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Effect of fungicides on soft rot of Turmeric

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Turmeric is infected by *Phytium myiotylum* Drch. causing soft rot. In order to control soft rot, the different fungicides used were Mancozeb, Thiram and Carbendazim. The concentration used for the treatment was from 0.25 to 2.0% by using slice method. Among these fungicides, thiram shows highest sensitivity by inhibiting the maximum growth of the pathogen. Carbendazim shows intermediate inhibition and mancozeb least inhibition of the pathogen. This clearly indicates that these fungicides can be used to control soft rot of turmeric caused by *Pthytium myriotylum* Drch.

Key words : Turmeric, Soft rot, Fungicides.

INTRODUCTION

Haldi or turmeric (*Curcuma longa* L.) is one of the most important condiment and colouring agents of the world. Turmeric is also a commodity of auspicious religious ceremonies in India. It is being used essentially in curry powder and is a common food preservative. Turmeric is grown in the states of Tamil Nadu, Kerala, Assam, Andhra Pradesh, West Bengal and Maharashtra. 'India produced six lakh metric tones of turmeric rhizomes on 1.4 lakh hectares in 1997 - 98 (Anonymous, 1999). Maharashtra produced 38,202 tonnes of turmeric in 6,191 ha. with the productivity of 6.17 tonnes per ha. (Anonymous, 2000).

Turmeric plays a very important role in agro-based industries. Domestically it is an important condiment, colouring and flavouring agent used in prepared dishes. It is important meat dressing materials and used in salad. Additionally, it has pharmaceutical value too. It's colour properties are due to crystalline pigment "curcumin". The dried rhizome has 0.5 - 0.6% curcumin and 5 - 6% volatile oil (Mogle, 1999).

In the Marathwada region, a step rise in the coverage under turmeric crop is evident and with the enhanced irrigation facilities due to Puma and Jayakwadi Project more area is likely to be occupied by this cash crop.

Therefore, the present investigation has been carried out on the fungal rots of turmeric caused by *Pythium myriotylum Dreschi* and their suitable control measures which possibly would ensure enhanced yield and also improve planting values of the mother sets or finger sets.

MATERIALS AND METHODS

In vivo evaluation of fungicides :

For evaluation of different fungicides, cut rhizome method was followed. Each fungicides was tested at different levels of concentrations *i.e.* 0.25, 0.50, 0.75, 1.0, 1.25, 1.50, 1.75 and 2.0%. The cut rhizome of size 2 cm in diameter and placed on blotter paper. A 5mm moculum disc of the pathogen (*Pythium myriotylum*) was inoculated in the centre of each cut rhizomes. The treatment was given in three replications. The observations were recorded after 7 days of incubation at room temperature ($28^0C \pm 1^0C$).

RESULTS AND DISCUSSION

To ascertain the sensitive conc. of fungicides in controlling rot rhizomes of turmeric were subjected to the different conc. of the fungicides.

From the data presented in Table 1, showed that as the conc. of fungicide increased there wass decline in the growth of pathogen. All the fungicidal conc. reduced

Table 1 : Effect of various conc. of mancozeb on rhizome rot of turmeric caused by *Pythium myriotylum*

Sr. No.	Conc. of fungicides (%)	Linear growth (mm)
1.	0.25	13
2.	0.50	12.5
3.	0.75	12.1
4.	1.0	11
5.	1.25	9
6.	1.50	8.7
7.	1.75	8.3
8.	2	8
9.	Control	18

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the growth of the pathogen significantly over control. The growth of pathogen was 18 mm in control while in different conc. of fungicide it ranged from 8 mm to 13 mm. The fungicidal conc. from 0.25% to 2.0% though at par with each other significantly reduced the growth of the pathogen over the fungicidal conc. ranging from 0.25% to 1.0%.

The rhizome rot induced by *Pythium myriotylum* were subjected after inoculation of rhizome to the various conc. of the effective fungicides. The data are presented in Table 2. It is evident from the data that all the fungicidal conc. from 0.25% to 2.0% significantly reduced the growth of the pathogen over control. The Thiram treatment showed desired in linear growth of the pathogen with the increase in conc. of the fungicides.

Table 2 : Effect of various conc. of thiram on rhizome rot of turmeric caused by *Phthium myriotylum*

Sr. No.	Conc. of fungicides (%)	Linear growth (mm)
1.	0.25	14
2.	0.50	13.1
3.	0.75	12.5
4.	1.0	11
5.	1.25	9
6.	1.50	8.5
7.	1.75	7.1
8.	2.0	5.5
9.	Control	18

The data presented in Table 3 show that all the fungicidal conc. used *i.e.* 0.25% to 2.0% significantly controlled growth of the pathogen. The highest conc. of Carbendazim induced in the experimentation *viz.* 2.0% gave lower growth of the pathogen *i.e.* 6 mm. The growth of pathogen was 11.5 mm in 0.50% and 10mm in 1.0% concentration of Carbendazium.

In the experiment on the fungicide by "Cut rhizome method" it was revealed that all the fungicides differed significantly in respect of toxicity to fungal mycelium. Thiram expressed significantly highest toxicity to fungal mycelium. Thiram was followed by carbendazim and mancozeb. Significantly less inhibition of vegetative mycelium was demonstrated by mancozeb over rest of the fungicides. Shankarrah *et al.* (1991) also worked on carbendazium and found that the disease was controlled when it applied at the first appearance of symptoms. Anandam *et al.* (1996) also reported that *in vitro* studies it was effective against the growth of fungus at 1000 ppm.

Table 3 : Effect of various conc. of carbendazim on rhizome rot of turmeric caused by *Pythium myriotylum*

Sr. No.	Conc. of fungicides (%)	Linear growth (mm)
1.	0.25	12
2.	0.50	11.5
3.	0.75	11.3
4.	1.0	10
5.	1.25	9.3
6.	1.50	8
7.	1.75	7.5
8.	2.0	6
9.	Control	1

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