

EFFECTIVE MANAGEMENT OF COLLAR ROT OF GROUNDNUT THROUGH SEED TREATMENT IN ODISHA

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Abstract: Groundnut is an economic important edible oilseed crop. Groundnut suffers seed, soil and foliar diseases. Among the groundnut diseases, collar rot is one of the economic important disease. Collar rot damaged regularly due to its seeds and soil borne nature. This disease has prevalent in almost all groundnut growing states. This disease is extensive in kharif than rabi/summer season. Field experiment was conducted for two years(2010-2012) in Odisha to find out effective fungicides for control of collar rot of groundnut. Nine treatments including five fungicides along with check were laid in randomized block design with three replications. Fungicides viz. vitavax 200 wp (carboxin 37.5% + thiram 37.5%), carboxin, ipconazole, kodiak, thiram, and mancozeb were tested in field conditions. Minimum disease incidence (5.16%) and maximum pod yield (1232 kg/ha) were recorded in the treatment of vitavax 200 wp 4.0g/kgseed followed by ipconazole 3.8 FS (0.1ml) + thiram 75wp (2.5g/kgseed) and vitavax 200 wp 3.0g/kg seed. As groundnut is a major crop after Paddy in Odisha so it may act as panacea for farmer friends.

Keywords: *Aspergillus niger*, collar rot, fungicide, ground nut.

Introduction: Collar rot of groundnut caused by *Aspergillus niger* (Van Teighem) is one of important seed and soil borne disease. This disease was first reported from India by Jain and Nenra (1952). Collar rot is prevalent in almost all groundnut growing states of India viz. Punjab, Andhra Pradesh, Tamil Nadu, Uttar Pradesh, Gujarat, Maharashtra, Rajasthan, Karnataka and Orissa. Collar rot is causing more damage in sandy loam and medium black soil. The most of the groundnut cultivars are susceptible to this disease. The disease is expressing their symptoms in pre and post emergence phases. Infected seeds become black and did not germination. After germination infection on collar region of plants and as a result seedling were wilted. Many seed dressing fungicides are reported to be effective against collar rot of groundnut (Gangopadhyay, *etal.*; 1996, Karthikeyan, 1996). The loss due to this disease was reported 28 to 50% (Bakhetia, 1983). Seed treatment with thiram or captan has been found effective for the control of both pre-immersion and post-emergence phases of groundnut (Agnihotri and Sharma, 1972). Looking to the losses due to this disease, field testing of combine molecules of fungicides was necessary as a seed treatment. Experiments were conducted for two years to find out effective seed dresser fungicide for control of collar rot disease.

Materials and methods: Two years field experiments were conducted at FTTC Pilot Project of NABARD, PIA-Dulal, Baripada, Odisha during *kharif* 2007-08 and *kharif* 2010-12. Groundnut variety GG-20 was used for study. The seed treatment was given as per treatments just before sowing. Fungicides viz. vitavax 200 wp (carboxin 37.5% + thiram 37.5%) 3g/kg and 4g/kg seed, carboxin (3g/kg), ipconazole (0.1ml/kg), ipconazole 3.8 FS + Thiram 75wp (0.05ml

+2.50g/kg), ipconazole 3.8 FS + thiram 75wp (0.1 ml +2.50g/kg), kodiak (2.50g/kg), thiram (5g/kg), and mancozeb (3g/kg) were tested in field conditions. Treatments were randomized block wise having plot area of 5.0 x 3.0 sq. m. and replicated thrice. The timely observations were recorded. All recommended agronomic practices were followed; Observations of, seedling mortality, pod yield and phytotoxicity were recorded.

Results and discussion: The data presented in table-1 revealed that in the year 2010 all treatments were significantly superior over control. Minimum disease incidence (5.16%) was observed in treatment of vitavax 200wp (4g/kg) followed by ipconazole 3.8 FS (0.1ml/kg) + thiram 75wp (2.5g/kg) and vitavax 200wp (3g/kg). Maximum collar rot was recorded in the control. In the year 2008 all treatments were found significantly superior over control and almost same trends was observed in the year 2007. Looking to the pooled analysis minimum disease incidence (4.77%) was recorded in the treatment of vitavax 200wp (4g/kg seed) followed by (6.97%) in ipconazole 3.8 FS (0.1ml) + thiram 75wp (2.5g/kg seed) and vitavax 200wp (3g/kg seed). They were at par. All treatments were found significantly superior over control in pod yield of groundnut in the 2007-08. Maximum pod yield of groundnut was observed in vitavax 200wp 4 g/kg seed (1232 kg/ha) followed by ipconazole 3.8 FS (0.1ml) + thiram 2.5g/kg seed (1200kg/ha). Same trend was observed in these treatments during 2008. Looking to the pooled analysis of data, maximum pod yield (1632 kg/ha) was recorded in vitavax 200wp (4g/kg) followed by ipconazole 3.8 FS (0.1ml) + thiram 75wp (2.5g/kg) 1557kg/ha and 1510 kg/ha in ipconazole 3.8 FS (0.05ml) + thiram 75wp (2.5g/kg).

