International Journal of Agriculture and Plant Science
www.agriculturejournal.in
Online ISSN: 2664-7664
Received: 02-01-2026, Accepted: 04-02-2026, Published: 21-02-2026
Volume 8, Issue 1, 2026, Page No. 147-150

Evaluation of yield attributing traits in groundnut (*Arachis hypogaea* L.) genotypes

P Harika[1*], B Rupesh Kumar Reddy[2], N K Gayathri[3], G Fareeda[4]
[1] Department of Seed Science and Technology, ANGRAU, S.V. Agricultural College, Tirupati, Andhra Pradesh, India
[2] Senior Scientist, Genetics and Plant Breeding, AICRP on Groundnut, RARS Tirupati, Andhra Pradesh, India
[3] Professor and Head, Seed Technology, Agricultural College, Mahanandi, Andhra Pradesh, India
[4] Scientist, RARS, Nandyal, Andhra Pradesh, India

Abstract
The present study was conducted during *Rabi*, 2024-25 at the dryland Farm of S.V. Agricultural College, Tirupati, under Acharya N.G. Ranga Agricultural University, Andhra Pradesh. Twenty groundnut genotypes were evaluated to assess variability in yield attributing traits. The field experiment was laid out in Randomized Block Design (RBD) with three replications. Significant differences were observed among genotypes for all studied traits. Among the twenty genotypes, Kadiri-7 exhibited best field performance with respect to pod yield per plant, kernel yield per plant and hundred seed weight. SMK was highest in Dharani and harvest index was highest in TCGS-2490. The findings indicate considerable genetic variability, offering scope for selection and improvement in groundnut breeding programs.

Keywords: Yield attributing traits, genetic variability, randomized block design, harvest index

Introduction

Groundnut (*Arachis hypogaea* L.) is an important oilseed crop, belonging to the family Leguminosae. This self-pollinating plant species possesses a specific chromosome count of 2n = 40. This crop is widely cultivated and consumed in various tropical and subtropical countries around the world. One of its unique characteristics is that it is geotropically positive, meaning its seeds develop underground. Groundnut is thought to be an indigenous to Brazil. It is the world's third largest oilseed, after cotton and soybean. Its introduction to India occurred in the first half of the sixteenth century.

China is the world's leading producer of groundnut, followed by India, the United States and Argentina. Globally, India is the largest exporter of groundnut, which is grown in an area of 4.7 million hectares with a production and productivity of 10.1 million tonnes and 2163 kg ha^{-1}, respectively. In India, groundnut is the largest oilseed crop in terms of production and is often referred to as “The king of oilseeds”. Being a legume, it occupies a unique position in the farming system. Groundnut is commonly described as unpredictable legume behaving differently relative to its seed viability and quality with respect to growing season and period of storage.

The quality of the seed of groundnut is becoming increasingly important. Development of high yielding groundnut varieties coupled with improved quality traits may help in meeting the raising nutritional demands (Sharma *et al.*, 2019) [19]. For achieving genotype with desirable traits, it is essential to look at the inter-relationships between different characters. The seed technological properties of new varieties have not been studied in detail. Meeting food and nutritional demands may be facilitated by the development of high yielding cultivars combined with enhanced seed quality features.

Material and Methods

The experiment was carried out using twenty groundnut genotypes at dryland farm of S.V. Agricultural College, Tirupati, Andhra Pradesh during *rabi*, 2024-25. The field trial was laid out in Randomized Block Design (RBD) with twenty genotypes and replicated thrice, with a spacing of 22.5 cm between the rows and 10 cm between the plants within a row, with row length of 5 m and four rows.

1. Observations recorded

The yield attributing traits studied in the field were number of pods per plant, pod yield per plant (g), kernel yield per plant (g), hundred seed weight (g), sound mature kernels (%) and harvest index (%).

1.1 Number of pods per plant

The average number of pods per plant were counted manually from randomly selected five plants and expressed as number of pods per plant.

1.2 Pod yield per plant (g)

Groundnut pods were harvested, stripped, dried and weighed from randomly selected five plants and pod yield per plant is expressed in grams.

1.3 Kernel yield per plant (g)

Groundnut pods were harvested, stripped, dried, shelled and weighed from randomly selected five plants and kernel yield per plant is expressed in grams.

