Frontiers in Food & Nutrition Research

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Research Article

COMPARATIVE STUDY OF SOME GROWTH ATTRIBUTIES OF TWO VARIETIES OF *Citrullus Lanatus* THUNB. (WATER MELON) CULTIVATED IN UMUDIKE ABIA STATE NIGERIA

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Received October 07, 2017; Accepted November 17, 2017; Published February 06, 2018;

Cite This Article: Egbucha, K., Aghale, D., Umeoka, N., Ibiam, R. (2018). Comparative study of some growth attributies of two varieties of *Citrullus Lanatus* Thunb. (Water Melon) cultivated in Umudike Abia State Nigeria. Frontiers in Food & Nutrition Research, 4(1). 1-3

ABSTRACT

Four growth attributes from two varieties of the vegetable crop *Citrullus lanatus* Thunb. (Water melon) cultivated in Umudike, Abia State of Nigeria were studied as the crops were growing on the field. Seeds of the two varieties viz. Wantoma60 and Raider52 were obtained from an Agricultural Research Institute within the town and planted in a Randomized Complete Block Design within the Botanical Garden of the Department of Plant Science and Biotechnology, Michael Okpara University of Agriculture, Umudike. Data on number of leaves, number of branches, vine length and number of internodes were collected from the growing plants of the two varieties. Student t-test statistical analysis tool was employed in analyzing and comparing the mean values of data. In all four parameters measured significant differences were recorded between the varieties at $P \leq 0.05$. Variety Wantoma60 performed higher than variety Raider52 in all parameters measured. The implication of the result is that variety Wantoma60 mmay be better adapted to grow vegetatively than variety Raider 52 in the climatic and edaphic conditions of Umudike south-east Nigeria.

KEY WORDS: Vine length, internode, carotenoid, chlorophyll, edaphic, t-value.

INTRODUCTION

Citrullus lunatus Thumb. Commonly referred as Water melon belongs to the plant family *Cucurbitaceae.* Tere is consensus among plant taxonomists that this crop originated in the desert regions of Africa (Kalahari and Sahara deserts) (Jarret *et al.*, 1996; Schippers, 2000). The fruit of water melon is consumed by many people all over the world as a refreshing delicacy. The fruit flesh is recommended as management food for some chronic disease condition such as heart and blood vessel ailments, kidney and liver disorders etc. In addition to its highly nutritious and thirst quenching quality, it is reputed to be the richest source of potassium and magnesium among fruits (IITA, 2013). The fruit also has reasonable content of folic acid and pectin substances including vital carotenoids such as phytofluene, phytoene, beta-carotene, lutein and neurosporene (De, 2001; Hon Code (2008); Mangila *et al.*, 2007).

In Nigeria, water melon is consumed by people from all regions of the country. During hot season as well as during the Ramadan fast, this commodity becomes of very high demand and farmers make profitable returns on their investment. Despite the wide consumption and acceptance in every part of the country, the growth and cultivation of the crop have remained mainly confined in the grassland and sahel regions of the country (Anon, 2006). Research efforts into the potentials of growing the crop in

commercial scale within the southern regions of the country have remained scanty (Enujeke, 2013; Ufoegbune *et al.*, 2014). This study was therefore carried out with the aim of conducting a comparative assessment of some growth attributes of two varieties of water melon (Wantoma 60 and Raider 52) cultivated in Umudike, Abia State, South East Nigeria.

MATERIALS AND METHODS

The experiment was carried out in the research Garden of the Department of Plant science and Biotechnology, Michael Okpara University of Agriculture Umudike, Abia State Nigeria between the months of March and June. Umudike is located between longitude 5^0 and 7^0 05E and latitude 5^0 and 5^o 25N.

Two different groups of seeds belonging to the varieties Wantoma60 and Raider52 were obtained from the seed bank of National Root Crop Research Institute, Umudike Nigeria and certified by staff of the Agricultural seed supply section of the Institute. The Land was prepared and plotted into four plots of 20 X 20m each. Seeds were sown in Randomized Complete Block Design and replicated four times. Growing plants were given equal tendering attention on the field. Four growth parameters namely, number of leaves, number of branches, vine length and number of internodes were measured and analyzed. Student t-test statistical protocol was employed in comparing difference in values obtained.

RESULT

Data was collected from growing plants on the field at a bi-weekly basis. The values were summarized and the means analyzed using student t-test protocol. Table one shows the summary of data on number of leaves produced by the two varieties of *Citrullus lanatus* Thumb.

Table 1: Summary of values on number of leaves of two varieties of Citrullus lanatus.

