

Study of seed dressing effect with bio – agents and chemicals in chilli crop



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SUMMARY

The study revealed that the effect of bio-agent and chemical treatment increased shoot, root length as well as vigour index, also showing decreasing seedling mortality in chilli.

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Key words : Bio-agents, Seed dressing, Mortality, Vigour index, Germination

Chilli, a most common, popular and principal high value vegetable crop belonging to family Solanaceae. Both the green and dried ripe fruits of chilli are used as condiments in cooking and culinary preparation. In India, it is cultivated over an area 9.56 lakh ha with estimated production of 945500 MT dry production under Maharashtra. The crop is grown on 101100 ha land having average production of 577700 tonnes during 1998-99 (Negi, 2002).

Looking to variability of pathogens, there is little scope for developing resistant variety as well as a successful fungicidal control alone. Under this situation, the growers are let with alternative of using bio-agents for control of major diseases of chilli crop. Considering the beneficial effect of *Trichoderma* and *Pseudomonas* investigation was planned at Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola.

MATERIALS AND METHODS

A field experiment was conducted by using Jayanti variety seed of chilli along chemicals such as TMTD and Carbendazim, taken from the Department of Plant Pathology, Dr. Panjabrao Deshmukh Krishi Vidyapeeth,

Akola, The different species of *Trichoderma* and *Pseudomonas* required for treatments were obtained from Mahatma Phule Krishi Vidyapeeth, Rahuri. These bio-agents were mass multiplied on PDA broth medium in laboratory and later formulated with talc based powder @ 150 ml broth with ½ kg talc producer. A above formulated dose was treated with seeds of chilli @ 4 g/kg of seed for 15 hrs before sowing. A nursery trail was conducted at Central Research Farm., Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola under Randomised Block Design taking 3 replications and 10 treatments with a plot size of 2 x 1 m². Each bed has three rows in which 300 seeds were sown. The observations on emergence of chilli seedling were taken on 10-15 DAS. Later, the observations on root and shoot length, number of leaves were recorded for each treatment per replication on five seedlings basis on 35 DAS. The observations on seedling mortality were recorded on 20, 35 and 45 DAS.

RESULTS AND DISCUSSION

The beneficial effect of inoculation of bio-agents and chemicals on seedling emergence, growth parameters and seedling

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Table 1 : Effect of seed treatment with bio-agents and chemicals on seed germination, seedling mortality and plant growth parameters of chilli

Treatments	Seedling emergence (%)	Seedling mortality (%)			Plant growth parameters		
		20 DAS	35 DAS	45 DAS	Shoot length (cm)	Root length (cm)	No. of leaves
<i>T. viride</i>	76.39	2.32 (1.52)	4.29 (2.07)	5.43 (2.32)	17.26	6.41	8.30
<i>T. harzianum</i>	76.56	2.17 (1.46)	4.10 (2.02)	5.19 (2.27)	17.31	6.52	8.40
<i>T. koningii</i>	73.33	2.98 (1.72)	5.14 (2.26)	5.88 (2.61)	16.41	5.74	7.46
<i>T. lingnorum</i>	73.31	2.72 (1.64)	50.5 (2.26)	6.76 (2.59)	16.82	6.01	8.10
<i>P. fluorescence</i>	75.33	2.31 (1.51)	4.10 (2.04)	5.00 (2.22)	17.47	6.81	8.45
<i>T. viride</i> + <i>P. fluorescence</i>	77.00	1.87 (1.36)	3.90 (1.97)	4.95 (2.17)	17.85	6.65	8.50
<i>T.harzianum</i> + <i>P. fluorescence</i>	77.22	2.00 (1.41)	3.73 (1.92)	4.72 (2.17)	17.83	6.86	8.70
TMTD (0.3%)	77.00	2.16 (1.46)	4.08 (2.01)	4.97 (2.22)	16.15	6.48	8.30
TMTD + Carbendazim (0.15 + 0.05%)	77.75	2.14 (1.45)	3.55 (1.88)	4.86 (2.20)	17.90	6.77	8.60
Control	70.78	4.23 (2.05)	6.81 (2.60)	8.53 (2.91)	16.01	5.29	7.46
F test	Sig	Sig	Sig	Sig	Sig	Sig	NS
S.E. ±	0.53	0.12	0.063	0.082	0.42	0.22	0.26
C.D. (P=0.05)	1.51	0.36	0.17	0.23	1.18	0.66	-

