



E-ISSN: 2278-4136  
P-ISSN: 2349-8234  
JPP 2019; 8(5): 368-371  
Received: 28-07-2019  
Accepted: 30-08-2019

Shweta Mishra  
Department of Plant Pathology  
Indira Gandhi Agriculture  
University, Raipur,  
Chhattisgarh, India

## Disease controlling potential of *Trichoderma harzianum* and *Trichoderma viride* against purple blotch of onion

Shweta Mishra

### Abstract

Disease controlling potential of *Trichoderma* strains evaluated *in vivo* against purple blotch of onion. Ten *Trichoderma* strains were taken among which nine were *Trichoderma harzianum* and one *Trichoderma viride*. *Trichoderma viride* strain T18 was found to be more effective for promoting plant growth and controlling purple blotch disease under field conditions showing its competence not only in promoting growth but also controlling foliar incidence of purple blotch. Whereas, *Trichoderma harzianum* strain T3 and T5 were more effective in increasing bulb weight/plant.

**Keywords:** *Trichoderma harzianum*, *Trichoderma viride*, disease controlling potential, purple blotch, *in vivo*

### Introduction

Onion (*Allium cepa*, L.) is one of the most important fresh vegetable crop cultivated across the world and is an important vegetable grown in all most all parts of India. Onion is regarded as a highly export oriented crop and earn valuable foreign exchange in the country. In India, Onion occupies an area of 1.20 million hectares with a production of 19.40 million tonnes and the productivity of 16.10 metric tonnes / ha, in the year 2015. The major onion growing states are Maharashtra, Madhya Pradesh, Karnataka, Gujarat, Bihar, Andhra Pradesh, Rajasthan, Haryana, Tamilnadu, Odisha, Telangana, UP etc., Maharashtra stands 1st in production of onion followed by MP and Karnataka. In Karnataka onion is cultivated in an area of 1.36 lakh hectares, with production of 2.06 million tones and productivity of 15.1 MT/ ha, contributing 11% to the total onion production of the country (Anon., 2015) [1]. Purple blotch disease of onion is a serious menace in majority of the onion-producing countries of the world (Pandotra, 1965) [2]. Purple blotch of onion caused by *Alternaria porri* (Ellis) Cif. is one among the serious fungal diseases that affect onion, causing heavy yield loss ranging from 2.5 to 87.8 per cent (Srivastava *et al.*, 1994) [3]. Purple blotch appears on leaves and seed stalk of onion and cause serious damage throughout the onion producing area of the country. Due to this, onion production is reduced drastically which is having adverse effect the exports and also results in price hike within the country.

### Materials and Methods

For purple blotch, FYM based formulations of different strains of *Trichoderma* were applied as soil treatment @ 5q /ha. After the appearance of initial symptoms of purple blotch, foliar spray of different strains was applied at 15 days interval. Total three sprays were given. Disease severity was recorded on 0-5 scale (Sharma, 1986) [3] and further per cent disease index calculated using following formula.

$$\text{PDI} = \frac{\text{Total sum of numerical ratings}}{\text{Number of observations} \times \text{Maximum disease rating}} \times 100$$

The details of 0-5 scale were as follows

- 0 - No disease symptom
- 1 - A few spots towards tip covering 10 percent leaf area.
- 2 - Several purplish brown patches covering up to 20 percent of leaf area.
- 3 - Several patches with paler outer zone covering up to 40 percent leaf area.
- 4 - Leaf streaks covering up to 75 percent leaf area or breaking of the leaves from center
- 5 - Complete drying of the leaves or breaking of leaves from center.

**Correspondence**  
Shweta Mishra  
Department of Plant Pathology  
Indira Gandhi Agriculture  
University, Raipur,  
Chhattisgarh, India

At harvest, five plants were selected randomly from each plot to record plant height weight of bulb.

### Statistical analysis

The data recorded were subjected to statistical analysis. The differences obtained due to different treatments were tested for their significance at 5 per cent using standard procedure as described by Gomez and Gomez (1983).

For purple blotch in onion all strains of *Trichoderma* were to be effective not only in promoting plant growth but also found effective for the control of purple blotch of onion. However, strain number T18 (*Trichoderma viride*) was found to be most effective strain in controlling purple blotch of onion whereas two strains number T3, T5 *Trichoderma harzianum* were significantly more effective and producing for higher bulb yield of onion per plant.

