Madras Agric. J., 82(3): 199-201 March, 1995
https://doi.org/10.29321/MAJ.10.A00714

BIOLOGICAL CONTROL OF FUSARIUM WILT OF EGG PLANT

J.SHEELA, K.SIVAPRAKASAM and K.SEETHARAMAN
Department of Plant Pathology, Agricultural College and Research Institute,
Tamil Nadu Agricultural University, Madurai 625 104

ABSTRACT

Trichoderma hamatum (isolate 1) when multiplied in FYM and applied to soil recorded the least incidence (33.34%) of wilt disease caused by *Fusarium solani* followed by *T.viride* (isolate 1) (38.89%) as compared to control (73.89%). The antagonists when multiplied in cocount coirpith compost, *T.hamatum* (isolate 1) recorded the least incidence of wilt (37.78%) followed by *T.viride* (isolate 1) (45.56%) as compared to control (73.89%).

KEY WORDS : Egg plant, Fusarium Wilt, *Trichoderma*, FYM, Coirpith,

Wilt disease caused by *Fusarium solani* in brinjal is one of the major diseases causing severe damage. Management of soil borne pathogens by using biocontrol agents like *Trichoderma* spp is an effective method. The present study reports the efficacy of biocontrol agents on the management of Fusarium wilt *(F.solani)* of egg plant.

MATERIALS AND METHODS

The fungal antagonists *viz., Trichoderma hamatum* (isolate 1, I.A.R.I., New Delhi), *T.viride* (isolate 1,I.A.R.I., New Delhi) and *T.harzianum* (isolate,1, I.A.R.I., New Delhi) obtained from Centre for Plant Protection Studies, Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore, and maintained in the Department of Plant Pathology, Agricultural College and Research Institute, Madurai, were multiplied in polypropylene bags containing 100 g of well powdered farmyard manure (FYM). The moisture content was adjusted to 50 per cent by adding requisite quantity of water. The bags were heat sealed and autoclaved for 2 h at 1.4 kg/cm^2 pressure for two successive days. Each bag containing the substrate was inoculated with a 9 mm dia culture disc of 7 days old PDA culture of the respective *Trichoderma* species. After 15 days, the substrates containing the antagonists *viz., T.hamatum, T.viride* and *T.harzianum* were separately added to FYM, decomposed coirpith and undecomposed coirpith at the rate of 100 g per 20 kg of substrate. The commercial product of *T.viride* was also applied at the rate of 100 g per 20 kg of substrate. The inoculated substrates were heaped

Table 1. Efficacy of antagonists mass multiplied in FYM against egg plant wilt disease (artificial inoculation).

Treatments	Wilt incidence (%)*			Mean
	15 DAT	30 DAT	45 DAT	
T. hamatum (isolate 1)	21.67 (27.69)	35.00 (36.24)	43.34 (41.14)	33.34 (35.02)
T. viride (isolate 1)	23.34 (28.81)	36.67 (37.24)	56.67 (48.83)	38.89 (38.29)
T. harzianum (isolate 1)	26.67 (31.05)	38.33 (38.23)	63.34 (52.74)	42.78 (40.67)
Commercial product of *T. viride*	25.00 (29.93)	36.67 (37.24)	58.33 (49.80)	40.00 (38.99)
FYM alone	36.67 (37.24)	48.34 (44.01)	71.67 (57.84)	52.23 (46.36)
Control	58.33 (49.81)	75.00 (60.11)	88.33 (70.49)	73.89 (60.14)
Mean	31.95 (34.09)	45.00 (42.18)	63.61 (53.47)	
	CD (P=0.05)			
Treatments	2.27			
Days	1.60			
Treatments x Days	3.93			

* Mean of four replications Values in parentheses are transformed values DAT : Days after transplanting.

Table 2. Efficacy of antagonists mass multiplied in decomposed coirpith against egg plant wilt disease (artificial inoculation).

Treatments	Wilt incidence (%)*			Mean
	15 DAT	30 DAT	45 DAT	
T. hamatum (isolate 1)	25.00	38.33	50.00	37.78
	(29.93)	(38.23)	(44.97)	(37.71)
T. viride (isolate 1)	30.00	43.34	63.34	45.56
	(33.15)	(41.14)	(52.74)	(42.34)
T. harzianum (isolate 1)	33.33	45.00	70.00	49.44
	(35.24)	(42.10)	(56.80)	(44.71)
Commercial product of *T. viride*	30.00	43.34	65.00	46.11
	(33.15)	(41.14)	(53.72)	(42.67)
Coir pith (decomposed)	45.00	56.67	75.00	58.89
	(42.10)	(48.83)	(60.11)	(50.35)
Control	58.33	75.00	88.33	73.89
	(49.81)	(60.11)	(70.49)	(60.14)
Mean	36.94	50.28	68.61	
	(37.23)	(45.26)	(56.47)	
	CD (P=0.05)			
Treatments	2.24			
Days	1.59			
Treatments x Days	3.88			

* Mean of four replications Values in parentheses are transformed values DAT : Days after transplanting.

and the moisture content was maintained at 50 per cent. The heaps were covered with polythene sheets and left for one month.

