

# Field Evaluation of some Varieties of Groundnut (*Arachis Hypogaea*, L.) on the Jos, Plateau

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**Abstract:-** The experiment was carried out in the demonstration farm of Federal College of Forestry, Jos during the 2017 farming season to evaluate eight varieties of groundnut (*Arachis hypogaea*, L.). The experiment consists of varieties of groundnut Samnut (10, 11, 21, 22, 23, 24, 25 and 26) which represent the treatments which were replicated three (3) times each in a plot size of 2×1m in a Randomized Complete Block Design (RCBD). Data collected include plant height at 3, 5 and 7WAP; leaf count 5 and 7WAP; number of branches 3, 5 and 7WAP; number of flowers at 50% and 100% flowering; number of pods, pods length at harvest and finally yield in kg/ha at harvest. The data were subjected to analysis of variance (ANOVA) and the least significant difference at 5% level of significance using mini-tab 17.0 versions to separate the means. The results show that there was significant difference at (P<0.05) for plant height at 3, 5 and 7WAP, while treatments did not differ significantly in terms of leaf count and number of branches at 3, 5 and 7WAP. In number of flowers, significant difference was observed at 50% flowering while there was no statistical difference at 100% flowering. Treatments did not show significant difference in terms of number of pods and pod length at harvest at (P<0.05). The highest yield value of (148.84kg/ha) was recorded in samnut 10. Other yields in kg/ha from other treatments includes samnut (22, 23, 11, 21, 25, 24 and 26) (107.00kg/ha, 53.67kg/ha, 47.84kg/ha, 40.84kg/ha, 39.07kg/ha, 37.00kg/ha and 36.96kg/ha). The results show that planting samnut 10 with some agronomic improvement in Jos will give much more yield compared to what was obtained.

**Keywords:-** *Arachis hypogaea*, weeks after planting (WAP), Randomized Complete Block Design (RCBD), ANOVA (Analysis of Variance).

## I. INTRODUCTION

Groundnut (*Arachis hypogaea*) also known as peanut, earthnut and goobers is an annual legume of the *fabaceae* family (De waele and Swanevelde, 2011). It is one of the world principal oil seed crops, widely grown in areas ranging from latitude 40° North and South. It is a major crop rotation component in many sub-Saharan countries in the world (Gbehounu and Adango, 2003).

The average yield of groundnut (unshelled nut) of up to six producers in the world are China, 14.30 tonne/ha, USA 23.4 tonne/ha, India 6.25 tonne/ha, Morocco 2.66 tonne/ha, Egypt 3.12 tonne/ha and Nigeria 1.55 tonne/ha (USDASTAT, 2009). Nigeria is one of the major groundnut producers in Africa, with 11% area, the country produces 7% of the world groundnut production (De waele and Swanevelde, 2001).

The annual peanut is grown for both forage and seed in other parts of the world (Larbi *et al.*, 1999). Okolo and Utoh, (1999) estimated that the land under cultivation in Nigeria is about 1.0 – 2.5 million hectare annually, and yield in the range of 500 – 3000 kg/ha. Nigeria has a land area of 92.4 million hectares of which about 44% are under permanent pastures which supports its domestic ruminants of over 101 million (FMAWR, 2012).

The Northern states of Kano, Kaduna, Bauchi, Adamawa and Borno cultivate groundnut in large hectares, but States like Taraba, Benue and Plateau also cultivate groundnut marginally, but has the capacity to become the groundnut hub of the nation going by their geographical location, conducive climatic conditions and the teaming youthful population who have embraced agriculture as a vocation and business due to Government change in attitude towards agriculture. Prior to the advent of oil (crude oil), Nigeria economy was agrarian based with the gross domestic production (GDP) earnings purely from our cash crops of which groundnut is one. But a shift from Agriculture to oil has seen a decline in agricultural activities and the results are evident in mass unemployment of our youths with damning consequences (Anon, 2016).

The 7% of the world groundnut production as reported by (De waele and Swanevelde, 2001) can be increased if Plateau State becomes a groundnut producing zone based on the above characteristics mentioned. Eight varieties that have performed well at various locations will be evaluated in Jos Plateau State, their growth and yield components compared and in addition determine the best performing variety for possible adoption.

