

## Effect of tomato bunchy top virus disease on nutrition of tomato (*Lycopersicon esculentum* Mill)

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### ABSTRACT

The effect of host nutrition on the plant growth as well as the concentration of bunchy top virus in tomato (*Lycopersicon esculentum* Mill) plants was studied. Two varieties of tomato viz., Pearson and Pusa Ruby were selected for study. The effect of nutrition (N, P and K) on Bunchy top virus disease of tomato (*Lycopersicon esculentum* L.) had been studied on 25, 35 and 45 days to find out the significance of the data C.D. has been worked out for inoculated and uninoculated material. The effect of nitrogen, phosphorus and potassium on height (cm), fresh weight (g) and dry weight (g). The height at 210 ppm was 25.00 cm and at 630 ppm was recorded maximum as 31.24 cm. Similarly fresh weight at 210 ppm was 3.14 g and at 630 ppm 3.89g. Dry weight at 210 ppm was 0.361 g and at 630 ppm 0.442 g. The height at 93 ppm was 16.20 cm and at 237 ppm was recorded maximum as 32.38 cm. Similarly fresh weight at 93 ppm was 3.22 g and at 237 ppm 3.32 g. Dry weight at 93 ppm was 0.393 g and at 237 ppm 0.416 g. The height at 78 ppm was 13.63 cm and at 704 ppm was recorded maximum as 32.25 cm. Similarly fresh weight at 430 ppm was 3.23 g and at 704 ppm 3.57 g. Dry weight at 430 ppm was 0.325 g and at 704 ppm 0.405 g. The effect of N, P and K on inoculated and uninoculated material has been shown.

**Key words :** Necrosis, Bunchy top, Virus disease, Aphids, White fly, Nitrogen, Phosphorus, Nutrients, Potassium

### INTRODUCTION

Tomato suffers heavily from several fungal, bacterial and viral diseases which take a heavily toll of the crop. Only few virus diseases have been reported to occur on tomato in our country which are of economic importance. The crop is subject to various types of virus disease, like mosaic, necrosis, streak, leaf roll, bunchy top and leaf curl. Some of the diseases are seed borne and some are spread by insects, such as the white fly (*Bemisia gossypiperda* M. Th.), grasshoppers and aphids, which feed on the leaves of diseased tomato or other Solanaceous plants; even unrelated crops like cucumber and perennial weeds serve as alternate hosts. The diseases are sap-transmissible and in some cases they are so infectious that simple contact with diseased plants spreads the virus.

In recent years bunchy top virus disease of tomato have been reported to cause severe damage to tomato crop causing yield reductions in terms of fruits. Fresh or ripe fruits of tomato are refreshing and appetizing and are consumed raw in salads or after cooking. Unripe fruits are cooked and eaten. Large quantities of fruits are canned. Tomatoes are consumed also in the form of juice, paste, ketchup, sauce, soup and powder (Girdhari Lal *et al.*, 1960).

Tomato bunchy top which had been found naturally occurring in Haryana, U.P., Punjab, Maharashtra, Bihar, Himachal Pradesh and West Bengal (Ganguly and Misra,

1992).

Therefore, the present investigation was taken up with a view to determine the effect of different levels of nutrition on the growth of tomato plants and the biological activity of the inoculant virus and its morbid anatomy. As this knowledge would be of basic importance in understanding the behaviour of the virus in the tomato plants and for a devising effective management practice for the control of bunchy top disease of tomato.

### MATERIALS AND METHODS

The present experiments were conducted at J.V. (P.G.) College, Baraut (Bhagpat) U.P. during the years 1990-1993. The culture of bunchy top virus was obtained from Division of Mycology and Plant Pathology, Indian Agricultural Research Institute, New Delhi. The inoculum was further multiplied by subculturing on tomato plant by serial transfer for the present studies.

All the experiments were conducted with plants grown from the seed and plants of the variety Pusa Ruby and Pearson susceptible to bunchy top virus were used. Young actively growing plants of the same age and approximately the same size as far as possible, were retained for each experiments.

The inoculations were conducted by the usual leaf inoculation method using fine carborundum powder of 600 mesh as an abrasive. The inoculum was prepared by crushing the fine pulp of bunchy top infected leaf of

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