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EFFECT OF ORGANIC SOIL AMENDMENTS ON PLANT GROWTH AND INTENSITY OF SHEATH BLIGHT OF RICE

The role of organic soil amendments in the suppression of soil-borne plant pathogens has been emphasized by several workers (Stover, 1962; Huber and Watson, 1970; and, Linderman, 1970). Successful control of black scurf of potato caused by *Rhizoctonia solani* (Singh, 1968) and soft rot of ginger caused by *Pythium aphanidermatum* (Rajan and Singh, 1972) by amending the soil with oil-cakes and sawdust has been reported. The present experiment has been under taken to study the effects of different oil-cakes and some agricultural and industrial waste products as soil amendments on the intensity of sheath blight of rice caused by *Corticium sasakii* (Shirai) Matsumoto.

Potted soil was artificially infested with *C. sasakii* and after one week well-powdered oil cakes and other organic materials were added at the rate of 10g/pot. Three week old seedlings of rice (variety *Annappurna*) were planted in these pots, 15 days after the addition of amendments. At the time of transplanting, N:P:K at the rate of 90:45:45 Kg/ha were added in those treatments which received sawdust, cashew shell powder or coconut pith. Controls were maintained with the addition of N. P. K. alone and without any treatment.

In all treatments, except mahuva cake, plant growth was superior to control (Table 1). However, in pots amended with eluppa cake the difference was not significant. Treatments with coconut pith and N. P. K., eluppa cake, rubber seed cake and punna cake reduced the intensity of the disease significantly. In other treatments, there was a slight and non-significant reduction in the intensity of disease. However, in the control which received N. P. K. alone, there was a remarkable increase in disease intensity.

Better plant growth and yield due to different oil-cakes and other organic materials have been well established. Singh (1968) and Rajan and Singh (1972) have suggested that the variations in yield and plant growth by amending the soil with organic materials might be due to the differences in their nutrient status and relative speed of decomposition. Depression of plant growth and yield by mahuva cake due to its low manurial value (high C : N ratio) and slow decomposition in soil have been observed by Singh (1968); Sharma *et al.* (1970) and, Mamen (1972). In the present trial, N. P. K. alone has increased the intensity of disease, while N. P. K. in combination with organic materials like sawdust, cashew shell powder and coconut pith reduced the disease considerably. It is indicative that the latter directly or indirectly through microbial antagonism reduced the activity of the pathogen in the soil. Rajan (1971) obtained significant negative

Table 1

Effect of organic soil amendments on plant growth and disease intensity

Treatments	Height of plants (Cm)	Mean per cent intensity of disease (transformed values)
Sawdust + N. P. K.	51.7	16.7
Ca&hew shell powder + N. P. K.	49.8	26.0
Coconut pith + N. P. K.	51.3	12.0
Groundnut cake	55.4	23.7
Sesamum cake	55.0	26.0
Coconut cake	54.4	31.7
Rubber seed cake	49.7	15.3
Marotti cake	49.5	19.0
Eluppa cake	42.8	14.3
Punna cake	49.3	15.3
Mahuva cake	37.5	23.7
N. P. K. alone (control)	55.1	55.7
Untreated (control)	38.3	27.0
C. D. at 5%	8.3	10.9

correlation between population of *Pythium aphanidermatum* (the causal organism of soft rot of ginger) and soil saprophytes (total fungi and bacteria) in a field amended with various organic materials. The role of oil-cakes in the control of soil-borne plant diseases has been emphasized by Choudhury (1946), Vasudeva *et al.* (1962), Mahmood (1964), Singh (1968) and Rajan (1971). The present work corroborates with the earlier observations. However, the utility of agricultural and industrial waste products such as cashew shell and cocount pith has not been investigated in detail. The results show that they may prove to be useful tools for the control of soil-borne diseases.

സംഹാരം

പലതരം പിണ്ണാക്കുകളും മരപ്പൊടി, കശുവണ്ടിതോട്, ചകരിച്ചോറ് മുതലായ ജൈവ വസ്തുക്കളും മണ്ണിൽ ഇടുന്നതുമൂലം നെൽപെടികളുടെ വളർച്ച സാരമായി വർദ്ധിക്കുകയും കോർട്ടീസ്യം സസാകി എന്ന കമീം മൂലമുണ്ടാകുന്ന തണ്ടുകരീച്ചിൽ രോഗം കുറയുകയും ചെയ്തു.

REFERENCES

- Choudhury, S. 1946. Effect of manuring on the Sclerotial wilt of pan Indian *J. Agric. Sci.* **16**, 290-293.
- Huber, D. M. and Watson, R. D. 1970. Effect of organic amendments on soil-borne plant pathogens. *Phytopathology*, **60**, 19-22.
- Linderman, R. G. 1970. Plant residue decomposition products and their effects on host roots *Phytopathology*, **60**, 19-22.
- Mahmood, M. 1964. Factors governing production of bulbiformin and its use in the control of pigeon-pea wilt. *Sci. & Cult.* **30**, 352.
- Mammen, K. V. 1972. Effect of oil-cakes on the incidence of root galls and the yield of bhendi in nematode infested soil. *Agri. Res. J. Kerala* **10**, 186-187.
- Rajan K. M. 1971. A study of soil factors influencing inoculum potential of *Pythium aphanidermatum* with special reference to organic amendments. Ph. D. thesis U. P. Agriculture University, Pantnagar, U. P. pp. 182.
- Rajan, K. M. and Singh, R. S. 1972. Effect of organic amendments of soil on plant growth, yield and incidence of soft rot of ginger. *The Proceedings of the National Symposium on Plantation Crops*, 102-106.
- Sharma, A. N., Sharma V. K. and Singh, R. S. 1970. Economics of oil cake and sawdust soil amendments. *Pans*, **16**, 287-297.
- Singh, R. S. 1968. Incidence of block scurf on potatoes in oil-cake amended soil. *Indian Phytopath* **21**, 120-121.
- Stover, R. H. 1962. The use of organic amendments and green manures in the control of soil borne phytopathogens *Recent Adv Microbiol.*, **8**, 267-275.
- Vasudeva, R. S., Singh, G. P. and Iyenger, M. R. S. 1962. Biological activity of bulbiformin in soil. *Ann. appl. Biol.*, **50**, 113-119.

Division of Plant Pathology,
College of Agriculture,
Vellayani

K. M. RAJAN
M. RAMANATHA MENON

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