### Result and Discussion

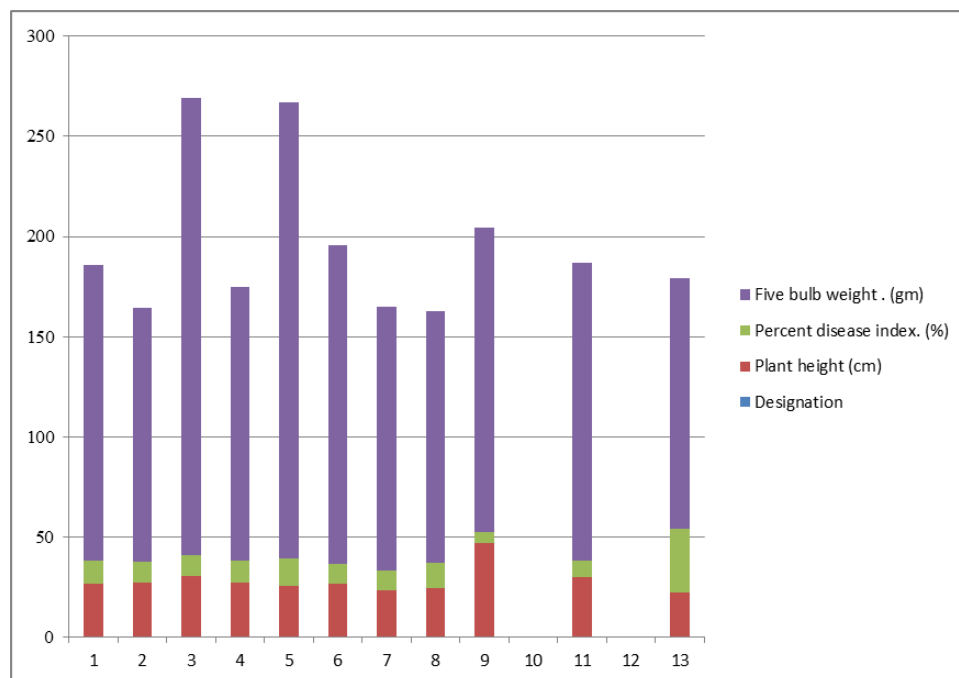
Experiment reveal that all isolates of *Trichoderma viride* / *Trichoderma harzianum* were significantly superior over control (22.06cm) for increasing plant height, weight of bulb / five plant, and suppressing disease severity over control in increasing plant height and controlling purple blotch plant

height was significantly higher in *Trichoderma viride* strain number T 18 (47.02cm) over other strains, whereas significantly least plant height was observed in *Trichoderma harzianum* strain number T 7 (23cm). Moreover T7 strain was significantly at par with control there was significantly reduction in percent disease index of purple blotch recorded from different plots treated with different *Trichoderma* strains (5.10) over control however strain number T18 *Trichoderma viride* was found to be highly significantly in reducing disease severity (5.10) and was significantly superior over other strains T28, T6, T7, T5 similarly weight of bulb /five plants was significantly higher in different strains over control however strain T3,T5 were significantly more effective over other strains in producing higher bulb weight/five plants.

Present study therefore indicates that different strains of *Trichoderma* have potential to promote plant growth reflected in terms of significantly higher pl. height and higher bulb weight /five plant similarly all strains have also potential to suppress disease severity of purple blotch over control amongst all strains of *Trichoderma*, *Trichoderma viride* strain number T 18 and T. harzianum T28 showed overall best performance in promoting plant height increasing bulb weight and suppressing disease severity.

**Table 1:** Disease controlling potential of indigenous strains of *Trichoderma harzianum* / *Trichoderma viride* as soil treatment and as foliar application against purple blotch of onion.

