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Performance of Groundnut (*Arachis Hypogaea* L.) Genotypes for Yield and Yield Attributing Characters

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***Abstract*-- The present experiment was conducted at Field Experimentation Center, Department of Genetics and Plant Breeding, Allahabad School of Agriculture, SHIATS, Allahabad with eleven groundnut genotypes including one check (K-6) during *Kharif*-2015 in Randomized Block Design with three replication to studied on performance of groundnut genotypes. Analysis of variance showed highly significant differences among eleven groundnut genotypes for thirteen agronomic and three seed quality characters studied except for pod width. Genotype ICG 15309 identified as best genotype for pod yield and kernel yield. Genotype ICG 4598 recorded highest 100 kernel weight (47.15gm). The genotype ICG 1399 (117.5) and ICG 14008 (117.67) were earliest in days to maturity. As such, only seed of high quality genetically pure and morphologically and physiologically sound is needed to increase the productivity. Keeping above in view, the present study is planned to identify the groundnut genotypes for seed yield and yield attributing traits and assess promising groundnut genotypes based on their seed quality traits.**

***Keywords*-- Groundnut (*Arachis hypogaea* L.), Agronomic and seed quality characters.**

I. INTRODUCTION

Groundnut (*Arachis hypogaea* L.) is a crucial food as well as an oilseed crop of the tropical and sub-tropical world. Groundnut is herbaceous annual plant, basically interlineate in growth habit. The habits are bunch (erect), semi spreading (ovate) and spreading (prostrate). In spreading forms the axis is very short and erect and primary branches spread horizontally along with the ground. Groundnut is photo-insensitive crop, which can be grown throughout the year. The gene pool of cultivated groundnut is divided into two subspecies *fastigiata* and *hypogaea*. The various popular types of groundnuts are Spanish, Runner, Virginia and Valencia [1]

As a rich source of energy (564 kcal 100g-1), it contains about 48–50% oil, 25–28% proteins and 20-26% carbohydrates.

Among oilseeds peanut is unique in that it can be consumed directly as a foodstuff. Peanut kernels also contain many health enhancing nutrients such as seven of the 20 essential minerals; 13 [2].

Groundnut is the world fourth largest and most important source of edible oil and third most important source of vegetable protein [3]. Of the world production, 66.13 per cent is in Asia, 25.13 per cent in Africa, 5.93 per cent in North America, 2.62 per cent in South America and 0.3 per cent in Europe. In India, the area, production and productivity of groundnut in India during 2012-13 is 5.0 mha, 5.43 mt, 1.08 t/ha respectively [4]. The area, production and productivity of groundnut in Uttar Pradesh during 2011-12 is 0.17 million hectare, 0.39 million tons, 1.7 t/ha respectively [5].

The crop also generates up to 60% cash earnings and up to 70% rural employment in the developing world, especially in Sub-Saharan Africa. However, productivity and incomes have remained low due to various production constraints. Biotic and abiotic stresses have greatly affected the productivity of the crop. Productivity of groundnut is mainly depends on yield attributing traits. The important yield attributing traits such as quality seed is one of the basic key to successful agriculture which reduces the involvement of other inputs to increase the productivity. Because, nothing will work upon a poor quality seed, no matter how lavishly other inputs are spent on the crop to be established from such seeds. Even for a resource poor farmer, the high quality of seed would be a great advantage, because it ensures 15 to 20% increased yield. As such, only seed of high quality genetically pure and morphologically, pathologically and physiologically sound is needed to increase the productivity. Keeping above in view, the present study is planned to identify the groundnut genotypes for seed yield and yield attributing traits and assess promising groundnut genotypes based on their seed quality traits.

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II. Materials And Methods

The field experiment for the current evaluation entitled "Performance of Groundnut (*Arachis hypogaea* L.) Genotypes for Yield and Yield Attributing Traits" was conducted during *Kharif* -2015 at Centre of Department of Genetics and Plant Breeding, Faculty of Agriculture, Sam Higginbottom Institute of Agriculture, Technology & Sciences, Allahabad, U.P. India, with 11 groundnut genotypes were planted in randomized block design with three replications, The land area was ploughed and harrowed. Each of the 11 genotypes was sown at two seeds per stand and later thinned to one. Inter row distance was 35cm with inter plant distance of 10cm. Standard agronomic practices were followed to ensure good yield. The evaluation was recorded on five randomly selected plants from each section and replication and their mean values were used for statistical analysis for the following parameters viz., field emergence (%), days to 50% flowering, plant height (cm), primary branches/plant, days to maturity, pods per plant, pod yield per plant (g), pod yield (q/ha), shelling (%), kernel yield (q/ha), hundred kernel weight (g), sound matured kernel (%), kernel uniformity(%), pod length (mm), pod width (mm), kernel length (mm) and kernel width (mm). The analysis of variance was worked out to test the differences among genotypes by F-test. It was carried out according to the procedure of Randomized Complete Block Design for each character as per methodology advocated by [6]**.** ANOVA helps in partitioning the total variance into three components *viz.*, replication, treatment and error.

