KUMAR S. and MAHMOOD, M. (1986). Evaluation of fungicides against *Colletotrichum capsici*, the incitant of die-back of chilli. **Pesticides 20 (4)** : 28-29.

MALRAJA, E.G.E.P. and NARAYANASWAMI, R.(1968). Effect of certain fungicides on incidence of *Colleirtrichum capsici* in chilli varieties K-1 and K-2 **South Indian Hort, 36 (4)** : 205-206.

MISHRA, D. (1988). Fungicidal control of anthracnose and fruit rot (*Colletotrichum capsici*) of chilli (*Capsicum annum* L.). **Indian J. Agri. Sci. 58** : 147-149.

RAJU, K. S. and RAO, G.S. (1989). Studies on bioefficacy of a new systemic fungicide 'Fenapanil' against chilli fruit rot. **Pestology 13 (2)** : 21-22.

SUBRAMANIAN, K. S., SRINIVASAN, S. and SHANMUGAM, N. (1971). A note on the control of fruit rot and die-back of chillies. **Madras Agri. J. 58 (6)** : 548-549.

SIVAPRAKASHAM, K.JAGANATHAN, R., PILLYAR SWAMY, K. and ANAVARADHAM, L. (1978). Control of die-back and fruit rot of chillies. **Vataka 1(1):103-105.**

THAKUR, D. P. and SINGH,S.A. (1973). Efficacy of chemicals *in vitro* and *in vivo* in controlling fruit rot of chillies by *C.capsici*. **Haryana J. Hort. 2** : 128-133.

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BIOLOGICAL CONTROL OF ROOT ROT OF GROUNDNUT

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ABSTRACT

Field trials were conducted to find out the effect of antagonists and neem cake on root rot disease incidence of groundnut. Among the eight treatments, *Trichoderma Viride* (ST) + Neemcake (SA) reduced the root rot disease (8.97%) as compared to control (22.51%).

KEY WORDS: Root rot, Tichoderma, Neem Cake

Root rot disease caused by *Macrophomina phaseolina* in groundnut is one of the major diseases causing severe damage. Chemical control of plant diseases leads to ill effects like residual toxicity, environmental pollution, resistance to fungicide etc., Therefore, an alternative method, biological control of plant pathogens has been focussed recently. Microorganisms like *Trichoderma harizianum, T.viride* and *Racillus subtilis* inhibited the growth of *M.phaseolina* considerably (Papavizas and Levis, 1981).

Organic amendments reduced the saprophytic activity of *Rhizoctonia bataticola* in the soil (Satisghandra *et.al.*,1979). The present study reports the efficacy of biocontrol agents and amendments on the management of root rot of groundnut.

MATERIALS AND METHODS

Field experiments were conducted at Agricultural Research Station, Aliyarnagar for two years to find out the effect *of Trichoderma viride* and neem cake on root rot disease incidence. The experiments were laid out in randomised block design with five replications in 5x3m plots using the cultivar CO2 (Kharif) and VRI 4 (Rabi) with the spacing of 30x10 cm. The commercial product of the fungal antagonists viz., *Trichoderma viride, T.harzianum* were used for seed treatment at the rate of 4 g/kg of seed. The bacterial biocontrol agent viz., *Pseudomonas fluorescens* was used at the rate of 10 g/kg of seed. The treated seeds were shade dried and sown. Carbendazim seed treatment was given at the rate of 2 g/kg of seed. Neem cake was applied to the respective plots at the rate of 160 kg/ha during the time of sowing. Control plot was maintained without any application.

The initial plant population was taken 10 days after sowing. The observation on root rot disease incidence was taken on 30,60 and 90 days after sowing. Pod yield was also recorded.

Table 1. Effect of antagonists on root rot disease incidence

S.No.	Treatments	Root rot incidence (%)				
		K '97	R 97-98	K '98	R 98-99	Mean
1.	*Trichoderma viride* (ST)	14.45 (22.38)	13.48 (21.56)	12.23 (20.44)	12.53 (20.70)	13.17 (21.30)
2.	*T. harzianum* (ST)	16.30 (23.81)	15.29 (23.03)	16.15 (23.73)	14.64 (22.46)	15.59 (23.26)
3.	*Pseudomonas fluorescens* (ST)	13.34 (21.39)	12.45 (20.70)	11.37 (19.73)	10.14	11.83
4.	*T. viride* (ST) + Neem cake (SA)	10.72 (19.09)	9.05 (17.56)	8.14 (16.54)	7.98 (16.32)	8.97 (17.36)
5.	*T. harzianum* (ST) + Neem cake (SA)	17.17 (20.36)	17.10 (20.36)	10.17 (18.63)	10.33 (18.72)	11.18 (19.55)
6.	*P. fluorescens* (ST) + Neem cake (SA)	11.39 (19.73)	10.60 (19.00)	9.66 (18.15)	8.85 (17.36)	10.13 (18.53)
7.	Carbendazim (ST)	5.47 (13.56)	6.06 (14.30)	5.37 (13.44)	4.36 (12.11)	5.37 (31.31)
8.	Control	27.33 (31.50)	19.55 (26.28)	26.08 (30.72)	17.09 (24.43)	22.51 28.32)
	CD (P=0.05)	0.78	1.23	0.42	0.43	

(Values in parantheses are transformed values)

RESULTS AND DISCUSSION

Among the eight treatments, Carbendazim (ST) showed the lowest (5.32 percent) disease incidence as compared to control (22.51 percent). The next best treatment was T.viride (ST) + neem cake (SA) which recorded 8.97 percent disease incidence (Table 1).