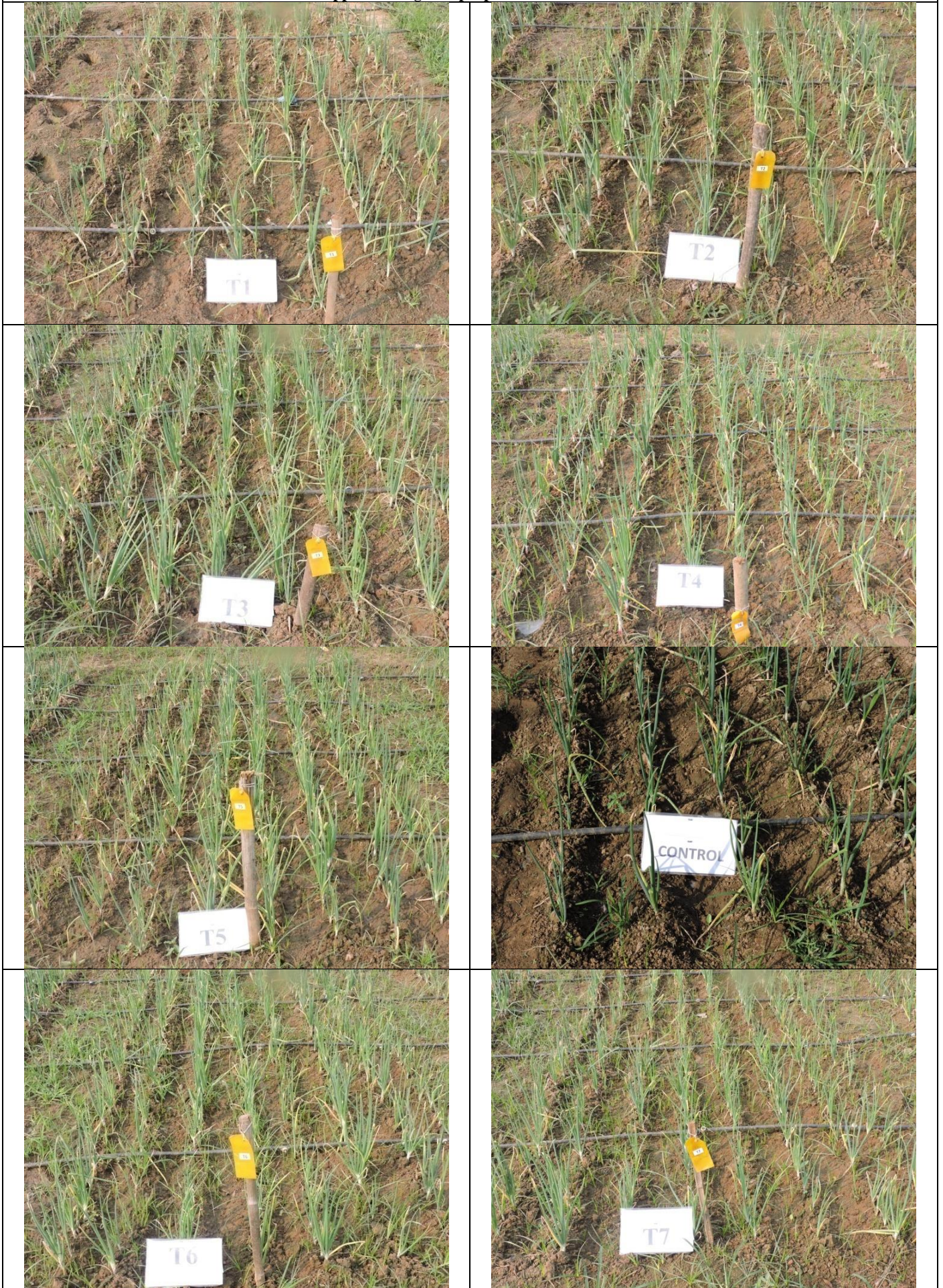
<i>Trichoderma</i> strains	Designation	Plant height (cm)	Percent disease index. (%)	Five bulb weight. (gm)
<i>Trichoderma harzianum</i>	(T 1)	26.80	11.56	147.50
<i>Trichoderma harzianum</i>	(T 2)	27.00	10.62	127.00
<i>Trichoderma harzianum</i>	(T 3)	30.16	10.74	228.50
<i>Trichoderma harzianum</i>	(T 4)	27.30	10.73	136.50
<i>Trichoderma harzianum</i>	(T 5)	25.65	13.48	228.00
<i>Trichoderma harzianum</i>	(T 6)	26.80	9.58	159.00
<i>Trichoderma harzianum</i>	(T 7)	23.09	9.83	132.00
<i>Trichoderma harzianum</i>	(T 8)	24.28	12.56	126.00
<i>Trichoderma viride</i>	(T 18)	47.02	5.10	152.50
<i>Trichoderma harzianum</i>	(T 28)	29.97	8.27	148.50
Control		22.06	32.13	125.00
S E m ( $\pm$ )		0.78	0.59	0.80
CD 5%		2.31	1.76	2.40



