Study on Testing the Role of Micronutrients on Chlorotic Mottle (geminivirus) Disease Development in Frenchbean (*Phaseolus vulgaris* L.)

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SUMMARY

Applications of micronutrients was found effective in frenchbean (*Phaseolus vulgaris* L.) cultivar Arkakomal and Contender against chlorotic mottle (geminivirus) disease by soil application and spray application. Observations were recorded in the form of disease appearance at days after sowing and disease index. After the applications of micronutrients, ferrous sulphate, magnesium sulphate, lime and zinc sulphate were found comparatively more effective in *rabi* and *kharif* seasons.

Key words : Chlorotic mottle, Geminivirus, Frenchbean.

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Frenchbean (*Phaseolus vulgaris* L.) is an important short duration vegetable and grain legume crop. The crop is cultivated in *kharif*, autumn, *rabi* and summer seasons. Due to its cultivation all the year round this crop serves as a good host of so many viruses. Chlorotic mottle disease of frenchbean caused by chlorotic mottle virus (geminivirus) has a very short history in Jabalpur region (Keshwal, 2001). The name of chlorotic mottle was coined to decribe the characteristics foliar symptoms in beans (Jayasinghe, 1982). Management of diseases caused by geminivirus through vector control and or use of resistant varieties have been found to be of no promise (Mali, 1986). Protective means of virus disease control like insectcidal and fungicidal sprays thus becomes inpracticable, laborious and costly. The role of micronutrients has been studied to know as what type of effect they do on host vis-a-vis reduction and or increase in disease. Experiment was conducted for screening and testing the effect of micronutrients on disease development.

MATERIALS AND METHODS

Experiments were conducted in the Plant Virology Laboratory and glasshouse of Plant Pathology Department, College of Agriculture, JNKVV, Jabalpur (M.P.). Election microscopy was done in Advance Centre for Plant Virology, IARI, New Delhi. Experiments were conducted in pot culture to see the effectivity of selected micronutrients (in the form of chemical compounds) *viz.*, manganese sulphate, zinc sulphate, copper oxide, ferrous sulphate, calcium carbonate, sulphur, potassium sulphate, magnesium sulphate, copper sulphate, lime, boron, ferric chloride. Arkakomal and Contender cultivars of frenchbean were grown in pots of 30cm diameter. Experiments were conducted separately in *kharif* and *rabi* seasons in year 2002-2003. Application of micronutrients was done by soil as well as spray. Microneutrients were applied at once in soil before sowing of seeds followed by spray application at 15 and 30 days after germination of seeds. Routine seed treatment with fungicides, thiram (3g/kg) and bavistin (1.5g/kg) along with rhizobium culture was done. The diseased plants in pots with severe symptoms of chlorotic mottle (geminivirus) disease were kept in between the replications for natural inoculation. Four replications were maintained. Observations were recorded just after germination in the form of disease appearance at days after sowing and also the disease index. Diseased plants were tagged and scoring of disease development was done in the scale of 0-5. The disease index was calculated from 5 random plants in the formula given below.

Disease index:

Numerical rating description
0 Healthy
1 Initial symptoms on leaf
2 Mild symptoms on leaf
3 Symptoms on leaf and other parts of