International Journal of Agriculture Sciences
ISSN: 0975-3710&E-ISSN: 0975-9107, Volume 9, Issue 55, 2017, pp.-4943-4944.
Available online at http://www.bioinfopublication.org/jouarchive.php?opt=&jouid=BPJ0000217

Research Article

EFFECT OF PLANT GROWTH REGULATORS ON QUALITY OF SWEET GOURD (*Momordica cochichinensis* ROXB.)

SUKLABAIDYA ASHIMA*

ICAR - Research Complex for NEH Region, Tripura Centre, Lembucherra, 799210, Tripura
*Corresponding Author: Email-ashimahorti@gmail.com

Received: December 14, 2017; Revised: December 16, 2017; Accepted: December 17, 2017; Published: December 30, 2017

Abstract- Kakrol is one of the indigenous, perennial, diocious and wholesome vegetables, which is grown for its nutritive value. Kakrol *(Momordica cochinchinensis* Roxb) is also known as sweet gourd. The immature tender green fruits, young leaves, flowers and seed are edible. An experiment was conducted to study the effect of growth regulators on quality traits of sweet gourd. The effect of growth regulators on various fruit qualities *viz.,* TSS, reducing sugar, non-reducing sugar, ascorbic acid, riboflavin, moisture and number of seeds though found to be non-significant except total sugar, yet growth regulators brought about marginal improvement in the qualities of fruits. Though kakrol is a potential vegetable crop for the hilly region of Tripura but till now there is very little technical know-how regarding growth regulators on various fruit qualities.

Keywords- Sweet Gourd, Kakrol, Growth regulators, Quality, Yield.

Citation: Suklabaidya Ashima (2017) Effect of Plant Growth Regulators on Quality of Sweet Gourd (*Momordica cochichinensis* Roxb.). International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 9, Issue 55, pp.-4943-4944.

Academic Editor / Reviewer: Julian A Valencia A, Aynur Demir, Deepak S. Bhadouria

Introduction

Among the cucurbitaceous vegetables, sweet gourd (*Momordica cochinchinensis* Roxb) has immense popularity for their delicious and high nutritive, medicinal and economic values. It is easily diuretic and fruit rich in protein and vitamin-C. Fruits are long and round, and light green to dark green in colour. It takes 26 days to reach edible maturity. The unripe fruits act as a appetizer and astringent. The ripe fruits are sweet oily and laxative. The seeds are used for chest problems and stimulate urinary discharge. The roots contain a triterpenoid saponin, which can be used as a substitute for soap. It removes piles, migraine excess sweating, cough etc. [1]. In modern agriculture, the quality of different fruits and vegetables are improved by applying plant growth regulators. The profound effect of growth substances to improve the quality of many cucurbitaceous vegetables have been reported by several workers. But owing to the confinement of sweet gourd in North Eastern Region of India only, no any work has been done on this crop in other parts of India to study the effect of plant growth regulators on quality traits. Keeping this in view, an experiment was planned to study the influence of few plant growth regulators on quality traits of sweet gourd under agro- climatic conditions of Tripura.

Material and Methods

The field experiment was conducted during 2012-13 at research farm of ICAR NEH region Tripura situated between 220 51' N latitude and 90007'E longitude. Physico-chemical properties of the soil were determined before the start of the experiment and the soil was sandy loam having PH of 5.4, organic Carbon (0.81%), available nitrogen of 265.3 kg/ha, available phosphorus of 21.5kg/ha and available potash was 119kg/ha. The experiment was laid out in a randomized block design with three replications and with five treatments *viz.* T1: Control (Co), T2: GA10 ppm, (G10), T3: Thiourea (2% + G10), T4: Ethrel-150 ppm (E150) and T5: Ethrel-250 ppm (E 250).

Tubers weighing 18-45 g were dipped in growth regulator solution for an hour, dried in shade for a while and then planted on raised bed at a depth of 20 cm with a spacing of 1m row to row and 1m plant to plant accommodating 5 plants in each bed for each treatment. The plots were fertilized by applying organic matter @ 30t/ha and N: P:K (in the form of urea, single superphosphate and muriate of potash) @ 80:50:50 kg/ha. Plants were provided with a support to twine by placing stout stakes. The fruits from each replication were picked at random from each treated plant and fresh fruits were analysed for total soluble solid, total sugar, reducing sugar and non-reducing sugar by adopting the standard method of A.O.A.C. [2]. The ascorbic acid was determined by iodine titration method [3] and riboflavin contents of fruits were analysed by fluorimetric method described by NIN, Hyderabad (1972). The statistical analysis was carried out as per procedure given by [4].

