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Efficacy of seed dressing agents against damping-off disease of chilli (*Capsicum frutescens*)*

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Chilli (*Capsicum frutescens* L.) is one of the important crops grown for the value of its fruits in making spice and condiment. *Pythium aphanidermatum* (Edson) Fitz. causes damping-off disease in chilli and various methods, both chemical and biological have been reported to control the disease (Ghosh 2002). The present study was conducted for four seasons during 2004–08 at Haringhata block of Nadia district, West Bengal with different seed treating agents against the disease and their relative efficacy was evaluated.

Isolation of *P. aphanidermatum* was done by using pointed gourd fruit as a bait (Saha *et al*. 2002). Mass inoculum of the fungus was prepared on sand-maize meal medium (20: 1, W/W) (Muthuswamy 1972) and used for soil inoculation in nursery. It was mixed @ 1 part to 20 parts of the soil used.

Three chemical fungicides, namely carboxin 37.5 DS in combination with thiram 37.5 (COSKO), Thiram 75 WS and Captan 50WP were used at the rate of 2.5 g/kg of seed, while two bio-antagonists, like *Trichoderma viride* (BIODERMA) and *Pseudomonas fluorescens* (BIOMONAS) were applied at 4 g and 5 g container medium/kg of seed, respectively. One formulation of biofertilizer, namely *Azotobacter* sp. which gave appreciable result in tomato (Gupta *et al*. 1995) were also used at 2 g container medium/kg of seed. Seeds of 'Pusa Jwala' was sown in nursery bed of 1 m^2 after testing its germination per cent which was 98.8. Each seed dressing agent was made into a slurry and 600 seeds were treated in it. Treated seeds were sown in pathogen pre-inoculated soil @200 seeds/plot. Each treatment was replicated thrice in randomized complete block design. Standard agronomic practices were followed in all the treatments. Pre-emergence damping off was recorded after 96 hr while post-emergence damping off was recorded 21 days after sowing.

Pooled analysis of four seasons (2004–08) clearly showed that all the treated seeds manifested lower pre-emergence and post-emergence losses than control (Table 1). Pre-emergence loss was minimum in case of Thiram 75WS treated seeds (6.52%) as compared to control (29.06%). Thiram was followed by Captan (9.79%) *Pseudomonas fluorescens* (10.46%) and Carboxin-Thiram combination (11.27%). However all these treatments were statistically similar. *Azotobacter* and *Trichoderma viride* formulation-treated seeds having 13.62 and 16.13% of pre-emergence losses also differed significantly than control. Captan was the most efficient treatment having only 15.94% of post-emergence losses, but was statistically similar to Thiram having 16.15% of post-emergence losses. Among bio-formulations, *Pseudomonas fluorescens* had the minimum loss(20.28%), followed by *Azotobacter* (24.02%) and *Trichoderma* (25.86%) as compared to control (59.12%) and the latter two formulations were statistically almost at par with each other. It is to be noted that the result manifested by *P. fluorescens* was significantly better than Carboxin-Thiram combination. The mycoparasitic potentiality of the

Table 1 On-field effect of different seed dressing agents on damping-off of chilli

Treatment	Dose (g/kg of seed)	Pre-emergence loss (%)	Post-emergence loss (%)
Carboxin 37.5% DS + Thiram 37.5% DS	2.5	11.27 [a]	22.01[ae]
Thiram 75 WS	2.5	6.52[b]	16.15[b]
Captan 50 WP	2.5	9.79[a]	15.94[b]
Trichoderma viride	4.0	16.13[c]	25.86 [c]
Pseudomonas fluorescens	5.0	10.46[a]	20.28[d]
Azotobacter sp.	2.0	13.62[d]	24.02[ce]
Control		29.06[e]	59.12[f]
LSD (*P*=0.05%)		1.84	2.40

Data collected over four years(2004–05 to 2007–08) and pooled mean values taken

Values within a column followed by the different letters are significantly different at 5% level according to Duncan's Multiple Range Test (DMRT)

*Short note

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bacteria can be attributed to the production of a variety of secondary metabolites by fluorescent *Pseudomonas* (Mathre *et al*. 1999) or it is known to induce systemic resistance by synthesizing chitinases and b-1, 3 glucanases (M'Piga *et al*. 1997).

Thus from the present study, it can be concluded unequivocally that seed treatment with Thiram 75WS, Captan 50WP and *Pseudomonas fluorescens* formulations reduces damping off significantly both during pre- and post-emergence stages and may be recommended to farmers for enhanced yield in chilli.

SUMMARY

Six seed treatment agents, viz Thiram, Captan, Carboxin-Thiram combination, *Pseudomonas fluorescens*, *Trichoderma viride* and *Azotobacter* sp. formulations were evaluated against damping-off of chilli caused by *Pythium aphanidermatum* and compared with an untreated control. All the treatments were effective in controlling the disease both during pre- and post-emergence stages. Thiram75 WS and Captan 50WP emerged to be the best treatment in the pre- and post-emergence stages, respectively.

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