S/N	Replicate	Varieties	
		WANTOMA60	RAIDER52
1	Rep.1	60	32
2	Rep. II	65	30
3	Rep. III	77	40
4	Rep. IV	68	38
	Total	270	145

Using students t- test analysis to compare the means gives a t- value of 16.23 which is highly significant statistically.

Table Two shows the summary of data on number of branches produced by the two varieties of *Citrullus lanatus* Thumb.

Table 2: Summary of values on number of branches of two varieties of *Citrullus lanatus.*

S/N	Replicate	Varieties	
		WANTOMA60	RAIDER52
1	Rep.1	11	05
2	Rep. II	13	07
3	Rep. III	15	09
4	Rep. IV	18	09
	Total	57	30

Using students t test analysis to compare the means gives a t value of 5.74 which is significant statistically compared to the critical t- value of 3.182, $P < 0.05$ df = 3.

Table Three shows the summary of data on vine length produced by the two varieties of *Citrullus lanatus* Thumb.

Table 3: Summary of values on vine length of two varieties of *Citrullus lanatus.*(cm).

S/N	Replicate	Varieties	
		WANTOMA60	RAIDER52
1	Rep.1	342	297
2	Rep. II	378	320
3	Rep. III	347	283
4	Rep. IV	252	226
	Total	1319	1226

Using students t test analysis to compare the means gives a t value of 5.76 which is significant statistically compared to the critical t value of 3.182, $P < 0.05$ df = 3.

Table Four shows the summary of data on number of internodes produced by the two varieties of *Citrullus lanatus* Thumb.

Table 4: Summary of values on number of leaves of two varieties of *Citrullus lanatus.*

S/N	Replicate	Varieties	
		WANTOMA60	RAIDER52
1	Rep.1	45	25
2	Rep. II	51	23
3	Rep. III	63	30
4	Rep. IV	54	21
	Total	213	99

Using students t test analysis to compare the means gives a t value of 9.24 which is highly significant statistically, $P < 0.05$ df = 3.

DISCUSSION

In these two varieties of *Citrullus lanatus* cultivated in Umudike, the varietal type significantly affected the nature and rate of vegetative growth exhibited by the plants. In all the growth parameters examined, statistically significant differences were recorded between the varieties at $P \leq 0.05$.

In the first parameter studied which is number of leaves per plant, variety Wantoma60 produced 42.2% more leaves than variety Raider52 even though the two varieties were growing under the same external environment. On the field variety Wantoma60 appeared visibly more luxuriant than Raider52. This result is similar to the findings reported by Ray and Sinclair (1997), Enujeke (2013), Ibrahim *et al.*,(2000) Majanbu *et al.*,(1996). Among six varieties of *Citrullus lanatus* investigated by Enujeke (2013), variety sugar baby was reported to have produced more leaves than the rest five. Differences in the number of leaves here were attributed to higher photosynthetic activity, better distribution of leaf surface, superior leaf arrangement and more active photosynthetic enzymes (Ray and Sinclair,1997). In the present study the significant difference in the number of leaves produced by the

varieties may be attributable to genetic differences. Differential genetic endowments may have enhanced biochemical and physiological processes involved in photosynthesis, chlorophyll content and leaf arrangement.

As with the number of leaves, variety wantoma60 also produced more branches than variety raider52. With a statistically significant t-value of 5.74 ($P < 0.05$), wantoma60 grew more robustly in the early season climate of Umudike, south-east Nigeria. Akinfoesoye (1997) explained that growth characters of crop species are not only due to genetic differences but also due to suitable agro-ecological zones. For the two varieties under investigation presently, the observed difference in branching habit is attributable mainly to genetic causes.

The remaining two growth parameters investigated ie vine length and number of internodes followed the same trend as the earlier discussed two. Variety Wantoma60 outperformed variety Raider52 in these attributes. The interaction effects of differences in genetic constitution with prevailing suitable agro-ecological conditions may have been produced this effects (Iken and Anusa, 2004; Mangila *et al.*, 2007; Ojo *et al.*, 2014). Reporting on the effect of spacing on the growth parameters, Ban *et al* (2011) noted that in-row plant spacing had an effect on the main vine length, number of leaves and number of branches. They also noted that early cultivars of water melon have shorter vegetative period and less vegetative growth than late cultivars.

CONCLUSION

Comparison of these four growth parameters in two varieties of Citrullus lanatus cultivated in Umudike, Abia State revealed that variety wantoma60 had higher rate of performance in these parameters than variety raider52. The wider implication of this is that genetic factors and/or the pace of interaction between these factors and prevailing climatic/edaphic condition do not operate at the same level in these two varieties. It is therefore recommended that farmer in these region wishing to go into production of this crop at early season go for Wantoma60.

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