

Performance of Groundnut Genotypes (*Arachis hypogaea* L.) for Yield and Yield Attributing Characters Suitable for Rainfed Tracts of Prakasam District of Andhra Pradesh

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ABSTRACT

A field experiment was conducted to evaluate groundnut genotypes suitable for Prakasam district at Agriculture Research Station, Darsi in kharif, 2022. Sixteen groundnut varieties including four superior checks were evaluated for different quantitative traits. Randomized complete block design with three replications was used in the experiment. Days to 50% flowering, plant height, seed pod⁻¹, 100 seed weight (gm), and seed yield kg ha⁻¹ significantly differ among different genotypes. TCGS1862 genotype took maximum days to flowering while the lowest days took by TCGS 2233; maximum plant height was observed in K2313 while the minimum height was observed in TCGS1872, TCGS1862. Maximum weight of 100 kernel were recorded by TCGS2117 and the early maturity were recorded by Dharani (C) while the late maturity was recorded by TCGS2117 and high shelling percentage were recorded by Dharani (C) while low recorded by K1736 and TCGS1872, which produce high yield while the lowest yield observed by TCGS211. Based on results, the recommended ground nut variety for adaptation and further research in the rain fed agro climate area TCGS1872 and TCGS1862 were found suitable.

Keywords: Rainfed agro climate, DFF, Days to maturity, Plant height, Kernel weight and Shelling percentage.

Groundnut (*Arachis hypogaea* L), commonly known as peanut, is a self-pollinated legume crop which belongs to family Fabaceae. The crop is grown between 40° N and S latitudes. Its growing period is 90 to 115 days for the sequential branched varieties and 120 to 140 days for the alternately branched varieties. The mean daily temperature for optimum growth is 22 to 28°C. The crop is best adapted to well drained, loose, finable medium texture soils. India is the second largest producer of groundnut after Brazil, accounting for 40.68 lakh ha of the total area and 66.15 lakh tonnes and productivity of 1626 kg ha⁻¹ in Kharif season. Andhra Pradesh ranks second both in area (6.48 lakh ha) and production (8 lakh tonnes) with an average productivity of 1238 kg ha⁻¹. Growing of groundnut in kharif as both rainfed and irrigated condition is gaining importance in Southern Agro-climatic zone of Andhra Pradesh. India imports the most edible oils because domestic demand exceeds production, horizontally expanding groundnut production in non-traditional areas [2]. The

increase in oilseed production was possible due to the availability of quality seeds of improved cultivars, advanced technology services, and the price support policy. But with the ever-increasing demand for food legumes and oilseeds due to the continuous rise in the population and competition from other remunerative crops, it is necessary to increase oilseed production both horizontally and vertically in the country. It is an important source of oil (43-55%) and protein (25-28%), hence used as food and feed (Din *et al.*, 2009) Groundnut is a good source of edible oil as it contains about 50% oil of good quality. Groundnut oil is one of the best cooking oils due to its high smoking point and is desirable for use in ghee, margarine, shortening and salad oil. The meal contains 25% protein and considered best meal for human consumption and livestock feed. Groundnut is also an excellent source of vitamins and contains high levels of thiamine, riboflavin and niacin.

MATERIALS AND METHODS

The experiment was carried out at Agricultural Research Station, Darsi during *Kharif* season for the year 2022-2023 with 12 interspecific groundnut genotypes along with 4 leading check varieties in a randomized block design (RBD) with three replications. Each accession was planted in 8 rows of 5 m in length, with a spacing of 30 cm between rows \times 10 cm between plants. Standard agricultural practices and plant protection measures were adopted for healthy crop production.

Observational data on days to 50% flowering (DFF), days to maturity (DM), days to 50% flowering (DFF), Plant height (PH; cm); No. Of seeds per pod; pod yield (PY; Kg/ha), hundred seed weight (HSW; g), shelling percentage (SP; %), were recorded from five randomly selected plants of each genotype in each replication.

RESULTS AND DISCUSSIONS

Days to 50% flowering

The days to 50% flowering ranged from 32-37 days. Most of the genotypes were at par with the check varieties and showed 32 days, where TCGS1862 recorded highest days to 50% flowering (37 days).

Plant Height (cm)

Analysis of the data showed for plant height was significantly affected by groundnut varieties (Table 1). The plant height ranged from 40.42 cm – 67.60 cm. The genotype K2313 (67.60 cm) showed highest plant height than the superior check Dheeraj (64.45 cm). The lowest plant height was recorded for TCGS1872 (40.42cm). Several workers reported a negative correlation between plant height and pod yield in groundnut. Less plant height with the larger number of pegs located in the lower third of the plant (Lakshmaiah *et al.*, 1983, Mallikarjuna *et al.*, 2003) having greater the efficiency in forming fruits.

