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Studies on effects of fertility levels and spacings on quality of okra (*Abelmoschus esculentus* (L.) Moench)

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SUMMARY
Experiment conducted at permanent experimental area of Bihar Agricultural College, Sabour in vegetable section in Kharif in 1998, revealed that the protein and starch content of the fruit increased successively with every increase in fertilizer levels. This increase was found to be maximum at the highest fertility level of $N_{250}P_{120}K_{120}$ and at the widest spacing of 60 x 60 cm. The moisture content of the fruit behaved independently with these two factors.

Key words : Okra, Nitrogen, Phosphorus, Potash, Spacing.

Okra (*Abelmoschus esculentus* (L.) Moench) is the most popular crop of family Malvaceae. It is a good source of carbohydrate, protein, vitamins and minerals at edible state. The presence of trace iodine in the pods of okra makes it a better remedy for goiter. Its intake is also beneficial in urinogenital infection, since, okra has both nutritional and medicinal value, so there is need to pay attention on its production and quality of produce both. Though, it is a very important crop, its production is very low. There are so many factors which influence production and quality of produce like fertilizer, disease, pest management, timely irrigation, proper harvesting at the edible stage, plant density. Proper dose of fertilizers and plant density are two most important factors which needs utmost care. Considering the above facts, an experiment was conducted to "Study the effect of fertility levels and spacings on quality of Okra (*Abelmoschus esculentus* (L.) Moench)".

MATERIALS AND METHODS

The experiment was carried out to study the effect of fertility levels and spacings on quality of Okra (*Abelmoschus esculentus* (L.) Moench) in the permanent experimental area of the Department of Horticulture (Vegetable and Floriculture) during the Kharif season of 1998 at the Bihar Agricultural College, Sabour (a campus of Rajendra Agricultural University, Bihar). The experiment was conducted under 'Factorial Randomized Block Design with twelve treatments replicated thrice. The treatment combinations were four levels of fertility i.e. F_1 ($N_{100}P_{60}K_{60}$), F_2($N_{150}P_{80}K_{80}$), F_3($N_{200}P_{100}K_{100}$), and F_4($N_{250}P_{120}K_{120}$) and three spacings i.e., S_1(60 x 30 cm), S_2(60 x 45 cm) and S_3 (60 x 60 cm). All cultural practices were adopted as per the crop need. Five plants were randomly selected from each treatment for detailed study. Observations were recorded on protein content of fruits using Lowry *et al.* (1951) method, starch content of the fruit. The moisture content of the fruits was determined by the formulae as:

$$\text{Moisture percentage} = \frac{\text{Wt. before drying - Wt. after drying}}{\text{Weight before drying.}} \times 100$$

RESULTS AND DISCUSSION

Moisture content of fruits as influenced by different treatments did not exhibit significant variation due either to fertilizer levels or spacing, showing thereby that this character is independent of above factors under investigation.

Starch content:

The highest starch content (9.99%) was recorded under the highest fertility level of F_4 and the minimum (8.40%) under F_1. Again, the maximum starch content (9.27%) found in the fruits produced by the plant spaced at the widest spacing (60 x 60 cm) and the minimum (8.67%) at the closest spacing i.e. (60 x 30 cm) (Table-1). This may be due to plants were at widest spacing getting more moisture, sunlight, fertilizers etc. So their fruit are much healthier than the fruits at lower fertility levels and spacing.

Protein content :

The effect of fertilizer levels and spacing on protein content showed that with the increase in the fertility level, there was corresponding and significant increase in protein content of fruit. Plants getting highest fertilizer dose i.e. $N_{250}P_{120}K_{120}$ produced fruits containing the maximum protein (0.48%). It was also observed that the maximum protein (0.46%) in the fruit was obtained at the widest spacing i.e. 60 x 60 cm (S_3). The lowest protein content in the fruits (0.43%) was associated with the spacing of 60 x 30 cm (S_1) (Table-2). This may be due to increased uptake of nitrogen, phosphorus and potash. Nitrogen which plays vital role in plant metabolism, is a major constituent of amino acids, nucleotides, nucleic acid and number of coenzymes. Potash helps in synthesis of protein and chlorophyll. Findings of present investigation in regard to quality aspects were in unison with the result of reported by Farag *et al.* (1994) and Pandey *et al.* (1996) who found that the

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