https://doi.org/10.29321/MAJ.10.A03696

The Effect of Irrigation and Manurial Levels of the Yield of Irrigated Cambodia Cotton (*Gossypium hirsutum* Linn.)

by

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Introduction: With a view to fix up proper levels of irrigation and proper dose of fertilizer and also to study the interaction effect if any present, in MCU 3 cotton an experiment was undertaken in Central Farm, Agricultural College and Research Institute, Coimbatore from 1962 to 1966.

Review of Literature: Much work has not been done on cotton with regard to interaction of levels of irrigation and manures. The only work cited by Nataraj (1965) was that irrigated Cambodia cotton did not show neither significance to both manure and irrigation levels nor to interaction between them from the experiments conducted between 1954-60. In the review of manurial experiments by Mariakulandai and Morachan (1965), they have concluded that 13.62 kg N per acre was the best for irrigated Cambodia Cotton besides the basal dose of bulky organic manure. Scarsbrook *et al.* (1961) in the United States have found the presence of interaction between N levels and irrigation in cotton.

Materials and Methods: The experiment was conducted at Central Farm, Agricultural College and Research Institute, Coimbatore during the years 1962-66. The soil is of red clayey loam laid underneath with *kankar* nodules and having soil reaction towards slight alkalinity. The field was irrigated with well water measured by using 'V' notch. Bulk irrigations were given at the time of sowing and upto the stage of gap filling. In calculation of irrigated water applied to the crop of effective rainfall during the crop period was deducted from the total quantity of irrigation water and the balance alone was given as supplemental irrigation at different levels allotted in the treatments. Farm Yard Manure at 5 Tonnes per acre was applied as basal dose and the fertilizer mixture (12:6:6) was applied in split doses, half at the time of sowing and the other half at the time of earthing up the crop *i.e.*, about 45 days of sowing.

The experiment was laid out in a split plot design with the following six treatments replicated six times.

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Received on 13—3—1966.

Main plot treatment:

I_1 : Irrigation level at 50.8 cm per irrigation;

I_2 : Irrigation level at 63.5 cm per irrigation;

I_3 : Irrigation level at 76.2 cm per irrigation.

Sub plot treatments:

M_1 : 16.5 Kg N/acre;

M_2 : 22 Kg N/acre;

M_3 : 27.5 Kg N/acre.

The total quantity of irrigation was restricted to 76.2 cm in case of higher level of irrigation (I_3) and 63.5 cm and 50.8 cm respectively in I_2 and I_1 treatments. The data of yield of *kapas* obtained from the crop raised in the three seasons were analysed.

Results: The results of the experiment for the first three years alone are presented and the results of years 1965–66 have not been included since the crop was infested with *hariali (Cynodon dactylon)* affecting the crop growth and yield potential [vide Table 1 and 1-(a)].

Irrigation: The irrigation water applied to the crop as supplemental irrigation is given in Table 2. From the result it is seen that irrigation water applied to the crop as per the schedule of treatments in the experiment did not influence the yield of *kapas* significantly.

Manure: The Manurial levels viz. 16.5 Kg, 22 Kg and 27.5 Kg N per acre adopted in this experiment significantly influenced the yield of *kapas* in two seasons *i. e.* (1962–63 and 1963–64) and not significant in the last season (1964–65). In the first season the M_3 level was superior to both M_1 and M_2 levels, while the latter themselves were on par to each other. In the second season all the three manurial treatments were individually distinct to each other with M_3, M_2 and M_1 in the order of superiority to the other.

Interaction between Irrigation and Manure: This was observed in the season 1963–64 only. The manurial application as M_3 level (the highest dose amongst the treatments *i. e.* 27.5 kg N/acre) favoured the moisture at I_3 level and is superior to the other two irrigation levels (I_1 and I_2).

In the combined analysis, the data indicated that there was no significant increase in yield of *kapas* both for fertiliser application and for irrigation levels in the experiment. Interaction effect between irrigation and manure was not significant.

TABLE 1. *Mean Weight of Kapas* (Kg/per acre)

	IRRIGATION											
	I_1			I_2			I_3			Mean		
	1962—63	1963—64	1964—65	1962—63	1963—64	1964—65	1962—63	1963—64	1964—65	1962—63	1963—64	1964—65
M_1	663.9	312.3	248.6	693.6	309.4	304.5	728.6	256.1	335.9	695.4	292.6	296.3
M_2	634.4	347.0	288.8	721.4	352.9	300.9	700.8	292.4	287.8	685.5	330.8	292.5
M_3	754.8	374.4	282.2	776.0	360.1	305.1	799.6	434.3	294.3	776.8	389.6	293.9
Mean	684.4	344.6	273.2	730.3	340.8	303.5	743.0	327.6	306.0			

1962—63

Manures (M)

S.E. (M)=31.0

CD Means (M)=63.31

Conclusion M_3, M_1, M_2

Irrigation (I) N.S.

