* L.)

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ABSTRACT: A total of 39 Groundnut accessions were used in this research work. Analysis of variance revealed significant difference among genotypes for all the seven characters studied. The magnitude of PCV and GCV was moderate to high for dry podyield and kernal yield. High heritability was recorded for hundred kernal weight, dry podyield and kernal yield. High heritability combined with high genetic advance was recorded for dry pod yield and kernal yield indicating that these characters are controlled by additive gene effect and phenotypic selection of these characters would be effective for further breeding purpose

Key words: Genetic variability, Heritability and Groundnut

INTRODUCTION

Groundnut (*Arachis hypogaea* L.) is an important oilseed crop and grain legume grown worldwide. Its seeds are rich source of edible oil (43-55%) and protein (25 to 28%). Its cake is used as feed or for making other food products and haulms provide quality fodder. The success of any crop improvement programs largely depends on the genetic variability present in the population. Heritability estimates are used to determine the amount of variation present in the population. Heritability combined with genetic advance will bring out the genetic gain expected from selection. However, it is self pollinating and possesses limited variability.The knowledge of genetic variability in germplasm will help in the selection and breeding of high yielding, good quality cultivars that will increase production. Keeping the above points in view, this study was carried out for genetic variability in 39 groundnut accessions to asses the variability, heritability and genetic advance of some quantitative characters.

MATERIALS AND METHODS

In the present study thirty nine genotypes were sown in randomized complete block design (RBD) with two replications at Professor Jayashankar Telangana State Agricutural University, Regional Agricultural Research Station, Jagtial during *Rabi* 2011-12. Each genotype was raised in 4m length with spacing of 30 X 10 cm. Recommended agronomic practices were followed to raise a good crop. Observations were recorded on days to 50% flowering, days to maturity, shelling(%),hundred kernel weight(g), dry pod yield(kg/ha), kernal yield(kg/ha) and dry haulm yield(kg/ha). The data were recorded on five randomly selected plants in each entry in each replication.The mean values were used for analysis of variance. The coefficient of variation was calculated as per Burton (1952). Heritability in broad sense and genetic advance were calculated as per Johnson *et al.*, (1955).

RESULTS AND DISCUSSION

In the present study the analysis of variation shown highly significant differences among the genotypes for all the characters studied *viz.*, days to 50% flowering, days to maturity, shelling(%),hundred kernel weight(g), dry pod yield(kg/ha), kernal yield(kg/ha) and dry haulm yield(kg/ha). The variation of different traits under this study revealed that the Phenotypic coefficient of variation (PCV) were higher than Genotypic coefficient of variation (GCV) for all the characters studied indicating the role of environmental variance in the total variance (Table 1). The traits dry podyield and kernal yield showed high PCV and GCV estimates. Hence, these characters can be relied upon and simple selection can be practiced for further improvement.

Heritability in broad sense estimates were high for hundred kernal weight, dry podyield and kernal yield. Genetic advance as per cent of mean (GA) is more reliable index for understanding the effectiveness of selection in improving the traits because the estimates are derived by involvement of heritability, phenotypic standard deviation and intensity of selection. Thus, genetic advance along with heritability provides clear picture regarding the effectiveness of selection for improving the plant characters. Noor *et al.,* (2004) had cautioned that high heritability per se is no index of high genetic gain hence it should be accompanied by high genetic advance. High heritability accompanied with high genetic advance recorded for dry pod yield and kernal yield indicated lesser influence of environment in expression of these characters and these characters are controlled by additive gene effect, hence, amenable for simple selection. High heritability and high genetic advance as per cent of mean for pod yield reported by John *et al*., (2007) ; Khote *et al.,* (2009) and Thirumala Rao *et al.*,(2014).

Table.1 Estimates of variability, heritability and genetic advance in Sesame

Character	Mean	Range	GCV (%)	PCV (%)	Heritability in Broadsence(H^2)	Genetic advance	GA as percent of mean
Days to 50% flowering	29.46	26-32	3.43	5.89	33.90	1.55	5.27
Days to maturity	119.47	117-123	0.58	1.59	13.30	0.67	0.56
Shelling (%)	63.14	56-71	3.30	5.90	31.20	3.07	4.86
Hundred Kernal weight	28.97	26-41	9.35	10.00	87.30	6.68	23.05
Dry pod yield	1483.69	967-22565	25.59	27.54	86.40	931.53	62.79
Kernel yield	939.68	562-1716	27.17	29.40	85.40	622.92	66.29
Dry haulm yield	3639.91	2428-5722	15.28	19.93	58.70	1124.55	30.90

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