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Short Communication

Effect of seed dressers against root rot of cowpea

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ABSTRACT

Studies were conducted to manage the root rot disease of cowpea through seed treatment with different seed dressers during *kharif* 2009-10, 2010-11 and 2011-12. The minimum root rot disease incidence was recorded in the seed treatment with Cosco @3gm/kg (11.3%) followed by Thiram @ 2gm/kg (12.9%) and Captan @ 2gm/kg (13.4 %). The yield data revealed that the highest grain yield was recorded in seed treatment with Cosco @ 3gm/kg (718 kg/ha) followed by Vitavax @ 2gm/kg (700 kg/ ha), Thiram @ 2gm/kg (698 kg/ha) and Captan @ 2gm/kg (675 kg/ha).

Key words: Rhizoctonia solani, Disease management

Cowpea (*Vigna unguiculata*) is one of the most important leguminous crops throughout the world, among various diseases, root rot caused by *Rhizoctonia solani* Kuhn inflict substantial yield losses. It is a soil borne disease and management of such soil borne pathogens with fungicides cause hazards to the human health and environment. In this context, soil amendment and seed treatments are gaining importance for managing such plant pathogens as another viable alternative to fungicides. Hence, the study was conducted to ascertain efficacy of different fungicides, bio-agent and cow dung against the disease.

The field experiments were conducted at Pulses Research Station, S.D. Agricultural University, Sardarkrushinagar during the cropping season 2009-10, 2010-11 and 2011-12. A most popular cowpea cultivar "GC 4" was sown by drilling method keeping seed rate 15 kg/ha with spacing 45 × 10 cm. Pre-sowing seed treatment was done with carbendazim 50 % WP @ 3 g/kg seeds, mancozeb 75% @ 2gm/kg seeds, combination of carbendazim and mancozeb @ 3gm/kg, thiram 75% WP @ 2 gm/kg, cosco 75% WP @ 3gm/ kg, *Trichoderma harzianum* @ 4gm/kg and cow dung (farmyard manure) @ 20 gm/kg along with untreated control. The experiment was laid out in randomized block design (RBD) with three replications The data collected were recorded for disease incidence and yield and were subjected to statistical analysis following 'Analysis of variance' techniques (Panse and Sukhatme1967). The data recorded on root rot disease incidence (%) and yield.

Data analysis revealed that all the treatments resulted significantly less incidence of root rot over untreated control (25.7%) during all the cropping seasons and as pooled. Seed treatment with cosco @ 3gm/kg resulted in the least mean disease incidence (11.3%) followed by thiram @ 2gm/kg (12.9%) and captan @ 2gm/kg (13.4%).

Seed treatment with vitavax @ 2 gm/kg seed (962 kg/ha) resulted in the highest grain yield during 2009 whereas, during the year 2010 and 2011 the highest yield was recorded in seed treatment with cosco @ 3gm/kg (632 and 637 kg/ha, respectively)). In pooled results, the maximum grain yield was observed in seed treatment with cosco (718 kg/ha) followed by vitavax (700 kg/ha), thiram (698 kg/ha) and captan (675 kg/ha). The present results are supported by the earlier studies (Monga and Grover, 1991).

Table 1 Effect of seed dressers for the control of root rot of cowpea

Sr. No	Treatment	Root rot (% incidence)				Grain yield (kg/ha)			
		2009-10	2010-11	2011-12	Pooled	2009-10	2010-11	2011-12	Pooled
1	Carbendazim 3gm/kg	16.6	17.4	16.4	16.8	890	537	539	655
2	Mancozeb 2gm/kg	20.9	20.3	18.8	20.0	707	497	497	567
3	Sixer 3gm/kg	12.1	14.7	15.0	13.9	914	591	592	699
4	Thiram 2gm/kg	11.3	13.9	13.4	12.9	852	620	622	698
5	Captan 2kg/mg	11.6	14.3	14.3	13.4	822	601	603	675
6	Cosco 3gm/kg	9.7	12.6	11.6	11.3	884	632	637	718
7	Vitavax 2gm/kg	17.1	16.2	15.8	16.4	962	570	569	700
8	*T. harzianum* 4gm/kg	17.9	18.6	17.5	18.0	784	511	517	604
9	Cow dung 20kg/kg	22.9	21.8	20.7	21.8	706	438	474	551
10	Untreated Control	25.7	26.4	25.1	25.7	677	407	399	494
	S. Em. ±	1.1	0.9	0.6	0.5	61.6	34.7	34.1	24.8
	C.D. at 5%	3.2	2.7	1.7	1.5	183.0	103.1	101.4	69.9
	C.V. %	11.4	9.0	5.8	9.0	13.0	11.1	10.8	12.3

Table 2 Economics of different treatments

Treatment No	Yield Kg/ha	Yield increased after control (kg/ha)	Gross extra income (Rs.)	Cost of treatment	Net return	ICBR
1	655.32	160.98	8049.00	2780.00	5269.00	1: 1.89
2	567.21	72.87	3644.00	2400.00	1244.00	1: 0.52
3	698.54	204.20	10210.00	2780.00	7430.00	1: 2.67
4	697.86	203.52	10176.00	2400.00	7776.00	1: 3.24
5	675.21	180.87	9044.00	2590.00	6454.00	1: 2.49
6	717.63	223.29	11165.00	2780.00	8385.00	1: 3.02
7	700.26	205.92	10296.00	2650.00	7646.00	1: 2.89
8	603.83	109.49	5475.00	1200.00	4275.00	1: 3.56
9	551.39	57.05	2853.00	2040.00	813.00	1: 0.40
10	494.34	--	--	--	--	--

Cowpea Price Rs. 50 /kg
Carbendazim Rs. 580 /kg
Mancozeb Rs.300 /kg
Sixer Rs.580 /kg
Thiram Rs.300 /kg
Captan Rs. 425 /kg
Cosco Rs. 580 /kg
Vitavax Rs. 540 /kg
T. harzianum Rs.150 /kg

The computed economics of different treatments (Table 2) revealed that the highest net return (Rs. 8385) was obtained in seed treatment with cosco followed by thiram (Rs. 7776), vitavax (Rs. 7646) and sixer (carbendazim + mancozeb) (Rs. 7430). The highest Incremental Cost Benefit Ratio (ICBR) was obtained in the seed treatment of *T. harzianum* (ICBR 1: 3.56) followed by thiram (ICBR 1: 3.24) and cosco (ICBR 1: 3.02). This is also indicative that bio-agent might be accelerating the crop growth along with management of soil borne pathogens.

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