*Figure in parentheses are square root transformation

NS=Non-significant

mortality of chilli crop were studied in field experiment. The effect of five bio-agents, two combinations of bio-agents and chemicals on per cent seedling emergence were recorded. The highest seedling emergence (77.75%) was observed with 0.15% TMTD + 0.05% Carbendazim which was followed by 77.22% with *T.harzianum* + *P. fluorescence* and least in control (70.78%). These result indicate that there were significant differences in bio-agents and chemicals treated plots and non-treated plots. Bunker and Mathur (2001) reported 71.4% germination in *T.harzianum* treated plot and in control 68.67% in chilli. The combined effect of fungicide and bio-agent on chilli was studied by Kelayia and Parkhia (2002), showing increased germination and reduced incidence of wilt. Similar studies conducted by Monaco *et al.* (1991) showed increased seed emergence when seed treated with *Trichoderma* spp.

The seedling mortality of chilli was monitored from 20 to 45 DAS. At 20 DAS lowest seedling mortality (1.87%) was recorded with *T.viride* + *P. fluorescence* followed by *T. harzianum* + *P. fluorescence* (2.0%). On 35 DAS, 0.15 TMTD + 0.05% Carbendazim showed minimum seedling mortality of 3.55% and 3.73% in *T. harzianum* and *P. fluorescence*. On 45 DAS showing lowest mortality in *T. harzianum* + *P. fluorescence* (4.72%) followed by 0.15% TMTD + 0.05% Carbendazim (4.86) which were statistically superior over control (8.53%).

The effects of bio-agents and chemicals on plant growth parameters of chilli were recorded at 35 DAS

which indicated that shoot and root length were statistically superior over control. In chilli, highest shoot length was obtained in TMTD + Carbendazim (17.90cm) while highest root length and number of leaves were found in *T. harzianum* + *P. fluorescence* which were 6.86 cm and 8.70 cm, respectively. Manoranjitham *et al.* (2000) reported that soil application of *T. viride* and *P. fluorescence* increased root and shoot length. Similar studies conducted by Inbar *et al.* (1994) showed that *T. harzianum* as a seed dresser in chilli increased seedling height by 23.8%. Manoranjitham *et al.* (2000) reported seed treatment with *T. viride* and *P. fluorescence* to reduce, pre and post emergence damping off by 7% and 12.50% as against 27.5 and 54.7% in control.

In view of the above, it is summarised that highest germination of 77.75% was found in TMTD 0.15% + 0.05% Carbendazim while lowest mortality 1.87% was recorded in *T. viride* + *P. fluorescence* at 20 DAS. Where as bio agents and chemicals increased shoot root length and number of leaves in chilli at 35 DAS.

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REFERENCES

- Bunker, R.N. and Mathur, Kusum (2001).** Integration of bio-control agents and fungicide for suppression of dry root rot of *Capsicum frutescens*. *J. Mycol Pl. Pathol.*, 31(3) : 330-334.
- Inbar, J., Abramskay, M., Cohen, D. and Chet (1994).** Plant growth enhancement and disease control by *T. harzianum* in vegetable seedlings grown under commercial condition *European J. Pl. Pathol.*, 100 (5):337-346.
- Kelayia, D.S. and Parkhia, A.M. (2002).** Intergrated management of chilli wilt. Abst. Ind. Phytopathol. Soc, Symposium on Major plant diseases and their management, Oct. 29-30 Nagpur, 2002, 20 pp.
- Manoranjitham, S.K., Prakasam, V. and Rajappan, K. (2000).** Biological control of chilli damping off using talc based formulation of antagonists. *Ann. Pl. Protec. Sci.*, 8 (2) : 159-162.
- Manoranjitham, S.K., Prakasam, V., Rajappan, K. and G.Amutha (2000).** Control of chilli damping off using bio-agents. *J. Mycol. Pl. Pathol.*, 30(2) : 225-228.
- Monaco, C., Perello, A., Alippi, N.E. and Pasquare, A.D. (1991).** *Trichoderma* spp. a biocontrol agent of *Fusarium* spp. and *Sclerotium rolfsii* by seed treatment. *Advances in Hort. Sci.*, 5(3) : 92-95.
- Negi, J.P. (2002).** Indian Horticulture Data base, NHB Gurgaon, Haryana (India).
