



E-ISSN: 2278-4136  
 P-ISSN: 2349-8234  
 JPP 2018; 7(3): 1282-1283  
 Received: 11-03-2018  
 Accepted: 15-04-2018

**Divya Bharathi AR**  
 Department of Plant Pathology  
 University of Agricultural and  
 Horticultural Sciences, Shimoga,  
 Karnataka, India

**Narayanaswamy H**  
 Department of Plant Pathology  
 University of Agricultural and  
 Horticultural Sciences, Shimoga,  
 Karnataka, India

## Integrated management of stem rot of tuberose (*Polianthes tuberosa* L.) caused by *Sclerotium rolfsii* (Sacc.)

**Divya Bharathi AR and Narayanaswamy H**

### Abstract

Tuberose is an ornamental flower crop of commercial importance. The crop suffers from many fungal diseases, stem rot caused by *Sclerotium rolfsii* is destructive soil borne disease which takes heavy toll on the crop. In this study, Treatment combinations viz., *Trichoderma viride* + Press mud + Carbendazim recorded a lesser incidence (10.66%), among fungicides the treatments Hexaconazole @ 0.1% recorded minimum disease incidence of 19.33 per cent. Soil drenching with *Trichoderma viride* alone recorded lower disease incidence (28.00%). Among organic amendments, Neem cake showed minimum disease incidence (32.66 %) followed by Press mud (33.33 %) which are on par with each other.

**Keywords:** *Sclerotium rolfsii*, tuberose, disease management

### Introduction

Tuberose (*Polianthes tuberosa* L.) is one of the most important bulbous ornamental crops of tropical and subtropical areas. It is commercially cultivated for cut and loose flower trade and also for the extraction of highly valued natural flower oil. Among the several diseases affecting the crop, stem rot caused by *Sclerotium rolfsii* is one of the most serious problems in tuberose growing areas of Karnataka. The fungus is a polyphagous, ubiquitous and has an extensive host range. The disease results in uneven crop stand, loss of plant population and subsequently yield, in case of severe attack no flowering shoots are obtained Das (1961) [1]. The commercial cultivation and production of this flowering plant has been hampered due to the occurrence of stem rot. Hence, it is necessary to evaluate bioagents, organic amendments and fungicides under field condition to formulate integrated disease management strategies for management of stem rot of tuberose.

### Material and Methods

A field trial was conducted at naturally infested farmer's field at Harnalli village of Shivamogga district, Karnataka. The experiment was laid out as randomized block design with five set of treatments, all the treatments were replicated thrice. Per cent disease incidence was calculated by using the formula given by Maiti and Sen, (1979) [2]. Observations on disease incidence and yield parameters were recorded, all the data were subjected to statistical analysis as per the procedure given by Panse and Sukhatme (1985) [3]. The details of the treatments were as given below.

$$\text{Per cent disease incidence} = \frac{\text{Number of plants infected}}{\text{Total number of plants examined}} \times 100$$

- T<sub>1</sub>= *Trichoderma viride* 10g/l (dip+ drench)  
 T<sub>2</sub>= Neem cake alone 500 g/m<sup>2</sup>  
 T<sub>3</sub>= Press mud alone 500 g/m<sup>2</sup>  
 T<sub>4</sub>= *T. viride* 10g/l + neem cake 500g/m<sup>2</sup> + Carbendazim 0.1%  
 T<sub>5</sub>= *T. viride* 10g/l + press mud 500g/m<sup>2</sup> + Carbendazim 0.1 %  
 T<sub>6</sub>= Carbendazim @ 0.1% (dip+ drench)  
 T<sub>7</sub>= Captan @ 0.2% (dip+ drench)  
 T<sub>8</sub>= Vitavax power @ 0.1% (dip+ drench)  
 T<sub>9</sub>= Hexaconazole @ 0.1% (dip+ drench)  
 T<sub>10</sub>= Untreated check

**Correspondence**  
**Divya Bharathi AR**  
 Department of Plant Pathology  
 University of Agricultural and  
 Horticultural Sciences, Shimoga,  
 Karnataka, India

## Results and Discussion

The experimental results presented in Table 1 revealed that, the per cent mean incidence of stem rot differed significantly among the treatments due to organic amendments, fungicides, bioagent and their combinations.

**Table 1:** Effect of different fungicides, organic amendments and bioagent on incidence of stem rot of tuberose

Treatments	% Disease incidence	% Reduction over control
T1 - <i>T. viride</i> @ 10g/l	28.00(31.91)*	70.42
T2 - Neem cake 500g/m <sup>2</sup>	32.66(34.85)	65.49
T3 - Press mud 500 g/m <sup>2</sup>	33.33(35.25)	64.78
T4 - <i>T. viride</i> +Neem cake +Carbendazim0.1%	12.00(20.09)	87.32
T5- <i>T. viride</i> + Press mud + Carbendazim	10.66(18.98)	88.73
T6- Carbendazim @ 0.1%	25.33(30.20)	73.24
T7- Captan @ 0.2%	26.66(31.07)	71.83
T8- Vitavax power @ 0.1%	21.33(27.48)	77.46
T9- Hexaconazole @ 0.1%	19.33(26.03)	79.57
T10- Control	89.33(71.01)	—
S.Em±	1.24	
CD at 5%	3.70	