## II. MATERIALS AND METHODS

The research was carried out in the experimental plot of Federal College of Forestry Jos, Plateau State during the 2016 cropping season. Jos is located on latitude 7°N and 25°E with elevation of 1200m above sea level. The climate is generally humid tropical with annual mean temperature of 25°C.

The material used in the experiment include measuring tape, hoe and eight varieties of groundnut and their description as shown below from Institute of Agricultural Research Zaria (IAR).

VARIETY	CHARACTERISTICS	YIELD/t/ha
Samnut 21	Growth habit: Semi-erect, days of maturity: 115-120	2.5 t/ha
Samnut 22	Growth habit: Semi-erect, days of maturity: 115-120, Seed: Tan rounded seeds	2-2.5 t/ha
Samnut 23	Growth habit: Semi-erect, days of maturity: 90-100, Seed: oblong	2-2.5 t/ha
Samnut 24	Growth habit: Semi-erect, days of maturity: 80-90, Seed: Rounded	2-2.5 t/ha
Samnut 25	Growth habit: Semi-erect, days of maturity: 80-90, Seed: Rounded	2.5-3.0 t/ha
Samnut 26	Growth habit: Semi-erect, days of maturity: 80-90	3.8 t/ha
Samnut 10	Growth habit: Spreading, days of maturity:	2.0 t/ha
Samnut 11	Growth habit: Spreading, days of maturity:	2.0 t/ha

Table 1:- Source: (Institute of Agricultural Research, Zaria 2016)

The area used for the experiment was cleared of all forms of grasses and root stumps; it was marked out using pegs and ropes. Three (3) ridges of 2 × 1m each were made to represent a plot size and 1m gap between three (3) ridges. Groundnut seeds were planted on the ridge according to the treatments at the spacing of 30cm × 30cm. The experiment was laid out in a Randomized Complete Block Design (RCBD) with eight treatments replicated three (3) times giving a total number of twenty (24) experimental plots. Data

collected include plant height at 3,5 and 7 WAP; leaf count at 3, 5, 7WAP; number of branches at 5, 7, and 9 WAP; number of flowers at 50% and 100% flowering, number of pods per plant per plot at harvest, pod length per plot per plant at harvest and yield in kg/ha. The data collected were subjected to analysis of variance (ANOVA) and the least significant difference (LSD) using a mini tab version 17.0 to separate the means.

## III. Results and Discussion

Varieties	3WAP	5WAP	7WAP
Samnut 10	3.77 <sup>a</sup>	6.00 <sup>b</sup>	8.33 <sup>b</sup>
Samnut 11	4.85 <sup>a</sup>	9.33 <sup>a</sup>	11.33 <sup>a</sup>
Samnut 21	3.27 <sup>a</sup>	6.00 <sup>b</sup>	8.38 <sup>b</sup>
Samnut 22	5.07 <sup>b</sup>	9.67 <sup>a</sup>	10.67 <sup>a</sup>
Samnut 23	4.40 <sup>a</sup>	8.33 <sup>a</sup>	10.67 <sup>a</sup>
Samnut 24	4.73 <sup>a</sup>	8.67 <sup>a</sup>	13.33 <sup>a</sup>
Samnut 25	5.07 <sup>b</sup>	8.67 <sup>a</sup>	12.67 <sup>a</sup>
Samnut 26	4.07 <sup>a</sup>	7.67 <sup>a</sup>	11.67 <sup>a</sup>
LSD	*	*	*

Table 2:- Mean values of plant height of groundnut varieties at 3, 5 and 7 weeks after planting  
Means in the same column with same superscript are not different significantly

Results on table 2, shows that treatments differ significantly at 0.05 level of probability on plant height for 3, 5 and 7WAP. However, at 3WAP, samnut 25 and samnut 22 gave the highest mean values of both (5.07) compared to samnut (10, 11, 21, 23, 24 and 26) which had (3.77, 4.85, 3.27, 4.40, 4.73 and 4.07) respectively. At 5WAP, samnut 22 had the highest mean value of (9.67) followed by samnut (11,

24, 25, 23, 26, 10 and 21) with (9.33, 8.67, 8.67, 8.33, 7.67, 6.00 and 6.00) respectively. At 7WAP, samnut 24 gave the highest mean value of (13.33) followed by samnut 25 (12.67) and the least samnut 11 (11.33). The others; samnut (21, 22, 23 and 26) had the following means (8.38, 10.67, 10.67 and 11.67).

