

## Evaluation of Talc-based Product of *Trichoderma viride* for the control of Blackgram Root rot

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In India the potential of *Trichoderma viride* Pers: ex.Fr. in managing soil-borne pathogens has been well demonstrated in many crop diseases like seedling diseases of cotton (Ramakrishnan and Jeyarajan, 1986), root rot of soybean (Jharia and Khare, 1986), and root rot of cowpea (Alagarsamy and Sivaprakasam, 1988). Jeyarajan *et al.* (1994) developed a talc-based powder formulation of *T.viride* which is being used as a carrier for seed treatment. This formulation contained  $2.8 \times 10^8$  CFU/g of powder. The present study was undertaken to standardize the exact inoculum level required for the management of root rot of urdbean.

A pot culture study was conducted with urdbean T9 a highly susceptible variety for root rot. Sclerotia of *Macrophomina phaseolina* (Tassi) Goid. multiplied in sand maize medium (Muthukrishnan, 1989) was mixed with sterilized soil in pots @ 500 g per 5 kg of soil. Talc-based formulation of *T.viride* was prepared as per the method described by Jeyarajan *et al.* (1994). Eight mm discs of 5-day old *T.viride* culture grown on potato dextrose agar was inoculated into 250 ml conical flasks containing 70 ml of yeast molasses broth. Eight days after incubation, the contents of the flasks including the mycelial mat and metabolite were homogenized using a mixie. Later it was mixed with talc powder at the rate of 1:2 (v/w) and shade dried for 2 days. Carboxymethyl cellulose 10g was added as sticky material for 1 kg of talc powder. On serial dilution, the formulation yielded  $2.73 \times 10^8$  CFU/g of talc powder. This talc-based formulation was used for seed treatment. Seeds of urdbean were treated with the formulation at different rates (Table 1) and survival of *Trichoderma* chlamydospores and sclerotia of the pathogen were estimated at

30th and 60th days of sowing (DAS). For *Trichoderma* estimation, the method described by Elad and Chet (1983) was followed. Sclerotial population was estimated as per the method of Singh *et al.* (1990). Root rot incidence was also recorded at 15 days interval from sowing date.

The results of the experiment revealed that root rot incidence was least (5.6%) in seed treatment with 8 g/kg of seed followed by treatment with 6 g/kg of seed (5.8%) (Table 1). However, these two were on par with 4 g/kg of seed which recorded 5.9% root rot incidence. At 30 DAS, highest population of  $27.5 \times 10^3$  CFU of *T.viride* was recorded in treatment with 8 g/kg of seed which was on par with 6 g/kg and 4 g/kg of seed. Number of sclerotia of *M.phaseolina* was least in seed treatment with 8 g/kg followed by 6 g/kg of seed which recorded 7.3 sclerotia per g of soil. This was on par with 4 g/kg of seed. Similar type of result was obtained at 60 DAS. Since there was no significant differences between 8, 6 and 4 g/kg of seed, it is concluded that 4 g of talc-based formulation of *T.viride* as seed dresser is sufficient to control root rot disease effectively in pulses. Carbendazim 2 g/kg of seed was as effective as *T.viride* @ 4 g/kg of seed and higher doses. Jeyarajan *et al.* (1994) reported that *T.viride* in talc-based formulation remained viable upto 120 days and recorded only 18.1% root rot incidence in sunflower as against 37.1% in control. Jeyarajan and Ramakrishnan (1991) tried different carriers, among which talc recorded the maximum chlamydospore population of  $280 \times 10^6$  CFU/g of talc powder. The present studies have shown that seed treatment with talc - based *T.viride* @ 4 g/kg of seed is sufficient to reduce the

Table 1. Evaluation of talc-based product of *Trichoderma viride* as seed treatment for the control of urdbean root rot.

Treatment	% Root rot incidence DAS			Population /g of soil (DAS)			
				<i>T.viride</i>	CFU* (x 10) <sup>3</sup>	No. of Sclerotia of <i>M.phaseolina</i>	
	30	45	60	30	60	30	60
<i>T.viride</i> 2g/kg	4.9	10.4	12.7	21.6	18.2	10.2	7.9
4g/kg	2.1	4.2	5.9	26.0	20.8	7.5	7.2
6g/kg	1.8	3.9	5.8	27.2	20.9	7.3	6.9
8g/kg	1.8	3.8	5.6	27.5	21.7	7.0	6.9
Carbendazim 2g/kg	6.2	10.6	14.2	0.0	0.0	7.5	7.6
Control	12.5	16.8	20.8	0.0	0.0	11.8	13.3
CD (0.05)	2.36	2.46	4.81	2.17	1.79	1.72	1.68

\* CFU = colony forming units

population of root rot pathogen *M.phaseolina* and root rot incidence.

KEY WORDS : *Trichoderma viride*,  
formulation, *Macrophomina*  
*phaseolina*, black gram root rot.

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