1.4 Hundred kernel weight (g)

Hundred seeds were counted at random from the harvested produce of each replication, weighed with an electronic weighing balance and recorded as hundred seed weight in grams.

1.5 Sound mature kernels percentage
In random sample of hundred kernels, the number of well-developed kernels were separated and counted and calculated by multiplying the ratio of number of sound mature kernels to total number of kernels by 100.

1.6 Harvest index
Harvest index was calculated by using the formula i.e., ratio of economic yield to biological yield given by Donald and Hamblin (1976) [4].

Results and Discussion
The analysis of variance on the study of yield attributing traits presented in Table 1. The data collected from the field experiment *viz*., number of pods per plant, pod yield per plant, kernel yield per plant, hundred seed weight, sound mature kernels and harvest index has shown significant difference for treatment mean sum of squares at 1 percent probability.

Table 1: Analysis of variance for yield attributing traits in twenty groundnut genotypes

S.No	Characters	Mean sum of squares		
		Replications (df:2)	Genotypes (df:19)	Error (df:38)
1	No of pods per plant	9.73	63.12**	4.60
2	Pod yield per plant(g)	0.64	35.02**	3.79
3	Kernel yield per plant(g)	1.57	9.55**	2.26
4	Hundred kernel weight(g)	6.85	309.99**	6.96
5	Sound mature kernels (%)	311.52	31.06**	6.62
6	Harvest index	1.90	195.54**	3.82

**significant at 1% probability level

1. Number of pods per plant
The data of different genotypes for number of pods per plant with mean of 18.47 presented in Table 2.

Number of pods per plant for different genotypes ranged from 10.82 to 29.45. Significant differences were found among the genotypes and highest number of pods per plant was recorded by TCGS-2369 (29.45). Second highest number of pods per plant was recorded by Kadiri-7 (25.18). Lowest number of pods per plant was recorded by Dheeraj (10.82) followed by Dharani (12.12).

Rasheed *et al*. (2015) [18] reported similar result that number of pods per plant is genetically controlled and one of the main yield contributing characters.

Findings of Bharathi (2010) [3] support the current study that significant differences were observed in number of pods per plant among seed sizes, genotypes and the genotypes also differed significantly for bearing well filled pods.

2. Pod yield per plant (g)
The data of different genotypes for pod yield per plant with mean of 18.49 (g) presented in Table 2.

Pod yield per plant for different genotypes ranged from 12.86 g to 28.13 g. significant differences were found among the genotypes and highest pod yield per plant was recorded by Kadiri-7 (28.13 g). Second highest pod yield per plant was recorded by TCGS-2369 (25.87 g). Lowest pod yield per plant was observed in Dharani (12.86 g) followed by Central Pragathi (14.94 g). The pod yield of genotypes was mainly due to favourable yield contributing characters like number of pods per plant, number of kernels and harvest index. These findings were on the similar lines to those reported by Borate *et al*. (1993)

Maurya *et al*. (2014) [14] noticed the prevalence of significant difference among the genotypes for pod yield per plant. The results were also in agreement with the studies of Bharathi (2010) [3] where significantly higher pod yield was obtained with large size seed.

3. Kernel yield per plant (g)
The data of different genotypes for kernel yield per plant (g) with mean of 13.07 (g) presented in table 2.

Kernel yield per plant for different genotypes ranged from 9.73 to 17.19 (g). Significant differences were found among the genotypes and highest kernel yield per plant was recorded by Kadiri-7 (17.19 g). Second highest kernel yield per plant was recorded by TCGS-2369 (16.37g). Lowest kernel yield per plant was observed in Dharani (9.73 g) followed by Kadiri-8 (9.75 g).

Findings of Maurya *et al*. (2006) [13] support the current study that analysis of variance revealed the prevalence of significant difference among the genotypes for kernel yield.

4. Hundred seed weight (g)
The data of different genotypes for hundred seed weight with mean of 43.80 g presented in Table 2.

Hundred seed weight of different genotypes ranged from 33.53 to 66.18 g. significant differences were found among the genotypes and highest hundred seed weight was recorded by Kadiri-7 (66.18 g) and second highest hundred seed weight was recorded by Kadiri-8 (62.30 g). Lowest hundred seed weight was recorded by TCGS-2301 (33.53 g) followed by TCGS-2370 (34.34 g). Yadav *et al*. (1998), Kathmale *et al*. (2000) [11] and Parmar *et al*. (2000) reported that hundred kernel weight and number of mature pods were the most important traits contributing to pod yield and oil content.

