ISSN: 2230-9926

*Available online at http://www.journalijdr.com*

IJDR

*International Journal of Development Research*
*Vol. 06, Issue, 02, pp. 7010-7011, February, 2016*

International Journal of
DEVELOPMENT RESEARCH

## *Full Length Research Article*

# STUDIES ON THE EFFECT OF NUTRIENT MANAGEMENT PRACTICES ON THE GROWTH AND YIELD OF SWEET CORN

***Kandasamy, S.**

Associate professor, Department of Agronomy, Annamalai University, TamilNadu, India

**ARTICLE INFO**

***Article History:***

Received 26th November, 2015
Received in revised form
14th December, 2015
Accepted 28th January, 2016
Published online 20th February, 2016

***Key Words:***

Nutrient management,
Humic acid, Sweet corn,
Grain yield.

**ABSTRACT**

A field experiment was conducted during summer, 2015 to study the response of sweet corn (Zea mays L) to various nutrient management practices, laid out in randomized block design with three replications that comprises of viz., T¬1 Control, T2 RDF alone (135 : 62.5 : 50) kg NPK ha-1, T3 RDF + Micro nutrient mixture @ 20 kg ha-1,T4 RDF + Soil application of humic acid @ 50 kg ha-1, T5 125% RDF alone, T6 125% RDF + Micro nutrient mixture @ 20 kg ha-1,T7 125% RDF + Soil application of humic acid @ 50 kg ha-1, T8 RDF + Micro nutrient mixture @ 20 kg ha 1+ soil application of humic acid @ 50 kg ha-1, T9 125 % RDF + micronutrient mixture @ 20 kg ha-1+ soil application of humic acid @ 50 kg ha-1. It was observed that growth and yield of sweet corn was significantly high in the treatment T9 (125 % RDF + micronutrient mixture @ 20 kg ha_1+ soil application of humic acid @ 50 kg ha-1). The results also revealed that highest green cob yield of 6628 kg ha-1 was recorded in treatmentand it was superior than other treatments.



## INTRODUCTION

Sweet corn (Zea mays corn var. saccharata var. rugora, also called as Indian corn, sugar corn) is a variety of maize with higher sugar content. Sweet corn is the result of a naturally accruing recessive mutation in the gene which control conversion of sugar to starch inside the endosperm of corn kernel. Among vegetables, for fresh consumption, sweet corn is consumed as raw or used as an ingredient in preparation of soup, salad, manchurians and Chinese dishes. Due to its delicacy and sweet flavors and crop nature it has a prominent place as an indispensable ingredient in many fancy dishes of today's cuisine and it is highly nutritive value crop. Maize being a $C_4$ plant has higher yield potential which also depends on nutrient supplying capacity of the soil. However, its potential could not be utilized fully due to lack of proper agronomic management practices like nutrient management, season and variety (Sahrawat *et al.*, 2008). Corn has always had high nutrient demands and already puts a great strain on soil and fertilizer nutrient sources. Large quantities of N, P, K, Ca, Mg and S are removed by the Grain and Stover. Currently generalized recommendation with respect to NPK fertilizer alone are pointing to soil degradation, proving their declined efficiency and thus needing improvement through proper nutrients, the concept of balanced fertilization (Gangaiya, 2013).

***Corresponding author:*** **Kandasamy, S.**
Associate professor, Department of Agronomy, Annamalai University, TamilNadu, India

Humic acid application along with recommended inorganic fertilizers and organic fertilizers play a greater role in plant bio-chemical, physical activities and soil fertility, consequently resulting in better growth and yield crops (kalaichelvi *et al.*, 2006). So the present investigation was planned to study the effect of NPK fertilizers, micronutrient mixture and humic acid on the growth and yield of sweet corn.

## MATERIALS AND METHODS

A field experiment was conducted at the Experimental farm, Department of Agronomy, Annamalai University, Annamalainagar. The soil of the experimental field is clay loam in texture with low in available nitrogen, medium in available phosphorus, high in available potassium and low in available sulphur. The experiment comprising of nine treatments viz.,$T_1$ - Control, $T_2$ - RDF alone (135 : 62.5 : 50 kg NPK ha-$^1$), $T_3$ - RDF + Micro nutrient mixture @ 20 kg ha-$^1$, $T_4$ - RDF + Soil application of humic acid @ 50 kg ha$^{-1}$, $T_5$ - 125% RDF alone, $T_6$ - 125% RDF + Micro nutrient mixture @ 20 kg ha$^{-1}$, $T_7$ - 125% RDF + Soil application of humic acid @ 50 kg ha$^{-1}$, $T_8$ - RDF + Micro nutrient mixture @ 20 kg ha$^{-1}$+ soil application of humic acid @ 50 kg ha$^{-1}$,$T_9$ - 125 % RDF + micronutrient mixture @ 20 kg ha$^{-1}$+ soil application of humic acid @ 50 kg ha$^{-1}$. sweet corn (F1 Hybrid Madhuar) was selected for the study.

