

## EVALUATION OF EGUSI VARIETIES (*CUCUMEROPSIS MANNII* L.) FOR GROWTH AND YIELD IN BAUCHI STATE COLLEGE OF AGRICULTURE, YELWA, BAUCHI. NIGERIA.

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### INTRODUCTION

Egusi commonly referred to as: egusi in Yoruba, Egushi in Igbo and agusi in Hausa, Nigerian dialects is schematically referred to as, *Cucumeropsis mannii* L., belong to the Family Cucurbitaceae, genus *Cucumeropsis* specie *mannii* .(WIKIPEDIA,2022). Some scientist considers it as specie of *Citrulus lanatus*. While some refer to it as *Colocynthis citrullus* (echocommunity 2022). While some scientist consider it as a species of *Citrulus lanatus* (Ogbonna,2006). Egusi(*Cucumeropsis mannii*) is a trailing annual plant with branching tendrils. Generally it is allowed to grow without support, its stem is angular, leaves are lobed. Plant body is generally covered with rough hairs. Male and female flowers are borne on the same plant hence a monoecious plant. (Tindall,1965). *Cucumeropsis mannii* is a fast spreading creeping vine. It produces climbing vines up to 4 meters long which are covered in stiff hairs; Its leaves are heart shaped or roughly palmate up to 12 cm long and 14 cm wide. Its fruits are egg shaped or elongated ovate shaped about 19 cm long. (WIKIPEDIA, 2022). *Cucumeropsis mannii* is said to be native to tropical Africa west of east rift. It is drought tolerant, thriving in West African dry regions, adapted to semi arid zones. Major growing nations include: Mali, Burkina Faso, Togo, Ghana, Cote d'ivoire. Benin, Nigeria.(WIKIPEDIA,2022).*Cucumeropsis mannii* as a widely grown crop in West Africa, with Nigeria accounting for about 65% of total production. The states with high melon production in Nigeria are: Enugu, Benue, Nasarawa, Taraba, and Kogi. (NRC, 2006) Egusi (*Cucumeropsis mannii*) prefers warm well fertilized soil, with good drainage that is also rich in nutrients.(WIKIPEDIA).

Egusi (*Cucumeropsis mannii*) thrives in harsh climates and high yields are attainable in barren landscapes. In the transitional zone of West Africa it is sown during the major rainy season between March and May. Here the soils are rich in organic matter, high rainfalls of about 1400mm well distributed between April and October. It does well on an elevation of

914m provided climatic conditions are satisfactory for growth. It is tolerant to a wide range of rainfall, but relatively dry conditions for ripening of fruits. Excessive humidity may affect flowering and heat may be harmful to fruits,(WIKIPEDIA, 2022). It can be planted on well prepared land either on ridges or flat (Saunder,1940).

Propagation of *Cucumeropsis mannii*, is entirely by seeds. Plant 2 to 3 seeds per hole in hole of 1 to 5 of 2cm deep, at distance of 1m apart. But in challenging areas it should be spaced at 3m apart. Emergence occurs 4-7 days after sowing. (echocommunity.org) It is harvested primarily for its large white seed. It is important to harvest it when the fruit has fully matured to secure seeds for maximum yields. Fruits are harvested 65 days after anthesis, this allows for increase in germination ability of stored seeds, and ensuring future yields. Physical signs of ripe fruit include a creamy colour and dried stems and leaves. Each plant averages 2 to 5 fruits each, weighing 0.8 to 1.8 kg, containing 90-400 seeds (WIKIPEDIA .2022).

Egusi is vulnerable to downy mildew and anthracnose. Diseases risk is reduced by crop rotation with non cucurbit crops. Avoiding susceptible to similar diseases as melon.(WIKIPEDIA .2022). Harvest fruits before first frost or when the attached stem withers and turns brown. Use a sledge hammer or a rock to break open fruits on a tap.(truelove seeds, 2022). Egusi soup is a kind of soup thickened with ground seeds. In Nigeria egusi is common among people of the south western: Yoruba people, Efik, Ibibio and Annang people of South- South Nigeria, and South Eastern part of Nigeria.(echo community,2022).

