

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.

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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 cultivar 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.

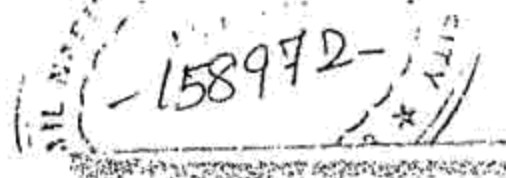


Table 1. Effect of treatments on yield, consumptive use and water use efficiency in banana

Treatments	Yield (t/ha)			Number of fruits/bunch			Consumptive use (mm)		
	1994	1995	Mean	1994	1995	Mean	1994	1995	Mean
I <sub>1</sub> 0.80 and 1.00 IW/CPE ratio (Gradual widening)	36.3	36.90	36.92	89.3	87.2	88.25	189.7	2243.8	
I <sub>2</sub> 0.80 and 1.00 IW/CPE ratio (Normal method)	37.44	37.33	37.39	89.6	88.0	88.80	2410.6	2861.3	
I <sub>3</sub> 1.00 and 1.00 IW/CPE ratio (GW)	40.63	39.80	40.25	91.5	89.8	90.65	1849.6	2289.4	
I <sub>4</sub> 1.00 and 1.00 IW/CPE ratio (NM)	41.20	41.06	41.13	93.3	90.4	91.85	2490.5	2678.5	
I <sub>5</sub> 1.00 and 1.20 IW/CPE ratio (GW)	41.71	41.44	41.58	94.9	91.1	93.00	1964.8	2275.1	
I <sub>6</sub> 1.00 and 1.20 IW/CPE ratio (NM)	42.48	43.55	43.02	97.5	91.2	94.35	2605.6	2814.2	
CD (5%)	1.86	1.06	1.42	4.3	2.1	3.12			
N <sub>1</sub> 75% recommended dose N	36.16	36.00	36.08	89.6	87.50	88.55			
N <sub>2</sub> 100% recommended dose N	38.99	38.49	38.74	90.6	88.89	89.75			
N <sub>3</sub> 125% recommended dose N	42.18	41.57	41.88	93.4	90.67	92.04			
N <sub>4</sub> 150% recommended dose N	44.64	44.16	44.40	97.1	91.44	94.27			
CD (5%)	1.40	0.75		2.52	1.43	2.24			

45 X 90 cm for 51-100 days and 60 x 120 cm for 101-150 days. Four levels of nitrogen were N<sub>1</sub> 75 per cent of the recommended N level, N<sub>2</sub> 100 per cent of recommended N; N<sub>3</sub> 125 per cent of recommended N and N<sub>4</sub> 150 per cent of recommended N level. The experiment was laid out in split plot design with three replications with a spacing of 1.8 m x 1.8 m in red sandy loam soil. The pH of the soil is neutral in reaction, EC = 0.2 dS<sup>-1</sup>m<sup>-1</sup>, the available nitrogen and phosphorus content of the soil is medium and potash content is high. The data on yield, number of hands/bunch and number of fruits were recorded, analysed statistically and presented in Table 1.

## RESULTS AND DISCUSSION

The data on fruit yield revealed that both irrigation treatments and nitrogen levels had significantly influenced the yield and yield attributes. Irrigating the crop at 1.00 IW/CPE ratio (once in 6-7 days) during first 7 month and 1.20 IW/CPE ratio (once in 5-6 days) in the later 7-14 months recorded the highest yield of 36.7 t/ha which was 18.7 per cent higher over 0.8 IW/CPE and 1.00 IW/CPE and 7.3 per cent higher over 1.00 IW/CPE throughout the crops period during both the years. Similar finding with regard to moisture

**Table 2. Water use efficiency**

Treatments	Water use efficiency (kg/ha/mm)	
	1994	1995
I <sub>1</sub> 0.80 and 1.00 IW/CPE ratio(GW)	19.98	16.62
I <sub>2</sub> 0.80 and 1.00 IW/CPE ratio(NM)	15.51	14.41
I <sub>3</sub> 1.00 and 1.00 IW/CPE ratio(GW)	21.95	17.95
I <sub>4</sub> 1.00 and 1.00 IW/CPE ratio(NM)	16.52	14.90
I <sub>5</sub> 1.00 and 1.20 IW/CPE ratio(GW)	21.60	19.16
I <sub>6</sub> 1.00 and 1.20 IW/CPE ratio(GW)	17.03	14.71

GW = Gradual widening      NM = Normal method

stress was reported by Ramadoss and Moosa Sherief (1993).

With regard to nitrogen application, application of nitrogen at 150 per cent of recommended level registered the higher yield of 44.4 t/ha which was higher by 18.7, 12.75, 5.0 per cent over 75 per cent, 100 per cent and 125 per cent of recommended level of N respectively. But 125 per cent of N was on par with 150 per cent of recommended N.

The number of fruits/bunch and number of hands/bunch were also higher in the above said treatments. The increased fruit yield was mainly due to increased number of fruit bunches. The

reduction in yield was due to moisture stress (Holder and Gumes, 1984).

With regard to consumptive use of water, the treatment of irrigating the crop 1.00 and 1.20 IW/CPW ratio consumed higher quantity of water (2605.6 mm in 1994 and 2814.2 mm in 1995) compared to other irrigation levels. Regarding gradual widening of channels and basins, there was a saving of 20-25 per cent of water over check basin method (Farmer's practice). The highest water use efficiency was obtained under gradual widening method of irrigation.

From the results, it is evident that irrigating the crop once in 6-7 days upto 7 months and once in 5-6 days later till harvest with 125 per cent of recommended level of N recorded the increased yield of 18.7 per cent over other treatments.

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## STIGMA RECEPTIVITY AND POLLEN VIABILITY STUDIES IN HYBRID PEARLMILLET KM2

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#### ABSTRACT

The pollen viability of pearl millet fertility restorer line (K560 D230) was tested during two consecutive summer seasons. The viability of pollen was judged in terms of seed setting on the male sterile line (MS 5141A). The pollination with fresh pollen and stored upto 2 hours resulted in good seed setting. Also the stigma receptivity of the male sterile line was tested by starvation and then by open pollination. Starvation upto two days resulted in better seed setting and after which the seed set declined.

**KEY WORDS:** Hybrid pearl millet, Pollen viability, Stigma receptivity.