\*Figures in parenthesis are arc sine transformed values

Among fungicides the treatments Hexaconazole @ 0.1%, Vitavax power @ 0.1% and Carbendazim @ 0.1% were on par with each other but significantly superior over untreated check. Least incidence was recorded in Hexaconazole @ 0.1% (19.33%), where as highest disease incidence recorded in Captan @ 0.2% (26.66%), triazole fungicides interfere with the ergosterol biosynthesis of the fungus the results are in

agreement with Vanitha and Suresh (2002) [4]. Soil drenching with *Trichoderma viride* alone recorded lower disease incidence (28.00%) compared to untreated check (94.66%) Similar findings were also reported by Khosla and Gupta (2005) [5]. Among organic amendments, Neem cake showed 32.66 % as against Press mud 33.33 % which are on par with each other.

There was significant reduction in the disease incidence among treatments at different intervals. All the treatments were significantly superior over untreated check. However least per cent disease incidence was recorded in the treatment combination *Trichoderma viride* + Press mud + Carbendazim, while it was on par with *Trichoderma viride* + Neem cake + Carbendazim at 30 days after sowing, 90 days after sowing and at the time of harvest. These two treatments reduced the disease incidence by 88.73% and 87.32% respectively over absolute control. This is followed by treatments with fungicides, bioagent and organic amendments. These results are in agreement with the findings of Ghewande (2003) [6] who reported that, application of karanja or Neem cake in furrow reduced the incidence of stem rot of groundnut caused by *S. rolfisii*.

Flower yield per plant was differed significantly in all the treatments compared to untreated check. Maximum yield per plant was recorded in treatment combination *Trichoderma viride* + Press mud + Carbendazim followed by *T. viride* + Neem cake + Carbendazim, respectively. These results are in agreement with the findings of Gaikwad (1988) [7] and Khosla and Gupta (2005) [8]. Rao *et al.* (2004) [9] who observed increased number of florets/spike, spike/plot and floral characteristics in bio-agent treated plots (Table 2).

**Table 2:** Effect of different fungicides, organic amendments and bioagent on yield per plant of tuberose

Treatments	Yield per plant (g)			
	90 DAS	120 DAS	At harvest	Yield (Kg/ha)
T1 - <i>T. viride</i> 10g/l	25.12	43.21	63.00	6970.8
T2 - Neem cake 500 g/m <sup>2</sup>	23.16	40.35	61.65	6837.6
T3 - Press mud 500g/m <sup>2</sup>	23.66	42.03	62.78	6926.4
T4 - <i>T. viride</i> 10g/l + Neem cake 500 g/m <sup>2</sup> + Carbendazim @ 0.1%	30.55	48.13	68.88	7636.8
T5- <i>T. viride</i> 10g/l + Press mud 500 g/m <sup>2</sup> + Carbendazim @ 0.1%	31.34	50.04	70.91	7858.8
T6- Carbendazim @ 0.1%	27.78	45.90	65.55	7237.2
T7- Captan @ 0.2%	26.94	44.56	64.65	7148.4
T8- Vitavax power @ 0.1%	28.03	47.25	66.73	7459.2
T9- Hexaconazole @ 0.1%	28.90	47.72	67.35	8391.6
T10- Control	10.94	20.12	30.07	3330.0
S.Em±	0.32	0.50	0.64	
CD at 5%	0.96	1.50	1.91	

## References

- Das AC. Diseases of rajanigandha (*Polianthes tuberosa* L.) and larkspur (*Delphinium ajacis* L.) caused by *Sclerotium rolfisii* Sacc. Sci Cul. 1961; 27:543-550.
- Maiti S, Sen C. Fungal diseases of betelvine, PANS, 1979; 25:150-157.
- Panse VG, Sukathme PV. Statistically methods for Agricultural workers, ICAR Publications, New Delhi, 1985; 145-155.
- Vanitha S, Suresh M. Management of collar rot of brinjal (*Sclerotium rolfisii*) by non-chemical methods. South Indian Horti. 2002; 50(4-6):602-606.
- Khosla K, Gupta AK. Crown and root rot of Chinese gooseberry caused by *Sclerotium rolfisii* and its management. J. Mycol. Pl. Pathol. 2005; 35:250-252.
- Ghewande MP, Savaliya S, Hingrajia HM, Padavi RD. Management of stem rot (*S. rolfisii* Sacc.) through organic soil amendments in groundnut. Proc. Of National Symposium on Recent Advances in Management of Plant Diseases, Technology Development and Application, 20-21 Dec. Pune, Maharashtra, India, 2003; 9-10.
- Gaikwad VN. Studies on stem blight of tuberose initiated by *S. rolfisii* Sacc. and its biocontrol. M.Sc (Agri) Thesis, K. K. V., Dapoli, Maharashtra, India, 1998; 43.
- Rao MS, Shylaja M, Reddy PP. Bio-management of *Meloidogyne incognita* on tuberose using a formulation of *Pochonia chlamydosporia*. Nematol. Medit. 2004; 32(2):165-167.