



STUDY ON GENETIC VARIABILITY IN GROUNDNUT

(*Arachis hypogaea* L.)

P.R. Bhandarge

K.N. Bagal

S.M. Surashe

ABSTRACT

The present investigation on “Assessment of genetic variability for high harvest index in summer groundnut (*Arachis hypogaea* L.)” was undertaken to study genetic advance, heritability, GCV, PCV for fourteen characters in Nine crosses of summer groundnut. The crosses were evaluated during summer, 2015, in a randomized block design with two replications. Observations were recorded on Days to 50% flowering, Days to maturity, Plant height (cm), Number of branches per plant, Number of mature pods per plant (gm), Dry haulm yield per plant (gm), number of immature pods per plant, Dry pod yield per plant(gm), Hundred kernel weight (gm), Shelling percentage, Harvest index%, Oil% content, Protein% content, Sound mature kernel%.

INTRODUCTION:

Groundnut (*Arachis hypogaea* L.) is a major oilseed crop in India. The crop accounts for near about 45.00 per cent of total area under oilseed and 55.00 per cent of the oilseed produced in the country. Groundnut seeds contain about 50.00 per cent edible oil and 25.00 per cent protein. The haulms are used as valuable nutritious fodder. Groundnut oil cake is an important cattle feed and a good soil amendment.

Major groundnut producing countries of the world are China, USA, India, Senegal, Brazil and West Africa. The India is second in production of groundnut after China. The total area in India under groundnut cultivation was 5.505 million hectares in the year 2015-16 with production of 5.106 million tonnes and productivity of 1078 kilogram per hectare (Source: Department of agriculture cooperation govt. of India, 2015). In Maharashtra, total area under groundnut cultivation was 0.315 million hectare with production 0.167 million tonnes and productivity of 1080 kg per hectare during year 2015-16. (Source: Department of Economics and Statistics, Dept. of Agriculture and Cooperation, 2015).



In formulating any hybridization programme, it is prerequisite to have genotype with higher yield potential i.e. high *per se* performance. In groundnut with this it is also important to have divergent parents with good performance for yield as well as other quantitative characters for hybridization, to obtain desirable segregants through selection in advanced generations. It is already proved in many crops that by using divergent parents, heterotic hybrids can be obtained than those between closely related.

The magnitude of variability and the knowledge of extent to which desirable characters are heritable is a pre-requisite for crop improvement. The inbuilt variability in the breeding material is very important for selection of superior plant types, where selection of superior plant is based not only on yield alone but also on the yield contributing characters. For the reliable field selection, it becomes necessary to partition the relative amounts of heritable and non-heritable variability exhibited by yield contributing characters.

The present study was undertaken to access variability in groundnut genotypes irrespective of their growth habit for yield and other component characters. Keeping in view, in the above important aspects, the present investigation was carried out with the following objectives.

Materials and Methods

The material used in the present study consisted of nine crosses of groundnut. The crosses were obtained from the Groundnut Breeder, All India Co-ordinated Research Project, on Groundnut, M.P.K.V.Rahuri. The experiment was conducted in a randomized block design with three replications. Each plot consisted of a single row of 5 m length with a spacing of 30 cm between rows and 10 cm between plants. One border row was sown at both the sides of block to reduce the border effect.

The parents and Nine crosses for genetic variability were used for conducting an experiment during summer-2015. The seeds were sown on 28th Jan2015 by dibbling single seed per hill at 30 x 10cm² distance (between rows and between plants).



Result and Discussion

Estimates of range, variability heritability (b.s) and genetic advance. It was observed that the estimates for genotypic coefficients of variation (GCV) were lower than the phenotypic coefficients of variation (PCV) for all the characters. Dry haulm yield/plant recorded the highest estimate of GCV (28.91) followed by No. of immature pods per plant (gm)(22.50),harvest index % wt basis (13.95),No. of mature pods per plant (13.46),plant height at maturity (cm) (11.57).

The highest value of PCV were observed Dry haulm yield per plant(gm) (31.29) followed by no. of immature pods per plant (25.81),harvest index % wt basis (17.85), no. of mature pods per plant (gm)(16.00),plant height at maturity (cm)(13.25).Low GCV and PCV value were recorded by character sound of mature kernel % (1.00 & 1.57), shelling percentage % (2.52 & 4.27).

Heritability (b.s.)

The heritability (b.s.) estimates were high in case of characters *viz.*, Dry haulm yield/plant (gm) (85.41), Dry pod yield per plant (gm)(81.00), Oil % (79.94),plant height(cm) (76.28), Number of immature pods per plant(76.03), Number of mature pods per plant(70.76), Days to 50% flowering (64.58),Protein % content (61.90),Harvest index % (59.83),Days to maturity (54.76),Hundred kernel weight (53.71), no of branches plant (51.01),sound mature kernel (41.23), Shelling % (34.86).given in Tab. No 5.

Genetic Advance

The highest magnitude of genetic advance was observed for Dry haulm yield per plant (gm) (19.85) followed by Number of mature pods per plant (8.62), Oil %(8.17), Harvest index % (7.90), Days to maturity (7.40), Plant height (cm) (5.33), Number of immature pods per plant (4.39).Dry pod yield per plant (gm) (4.10). The lowest value of



genetic advance was observed for number of Branches per plant (0.7), sound mature kernel % (1.14).

Genetic advance as a percent of mean was the highest for Dry haulm yield per plant (gm) (55.05) Number of immature pods per plant (40.42) followed by Number of mature pods per plant (23.33), Harvest index % (22.01) and In contrast, Sound mature kernel % (1.33) recorded lowest value followed by Shelling percentage % (3.07).

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