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Influence Of Different NPK Levels On The Impact Of Growth And Development Of Sweet Orange (*Citrus Sinesis*osbeck) Plants

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Abstract

The present investigation entitled Effect of different levels of Nitrogen (N) Phosphorus (P_2O_5) and Potassium (K_2O) on growth and development of Sweet Orange (*Citrus sinesis* Osbeck) plants were carried out at Fruit Research Farm, Rama University, Kanpur (2019).The results revealed that the treatment T_3 (350 g / plant Nitrogen, 250 g / plant Phosphorus and450 g / plant Potash)was found to be the best in terms of maximum plant height (83.57cm), maximum number of leaves (421.04), maximum number of branches (26.36), maximum stem diameter (3.04 cm), maximum spread of canopy(42.36 cm)and maximum length of inter-nodes (9.68cm) followed by treatment T_9 (300 g / plant Nitrogen, 250 g / plant Phosphorus and500 g / plant Potash) and the minimum was recorded in T_{12}(300g / plant Nitrogen, 250g / plant Phosphorus and 300g / plant Potash).

Keywords: Sweet Orange,Nitrogen, Phosphorus, Potassium and Growth.

Introduction

In India citrus fruits have a prominent place among popular and extensively grown tropical and subtropical fruits after mango and banana in India. Mandarin (*Citrus sinesisOsbeck*) is considered to be one of the most important cultivated species among citrus and is being commercially grown in certain specific region of the country like Sweet Orange in Central India. The crop occupies the first position among the citrus in India with respect to area and production. Manures and fertilizers are applied on the basis of soil, climate, age of plant and location etc. In Uttar Pradesh, N, P_2O_5 and K_2O are applied @ 850: 600 and 850 g/tree for the crops at the age of 10 years or above old. Nutrition constitutes an important component in the cultivation of all the crops. Citrus groves require 17 essential nutrients for its growth and development. Among these, carbon, oxygen, hydrogen and part of nitrogen are provided by rain water or air; the remaining nitrogen and rest of the essential nutrients are replenished by soil, irrigation water, organic or synthetic fertilizers

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It has stood the test of time and is still very popular among the poor and marginal farmers. Majority of farmer are still growing local cultivar. There is lack of suitable cultivars in Allahabad agro-climatic condition. Therefore, there is need to evaluate grafted plants of Sweet Orangefor their performance in Allahabad agro-climatic conditions so the suitable dose of fertilizer can be identified for the region for growth, development and higher productivity.

MATERIALS AND METHODS

The experiment was carried out using Sweet Orange plants on different levels of Nitrogen (N) Phosphorus (P_2O_5) and Potassium (K_2O) on growth and development in the Kanpur agro climatic conditions at the experimental field of Rama University, Kanpur (2019). The experimental design was complete randomized block with twelve treatments of the following as inadequate levels of Nitrogen (N) Phosphorus (P_2O_5) and Potassium (K_2O) was applied for all the treatments. The first doses of fertilizers were applied immediately after weeding. Intercultural operations like weeding, irrigation, pruning, disease and insect management were done as per necessary. Data on growth and development characters were taken duly. Data were statistically analyzed using computer MSTATC program.

Treatment Combination

Treatment	Nitrogen (gm)	Phosphorus (gm)	Potassium (gm)
T_1	300	250	450
T_2	250	250	450
T_3	350	250	450
T_4	400	250	450
T_5	300	300	450
T_6	300	400	450
T_7	300	250	450
T_8	300	200	450
T_9	300	250	500
T_{10}	300	250	550
T_{11}	300	250	350
T_{12}	300	250	300

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RESULTS AND DISCUSSION

The results of the investigation at 30 days, regarding the growth and development of Sweet Orange have been presented.

The maximum plant height was recorded in T_3 {83.57 cm (350 g / plant Nitrogen, 250 g / plant Phosphorus and450 g / plant Potash)} followed by T_9 {79.45 cm (300 g / plant Nitrogen, 250 g / plant Phosphorus and500 g / plant Potash)}. However minimum plant height was recorded in T_{12} {62.34 cm (300 g / plant Nitrogen, 250g / plant Phosphorus and300 g / plant Potash)}

The maximumnumber of leaveswas recorded in T_3 {421.04(350 g / plant Nitrogen, 250 g / plant Phosphorus and450 g / plant Potash)} followed by T_9 {418.05 (350 g / plant Nitrogen, 250 g / plant Phosphorus and450 g / plant Potash)}. However minimum number of leaves was recorded in T_{12} {352.08((300 g / plant Nitrogen, 250 g / plant Phosphorus and300 g / plant Potash)}.

The maximumnumber of branches per plantwas recordedT_3 {26.36 (350 g / plant Nitrogen, 250 g / plant Phosphorus and450 g / plant Potash)} followed by T_9 {22.54(350 g / plant Nitrogen, 250 g / plant Phosphorus and450 g / plant Potash)}. However minimum number of branches per plant was recorded in T_{12} {16.45(300 g / plant Nitrogen, 250 g / plant Phosphorus and300 g / plant Potash)}.

The maximumstem diameter (cm) was recorded in T_2 {3.04 cm ((350 g / plant Nitrogen, 250 g / plant Phosphorus and450 g / plant Potash)} followed by T_9 {2.70 cm (350 g / plant Nitrogen, 250 g / plant Phosphorus and450 g / plant Potash)}. However minimum stem diameter was recorded in T_4 {1.21 cm (300 g / plant Nitrogen, 250 g / plant Phosphorus and300 g / plant Potash)}.

The maximumspread of canopy(cm) was recorded in T_3 {42.36 cm (350 g / plant Nitrogen, 250 g / plant Phosphorus and450 g / plant Potash)} followed by T_9 {30.06 cm (350 g / plant Nitrogen, 250 g / plant Phosphorus and450 g / plant Potash)}. However minimum spread of canopy(cm) was recorded in T_{12} {27.74 cm (300 g / plant Nitrogen, 250 g / plant Phosphorus and300 g / plant Potash)}

The maximumlength of inter-nodes (cm) was recorded in T_3 {9.68 cm (350 g / plant Nitrogen, 250 g / plant Phosphorus and450 g / plant Potash)} followed by T_9 {9.50 cm (350 g / plant Nitrogen, 250 g / plant Phosphorus and450 g / plant Potash)}. However minimum length of

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inter-nodes (cm)was recorded in T_{12} {7.68 cm (300 g / plant Nitrogen, 250 g / plant Phosphorus and300 g / plant Potash)}

CONCLUSION

In view of the experimental results obtained during the present investigation,the treatment T_3(350 g / plant Nitrogen, 250 g / plant Phosphorus and450 g / plant Potash)was found to be the best in terms of maximum plant height (83.57cm), maximum number of leaves (421.04), maximum number of branches (26.36), maximum stem diameter (3.04 cm), maximum spread of canopy(42.36 cm), maximum length of inter-nodes (9.68cm) and minimum incidence of disease percentage (1.51 %).

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