**Table 1. The Effect of Nutrient Management Practices on the Growth and Yield of Sweet Corn**

| Treatments | Plant height (cm) | Cob length (cm) | Cob diameter (cm) | Number of grains $cob^{-1}$ | Green cob yield kg $ha^{-1}$ | Stover yield kg $ha^{-1}$ | Harvest Index |
|---|---|---|---|---|---|---|---|
| $T_1$ - Control | 121.30 | 9.25 | 3.38 | 210.00 | 2375.00 | 5343.00 | 30.77 |
| $T_2$ -RDF alone (135 : 62.5 : 50 kg NPK$ha^{-1}$) | 129.60 | 11.12 | 4.29 | 262.00 | 3994.00 | 6003.00 | 31.59 |
| $T_3$ -RDF + Micro nutrient mixture @ 20 kg $ha^{-1}$ | 137.60 | 12.65 | 4.64 | 280.00 | 4158.00 | 8484.00 | 32.89 |
| $T_4$ -RDF + Soil application of humic acid @ 50 kg $ha^{-1}$ | 147.40 | 14.50 | 5.06 | 310.00 | 4550.00 | 8719.00 | 34.29 |
| $T_5$ -125% RDF alone | 150.50 | 14.49 | 5.18 | 322.00 | 4711.00 | 8742.00 | 35.02 |
| $T_6$ -125% RDF + Micro nutrient mixture @ 20 kg $ha^{-1}$ | 162.40 | 16.31 | 5.50 | 365.00 | 5163.00 | 9020.00 | 36.40 |
| $T_7$ -125% RDF + Soil application of humic acid @ 50 kg $ha^{-1}$ | 165.60 | 18.82 | 5.65 | 378.00 | 5317.00 | 9035.00 | 37.04 |
| $T_8$ -RDF + Micro nutrient mixture @ 20 kg $ha^{-1}$+ soil application of humic acid @ 50 kg $ha^{-1}$ | 172.50 | 20.17 | 6.03 | 403.00 | 5733.00 | 9197.00 | 38.39 |
| $T_9$ -125 % RDF + micronutrient mixture @ 20 kg $ha^{-1}$+ soil application of humic acid @ 50 kg $ha^{-1}$ | 180.50 | 22.71 | 6.36 | 446.00 | 6628.00 | 9958.00 | 39.95 |
| S.Ed | 3.20 | 0.61 | 0.13 | 6.62 | 77.00 | 130.77 | 0.38 |
| CD | 6.76 | 1.30 | 0.29 | 14.04 | 162.00 | 277.25 | 0.81 |

The trial was laid out in a randomized block design with three replication plot size was 5 x 4 m for crop seed rate is 6 kg $ha^{-1}$sweet corn (F1 Hybrid Madhur). N, P, K were applied in the form of urea, single super phosphate and muriate of potash at 135:62.5:50 NPK $ha^{-1}$ respectively was followed as RDF. Micronutrient mixture was applied as basal in the experiment field @20 kg $ha^{-1}$.the nutrient composition of micro nutrient is Copper 0.5%, Ferrous 3.5%, Magnesium 1.5%, Manganese 1.25%, Sulphur 10.0%, Zinc 7.5%, pH not less than 3.5, solubility in water 98.5%. The humic acid was applied as Biowin a commercial product. Biowin contains a concentration of 85% humic acid in 100% soluble powder form, it can be applied at time of sowing maize crop @50 kg $ha^{-1}$ as basal dose as per the treatment schedule. All the agronomic practices were carried out uniformly to raise the crop. During the course of experiment, Sweet corn plant data were taken at 30, 45 and 60 days after sowing (DAS).

## RESULTS AND DISCUSSION

The results of the field experiment on sweet corn crop revealed that the growth characters were markedly influenced by the application of NPK fertilizers, micronutrient mixture and humic acid. Among the different treatments tried, $T_9$ (125 per cent RDF + micronutrient mixture @ 20 kg $ha^{-1}$ + soil application of humic acid @ 50 kg $ha^{-1}$), significantly influenced the green cob yield 6628 kg $ha^{-1}$ and Stover yield 9958 kg $ha^{-1}$ in (Table 1). Application of both macro and micronutrients increased the soil physical properties as well as to enhances the microbial activities and provide stable supply nutrients to the sweet corn might be the reason for the increased value on growth components *viz.,* plant height, LAI and DMP in the treatment ($T_9$).

This could be due to better nutrient uptake and efficient assimilation of applied nutrients, resulted increased values on plant height, cob length, cob diameter and number of grains $cob^{-1}$ and thus increased green cob yield and stover yield. Lucino Canellas and Fabio Olivares(2014) reported application of 50 kg humic acid increased the yield this might be due to better photosynthesis activity enhanced amount of photosynthesis in favourable morphological growth characters with improved the yield attributes which lead to higher green cob yield.

### Conclusions

In the light of the above facts, it may be concluded that application of 125 per cent recommended dose of NPK + micronutrient mixture @ 20 kg $ha^{-1}$ + soil application humic acid @ 50 kg $ha^{-1}$ ($T_9$) is a fitting and cost effective practice for augmenting higher sweet corn yield.

## REFERENCE

Gangaiya .2013. Pocket book on agricultural statistics. Tamil Nadu, India. pp.32.

Kalaichelvi, K., C. chinusamy and A. Arul Swaminathan. 2006. Exploiting the natural resource lignite humic acid in agriculture. *A review. Agric. Rev.,* 27(4): 276 -283.

Lucino Canelas and Fabio Olivares 2014. Physiological responses to humic substances as plant growth promoter. *Springer International Publishing*. 1(1): 1-11.

Sahrawat, K.L., T.J. Rego, S.P. Wani and G. Pardhasaradhi. 2008. Sulphur, boron and zinc fertilization effects on grain and straw quality of maize and sorghum grown on farmers field in semi arid tropical region of India. *J. Plant Nutr.,* 31:1578 – 1584.

*******