## **EXPERIMENTAL DESIGN AND SOWING METHOD**

Two separate experiments were carried out at the experimental site of Bauchi State College of Agriculture, (Green House site)Yelwa, Bauchi, Nigeria. In 2017 The Experiment was laid out in a Randomized Complete Block Design. The experiment, consisted of three treatments which are three varieties replicated five times giving a total of fifteen treatments. The varieties used as treatments were V1(Igbo type), V2 (Yoruba type), V3 (Igala Type) Each treatment was laid to a block with a size of 4x4=16 m<sup>2</sup> with a path way of 0.5m. Which given so as to facilitate farm operations' and data collection Seeds from local traders in the market, and some farmers who had previously harvested stock were collected and used for the experiment. Marked plots using gutters chain,

pegs, were ploughed manually using hand hoe: after previous farm debris have been removed and burnt. Then seeds were sown manually through dibbling method where two to three seeds were dropped into a slit that has been opened, then seeds were properly covered with top soil. Spacing between rows and between plant stands was 1m apart. Weeds were removed at 2 and 4 weeks after germination. Subsequent weeding was carried out by hand pulling of any grown up weeds that could not be controlled by the trailing plants during 2017 experiments pests were encountered which were black ants at seed emergence and seedling stage, that were feeding on the young shoots of the emerged seedling. They were controlled through an insecticide called pit paff. Then later on fruit worm's were encountered when it started fruiting, they were also controlled by spaying through the insecticides: which were, Ambush and Sevin. Mean values of the data collected in the course of the experiment were analysed and are presented below from Table 1 to 5. The parameters observed recorded and analysed were:-Plant height/ Stem or Vine Length (cm), Leaf area, (cm<sup>2</sup>) at 2,4,6,8,10,12 and 14 weeks after germination. Number of Leaves per Plant at 3,4 5 6 7 8 9 weeks after germination. Number of Branches per plant at 3.4.5.6.7.8.9 weeks after germination, Number of flowers at 6, 7, 8 weeks after germination. Number pods produced per Plant at 6,7,8,9 weeks after germination. Harvested Fruit weight were also recorded along with final seed yield all in (Kg/ha). Similarly parameters observed, measured recorded and analysed in 2018 experiment were /Plant height/ Vine Length (cm) , Leaf area (cm<sup>2</sup>), Number of Leaves per Plant, Number of Flowers per plant, all at 3, 6 and 9 weeks after germination, While Number of Fruits per Plant was only taken at 9 weeks after germination. Then the weight (kg/ha.) of freshly harvested fruits were noted per variety, subsequently the weight of final dry seed yield (kg/ha.) per variety was taken and recorded. Mean values of data collected in both 2017 and 2018 were subjected to analysis of variance using the Spss analytical tool. Analysed results of 2017 are as presented on Tables 1 to 5, and that of 2018 are as presented on Tables 1 to 6.

## RESULTS AND DISCUSSIONS

**Table 1. Evaluation of Egusi ( *Cucumeropsis mannii* ) Varieties on its Plant height/ Vine length/ (cm) as observed at 2,4,6,8 10 12,and 14 weeks after germination Weeks after germination**

Varieties	2	4	6	8	10	12	14
V1( Igbo type)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
V2(Yorubatype)	34.00	68.20	102.00	136.20	181.60	211.80	278.00
V3(Igala type)	33.00	68.60	101.40	136.20	161.00	223.30	320.80
LS.	NS	NS	NS	NS	NS	NS	NS

**Table 2 Evaluation of Egusi ( *Cucumeropsis mannii* ) Varieties on its Leaf area (cm<sup>2</sup>)as observed at 2,4,6,8 10 12,and 14 weeks after germination Weeks after germination**

Varieties	2	4	6	8	10	12	14
V1(Igbo type)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
V2(Yorubatype)	<b>9.40</b>	<b>11.00</b>	<b>27.00</b>	<b>13.60</b>	<b>13.20</b>	<b>13.20</b>	<b>11.80</b>
V3(Igala type)	<b>3.80</b>	<b>12.80</b>	<b>14.60</b>	<b>14.80</b>	<b>15.00</b>	<b>15.20</b>	<b>16.40</b>
LS.	NS	NS	NS	NS	NS	NS	NS

**Table 3 Evaluation of Egusi ( *Cucumeropsis mannii* ) Varieties on its Number of branches per plant as observed at 2,4,6,8 10 12,and 14 weeks after germination Weeks after germination**

Varieties	2	4	6	8	10	12	14
V1( Igbo type)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
V2(Yorubatype)	<b>2.40</b>	<b>4.01</b>	<b>5.60</b>	<b>13.03</b>	<b>13.63</b>	<b>16.61</b>	<b>19.01</b>
V3(Igala type)	<b>2.20</b>	<b>4.42</b>	<b>6.02</b>	<b>12.22</b>	<b>14.61</b>	<b>20.60</b>	<b>20.62</b>
LS.	NS	NS	NS	NS	NS	NS	NS

