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# EFFECT OF DIFFERENT DOSES OF NITROGEN FER TILIZA TION ON THE GROWTH AND YIELD OF CAPSICUM *(CAPSICUM· \ANNUUM* L.) CV. CALIFORNIA WONDER

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Three levels of nitrogen viz. 80, 100 and 120 kg per hectare alongwith a common dose of 80 and 40 kg per hectare of $P_2O_5$ and $K_2O$, respectively were tested with sweet pepper cultlvar 'California Wonder'. Nitrogen fertilization increased plant height, number of branches, number of fruit per plant, total fruit weight per plant and fruit yiel? per hectare. The maximum yield of 59.25 t ha was obtained with the application of nitrogen at the rate of l_i0 kg ha $^{-}$ • This yield was higher by 24.05 $^{-1}$ ha than the control, which averaged 35.20 t ha •

## INTRODUCTION

Capsicum (Capsicum annuum L.) is a popular summer vegetable of Pakistan and forrns a rich source of vitamins A, Band C. Despite its wide popularity, little attention is being paid with regard to the nitrogen management for increasing its productivity. The knowledge and use of opti mum rate of nitrogen application for each soil-plant environment would greatly reduce the undesirable application of excess nitogen which may affect the maturity, yield and quality of the produce. There are many reports in literature which indicate that the use of balanced fertilizer influences the yield and yield components of high potential pepper varieties. (Srinivas and Prabhakar, 1982; Albregts, 1971). Hegde (I 986) opined that nitrogen was the only element required in large quanti ty for higher sweet pepper production. Joseph and Pillai (1985) observed that successful peper

crop can be produced with the application of 112.5 kg nitrogen, 60 kg phosphorus and 30 kg of potash per hectare. Narasappa et al. (1985) reported that application of 100 kg/ha each of phosphorus, and potash and nitrogen @ 150 kg per hectare gave maximum green fruit yield in pepper. However, a decline in yield was observed at 250 kg N ha due to over-stimulation. of plant growth ultimately affecting the yield. The information available on the efficient use of fertilizer is mostly confined to foreign pepper varieties which can hardly be exptrapolated to the one commercialized in Pakistan.

Results are presented here on the variety California Wonder which is very popular among the vegetable growers of Pakistan.

## MATERIALS AND METHODS

The experiment was conducted in the vegetable area of National Agricultural Research Centre, Islamabad during the Kharif Season of 1987 on Capsicum *cv.* California Wonder.

Following fertillzer treatments were given:

$T_0$ = Control
$T_1$ = 80 kg N $ha^{-1}$
$T_2$ = 100 kg N $ha^{-1}$
$T_3$ = 120 kg N $ha^{-1}$

The experiment was laid out in a randomised complete block design with four replications. The entire dose of phosphorus (80 kg $P_2O_5$ $ha^{-1}$) and potassium (40 kg $K_2O$ $ha^{-1}$) and half of the nitrogen were applied at the time of bed preparation. The rest of nitrogen was applied at the time of fruit setting. About a month before transplanting the field was manured at the rate of 50 tons farm yard manure per hectare and ploughed twice. The crop was regularly irrigated at an interval of seven days. Fruits were harvested at an interval of ten days and total yield was recorded.

The data were collected on the following characteristics:-

1. Number of fruits per plant.
2. Weight of fruit per plant and hectare.
3. Average weight per frui t,
4. Number of branches per plant.
5. Plant height.

Observations of plant height and number of branches were recorded from the plants selected at random from each plot.

## RESUL TS AND DISCISSION

Application of nitrogen increased the plant height and the number of branches significantly (Table). Plant height i~qreased significantly with all levels of N upto *120* kg N ha . As shown in the Table, the maximum plant height of 55.23 cm w~r obtained when nitrogen was applied at the rate of *120* kg ha as compared with control (36.48 cm). Similarly the maximum number of branches (3.55) was obse':.~ed with the application of nitrogen at the rate of *120* kg ha as against control with 2.38 branches. The fruit size was not affected by N levels. Similar results regarding plant height and number of branches per plant as affected by different nitrogen levels were observed by Srinivas and Prabhakar (1982).

As is evident from Table, all levels of nitrogen significantly increased number of fruit per plant. The maximum number of fruit per plant (26.45) w~~ recorded when nitrogen was applied at the rate of *120* kg ha as compared with control (J 6.37) while the fruit size did not show any improvement.

The average values for fruit weight per plant showed that the fruit weight increased with increase in the levels of nitrogen fertilization. The maximum fruit weight of 1211 g per plant w~~ obtained when nitrogen was applied at the r~~e of 120 kg ha as compared to control which was 720.19 g plant .

All levels of nitrogen fertilization increased the crop yi<:,lf significantly. The maximum average *yield* of 59.25 tons ha was obt~fed with the application of nitrogen at t~f rate of *120* kg ha . This yield was higher by 24.05 tons ha than

Table: *Growth and yield of Capsicum cv. ∞ifornia Wonder as affected by different levels of nitrogen*

| Treatments | Plant height (cm) | Number of branches per plant | Number of fruit per plant | Fruit weight per plant (g) | Average weight of single fruit (g) | Yield [illegible] |
|---|---|---|---|---|---|---|
| $T_0$ | 36.48 d | 2.38 c | 16.37 c | 720 d | 44.05 | 35.20 d |
| $T_1$ | 46.03 c | 3.05 b | 22.47 b | 1047 c | 46.38 | 50.27 c |
| $T_2$ | 51.05 b | 3.25 b | 25.34 a | 1159 b | 45.73 | 56.63 b |
| $T_3$ | 55.23 a | 3.55 a | 26.45 a | 1211 a | 45.83 | 59.25 a |

[illegible] followed by the same letter do not differ significantly at one percent level by DMRT significant difference test.

the control, which averaged 35.20 tons $ha^{-1}$ (Table). These results are in agreement with those reported by Albregts (1971), and Srinivas and Prabhakar (1982). The yield increase can be associated with similar increase in growth and yield attributes. As is evident from the Table the yield increase is mainly due to more number of fruits per plant which resulted in increasing total fruit weight per plant and enhanced average yield per hectare.

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