Varieties	5WAP	7WAP
Samnut 10	110.00 <sup>a</sup>	198.00 <sup>b</sup>
Samnut 11	118.33 <sup>a</sup>	231.33 <sup>b</sup>
Samnut 21	113.33 <sup>a</sup>	221.00 <sup>b</sup>
Samnut 22	118.67 <sup>a</sup>	198.00 <sup>b</sup>
Samnut 23	112.00 <sup>a</sup>	185.00 <sup>b</sup>
Samnut 24	106.00 <sup>a</sup>	117.33 <sup>b</sup>
Samnut 25	104.67 <sup>a</sup>	185.00 <sup>b</sup>
Samnut 26	89.00 <sup>a</sup>	185.00 <sup>b</sup>
LSD	NS	NS

Table 3:- Mean value of leaf count of groundnut varieties at 5 and 7 WAP  
Means in the same column with same superscript are not different significantly

The results of leaf count as shown on table 3, indicates that at both 5WAP and 7WAP, the treatments varieties did not differ significantly at 0.05 level of probability. However, from the results at 5WAP samnut 22 had the highest mean value of (118.67) compared to samnut (11, 21, 23, 10, 24, 25 and 26) of (118.33, 113.33, 112.00, 110.00, 106.00 and

104.67) and the least of (89.00) respectively. At 7WAP however, samnut 11 had the highest mean value of (231.33) compared to samnut (21, 22, 10, 23, 25, 26 and 24) which had (221.00, 198.00, 198.00, 185.00, 185.00, 185.00) and (117.33) respectively.

Varieties	3WAP	5WAP	7WAP
Samnut 10	10.30 <sup>a</sup>	25.00 <sup>a</sup>	48.67 <sup>b</sup>
Samnut 11	10.10 <sup>a</sup>	27.00 <sup>a</sup>	55.67 <sup>b</sup>
Samnut 21	10.52 <sup>a</sup>	31.33 <sup>a</sup>	54.33 <sup>b</sup>
Samnut 22	8.50 <sup>a</sup>	27.33 <sup>a</sup>	49.33 <sup>b</sup>
Samnut 23	8.83 <sup>a</sup>	27.33 <sup>a</sup>	45.33 <sup>b</sup>
Samnut 24	8.83 <sup>a</sup>	27.67 <sup>a</sup>	43.33 <sup>b</sup>
Samnut 25	8.50 <sup>a</sup>	26.00 <sup>a</sup>	47.00 <sup>b</sup>
Samnut 26	8.83 <sup>a</sup>	27.00 <sup>a</sup>	48.00 <sup>b</sup>
LSD	NS	NS	NS

Table 4:- Mean values of number branches of groundnut varieties at 3,5 and 7weeks after planting  
Means in the same column with same superscript are not different significantly

The mean value of numbers of branches of groundnut as presented in table 4, indicates that at 3, 5 and 7WAP, treatments did not differ significantly at 0.05 level of confidence, observations however, showed that at 3WAP, the highest mean value was recorded in samnut 21 (10.52) and the least mean value was recorded in samnut (22 and 25) (8.50) compared to (10, 11, 23, 24 and 26) with (10.30, 10.10, 8.83, 8.83 and 8.83) respectively. Similarly, at 5WAP, samnut 21 (31.33) recorded the highest mean value with the

minimum obtained in samnut 10 (25.00) samnut (11, 22, 23, 24, 25 and 26) recorded the following mean values (27.33, 27.33, 27.67, 26.00 and 27.00) respectively.