**Table 4 Evaluation of Egusi ( *Cucumeropsis mannii* ) Varieties on its Number of flowers per plant as observed at 6,7 and 8 weeks after germination Weeks after germination**

Varieties	6	7	8
V1( Igbo type)	0.00	0.00	0.00
V2(Yorubatype)	<b>2.41</b>	<b>12.42</b>	<b>11.60</b>
V3(Igala type)	<b>2.81</b>	<b>5.00</b>	<b>21.41</b>
LS.	NS	NS	NS

**Table 5 Evaluation of Egusi ( *Cucumeropsis mannii* ) Varieties on its Number of fruits per plant along with Number of fresh seeds per pod and Dry weight of the seeds per pod as observed at 6,7,8 ,and 9 weeks after germination Weeks after germination**

Varieties	6	7	8	9	NSP	DW(Kg./16m <sup>2</sup> )
V1 (Igbo type)	0.00	0.00	0.00	0.00	0.00	0.00
V2(Yorubatye)	<b>0.800</b>	<b>1.81</b>	<b>2.41</b>	<b>3.01</b>	<b>128.00</b>	<b>50.00</b>
V3(Igala type)	<b>0.800</b>	<b>2.01</b>	<b>2.80</b>	<b>2.200</b>	<b>313.00</b>	<b>143</b>
LS.	NS	NS	NS	NS	NS	NS

From the analysed data collected in 2017 experiment, Igbo type had complete failure from the onset of the experiment, most the seeds didn't germinate. While the few that germinated died back possibly due poor viability, none survived till data stage hence its data read zero all through. All through the period of the investigation, the results obtained and analysed showed non significant effect in both vegetative and reproductive stages observed. However the igala type indicated better performance than the Yoruba type in both the vegetative and reproductive phases.

**20 18 Cropping Season Experimental Data collected and analysed. Presented from Tables 1 to 6**

**Table 1.Evaluation of Egusi ( *Cucumeropsis mannii* ) Varieties on its Creeping or stem length/ Plant height (cm) as observed at 3.6 and 9 weeks after germination Weeks after germination**

Varieties	3	6	9
V1- Igala type	23.28	102.92	256.92
V2-Yoruba type	26.08	100.37	290.60
V3- Igbo Type	52.37	138.91	266.96
LS	**	NS	NS

**Table 2.Evaluation of Egusi ( *Cucumeropsis mannii* ) Varieties on its Leaf area (cm<sup>2</sup>) ,as observed, at 3.6 and 9 weeks after germination Weeks after germination**

Varieties	3	6	9
V1- Igala type	69.43	167.48	292.07
V2-Yoruba type	45.10	155.62	164.55
V3- Igbo Type	62.53	197.31	174.15
LS	*	*	**

Table3 .**Evaluation of Egusi ( *Cucumeropsis mannii* ) Varieties on its Number of Leaves per Plant, as observed, at 3.6 and 9 weeks after germination Weeks after germination**

Varieties	3	6	9
V1- Igala type	9.04	28.24	100.65
V2-Yoruba type	14.06	70.63	239.69
V3- Igbo Type	19.43	61.25	268.82
LS	*	*	**

Table 4.**Evaluation of Egusi ( *Cucumeropsis mannii* ) Varieties on its Number of Flowers per Plant, as observed, at 3.6 and 9 weeks after germination Weeks after germination**

Varieties	3	6	9
V1- Igala type	16	6.08	21.20
V2-Yoruba type	16	10.00	73.87
V3- Igbo Type	5.04	12.36	35.44
LS	**	*	NS

Table 5**Evaluation of Egusi ( *Cucumeropsis mannii* ) Varieties on its Number of Fruits Per plant as observed at 9 weeks after germination Weeks after germination**

Varieties	9
V1- Igala type	6.44
V2-Yoruba type	13.42
V3- Igbo Type	12.05
LS	NS

**Table 1. Evaluation of Egusi ( *Cucumeropsis mannii* ) Varieties on its Freshly Harvested Weight and Final Seed Yield after Harvest.(Kg/ha.)**

Varieties	Weight of Freshly Harvested fruits(Kg/ha.)	Final Seed Yield (Kg/ha.)
V1- Igala type	1074.91	32.41
V2-Yoruba type	902.50	76.79
V3- Igbo Type	1149.91	79.00
LS	NS	**