III. Results And Discussions

Significant differences were observed for all the agronomic and seed quality parameters recorded on the 11 groundnut genotypes except for pod width (Table), which shows that the presence of a high degree of variability. The mean number of days to 50% flowering was 27.51 DAS. The genotype ICG 1137 had earliest days to 50% flowering while ICG 4527 had the longest days to 50% flowering. The Genotype ICG 1137 had earliest days to maturity while ICG 4527 had late days to maturity. Such variation with respect to field performance of different genotype is reported by **[7].** Among the yield components, number of primary branches per plant, number of pods per plant and pod yield per plant were more closely associated with pod yield per ha. Genotype ICG 4750 had highest number in Primary branches/plant, Pod yield/plant, Pod yield, Kernel yield, hundred kernel weight while these parameters are observed minimum in ICG 1668 and ICG1137.

Similar findings were reported by [8-10]. Higher kernel yield was mainly attributed to greater shelling percent, kernel yield per plant, 100 kernel weight, sound matured kernel and kernel uniformity in different genotypes The Genotype ICG 2925 had highest shelling %, ICG 4746 had highest sound matured kernel % and ICG 1415 had highest kernel uniformity % whereas ICG 1137 had lowest in these parameters. The similar findings were reported by [8, 10-12]**.**

Seed quality parameters such as pod length, pod width, kernel width are maximum observed in genotype ICG 1137 while minimum pod length observed in genotype ICG 1668 and lowest pod width and kernel width observed in genotype ICG 4527.Low number of pods per plant, had the highest pod width, pod length, seed width and seed length. The similar finding result was found to [13]**.**

IV. Conclusion

Present study concluded that the genotype ICG 13787 identified as best genotype for plant height (48.28cm). Genotype ICG 4750 identified as best genotype for primary branches/plant (5.56), Kernel yield q/ ha (17.46) and for 100 Kernel weight (47.15). Genotype ICG 4527 was best for pods per plant (14.46). Genotype ICG 1137 identified as best genotype for days to 50% flowering (25.00) and days to maturity (117.50). Highest shelling% (74.16) in genotype ICG 2925 and highest sound matured kernel (74.64) in genotype ICG 4746. In pod and seed characters, ICG 1137 (31.37 mm) identified as best genotype for pod length, ICG 928 (13.87 mm) identified as best genotype for kernel length and ICG 1137 (8.29 mm) identified as best genotype for kernel width. Also, significant variations were observed for all the different agronomic and seed quality characters studied among the genotypes except pod width. As yield contributing traits are the key factor for better yield and productivity, genotype which performed best in yield contributing traits can be regarded as promising groundnut genotypes in breeding programme. So these genotypes (ICG-13787, ICG-4750, ICG-4527, ICG-1137, ICG-2925 and ICG-4746) can be used as parents for future crop improvement programme.

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REFERENCES

[1] Talawar, S. (2004). Peanuts in India: History, Production and Utilization. Peanuts in local and Global Food Systems Series Report no. 5. [online] Available from http://www.worldpeanutinfo.com/documents/IndiaProduction.pdf (Accessed on October 29, 2013).

[2] Francisco, M. L. D. L., & Resurreccion, A. V. A. (2008). Functional components in peanuts. Critical Review on Food Science and Nutrition. 48, 715-746.

[3] Anonymous (2000). Oil Seeds Situation - A Statistical Compendium, International Crops Research Institute for the Semi-arid Tropical (ICRISAT), Patancheru, India.

[4] "Agricultural Statistics at a Glance", Directorate of economic and statistics, Government of India, 2014.

[5] Anonymous (2012) Coverage and Production of Groundnut in India. International Crop Research Institute for Semi Arid Tropics (Patancheru) Hyderabad.

[6] Panse, V. G. and Sukhatme P.V. (1967). Statistical methods for agricultural workers (2nd Ed.) ICAR Publication, New Delhi. : 259.

[7] Mallikarjuna S.B.P., Upadhyaya, H.D., Kenchana G.P.V., Kulliswamy, B.Y. Singh (2003) Phenotypic variation for agronomic characteristics in a groundnut core collection for Asia. Field Crop Research, 84: 359-371.

[8] Borkar, V. H, Dharanguttikar V. M. (2014).Evaluation of groundnut (Arachis hypogaea L.) genotypes for physiological traits. International Journal of Scientific and Research Publications, 4: 2250-3153.

[9] Sah, J.N., Rameshkumar andVarshney, S.K. (2000). Correlation and path analysis in mutant cultures of groundnut.Journal of Oilseed Research, 17(1): 23-28.

[10] Kumar K., Rai P. K., Kumar A., Singh B. A. (2014). Study on the performance of groundnut (Arachis hypogea L.) genotypes for quantitative traits in Allahabad region. Caribbbean Journal of Science and Technology, 2: 564-569.

[11] Khan, A. Rahim, M. Khan M.I. and Tahir M.(2000). Genetic variability and criterion for the selection of high yielding peanut genotypes. Journal of Agricultural Research Volume 16(1) 9-12.

[12] Shukla, A.K. and Rai, P.K. (2014). Evaluation of Groundnut Genotypes for Yield and Quality Traits. Annals of Plant and Soil Research. 16(1):41-44.

[13] Jonah, P. M., Aliyu, B., Kadams, A. M. and Jibung, G. G. (2005). Variation in pod yield characters and heritability estimates in some accessions of Bambara Groundnut (*Vigna subterranea* L.) Department of Agricultural Technology, Plateau State College of Agriculture, Garkawa, Plateau State, Nigeria, 2: 25-30.