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## EFFECT OF FRUIT AGES ON MOTHER- PLANT SEED QUALITY OF "EGUSI" MELON (*Cucumeropsis manni* Naudin) CULTIVARS

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### ABSTRACT

Melon fruits produced at the base of the stem are older. Age reduces as they get closer to the apex of the stem. Melon farmers however, conduct harvest operation on the same day and do not grade fruits according to their ages and position on the mother- plant before extraction of seeds. The experiment was conducted in 2019 at the laboratory of Crop Production Department, Federal University of Technology, Minna to evaluate the qualities of two "egusi" melon cultivars harvested at different ages on their mother-plant. The treatments were three harvesting stages, 23, 33, 43 days after anthesis (DAA) and two "egusi" melon cultivars ("paragi" and "ofe"). The seeds were placed on filter paper moistened with distilled water in plastic dishes and laid out in Completely randomized design (CRD) in four replications. Data were collected on seed length, dry seed weight, seed diameter, 100-seed weight and germination percentage. Data collected were subjected to analysis of variance (ANOVA) and means were separated using Tukey's test. The results indicated that, the "Paragi" variety recorded significantly higher values for all the observed seed parameters except seed length and seed diameter. The results also revealed 23 days after anthesis had significantly lower values compared to 33 and 43 days after anthesis for 100-seed weight, number of seeds per fruit and weight of seed. For seed length and seed diameter, 43 days after anthesis was significantly higher. The germination percentage between the two varieties were generally similar throughout the duration of storage. Though significant germination percentage differences were recorded among the seeds harvested at different days after anthesis at 0, 6, 8, 10, 12 and 14 storage periods, the trend was not consistent. Seed of cultivar "Paragi" retained higher quality traits. For optimum storability and good seed quality, "egusi" melon should be harvested at 43 days after anthesis.

Keywords: "Egusi" Melon, Seed Quality, Germination percentage

### INTRODUCTION

"Egusi" melon (*Cucumeropsis manni*) is the biological ancestor of the watermelon now found all over the world. It is a member of the cucurbitaceae family and the genus *Citrullus* (Ogbonna and Obi, 2010). Melon consisted of 4 to 5 species of the genus, viz: *Cucumeropsis manni* (thumb), *Citrullus colocynthis* (L) Sachred, *Citrullus ecirrhorous* (Cogn) and *Citrullus naudrnianus* (Sord Hook), with the basic chromosome number of  $2n = 22, n = 11$  (Ogbonna, 2013). The word "Egusi" is derived from Yoruba language, (Vossen *et al.*, 2004). Bello (2011), stated that "egusi" melon is a native of African where it was cultivated for many centuries. It has been referred to *Citrullus*



*vulgaris* in some texts (Ogbonna and Obi, 2007) and *Cucumeropsis manni* (Ogbonna, 2013). “Egusi” melon is now wide spread in all tropical, sub-tropical and warm temperate (hot summers) regions of the world, including Africa. The kernels of its seed can be eaten as snacks when roasted and used for the purpose of cooking oil source (Bande *et al.*, 2012). According to Demir and Smith (2001); Oladiran and Kortse (2002) and Demir *et al.*, (2004) seed age is a major determinant of seed quality. Most small-holder farmers obtain fruits that have been left to weather on the field; which are most likely to be seeds from fruits of different position and ages, such seeds are known to be of poor quality. Such seeds are known to germinate poorly when planted. This has over the years resulted in low productivity among peasant vegetable growers as they are usually unable to access improve and high-quality seed due to high cost. Therefore, the objective of the study was to evaluate the variabilities in the qualities of two “egusi” melon cultivars harvested at different ages.

## MATERIALS AND METHODS

The experiment was conducted in 2019 at the laboratory of Crop Production Department, Federal University of Technology, Minna, Niger State (latitude 9<sup>o</sup> 51 N and longitude 6<sup>o</sup> 44 E). The treatment was a factorial combination of “egusi” melon cultivars (“paragi” and “ofe”) and three harvesting stages (23, 33, 43 days after anthesis (DAA)). Twenty-five seeds from each treatment were placed on filter paper moistened with distilled water in a petri dish and arranged in a completely randomized design (CRD) with four replicates. Data were collected on 100-seeds weight, number of seeds per fruit, dry seed weight, seed length, seed diameter and germination percentage. The seed moisture content was determined as follows:

$$\frac{\text{Weight of wet seeds} - \text{weight of oven dried seeds}}{\text{Weight of wet seed}} \times 100$$

Germination test were done by counting four replicates of 25 seeds each of the treatment combinations which were placed on filter paper. The Petri-dishes were carefully arranged in seed germination chamber at a constant temperature of 30 °C. Germination counts were taken every-other-day and results were expressed in percentages. Data collected were subjected to analysis of variance (ANOVA) using Minitab and means were separated using Tukey test at 5 % level of probability where significant differences exists among the treatments.