The 2018 analysed results of data obtained within the period of the investigation as presented on Table 1 to 6 Within this period of the investigation all the three varieties Table 1 which is the analysed results on the Effect of Varieties on Egusi Plant height/Vine length(cm) was significant at 3 weeks after germination., with Variety V3-(Igbotype) producing crops with significantly longer vines, with mean value of 52.37cm, followed by V2-(Yoruba type) with mean value of 26.08cm, then V3( Igala Type) had significantly shortest Vine length with mean value of 23.28cm. Effect of Variety of Egusi (*Cucumeropsis mannii*) all through the period of the investigation had significant effect on its Leaf area (cm<sup>2</sup>). With Variety V1-(Igala type ) at 9 weeks after germination, producing crops with significantly ( $P \leq 0.05$ ) largest Leaf area (cm<sup>2</sup>) with mean value 292.07cm<sup>2</sup>, followed by V3- (Igbo type) with mean value of 174.15cm<sup>2</sup>, then V3- (Yoruba type) with mean value of 164.55 cm<sup>2</sup>. Effect of Varieties on Egusi Number of Leaves per plant all through the period of the investigation had significant effect( $P \leq 0.05$ ), with V3- (Igbo type) producing crops with significantly highest Number Leaves per Plant at 9 weeks after germination. With mean 268.82, and lowest Number of Leaves per plant observed from crops produced by V1-(Igala type) with mean value of 100.65. In the reproductive phase of the experiment, "Effect of Variety on Egusi (*Cucumeropsis mannii*) Number of flowers per Plant " was highly significant ( $P \leq 0.05$ ), at 3 weeks after germination with V1-(Igala type) and V2 (Yoruba type) producing significantly ( $P \leq 0.05$ ) highest number of flowers per plant(16) each. While significantly ( $P \leq 0.0$ ) lowest Number of flowers per plant was observed in V3-(Igbo type) 5.04. However at 6 weeks after germination V3 (Igbo type) produced significantly highest Number of flowers per plant: with mean

value of 12.06 and least was observed in variety V1 (igala type) (6.08). Effect of Varieties of Egusi Number of Fruits as observed at 9 weeks after germination was statistically non significant within the period of the investigation. In the study area Effect of Varieties on freshly harvested fruits of Egusi within the period of investigation was also non significant. But variety had very high significant effect ( $P \leq 0.0$ ) on Egusi Final Seed Yield (kg/ha.) with Variety V3( Igbo type) producing significantly highest seed yield 79.00 (kg/ha) followed by V2- (Yoruba Type) with 76.79 Kg/ha, and significantly( $P \leq 0.05$ ) lowest seed yield was observed in V1-( Igala type) with mean value of 32.41(kg/ha.).

## DISCUSSION

The results obtained analysed and presented as per the Effect of Varieties on the growth and yield of Egusi Varieties in the study area ., in 2017 and 2018 rainy season indicated that seed viability is a very important factor in seed germination growth and development. Hence poor viability must have contributed to seed failure in germination as per Igbo type in 2017m and the subsequent inability of the few seedlings that germinated to establish for good growth and yield. The comparatively poor vegetative performance of the Igala type and Yoruba type at both vegetative and reproductive phase in 2017 experimental period could still be linked to late planting, which was 27/6/2017 of the crop in the study area. At this the rains had fully established. The recommended practice is that egusi for good performance should be sown in the month of May as opined by WIKIPEDIA(2022), this is normally carried out with the first or second big rains that could provide enough soil moisture for germination. Hence 2017 crops though produced good flowers, yet had few fruits which may be due abortion of flowers from the effect of high rainfall which is normally experienced in the months of July to August in he study area. The number of fruits as obtained recorded and analysed in both 2017, and 2018 experiments though statistically non significant at 9 weeks after germination compared favourably with the report of WIKIPEDIA (2922) who opined that egusi produces 2 to 5 fruits per plant. WIKIPEDIA (2022) reported expected number of seeds per plant to the tune of 90 to 100 seeds: in 2017 experiment the Yoruba type had mean ssed number per pod of 128, while Igala type had 313 though statistically non significant in the study area. However with improvement in obtaining viable seeds especially the igbo variety that failed in 2019, and using the stored Igala and Yoruba type Varieties than were produced in 2017, the 2018 had a better vegetative and reproductive performance the study



Evaluation of Egusi Varieties (*Cucumeropsis mannii* L.) for Growth and Yield in Bauchi State College of Agriculture, Yelwa, Bauchi. Nigeria.

area. Crop spacing was also changed so as to improve plant population per unit area and better crop performance. The Igbo type which though produced less number of Flowers at 9 weeks after germination in comparisons to Yoruba type gave significantly highest seed yield (79.00,Kg/ha.) in the study area. The Yoruba type \performed better than Igala Type in 2018 experiments in respect of final seed yield.

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