



Management of Wilt of Chickpea

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Abstract:

(*Cicer arietinum* L.) is the most important pulse crop grown all over India in *rabi* season. Wilt caused *Fusarium oxysporum* f. sp. *ciceri* is the most serious disease of chickpea in vidharbha region, which is soil and seed borne. Heavy inoculum in soil and favorable environment condition results in the death of infected plant and therefore total yield loss. In this study, two antagonists, two fungicides were studied against *Fusarium oxysporum* f. sp. *Ciceri* causing chickpea wilt. Field studies found that carboxin + thiram + *T. viride* (2.5 + 6 g / kg seed) gave minimum wilt disease incidence followed by carbendazim + thiram (1 g / kg seed). Among the bioagent *Trichoderma viride* and *Trichoderma harzianum* seed treatment also significant in enhancing less disease incidence as compared to control.

INTRODUCTION:

Chickpea (*Cicer arirtinum* L.) is one of the most important pulse crop comes under leguminosae family. Chickpea is a source of human food and animal feed, it also help in the management of soil fertility, particularly in dry lands and conserve natural resources which are essential for sustainable agriculture. Chickpea crop is associated with various diseases, wilt (*Fusarium oxysporum* f. sp. *ciceri*) root and stem rot (*Rhizoctonia solani*, *Sclerotium rolfsi*), blight (*Ascochyta rabie*). Out of these diseases, *Fusarium* wilt is causing a serious in chickpea production. Soil borne fungal pathogen are major threats to cereals and pulses which are responsible for heavy losses annually, chickpea wilt caused by *Fusarium oxysporum* f. sp. *ciceri* account for 10 - 100 per cent yield losses annually in India depending on varietal susceptibility and agro climatic condition (Chand and Khirbat, 2009). Chickpea wilt result high economic losses, disease is seed and soil borne and persist for long years in soil. Management of disease by single approaches is difficult and uneconomic. Hence adequate attention needs to paid on management of chickpea wilt. Considering the above facts and seriousness of disease the present studies were undertaken to integrate different methods involving use of fungicides and bioagents for management of chickpea wilt

MATERIALS AND METHODS:

The present investigation on "Management of wilt of Chickpea caused by *Fusarium oxysporum* f. sp. *Ciceri*" conducted at Plant Pathology Section, College of Agriculture, Nagpur during 2014-15. The culture of *Fusarium oxysporum* f. sp. *ciceri* is used in the present

investigation was isolated from infected Chickpea field. **Isolation and purification of *Fusarium oxysporum* f. sp. *ciceri*.**

Chickpea plants showing yellowing, drooping of leaves, was collected from *fusarium* wilt sick plot, plant pathology research field, college of Agriculture, Nagpur. Test pathogen was identified as *Fusarium oxysporum* f. sp. *Ciceri* on the basis its microscopic observation. Pathogenicity test was carried on Chaffa 816 in sick pot and Koch's postulates were proved.

Preparation of mass inoculum of *Fusarium oxysporum* f. sp. *Ciceri*.

The sorghum grains were soaked partially for one hour in warm water and then spread on the clean blotting paper for air drying. About 300 g moistened were filled in each 1000 ml flask with 10 ml water and autoclaved for 30 minute at 15 lbs psi pressure. The mycelium bit of pure culture of *Fusarium oxysporum* f. sp. *Ciceri* were inoculated under aseptic condition in those flask containing grains and to facilitate early growth of the fungus. The grains turn whitish due to mycelial growth of the test fungus. These mass inoculums were spread in the experimental sick plot before two weeks of sowing.

Seed Treatments

The bioagents, *Trichoderma viride* and *Trichoderma harzianum* were obtained from Department of plant pathology, College of Agriculture, Nagpur were used for seed treatments. Fungicides treatment was given to seeds. Experiment is carried out in three replication and periodic observations for wilting incidence were recorded. The bioagents and fungicides were evaluated in vivo by Randomized Block design and data were statistically analyze d.

Results and discussion:

Sr. No	Treatments	Wilt incidence (%)			%Wilt reduction over control
		30 DAS	45 DAS	60 DAS	
1	Carboxin + thiram	8.50 *(2.91)	14.33 *(22.24)	23.79 *(29.19)	58.40
2	Cabendazim	7.26 (2.69)	13.10 (21.20)	22.78 (28.50)	60.17
3	Carboxin + thiram + T.viride	5.93 (2.43)	11.86 (20.14)	21.60 (27.69)	62.23
4	Cabendazim + thiram	6.04 (2.45)	12.10 (20.34)	22.10 (28.04)	61.36
5	Trichoderma viride	9.73 (3.11)	15.03 (22.80)	24.11 (29.40)	57.84
6	Trichoderma harzianum	10.86 (3.29)	15.76 (23.39)	25.16 (30.10)	56.01
7	Control	26.23 (5.12)	38.59 (39.40)	57.20 (49.14)	
	F' test	Sig	Sig	Sig	
	S.E. (m) ±	0.07	0.32	0.32	
	C.D. (P= 0.01)	0.25	1.27	1.21	

(*Figures in parenthesis are square root transformed values,

*Figures in parenthesis are sign transformed values)

The data presented in table and reveal that 30, 45 and 60 DAS Wilt incidence recorded in all treatments. In the current study, it was observed that all the treatments were significantly superior over control. The lowest wilt incidence was recorded in (T₃) Carboxin + thiram + *T. viride* (21.60%), followed by (T₄) carbendazim + thiram (22.10%) and (T₂) seed treatment with carbendazim (22.78 %), significantly superior over the control (57.20 %). Among bioagent *T. viride* which control (57.84 %) wilt incidence. These result also in agreement with findings of Nikam *et al.* (2007) also reported seed treatment with carbendazim showed minimum wilt incidence (38.10) over the control. Rajput *et al.* (2010) reported that seed treatment with thiram + carbendazim @ 2 g+ 1 g kg⁻¹ and recorded minimum wilt disease incidence (17.78 %) over the control (33.69 %). Kamdi *et al.* (2012). reported that seed treatment with carbendazim showed minimum wilt disease incidence (26.38%) followed by *Trichoderma viride* (28.19) and showed reduced wilting percent over control (60.01 %), Shabir Rehman *et al.* (2013) reported that seed treatment with carbendazim showed minimum wilt disease incidence over the control.

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