## RESULTS

Table 1 shows the effects of harvesting at different days after anthesis on seed parameters of two “egusi” melon cultivars. The “Paragi” cultivar recorded significantly higher values for all the observed seed parameters except seed length and seed diameter. Also, 23 days after anthesis had significantly lower values compared to 33 and 43 days after anthesis for 100-seed weight, number of seeds per fruit and weight of seed. For seed length and seed diameter, 43 days after anthesis was significantly higher. The interaction effect of “egusi” melon cultivars and harvesting at different days after anthesis was significant at 100-seed weight, highly significant for both number of seeds per fruit and dry seed weight, but not significant for both seed length and seed diameter. The interaction effect of cultivars and harvesting at different days after anthesis were revealed in Table 2. There was a significantly low values of harvesting at 23 days after anthesis compared to 33 and 43 days after anthesis at all the seed parameters irrespective of the cultivar. At each seed parameter, the trend in the values of harvesting at different days after anthesis protocol varied with cultivar. At 100-seed weight, whereas the values for “Paragi” cultivar were not significant in harvesting at 33 and 43 days after anthesis, significant variations were recorded for values with “Ofe” cultivar. At this latter cultivar, the best value was recorded at harvesting at 43 days after anthesis (10.20g). The poorest value was obtained at 23 days after anthesis in “Paragi” cultivar. Variations in responses and trends of values among harvesting at different days after anthesis was recorded at the other seed quality parameters as well. Table 3 shows the effects of harvesting at different days after anthesis on germination percentage on “egusi” melon cultivars at different storage periods. The germination percentage between the two cultivars were generally similar throughout the duration of storage. Though significant germination percentage differences were recorded among the seeds harvested at different harvesting days after anthesis at 0, 6, 8, 10, 12 and 14 storage periods, the trend was not consistent. Furthermore, the interaction between cultivars and harvesting at different days after anthesis was not significant throughout the duration of storage (Table 3



Table 1. Effects of harvesting at different days after anthesis on seed parameters of two "Egusi" melon cultivars

Treatments	100-seed weight (g)	Number of seeds per fruit	Dry seed weight (g)	Seed length (cm)	Seed diameter (cm)
Cultivars (C)					
"Paragi"	10.24a	191a	16.21a	1.06a	0.44a
"Ofc"	9.46b	112b	12.41b	1.03a	0.43a
LSD	0.17	10.85	1.31	0.09	0.05
Days after anthesis (D)					
23	8.93b	108b	13.91b	0.91c	0.29b
33	10.18a	172a	19.11a	1.04b	0.49b
43	10.43a	175a	19.90a	1.20a	0.53a
LSD	0.21	13.29	1.61	6.10	0.06
Interaction					
C x D	*	**	**	NS	NS

LSD = Least Significant Different at 5% level of probability; \* = significant; \*\* = highly significant; NS = not significant

Table 2. Interaction effects of harvesting at different days after anthesis and "Egusi" melon cultivars on 100-seed weight, number of seeds per fruit and weight of seed

Cultivars	Days after anthesis	100-seed weight (g)	Number of seeds per fruit	Dry seed weight (g)
"Paragi"	23	9.46c	112b	13.91b
	33	10.60a	232a	23.34a
	43	10.67a	229a	24.38a
"Ofc"	23	8.44d	103b	6.91c
	33	9.76bc	112b	14.90b
	43	10.20ab	121.b	9.64c
LSD		0.49	30.97	3.75



Table 3. Effects of harvesting at different days after anthesis on germination percentage of two "egusi" melon cultivars at different storage periods

Storage period (weeks)	0	2	4	6	8	10	12	14
Treatment								
Cultivars (C)								
"Paragi"	88.33a	93.00a	95.33a	83.33a	78.00a	64.00a	68.00a	65.33a
"Ofe"	86.50a	94.67a	94.00a	82.00a	78.67a	71.08a	67.75a	61.33a
LSD	7.49	4.87	2.80	7.96	10.08	11.44	9.20	13.47
Days after anthesis (D)								
23	79.00b	91.50a	90.00a	73.00b	70.50b	62.50b	59.00b	49.00b
33	92.00a	95.50a	97.00a	90.50a	81.00a	63.50ab	70.13ab	49.00ab
43	91.25a	94.50a	97.00a	84.50a	83.50ab	76.63a	74.50a	73.50a
LSD	9.17	5.92	3.43	9.75	12.35	14.01	11.27	16.50
Interaction								
C x D	NS	NS	NS	NS	NS	NS	NS	NS

LSD = Least Significant Different at 5% level of probability; NS = not significant

#### DISCUSSION

The "egusi" melon, when harvested at 23 days after anthesis, revealed that the seed still had the high moisture content which greatly impact on the storability but progress in maturity and storability were found in harvesting at 43 days after anthesis. This was similar to the results reported by Demir and Ernis (2005) who had hypothesized that the reduction in the storability might be due to maturity associated issues with development of seeds such as accumulation of dry matters, desiccation development cessation of mobilization. In addition, the higher the moisture content at harvest, the lower the germination percentage was alluded to by Owolade *et al.* (2003) who also observed that the higher the moisture content the higher the loss of seed at storage. It is important to note that the superiority of seeds harvested at 43 days after anthesis was particularly more obvious in age and at the seed quality.

#### CONCLUSION

It is concluded that seeds of the two cultivars used in this study possessed seed quality potentials but "Paragi" cultivar germinated and stored better than "Ofe" cultivar in few cases. The study also

revealed that it may be necessary to immediately record the day of anthesis in "egusi" melon production. Seeds of "egusi" melon harvested at 43 days after anthesis retained higher germination for longer period and exhibited good seed quality. It is therefore recommended that "Paragi" cultivar be nominated for evaluation trials for subsequent release as "egusi" melon variety in Nigeria. Also, that harvesting of "egusi" melon at 43 days after anthesis be adopted in order to enhance good seed quality.

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