This finding collaborate with the finding of earlier

workers Meena and Gangwar (2011) reported that five fungicides used as seed treatments were evaluated against collar rot of groundnut and found that vitavax power (carboxin 37.50% + thiram 37.50%)@3.0g/kg seed was found minimum diseases incidence and obtained maximum pod yield. Similar results were

also obtained by Shivpuri Asha *et al* (2011). The phytotoxicity was assessed visually for two *kharif* season of groundnut at seedling, 10 days after germination in all treatments. No any phototoxic effect was observed of above fungicides as seed dressers at their respective concentrations.

Table-1. Effect of fungicidal seed treatments on collar rot incidence at 10 days after sowing

		2007		2008		Pooled Mean	
		1	Vitavax 200 wp (3.0g/kg)	17.86*	(9.46)	13.65*	(5.57)
2	Vitavax 200 wp (4.0g/kg)	13.13	(5.16)	12.09	(4.39)	12.61	(4.77)
3	Vitavax 75 wp (3.0g/kg)	23.53	(15.94)	14.75	(6.48)	19.14	(10.75)
4	Ipconazole 3.8 FS (0.1ml)	19.10	(10.71)	13.85	(5.73)	16.47	(8.04)
5	Ipconazole 3.8 FS (0.05ml) + Thiram 75wp (2.5g/kg)	16.51	(8.08)	14.78	(6.51)	15.65	(7.28)
6	Ipconazole 3.8 FS (0.1ml) + Thiram 75wp (2.5g/kg)	17.26	(8.80)	13.36	(5.34)	15.31	(6.97)
7	Kodiak (2.5 g/kg)	24.77	(17.55)	18.19	(9.74)	21.48	(13.41)
8	Thiram (5g/kg)	21.07	(12.92)	15.38	(7.03)	18.22	(9.78)
9	Mancozeb (3g/kg)	25.89	(19.07)	14.14	(5.97)	20.01	(11.71)
10	Untreated control	42.50	(45.6)	19.51	(10.82)	31.01	(26.58)
	SEM ±	1.91		1.01		3.19	
	C. D. at 5%	5.67		3.00		10.21	
	C.V. %	14.91		11.70		14.24	

*Arcsine value

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Conclusion: Collar rot of groundnut caused by *Aspergillus niger* (Van Teighem) is one of economic important seed borne disease. The disease is expressing their symptoms in pre and post emergence phases. This disease is extensively damage in *kharif*

season. Two years pooled analysis of data concluded that the minimum disease incidence (4.77%) and maximum pod yield (1632 kg/ha) were recorded in treatment of vitavax 200wp (4g/kg seed) followed by ipconazole 3,8 FS (0.1ml) + thiram 75wp (2.5g/kg seed)

1557kg/ha. During experimental period, no any phototoxic effect was observed of above fungicides as seed dressers at tested concentrations.

Table-2. Effect of fungicidal seed treatments on pod yield of groundnut

Sr. No.	Treatments	Pod yield (kg/ha)		
		2010	2011	Pooled Mean
1	Vitavax 200 wp (3.0g/kg)	1086	1798	1442
2	Vitavax 200 wp (4.0g/kg)	1232	2031	1632
3	Vitavax 75 wp (3.0g/kg)	1049	1702	1376
4	Ipconazole 3.8 FS (0.1ml)	1039	1841	1440
5	Ipconazole 3.8 FS 0.05ml +			

	Thiram 75wp 2.5g/kg	1156	1864	1510
6	Ipconazole 3.8 FS 0.1ml + Thiram 75wp 2.5g/kg	1200	1913	1557
7	Kodiak 2.5 g/kg	760	1242	1001
8	Thiram 75wp , 5g/kg	1028	1500	1264
9	Mancozeb 75wp, 3 g/kg	972	1317	1144
10	Untreated control	548	805	677
	SEM \pm	72	115	68
	C. D. at 5%	215	342	195
	C.V. %	12.46	12.47	12.78

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