Interation — N.S. (M×I)

Manures: 1963-64

S.E. Means (M) 8.83

CD Means (M) 25.5

Conclusion: M_3, M_2, M_1

Irrigation N.S.

Interaction: (M×I)

1. S.E. Means between, Manures at any on I level 15.04
2. C.D. Mean 42.5

(ii) S.E. Means (Between I levels at any on M. level) 33.4

C.D. Means 72.6

Conclusions for (I×M)

Manure:

I_1	M_3	M_2	M_1
I_2	M_3	M_2	M_1
I_3	M_3	M_2	M_1

Irrigation:

M_1	I_3	I_2	I_1
M_2	I_2	I_1	I_3
M_3	I_3	I_1	I_2

Manures (M) N.S. 1964-65

S.E. (M) =20.17

Irrigation (I) N.S. Interaction (N×I)=N.S.

TABLE 1(a). *Combined analysis.*

Manures: Mean yield of kapas kg/acre.

Years/Manures	1962—63	1963—1964	1964—65	Total	Mean
M_1	231.8	97.5	98.8	428.1	142.7
M_2	228 5	110 3	97.5	436 3	145.4
M_3	258.9	129.9	98.0	486.8	162 3
Total	719.2	337.7	294.3	1351.2	—
Mean	239.7	112.6	98.1	—	

S.E. 5.74

Analysis of Variance

Source	D.F.	S.S.	M.S.	F. Value
Years	2	33322	16661	
Manures	2	606	303	3.306
Interaction	4	367	92	Not significant

TABLE 2. *Rainfall received during crop period and quantity of supplemental irrigation water applied.*

Year	Date of sowing	Period of harvest	Rainfall in crop period (cm)	Depth of irrigation water applied (cm in each treatment)		
				I_1	I_2	I_3
1962—63	30—8—62	21—1—63 to 25—4—64 (95 days)	52.07	—	10.8	23.5
1963—64	1-10—63	22—2—64 to 21—4—65 (60 days)	23.4	27.4	40 1	52.8
1964—65	29—9—65	26—2—64 to 28—4—65 (63 days)	36.1	14.7	27.4	40.1

TABLE 3. *Economics*

Treatment	Kapas yield (kg/acre)	Gross monetary return Rs.	*Extra net monetary return over I_1M_1 Rs.
I_1M_1	408.9	818.00	0
I_1M_2	421.4	842.80	2.40
I_1M_3	468.1	936.20	73.40
I_2M_1	434.2	868.40	50.40
I_2M_2	456.5	913.00	72 60
I_2M_3	479.2	958.40	95.60
I_3M_1	439.0	878.00	60.00
I_3M_1	426.0	852.00	11.60
I_3M_3	508.2	1016.40	153.60

* The extra cost of fertiliser I_1M_1 alone is deducted from gross monetary return (Cost of fertiliser Re. 0.42 per kg; Cost of *kapas* Rs. 2/- per kg).

Acknowledgements: The investigations were carried out in a scheme partly financed by I.C.A.R. and the authors gratefully acknowledge the financial help rendered. Grateful thanks are due to Dr. B. R. Murthi, Biometrical Geneticist, I.A.R.I., New Delhi for offering valuable suggestions in the preparation of this paper. The authors also thank Mr. G. Damodaram, Research Assistant and other field staff for their help in reeording observation in the fields.

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Studies on Genetic Variability in Ragi-II. Phenotypic, Genotypic and Environmental Correlations between Important Characters and their Implications in Selection

by

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Introduction: Several plant breeders have attempted to assess the relationship of different plant characters to yield in different crops and the correlations will fall under the category of environmental correlations. But such information in fingermillet ragi *(Eleusine coracana)* is very meagre. There is no information on phenotypic, genotypic and environmental correlations in ragi· In this paper an attempt has been made to study these three types of correlations in some important quantitative characters contributing to yield and their importance in selection work in plant breeding.

Materials and Methods: The materials for the present investigations comprise fourteen ragi varieties which differ widely for many charecters. The varieties were studied in a randomised block design with three replications

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Received on 20-2-1968.