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EFFECT OF CROP SEQUENCE ON SURVIVAL OF INOCULUM OF *MACROPHOMINA PHASEOLINA* IN SOIL

Macrophomina phaseolina (Tossi) Goid is a soil borne pathogen and it has been reported to have a very wide host range (Ghaffer, 1968, Shaw *et al.*, 1915). Chattopadhyay *et al.* (1952) have shown that the jute-potato rotation tended to increase the attack of stem rot of jute, where jute followed by potato in winter season. But recently jute followed by wheat in the winter season is being practised in some localities.

No critical experiment has so far been undertaken to find out the exact role of potato or wheat in perennation of *Macrophomina phaseolina*.

To study the effect of crop sequence on survival of inoculum of *M. phaseolina* in soil in jute-potato and jute-wheat crop sequence the soil was collected in a bulk from the pots 20 cm in diameter, where jute seedlings were grown and inoculated. This soil was primarily divided into two equal parts. Taking one part of the soil, eighteen pots were filled up. Six for potato, six for wheat and three for fallow without any host and rest of three for measuring the initial infectivity of the soil by growing jute seedlings of variety D-154, using twenty five seeds in each pot. The next bulk of soil was sterilized and eighteen pots were filled up as in previous case. Potato plants of variety "Kufri Chandramukhi" and wheat seeds of 'Kalyan Sona' were grown in the pots. For potato, six tubers in each pots and twenty five wheat seeds per pot were used. The experiment was started in the middle of November 1972 and ended in the Month of March, 1973.

Periodic observations were taken on both wheat and potato plants grown in inoculated soil as well as in sterile soil. Infectivity of the soil was determined after

the harvest of potato and wheat by growing jute seedlings of variety D-154, using twenty five seeds in each pot.

Table 1. *Inoculum potentiality of* M. phaseolina *in soils under different system of crop rotation* (*Figure in per centage of seedling affected*)

Treatments	Inoculum index in November	Crops	Jute disease index (in March)
Inoculated	75.7	Potato	70.5
soil with		Wheat	64.4
M. phaseolina		Fallow	27.6
Inoculated soil	1.2	Potato	2.3
With *M. phaseolina*		Wheat	2.1
after sterilization		Fallow	1.2

Potato plants grown in inoculated soil showed signs of infection from end of December to mid January, blackened areas on the haulms near the soil surface could be observed on carefully removing the soil without disturbing the plants. The shoots or haulms were found to have a spindly appearance in the underground region. Isolation from the diseased plants showed presence of *Macrophomina phaseolina*. Aerial tubers cosidered to be a characteristic feature of attack of *Rhizoctonia* sp. were noticed. Every plant in the sick soil showed symptoms. None of the plants in sick soil showed death though they exhibited symptoms of varying degrees. Infection on tubers was not distinct. Sclerotia were found to be present in the haulm above the tuber bearing region. Plants in sterile soil showed normal growth. Observations on wheat plants failed to reveal any distinctive symptom of attack due to *M. phaseolina* except blackening on the cortical region. Microscopic observations revealed presence

of hyphae in the outer cortical region of the leaf-sheath. Isolations made from the plants showed presence of *Macrophomina phaseolina*. Studies on growth in sterilized soil failed to show presence of *M. phaseolina*.

From the data presented in Table 1, it was observed that in pots containing potato and wheat, infectivity of inoculum was maintained with only slight reduction of infectivity of soil with wheat as it was a non-host of *M. phaseolina*. The inoculated soil kept fallow (without any plant), a sharp fall in infectivity was noticed. The inoculum index in sterilized soil was very low because all the microorganisms has been inactivated only in one or two cases mortility was noticed. This clearly demonstrated that both potato and wheat served as suitable hosts for survival and perennation of the pathogen of stem rot of jute.

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