More so at 7WAP, samnut 11 (55.67) had the highest mean value followed by samnut 21 (54.33), the least mean value was recorded in samnut (22, 23, 25 and 26) which had (49.33, 45.33, 47.00 and 48.00) respectivel

Varieties	50% flowering	100% flowering
Samnut 10	11.33 <sup>a</sup>	8.67 <sup>b</sup>
Samnut 11	5.00 <sup>b</sup>	10.00 <sup>b</sup>
Samnut 21	3.80 <sup>b</sup>	11.33 <sup>b</sup>
Samnut 22	3.62 <sup>b</sup>	10.00 <sup>b</sup>
Samnut 23	8.00 <sup>a</sup>	10.33 <sup>b</sup>
Samnut 24	3.80 <sup>b</sup>	11.67 <sup>b</sup>
Samnut 25	7.10 <sup>a</sup>	11.00 <sup>b</sup>
Samnut 26	9.00 <sup>a</sup>	10.67 <sup>b</sup>
LSD	*	NS

Table 5:- Mean values of flowers at 50% and 100% flowering  
Means in the same column with same superscript are not different significantly

The number of flowers as recorded in table 5, shows that at 50% flowering treatments differ significantly at 0.05 level of confidence, but observations showed samnut 10 (11.33) gave the highest number of flowers followed by samnut 26 (9.00) the least number of flowers were recorded in samnut (21 and 24) respectively. Samnut (23, 25 and 11)

had (8.00, 7.10 and 5.00) respectively. At 100% flowering, treatments did not differ statistically at 0.05 level of confidence, samnut 24 (11.67) gave the highest mean value compared to samnut (21, 25, 23, 26, 22, 11 and 10) which had (11.33, 11.00, 10.67, 10.33, 10.00, 10.00 and 8.67) respectively.

Varieties	Number of pods/plant/plot at harvest
Samnut 10	11.33 <sup>c</sup>
Samnut 11	8.67 <sup>c</sup>
Samnut 21	12.33 <sup>c</sup>
Samnut 22	16.33 <sup>c</sup>
Samnut 23	10.00 <sup>c</sup>
Samnut 24	9.00 <sup>c</sup>
Samnut 25	9.00 <sup>c</sup>
Samnut 26	8.33 <sup>c</sup>
LSD	NS

Table 6:- Mean values of number of pods/plant/plot at harvest  
Means in the same column with same superscript are not different significantly

Table 6, presents the number of pods/plant/plot at harvest the results showed that treatments did not differ statistically at 0.05 level of confidence, observation shows that samnut 22 (16.33) had the highest mean pods value

followed by samnut 21 (12.33) and the least mean value was recorded in samnut 26 (8.33), samnut (10, 11, 23, 24 and 25) had (11.33, 8.67, 10.00, 9.00 and 9.00) respectively.

Varieties	Mean pod length
Samnut 10	2.49 <sup>a</sup>
Samnut 11	2.57 <sup>a</sup>
Samnut 21	3.03 <sup>a</sup>
Samnut 22	2.70 <sup>a</sup>
Samnut 23	2.73 <sup>a</sup>
Samnut 24	2.37 <sup>a</sup>
Samnut 25	2.57 <sup>a</sup>
Samnut 26	2.67 <sup>a</sup>
LSD	NS

Table 7:- Mean values of pod length in cm of groundnut varieties plant/plot at harvest  
Means in the same column with same superscript are not different significantly

The mean value of pod length (cm) as shown in table 7, indicates that treatments did not differ significantly at 0.05 level of probability, but samnut 21 (3.03) had the highest

mean value compared to samnut (23, 22, 26, 25, 11, 10 and 24) with the values of (2.73, 2.70, 2.67, 2.57, 2.57, 2.49 and 2.37) respectively.

Varieties	kg/ha
Samnut 10	148.2
Samnut 11	47.84
Samnut 21	40.84
Samnut 22	107.00
Samnut 23	53.67
Samnut 24	37.00
Samnut 25	39.07
Samnut 26	36.95

Table 8:- Yield of groundnut in kg/ha at harvest  
Means in the same column with same superscript are not different significantly

Table 8, gave the yield in kilograms per hectare for the varieties, samnut 10 (148.20 kg/ha) recorded the highest yield in kg/ha at harvest compared to samnut (22, 23, 11, 21, 25, 24 and 26) which had (107.00, 53.67, 47.84, 40.84, 39.07, 37.00 and 36.95) kg/ha respectively.

#### IV. CONCLUSION

In conclusion the variety samnut 10 gave the highest yield compared to the other varieties. The result showed that planting samnut 10 with an improved agronomic practices there will be capacity to give much more yield.

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