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EFFECT OF SOME FACTORS ON THE INCIDENCE OF CHARCOAL ROT OF MAIZE CAUSED BY *MACROPHOMINA PHASEOLINA* (TASSI) GOID.

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Effect of some factors on the incidence of charcoal rot of maize were studied. Incidence of the disease significantly increased with the increase in host population. Disease severity was also influenced by late sowing as compared to early sowing. Application of NPK fertilizers and compost also increased the disease incidene.

INTRODUCTION

Effect of some factors including plant maturity, temperature and crop residue on the incidence of *Macrophomina phaseolina* on maize were studied (Kaiser and Das, 1983). Experiments were conducted inorder to find out the effect of some other faetors like plant population, date of sowing and NPK fertilizers and compost on the incidence of this disease in sick plots during Rabi season the results of which are presented and discussed here.

MATERIALS AND METHODS

Seeds of hybrid Ganga 5 were included in the study. Seeds were obtained from the Project Coordinator (Maize), IARI, New Delhi-12. The experiments were conducted in sick plots at the University Experimental Farm, Kalyani during Rabi season with normal agronomic practiccs.

The effect of host population was studied by planting seeds in three replications. Four plant populations of 35000,45000,55000 and 65000per hectare were maintained by keeping plant to plant distance at 30, 25, 20 and 15 cm respectively in each case. The row to row distance was kept 60 cm. The effect of time of sowing was studied by planting seeds on six dates at 15 days interval from November 15 onwards in single row plot with two replications. The role of NPK fertllizers and compost was studied as follows. N, P and K were applied respectively as ammonium

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nium sulphate, single superphosphate and muriate of potash in the proportion of 160 kg : 60 kg per hectare. Nitrogen was applied in three split doses at the time of sowing, knee-high stage and flowering stage whereas Phosphorus and Potassium at the time of sowing. Compost was applied in a separate plot at the rate of 23 cartloads per hectare three months prior to sowing. Seeds were planted in simpie randomised plots with three rows in four replications. Adequate control was kept where it was necessary and no plant protection measure was undertaken. The data was recorded when all the plants had flowered.

RESULTS AND DISCUSSION

The results on the effect of plant population, time of sowing and NPK fertilizers and compost on the incidence of *M. Phaseolina* as presented in Table 1, Tables 2 and 3 respectively are described and discussed as follows.

Table 1. *Plant population in relation to disease severity*

Plant population/ha	% Infection
35000	17.5
45000	28.4
55000	45.5
65000	61.2

C. D. at 5% = 12.5

It is evident from Table 1 that disease incidence was significantly low at a population of 35000 per hectare. Significant increase in the incidence was observed with the increase in plant population. The result shows that high population of 65000 per hectare produced high disease incidence. The importance of root exudation in influencing the growth of soil borne plant pathogens have been demonstrated by severat workers (Buxton 1957, 1962, Kaiser and Sengupta. 1978). Increased production of root exudate in soil due to increase in the host population may influence the growth and multiplication of soil pathogen for rapid disease

Table 2. *Time of sowing in relation to disease incidence*

Date of sowing	% Plants infected
December 1	12.5
December 15	26.6
January 1	45.5
January 15	56.3
February 1	33.3
February 15.	16.4

C. D. at 5% = 8.5

development. Increase in the disease severity with the increase in plant population in the present case may also be due to same reason.

Table 2 shows that highest disease incidence occured when seeds were planted on Januaty 15. The disease incidence gradually decrcased when planting was done before or after this date. Soil temperature might be the main attributing factor for such disease development. When planted on January 15 the crop is exposed to high summer temperature at 34 C and above after the flowering stage. When planted earlier or later this date the temperature may not be conductive for such disease development. Livingston (1945) also reported that the disease was more severe in dry soils where the temperature was held at 38°C. Experiment carried out at Hyderbad for three seasons also showed that thc disease was influenced by high temperature above 28°C after flowering (Payak and Renfro, 1969).

Table 3. *Effect of NPK fertilizers and compost on disease incidence*

Treatments	% Infection
N+P+K	56.6
Compost	49 3
Controral (no fertilizer)	28.5

C. D. at 5% = 15.6

It is evident from the Table 3 that both NPK fertilizers and compost significantty increased the disease over control. However, no signifieant difference in the disease incidence was observed between NPK fertilizers and compost. Incidence of *Pythinm* stalk rot in maize was also increased by NPK fertilizers and crop residues as observed by Payak (1975) . The individual role of N, P and K were, however, not included in the present study. Further work is necessary to study the specific role of these nutrients on this disease.

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