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**Ravindra Pratap Singh Jetawat**  
Department of Plant Pathology,  
Rajasthan College of Agriculture  
(MPUAT), Udaipur, Rajasthan,  
India

**RS Ratnoo**

Department of Plant Pathology,  
Rajasthan College of Agriculture  
(MPUAT), Udaipur, Rajasthan,  
India

**Hanuman Singh**

Department of Plant Pathology,  
Rajasthan College of Agriculture  
(MPUAT), Udaipur, Rajasthan,  
India

**Chandra Veer**

Department of Plant Pathology,  
Rajasthan College of Agriculture  
(MPUAT), Udaipur, Rajasthan,  
India

**Correspondence**

**Ravindra Pratap Singh Jetawat**  
Department of Plant Pathology,  
Rajasthan College of Agriculture  
(MPUAT), Udaipur, Rajasthan,  
India

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### Effect of fungicides against dry root rot of chilli caused by *Rhizoctonia solani*

**Ravindra Pratap Singh Jetawat, RS Ratnoo, Hanuman Singh and Chandra Veer**

**Abstract**

The fungal pathogens were isolated, purified and identified as *Rhizoctonia solani* and their pathogenicity was confirmed on dry root rot of chilli. All fungicides inhibited mycelial growth of the fungus over when controlled at two concentrations (0.1 and 0.2% *a.i.*) while testing in the laboratory. The fungicides, SAAF, Bavistin and Tebuconazole were found most effective to inhibit the growth of the pathogen at 0.1% concentration also 0.2% concentration SAAF, Bavistin and Tebuconazole were found most effective.

**Keywords:** *Rhizoctonia solani*, pathogenicity, SAAF, Bavistin

**Introduction**

Chilli is an important vegetable and spice horticulture crop and belongs to the family solanaceae. *Capsicum annum* L. and *Capsicum frutescens* L. are two important species cultivated in several tropical and subtropical climates both for green and ripen dry fruits. India is the largest producer of red chilli followed by China, Mexico and Pakistan. In India area under chilli cultivation is around 7.67 lac hectares with annual production of 12.30 lac tones (Anonymous, 2013) <sup>[1, 2]</sup>. The major chilli producing states in India are Andhra Pradesh, Orissa, Maharashtra, West Bengal, Karnataka, Rajasthan and Tamil Nadu (Subbiah and Jaykumar, 2009) <sup>[3]</sup>.

In Rajasthan, chilli is cultivated in 15,505 h area with production of 15,987 MT. The Major chilli growing districts of Rajasthan are Jodhpur, Sawaimadhapur, Ajmer, Tonk, Pali, and Nagour (Anonymous, 2013) <sup>[1, 2]</sup>. Dry root rot disease of *C. frutescens* is of serious concern in Udaipur district, where *Capsicum frutescens* is widely cultivated in all season and this disease has been observed to occur every year in most of the fields. *Rhizoctonia solani* a noxious soil borne pathogen that can survive through its sclerotia for several year in the soil. Since, the pathogen remains in the soil for long time and the crop is vulnerable to its attack during all the stages of crop growth.

**Materials and Methods****Isolation and Purification of the pathogen**

For isolation of the pathogen, the diseased roots were thoroughly washed first in the running tap water and finally with sterilized water. Then air dried diseased roots were cut in to 0.5 cm long bits. Bits of infected roots were surface sterilized by dipping in 0.1% mercuric chloride solution for 2 minutes followed by three washings in sterilized distilled water and aseptically plated on Potato Dextrose Agar (PDA) medium and the plates were incubated at  $28 \pm 2$  °C and examined daily for any fungal growth. After five days fungal growth coming from these diseased roots pieces was aseptically picked up on fresh PDA plates. The greyish black culture so obtained, was further purified by employing hyphal tip method.

**Efficiency of Fungicides**

Relative efficacies of different fungicides were evaluated by using poison food technique. Two concentration *i.e.* 0.1 and 0.2%. Desired quantity of each fungicide was added separately to sterilized medium, mixed thoroughly and poured in sterilized Petri plates and allowed to solidify. Each plate was inoculated with 5 mm disc of fungal culture and incubated at  $28 \pm 1$  °C. The linear growth after 7 days was recorded and per cent inhibition was calculated.

$$\text{Per cent inhibition} = \frac{(C-T) \times 100}{C}$$

Where,

C = Diameter of the colony in control.

T = Diameter of colony in treatment.

A check was also maintained where medium was not supplemented with any fungicide.

### Results and Discussion

All the fungicides inhibited mycelial growth of *R. solani* at concentrations (0.1 and 0.2%) as compared to control. However, complete inhibition of mycelial growth was recorded with SAAF, Bavistin, Tebuconazole (0.00) mm growth at 0.1% followed by propiconazole (18.00) mm and Hexaconazole (20.00) mm growth. Further, at 0.2%

concentration complete inhibition of mycelial growth was recorded with SAAF, Bavistin, Tebuconazole (0.00) mm growth. Followed by propiconazole (10.00) mm and Hexaconazole (12.00) mm growth

Of the fungicides tested for inhibition growth of the Pathogen on *R. solani* at 0.1 and 0.2 per cent concentrations maximum growth inhibition was caused by SAAF, Bavistin and Tebuconazole, followed by Propiconazole and Hexaconazole. Gupta *et al.*, (1999) [4], Vadhera *et al.*, (1997) [6], Mishra and Sinha (1999) studied that the fungicidal management of root rot (*R. solani*) of French bean under greenhouse condition and reported that seed treatment with Carbendazim (0.2%) was highly effective in reducing pre-emergence root rot and damping-off, and Mancozeb (0.1%), Thiophanate-methyl (0.2%), Chlorothalonil (0.2%) and Tebuconazole (0.1%) were highly effective in reducing post-emergence root rot.

Table 1

S. No.	Fungicides	Mycelial growth (mm)	
		Concentration 0.1%	Concentration 0.2%
1 (T <sub>1</sub> )	Hexaconazole	20.0	12.0
2 (T <sub>2</sub> )	Bavistin	0.0	0.0
3 (T <sub>3</sub> )	Tebuconazole	0.0	0.0
4 (T <sub>4</sub> )	Propiconazole	18.0	10.0
5 (T <sub>5</sub> )	SAAF	0.0	0.00
	Control	90.0	90.0
	SEm±	0.2408	0.3807
	CD at 5%	0.6986	1.1046
	CV%	18.10	18.10

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