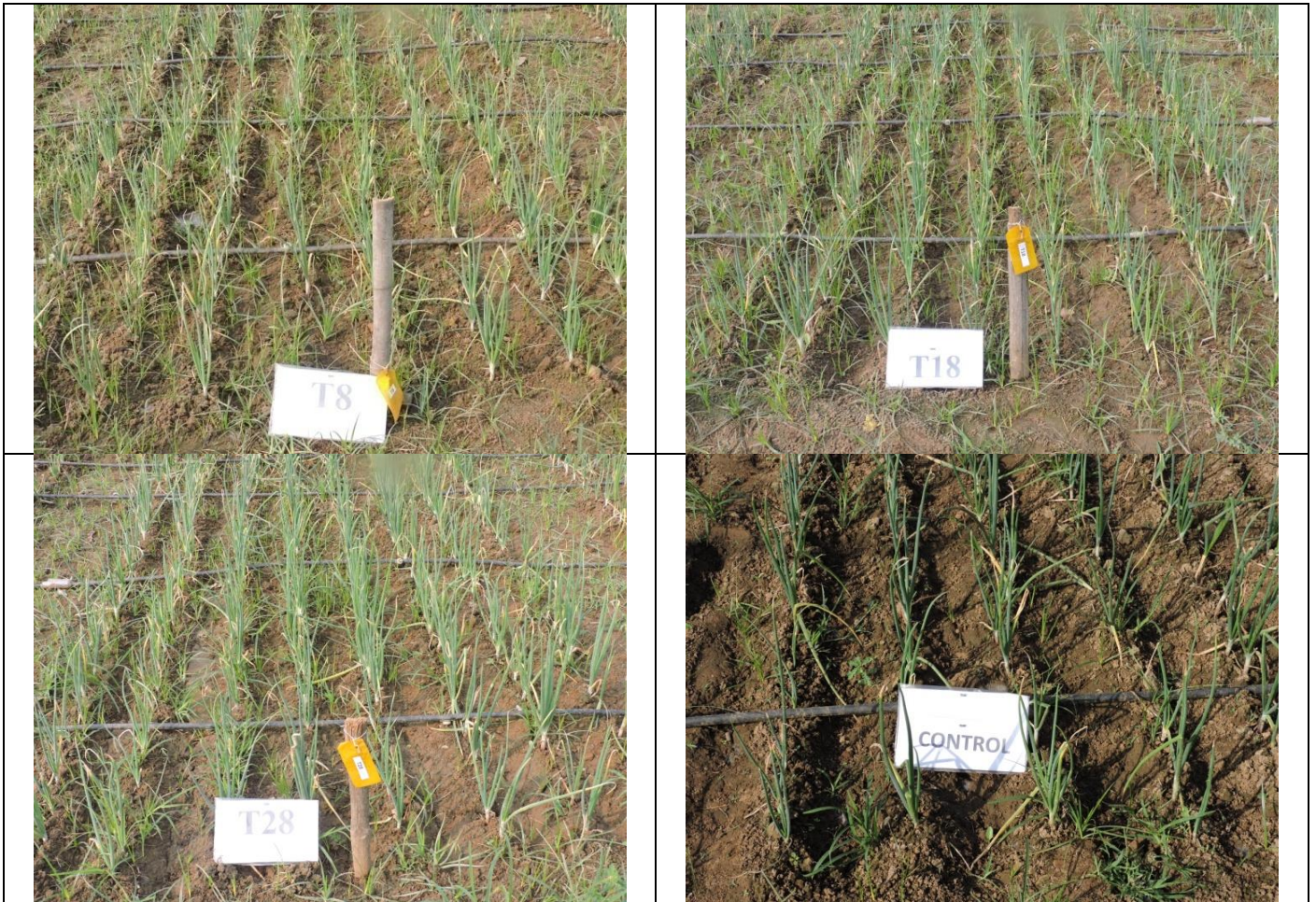
**Fig 1:** Disease controlling potential of indigenous strains of *Trichoderma harzianum* / *Trichoderma viride* as soil treatment and as foliar application against purple blotch of onion.



**Disease controlling potential of indigenous strains of *Trichoderma harzianum* / *Trichoderma viride* as soil treatment and as foliar application against purple blotch of onion.**







**Fig 1:** Disease controlling potential of indigenous strains of *Trichoderma harzianum* / *Trichoderma viride* as soil treatment and as foliar application against purple blotch of onion.

### References

1. Bandyopadhyay S, Sharma ND and Dutta S. Screening of potential *Trichoderma* strain against major root pathogens. Annual of plant protection Sciences. 2003; 11(1):163.
2. Kwanchai Gomez and Arturo Gomez. Statistical procedure for agricultural research. IRRRI book 978-0-471-87092-0, 2001.
3. Sharma SR. Effect of fungicidal on purple blotch and bulb yield of onion. Indian Phytopathology. 1986; 39:78-82.