Fig-1 Kakrol plant in trellies



Fig-2 harvested matured fruits

Result and Discussion

The mean performance of the effect of plant growth regulators on quality is presented in [Table-1]. Though the application of plant growth regulators did not significantly affect the quality yet an increasing trend with respect to TSS, non-sugar, non-reducing sugar, ascorbic acid and riboflavin was observed as compared to control [Table-1]. Only the total sugar had significant effect. Similar increase in TSS by the application of growth regulators was also reported by Das [4] in ridge gourd. Doijode and Rao [5] also observed significant higher sugar content in peas by seed treatment with 30 ppm NAA and 60 ppm GA3 as compared to control. The increase in sugars due to growth regulators treatments may be due to accumulation of sugar at lower concentrations. Though the growth regulators could not produce any significant effect on riboflavin content of fruit, yet increased riboflavin content of fruits was observed due to growth regulators. As regards the fruits quality expressed in terms riboflavin, ethrel 250 ppm proved to be promising by registering an increased value of 0.29 mg/100 g over control, while the G10, TG 10 and E150 behaved more or less in a similar trend in influencing the riboflavin content of fruits [Table-1]. There was an increase in the ascorbic acid content of the fruit due to growth regulators. However, the effect was not significant. Among the growth regulators, higher concentration of ethrel (250 ppm) recorded the highest ascorbic acid of 264.00 mg/100 g [Table-1]. Similar increase in the ascorbic acid content by spraying ethrel was also reported by Das [4] in ridge gourd.

Though the number of seeds in sweet gourd fruit is an important attribute of fruit quality, yet all the growth regulators did not contribute any significant effect to reduce the number of seeds. However, G10 was found to exert the maximum influence over the control in reducing the number of seeds [Table-1].

Table-1 *Effect of plant growth regulators of quality of sweet- gourd*

Treatment	TSS (%)	Total sugar (%)	Reducing sugar (%)	Non reducing sugar (%)	Ascorbic acid (mg/100mg)	Ribo-flavin (mg/100mg)	Moisture of the fruit (%)	Number of seeds per fruit
Control	4.60	2.14	1.70	0.38	243.42	0.11	82.80	29.00
G10	5.10	2.39	1.90	0.43	245.60	0.14	85.61	24.56
TG10	4.80	2.26	1.75	0.42	253.94	0.16	88.69	25.00
E150	4.82	2.29	1.76	0.53	254.60	0.15	86.50	25.56
E250	5.00	2.37	1.83	0.54	264.00	0.17	89.69	26.10
C.D. at 0.05	N.S	0.10	N.S	N.S	N.S	N.S	N.S	N.S

Plant growth substances were found to be not significantly effective as compared to control in moisture percent of the fruit. All the concentrations of growth regulators showed higher moisture per cent over control. This may be done to the effect of higher relative humidity on plant material. Plant growth regulators generally enhance the loss of moisture from plant materials in post-harvest condition [6] which was due to increase enzymatic activities created by plant growth regulators. However, in pre-harvest condition, loss of moisture was not enhanced probably due to continuous uptake of moisture by plant in growing condition. Wills *et al.,* [7] reported that increase in the relative humidity prevented moisture loss. Therefore, this insignificant variation of moisture percent in the present investigation might be associated with the high relative humidity prevailing in the morning [8].

Conclusion

Tripura is a potential state for kakrol cultivation. Therefore, to encourage scientific practices using growth regulators to enhance the quality of fruits among the farmers is essential. Both wild and cultivated forms of sweet gourd found in India indicate its place of origin. Owing to cleaning of forests, people have started domesticating it in the sloppy hilly tracts of Tripura.

Acknowledgement / Funding: Author is thankful to Dr. M. Datta, Joint Director, ICAR-Research Complex for N. E. H. Region, Tripura Centre, Lembucherra, 799210, West-Tripura, India for giving the support in conducting this trial.

Author Contributions: Author contributed in field and lab work.

Author statement: Author read, agreed and approved the final manuscript

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

Conflict of Interest: None declared

References

[1] Suklabaidya Ashima, Bhowmick S., Sankaran M and Singh N.P. (2005) *Farmer's Digest,* 38 (4), pp: 30-32.
[2] A.O.A.C. (1980) Official method of analysis of the association of analytical chemists.Benjamin franklin station Washington D.C. 1010p.
[3] Jacob M.B. (1958) The chemical analysis of food and food products. pp 724-727.
[4] Panse V.G. and Sukhatme P.V. (1985) Statistical Methods for Agricultural Workers. (4th enl.edn.) Indian Council of Agricultural Research, New Delhi.
[5] Das R.C. (1975) *Madras Agric. Journal*, 62 : 463-467.
[6] Doijode S.D. and Rao M.M. (1983) *South Indian Hort*., 31, 300-302.
[7] Das, N.N. (1979) M.Sc. (Agri.) Thesis submitted to Assam Agricultural University, Jorhat.
[8] Wills R.H.H., Loc T.H, Graham D., Glasson W.B. and Hall E.G. (1981) Post harvest. An introduction to the physiology and handling of fruit and vegetables, Granada, London.
[9] Puzari N.N. (1999) *Indian Journal of Hill Farming,* 12(1-2), 62-64.