Table 2. Effect of antagonists on dry pod yield of groundnut

S.No.	Treatments	Pot yield (kg/ha)				
		K '97	R 97-98	K '98	R 98-99	Mean
1.	*Trichoderma viride* (ST)	919.99	2564.82	900.00	1106.67	1371.87
2.	*T. harzianum* (ST)	905.33	2435.18	880.00	1113.33	1313.46
3.	*Pseudomonas fluorescens* (ST)	944.00	2601.86	913.33	1179.99	1409.79
4.	*T. viride* (ST) + Neem cake (SA)	983.07	2829.85	960.00	1226.66	1499.66
5.	*T. harzianum* (ST) + Neem cake (SA)	953.73	2672.42	920.00	1231.34	1439.87
6.	*P. fluorescens* (ST) + Neem cake (SA)	962.67	2731.49	960.00	1206.67	1465.21
7.	Carbendazim (ST)	1113.20	2889.09	1053.33	1406.67	1615.57
8.	Control	836.00	2100.75	800.00	1000.00	1184.19
	CD (P=0.05)	55.62	79.26	63.48	157.70	

Groundnut pod yield was higher in Carbendazim (ST) (1615.57 kg/ha) followed by T.viride (ST) + neem cake (SA). (1499.66 kg/ha).(Table 2.)

Bioprotectants provide unique opportunities for crop protection. In most of the crops, the biological seed treatment provides longer protection to the crop when compared with the fungicidal seed treatment. Because the biocontrol agents can grow and proliferate, they can colonize and protect newly formed plant parts to which they were not initially applied (Harman,1991).

From this present study, it was found that *T.viride* (ST) + neem cake (SA) reduced the root rot disease next to Carbendazim (ST). Therefore biological control is an alternative and safer method for the control of root rot disease of groundnut.

REFERENCES

HARMAN.G.R.(1991). Seed treatment for biological control of plant disease. **Crop protection 10**:166-176.

PAPAVIZAS.G.C. and LEVIS.J.A. (1981). Introduction and augmentation of microbial antagonists for the control of soil borne plant pathogens. In: **Biological control in Crop Production, Beltsville Symp, Agric. Res., Vol.5,** PP 305-322 (Ed. Papa vizas, G.C), Allenheld, Osmum and Co., Totowa, New Jersey, 361 PP.

SATISCHANDRA,K.M. HIREMATH.R.V. and HEGDE.R.K. (1979). Effect of organic amendments and fungicides on the saprophytic activity of *Rhizoctonia batticola* causing root rot of beans. **Indian Phytopath., p32:** 543-546.

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IRRIGATION AND NUTRIENT MANAGEMENT IN BANANA

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ABSTRACT

The results of the experiment conducted at Agricultural Research Station, Bhavanisagar during 1994 and 1995 on irrigation and nutrient management in banana (variety Rasathali) revealed that irrigating the crop once in 6-7 days upto 7 months and once in 5-6 days from 7-14 months recorded 18.7 per cent increased yield over normal practice. Regarding nitrogen, application of 125% of recommended dose of N was found to be the best.

KEYWORDS: Irrigation, Nitrogen, Banana

The nature of banana cultuivar in India is polyclonal with an array of varieties under cultivation, which differed in terms of morphology, genome and polidy. Moreover the crop is cultivated under different systems. In semi arid tropics like India, drought can be expected during the intermittant or terminal phase of crop growth and thus leads to considerable reduction in yield. The crop is a heavy feeder of all nutrients. It exhausts the soil fertility if the soils are not replenished with nutrients. Since it is a long duration crop, both water and fertiliser nutrients, if used indiscriminately, will go waste. With a view to get the information on the effect of moisture stress and nitrogen levels on the yield and water use efficiency as influenced by irrigation and fertiliser nitrogen, the present investigation was conducted.

MATERIALS AND METHODS

Field experiments were conducted during 1994 and 1995 to find out the optimum irrigation and fertiliser nitrogen level for getting higher yield in banana (Variety Rasthali) at Agricultural Research Station, Bhavanisagar. The treatments consist of three levels of irrigation viz., 0.30, 1.00 and 1.20 IW/CPE ratio with gradual widening and normal method of irrigation. Irrigations were given based on open pan evaporation (Dastane, 1967). Gradual widening of basins was adopted as follows: 30 cm channel width and 60 cm basin width for 0-50 days.