

# Effect of seed treatment with bio-agents and chemicals in management of nursery diseases in tomato



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## SUMMARY

Tomato is most popular and important vegetable, which is highly susceptible to damping off, collar rot, root rot which is caused by soil borne pathogens. Experimental finding revealed the beneficial effect of seed treatment and chemicals in contrast of nursery diseases better for germination and also showed increased vigor index of seedling in nursery stage.

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## Key words :

Seed treatment,  
Bio-agents,  
Nursery diseases

Tomato is one of important vegetable crop grown in India due to its special nutritive value. Tomato is used for soup, salad, pickles and in ketchup preparation. Total production of tomato in India during 2000-2001 was 8.40 million tones from area of 0.50 million ha. out of that Maharashtra contributes about 35,000 ha area with 7,71,000 tonnes production (Negi, 2002).

Per-hectare productivity of tomato is quite low because of several factors in which diseases is one of the important factors. In nursery fungi like *Fusarium*, *Pythium*, *Phytophthora* and *Sclerotium*, cause soil borne diseases. Use of bio-agents and chemicals is the only alternative remained for control. So the present investigation was planned at Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola.

## MATERIALS AND METHODS

An experiment was carried out at the field of Central Research Farm. Cultures of *Trichoderma* and *Pseudomonas* were obtained from Department of Plant Pathology, Mahatma Phule Krishi Vidyapeeth, Rahuri, in pure culture form which were mass multiplied on PDA broth medium for 7 days at Department

of Plant Pathology, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola and later formulated with talc powder @ 150 ml. broth with ½ kg talc powder seeds of tomato were taken from Department of Plant Pathology, Akola. These seeds were treated with above formulated bio-agents and chemicals @ 4 g/kg before 15 hrs. of sowing. Various 10 treatments were allotted to separate plots of size 2 x 1 m<sup>2</sup>. Each bed has three rows having 300 treated seeds sown. Germinations count were made 10-15 days after sowing where as mortality was recorded on 20, 35 and 45 DAS. Observations regarding vigour index were made on five plant base at 35 DAS with root and shoot length and number of leaves.

## RESULTS AND DISCUSSION

Seedling emergence result (Table 1) indicated that there was significant difference in bio-agents and chemical treated plots and non-treated plots. Results showed highest germination (83.17%) on treatment of *T. viride* + *P. fluorescence* and least (74.99%) in control. Dinakaran and Ramakrishan (1996) found that *T. viride* seed treatment to tomato @ 4 g/kg showed 75% seedling emergence while in control it was 65%.

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**Table 1 : Effect of seed treatment of bio-agents and chemicals on seed germination seedling mortality and plant growth parameters of tomato**

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>	81.55	2.58 (1.60)	4.06 (0.23)	5.09 (2.25)	13.42	2.78	23.46
<i>T. harzianum</i>	82.33	2.43 (1.55)	3.84 (1.95)	4.84 (2.14)	13.53	2.82	23.53
<i>T. koningii</i>	80.66	3.16 (1.77)	4.55 (2.13)	5.33 (2.30)	12.83	2.44	22.10
<i>T. lingnorum</i>	78.77	2.95 (1.71)	4.72 (2.16)	6.28 (2.50)	12.93	2.36	22.43
<i>P. fluorescences</i>	82.16	2.53 (1.59)	3.86 (1.96)	4.69 (2.15)	13.43	2.80	23.66
<i>T. viride</i> + <i>P. fluorescences</i>	83.17	2.13 (1.45)	3.63 (1.90)	4.44 (2.10)	13.73	2.87	23.73
<i>T.harzianum</i> + <i>P fluorescences</i>	83.10	2.27 (1.50)	3.47 (1.85)	4.36 (2.08)	13.86	2.87	23.80
TMTD (0.3%)	81.38	2.45 (1.55)	3.91 (1.97)	4.75 (2.17)	13.65	2.91	23.66
TMTD + Carbendazim (0.15 + 0.05%)	81.88	2.30 (1.51)	3.40 (1.84)	4.61 (2.14)	13.87	2.98	23.91
Control	74.99	4.44 (1.93)	6.49 (2.54)	9.00 (3)	12.10	1.48	21.83
F test	Sig	Sig	Sig	Sig	Sig	Sig	NS
S.E. ±	0.63	0.088	0.061	0.086	0.29	0.13	0.49
C.D. (P=0.05)	1.78	0.24	0.17	0.23	0.82	0.39	-

\*Figure in parentheses are square root transformation

NS=Non-significant

The results obtained with regards to seedling mortality indicated that all the treatments were significantly superior over control. At 20 DAS 2.13% lowest mortality was recorded in *T.viride* + *P. fluorescences*, at 35 DAS TMTD + Carbendazim recorded 3.40 % mortality while at 45 DAS 4.36% mortality were recorded with *T. harzianum* + *P. fluorescences*. Anandh and Prakasam (2001) observed the effect of activated formulation of *T. harzianum* on control of damping off of tomato and similar results were reported by Manoranjitham *et al.* (2000).

The result of plant growth parameters indicated that shoot length was highest in TMTD + Carbendazim (13.87 cm). Highest root length and number of leaves were found in same treatment being 2.98 cm and 23.91, respectively. Manoranjitham *et al* (2001) reported that *T. viride* and *P. fluorescences* application to tomato seed increase root length by 2.27 and 2.15 cm while shoot length by 12.85 cm.

From above result, it is summarised that highest germination 83.17% was shown by *T. viride* + *P. fluorescences* while low mortality (2.13%) was recorded in same treatment at 20 DAS. Where as, chemicals TMTD + Carbendazim increased root, shoot, length and number leaves at 35 DAS in Tomato.

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