Pots were filled with the uniform soil mixture to which the pathogenic inoculum (*F.solani*) grown in sand maize medium was added at 20 per cent (w/w). The antagonists multiplied on FYM, decomposed coirpith and undecomposed coirpith were applied at the rate of five g per kg of pot culture soil. Egg plant seedlings (40-45- day old) were transplanted at the rate three per pot. Five pots were considered as one replication. Three replications were maintained for each treatment. The pots were arranged in a randomised block design. The observations on the wilt disease incidence were recorded at fortnightly intervals commencing from 15 days after transplanting.

RESULTS AND DISCUSSION

The antagonists multiplied in different substrates significantly differ in their relative effect on the wilt incidence. Among the substrates used for mass multiplication, the antagonists multiplied in FYM was effective in controlling the wilt desease followed by those multiplied in decomposed coirpith. *T.hamatum* multiplied in FYM when applied to soil recorded the least incidence of the wilt disease followed by *T.viride*. The commercial product *T.viride* was next effective treatment as compared to control (Table 1). Among the antogonists multiplied in decomposed coirpith *T.hamatum* recorded the least incidence of wilt followed by *T.viride* as compared to control (Table 2). *T.hamatum* multiplied in undecomposed coirpith exhibited the least disease incidence as compared to control (Table 3).

The introduction of antagonist through appropriate food base is suggested for its successful establishment. Wright (1956) emphsised that the production of antibiotics by antagonists was influenced by the food base on which they were grown. FYM has been reported to be an effective substrate for the growth and multiplication of *T.harzianum* and *T.viride* (Kousalya and Jeyarajan, 1988). The ability of *T.viride* to hasten the process of composting of organic wastes had already been demonstrated (Gaur *et al.*, 1984). The antagonistic fungi utilised the cellulose and chitin present in the organic substrates by elaborating eneymes like β-1,3 glucanases and chitinases (Hadar *et al.*, 1979). Nelson *et al.*, (1983) reported that the proliferation of the antagonist was favoured only by mature compost. This corroborated with fact that the FYM and decomposed coirpith used in the present study were in the advanced stages of composting

Table 3. Efficacy of antagonists mass multiplied in undecomposed coirpith against egg plant wilt disease (artificial inoculation).

Treatments	Wilt incidence (%)			Mean
	15 DAT	30 DAT	45 DAT	
T. hamatum (isolate 1)	26.67 (31.05)	40.00 (39.23)	56.67 (48.81)	41.11 (39.70)
T. viride (isolate 1)	31.67 (34.19)	46.67 (43.80)	70.00 (56.80)	49.45 (44.93)
T. harzianum (isolate 1)	66.67 (37.24)	51.67 (45.93)	75.00 (60.11)	54.55 (47.76)
Commercial product of *T. viride*	31.67 (34.19)	50.00 (44.97)	70.00 (56.80)	50.56 (45.32)
Coirpith (undecomposed)	48.34 (44.01)	63.34 (52.74)	78.33 (62.30)	63.34 (53.02)
Control	58.33 (49.81)	75.00 (60.11)	88.33 (70.49)	73.89 (60.14)
Mean	38.89 (38.42)	54.45 (47.80)	73.06 (59.22)	
	CD (P=0.05)			
Treatments	2.23			
Days	1.58			
Treatments x Days	3.86			

* Mean of four replications Values in parentheses are transformed values. DAT : Days after transplanting.

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Madras Agric. J., 82(3): 201-204 March, 1995

INFLUENCE OF LIGHT AND REGULATORS ON SENESCENCE RELATED CHANGES IN DETACHED SOYBEAN LEAVES *Glycine max*

K.ANNAMALAINATHAN, G.PATHMANBHAN, K.MANIAN, M.NAGARAJAN AND T.R.KARIVARADHARAJU

Department of Crop Physiology, Agricultural College and Research Institute
Tamil Nadu Agricultural University, Coimbatore 641 003

ABSTRACT

The rate of senescence and the soluble protein profile from the detached soybean leaf senescing either in darkness or light was analysed and compared to those of leaves in which senescence was delayed by application of cytokinin, IAA or enhanced through the action of abscisic acid. Senescence of detached leaf in light differed significantly from senescence in darkness. The chlorophyll and protein were lost at a higher rate in darkness than light. Changes observed during incubation in light or darkness appeared to be related to the condition rather than the rate or progress of senescence. Incubation with IAA delayed senescence only moderately as compared to BA. Cytokinins delayed and ABA accelerated the changes in soluble protein profile compared to water.

KEY WORDS : Soybean, Leaves, Senescence, Light, Regulators, Influence