Bharathi (2010) [3] reported significant differences in seed weight between varieties. Similar findings of Maurya *et al*. (2006) [13] revealed the prevalence of significant difference among the genotypes for pod yield.

5. Sound mature kernels (%)
The data of different genotypes for sound mature kernels with mean of 83.57 % presented in Table 2.

Sound mature kernels of different genotypes ranged from 75.67% to 87%. Significant differences were found among the genotypes and highest sound mature kernels was recorded by Dharani (87.00 %) which was on par with Kadiri-1812 (87.00%) and second highest sound mature kernels was recorded by Kadiri-6 (86.67%). Lowest sound mature kernels was recorded by Kadiri-9 (75.67%) followed by TCGS-2490 (77.67%).

Kathmale *et al*. (2000) [11] and Rajagopal *et al*. (2000) [17] noticed the prevalence of significant difference among the genotypes for sound mature kernels.

6. Harvest index

The data of different genotypes for harvest index with mean of 38.32 presented in Table 2.

Harvest index among different genotypes ranged from 26.74 to 55.03 per cent. Significant differences were found among the genotypes and highest was recorded by TCGS-2490 (55.03 %) and second highest was recorded by Kadiri-1812 (50.15%). Lowest harvest index was recorded by TCGS-1694 (26.74 %) followed by TCGS-2368 (27.33 %).

Reduction in the harvest index of TCGS-1694 was due to reduction in the economic yield.

Table 2: Mean values for number of pods per plant, pod yield per plant and kernel yield per plant of twenty groundnut genotypes

Genotypes	Number of pods per plant	Pod yield per plant(g)	Kernel yield per plant(g)	hundred seed weight (g)	Sound mature kernels (%)	Harvest Index
TCGS-1694	16.36	18.99	13.21	37.41	84.33	26.74
Dheeraj	10.82	15.76	13.48	38.88	83.67	27.80
Nithya Haritha	17.42	18.04	13.25	51.29	85.00	48.46
Dharani	12.12	12.86	9.73	38.03	87.00	37.42
Central Pragathi	15.31	14.94	12.01	35.38	82.33	35.16
ICAR Konark	14.76	17.34	11.67	42.80	83.33	46.05
TAG-24	19.14	17.80	13.38	43.02	85.00	41.65
Kadiri-6	12.51	15.74	11.89	59.70	86.67	37.71
Kadiri-7	25.18	28.13	17.19	66.18	82.33	33.65
Kadiri-8	20.47	19.00	9.75	62.30	78.67	27.83
Kadiri-9	16.85	17.23	13.48	42.31	75.67	32.56
Kadiri-1812	22.33	18.57	13.20	37.64	87.00	50.15
TCGS-2055	16.40	17.81	14.36	58.90	85.67	40.02
TCGS-2301	23.68	20.37	12.18	33.53	85.67	31.64
TCGS-2359	19.05	20.27	14.58	38.56	81.67	40.55
TCGS-2361	20.43	16.99	12.34	42.76	81.67	40.35
TCGS-2368	21.69	17.48	12.74	34.88	86.33	27.33
TCGS-2369	29.45	25.87	16.37	35.55	86.33	43.53
TCGS-2370	18.49	17.90	13.37	34.34	85.33	42.81
TCGS-2490	16.88	18.78	13.14	42.60	77.67	55.03
Mean	18.47	18.49	13.07	43.80	83.57	38.32
S.Em. ±	1.24	1.12	0.87	1.52	1.49	1.13
C.D. (0.05)	3.55	3.22	2.49	4.36	4.25	3.23
C.V. (%)	11.61	10.52	11.51	6.02	3.08	5.10

Conclusion

There was significant difference among the twenty genotypes for all the field parameters. Kadiri-7 exhibited best field performance with respect to pod yield per plant, kernel yield per plant and hundred seed weight. Number of pods per plant were highest in TCGS-2369 and least in Dheeraj. SMK was highest in Dharani and Kadiri-1812 and least was observed in Kadiri-9. Harvest index was highest in TCGS-2490 and least was observed in TCGS-1694.