Days to plant maturity

Statistical analysis of the data revealed that genotypes have no significant variations in their physiological maturity (Table 1). However, TCGS2117 took maximum days (110 days) to physiological maturity and Dharani (C) recorded minimum days to maturity (100.5days). The genotypes TCGS1707, TCGS2104 showed at par performance with the check K1812(C) which took

(101.50 days). These results revealed that all genotypes belong to same maturity group.

100-Seed weight (g)

100-Seed weight is an important yield contributing component in groundnut Aminifar *et al.*, (2013). Genotypes have significantly affected 100-Seed weight of the crop (Table 1). Analysis revealed that highest Seed weight was recorded for TCGS2117(57.76), TCGS2104(52.43) and K1736(52.33) than the best check Dheeraj (47.86) which may be due to their superior genetic makeup causing high partitioning of assimilates to pods. Lowest seed weight was recorded for K1909.

Seeds per pod

Genotypes of groundnut have no significant effect on the seeds pod-1 as revealed after statistical analysis (Table 1). However, all the genotypes showed similar results with check varieties.

Pod yield (Kg ha⁻¹)

Analysis of the data revealed that all genotypes shown significant variation in pod yield (Table 1). The pod yield ranged from 1435.15 kg ha⁻¹ to 4101.33 kg ha⁻¹ where the genotype, TCGS1872 (4101.33 kg ha⁻¹) showed superior pod yield than the check varieties followed by TCGS1862 (3870.33 kg ha⁻¹) and the lowest pod yield was recorded in TCGS2117(1435.15 kg ha⁻¹) respectively. Highest yield of TCGS1872 may be attributed to the cumulative performance of the genotype in terms of seeds pod⁻¹ and shelling percentage (Nautiyal *et al.*, 2011; Ahmad and Rahim. 2007, Tarawali and Quee, 2014 and Compang *et al.*, 1980).

Shelling (%)

High shelling percentage has been regarded as an important trait in breeding for improvement Lampang *et al.*, . Statistical analysis showed that shelling percentage was significantly affected by the genotypes (Table 1). The shelling percent ranged from 72.67 to 83.33%. Highest shelling percentage was recorded in Dharani (83.33 %) and YLG-4 (82.33 %). The lowest shelling percentage (72.00) was recorded for K 1736. Hartmond *et al.*, (2006) reported differences in shelling percentage of groundnut genotypes. They asserted that Calcium plays an important role in shelling percentage and some genotypes having sensitivity to soil Calcium.

Table No: 1 Performance of groundnut genotypes for quantitative traits

S.no	Genotype	Days to 50% flowering	Days to maturity	Plant height (cm)	Seeds per pod	100 seed wt (g)	Pod yield (kg/ha)	Shelling %
1	TCGS1707	35.5	101.5	54.11	2	42.73	3393.47	75.67
2	K1736	35	106.5	53.1	2	52.33	2305.53	72
3	TCGS1862	37	108.5	46.3	2	46.02	3870.33	79
4	K1812 (C)	33.5	101.5	47.09	2	44.2	3398.1	80
5	TCGS1872	34.5	106	40.42	2	43.85	4101.83	78
6	K1909	34.5	106.5	49.91	2	36.64	3768.47	74.67
7	TCGS1877	32.5	103	59.32	2	41.92	2546.23	79.33
8	Dheeraj (C)	35	107.5	64.07	2	47.86	1657.4	77.33
9	YLG3	36	102	56.85	2	43.71	2300.87	81
10	TCGS2104	32.5	101.5	59.94	2	52.43	3083.27	73
11	Dharani (C)	34.5	100.5	61.95	2	44.77	2550.87	83.33
12	TCGS2233	32	108.5	48.25	2	43.94	3421.27	77
13	K2313	35.5	104	67.6	2	45.06	1680.5	79.67
14	Kadiri6 (C)	34	105.5	64.71	2	43.42	1675.87	79
15	YLG4	32.5	102.5	55.48	2	43.24	2578.7	82.33
16	TCGS2117	33.5	110.5	50.05	2	57.76	1435.15	72.67
	S em	1.22	1.28	2.66	0.21	2.46	416.59	1.4
	CD	3.59	3.76	7.79	0.61	7.22	1221.89	4.11
	CV	6.33	2.95	9.2	17.87	7.38	50.28	3.34

Selection and evaluation is an important principle of crop improvement used to identify high yielding varieties of a crop. In the present experiment sixteen different groundnut varieties were evaluated on the basis of different quantitative parameters at Agriculture Research Station Darsi, Prakasam district. Based on the results it is concluded that overall performance of TCGS1872 was superior among the varieties used in the trial and is recommended for planting in tract of Prakasam district of Andhra Pradesh.

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