References

1. Abadya S, Shimelis H, Pasupuleti J, Mashilo J, Chaudhari S, Manohar SS, *et al*. Assessment of the genetic diversity of groundnut (*Arachis hypogaea* L.) genotypes for kernel yield, oil and fodder quantity and quality under drought conditions. Crop Science,2021:61(3):1926-1943.
2. Badigannavar AM, Kale DM, Murthy GSS. Assessment of yielding ability of Trombay groundnut (*Arachis hypogaea* L.) varieties through growth analysis. Journal of Oilseeds Research,2002:19:207-212.
3. Bharathi M. Effect of seed size on seedling vigour and crop productivity in groundnut. PhD Thesis. Acharya N G Ranga Agricultural University, Rajendranagar, Hyderabad, 2010.
4. Donald CM, Hamblin J. The biological yield and harvest index of cereals as agronomic and plant breeding criteria. Advances in Agronomy,1976:28:361-405.
5. Hampannavar MR, Khan H, Temburne BV, Janila P, Amaregouda A. Genetic variability, correlation and path analysis studies for yield and yield attributes in groundnut (*Arachis hypogaea* L.). Journal of Pharmacognosy and Phytochemistry,2018:7(1):870-874.
6. Hatkar HP, Deshmukh MP, Deonkar AB, Patil RC. Effect of different stages of seed on dry pod yield in groundnut cv. Phule Pragati (JL-24). Journal of Oilseeds Research,1992:9:157-158.
7. Hossain KM, Uddin MN, Karim MM, Ashrafuzzaman M. Morpho-physiological attributes and yield of four groundnut genotypes as influenced by different plant spacing. International Journal of Natural and Social Sciences,2016:3(4):35-42.
8. Jeyaramraja PR, Fantahun Woldesenbet FW. Characterization of yield components in certain groundnut (*Arachis hypogaea* L.) varieties of Ethiopia. Journal of Experimental Biology and Agricultural Sciences,2014:2(6):592-596.
9. John K, Srividhya A, Viswanath K, Reddy CKK. Estimates of genetic parameters for morphological, yield and yield attributes and disease reaction in groundnut. International Journal of Multidisciplinary Research,2023:5(5):1-11.

10. John K, Vasanthi RP, Venkateswarlu O, Muralikrishna T, Naidu PH. Genetic analysis and regression studies for yield and yield attributes in F2 segregating populations of groundnut crosses. Legume Research,2008:31(1):26-30.
11. Kathmale DK, Kamble MS, Jadhav JD, Patil RC. Yield maximization of post-rainy season groundnut through polythene film mulch technology in western Maharashtra, India. International Arachis Newsletter,2000:20:82-84.
12. Lothe GR, More SR. Assessment of physiological indices for growth and yield of groundnut (*Arachis hypogaea* L.). The Pharma Innovation Journal,2022:11(5):1393-1398.
13. Maurya CL, Khan AA, Singh P, Yadav VKS. Studies of various vigour tests and their correlation with field emergence in oat (*Avena sativa* L.). Farm Science Journal,2006:15(1):73-74.
14. Maurya MK, Rai PK, Kumar A, Singh BA, Chaurasia AK. Study on genetic variability and seed quality of groundnut (*Arachis hypogaea* L.) genotypes. International Journal of Emerging Technology and Advanced Engineering,2014:4(6):818-823.
15. Panse VG, Sukhatme PV. Statistical Methods for Agricultural Workers. ICAR Publications, New Delhi, 1985.
16. Paulos M, Loha G, Kassa M. Characterization and evaluation of Bambara groundnut (*Vigna subterranea* (L.) Verdc.) for yield and related traits in Asosa zone, northwestern Ethiopia. Applied and Environmental Soil Science,2022:2022(1):8533233.
17. Rajagopal K, Chandran K, Mishra JB, Bhalodia PK, Mathur RS. Evaluation of bold-seeded groundnut accessions for confectionery attributes. International Arachis Newsletter,2000:20:18-20.
18. Rasheed B, Rasheed H, Khan A. Screening and selection of high yielding groundnut genotypes for commercial cultivation. Journal of Agricultural Sciences and Research,2015:2(1):85-90.
19. Sharma S, Brar KS, Sandhu SK. Profiling of groundnut (*Arachis hypogaea* L.) genotypes for seed quality traits. Indian Journal of Plant Genetic Resources,2019:32(1):72-79.