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Optimum Dose of Fertilizers for *Ragi* in the Lower Bhavani Project

by

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Introduction: In the Lower Bhavani Project ayacut, *Ragi* was one of the major food crops raised under pre-project conditions. The soils of the ayacut are poor in nutrients resulting in low yield of crops. It was therefore, to be expected that the crops would respond to application of fertilizers under conditions of canal irrigation. To study the response of *Ragi* under irrigated conditions to different manurial treatments for fixing the optimum and economic manurial practice, manurial trials were conducted at the Agricultural Research Station, Bhavanisagar from 1960–'61 to 1964–'65 and the results of these trials are presented in this paper.

Review of Literature: Recent work at Coimbatore on the response of *Ragi* to the application of manures by Shetty (1961), Ranganathan (1962) and Kulandaiswamy (1964) have shown fairly consistant response by the crop to the application of nitrogen as ammonium sulphate. Michaelraj *et al* (1965) have recorded a significant yield increase in *Ragi* to the application of 60 lb. K_2O as basal dressing over 5 tons of compost. There was however no response to application of 20 lb. and 40 lb. K_2O.

Materials and Methods: The experiments were conducted with *Ragi* Co. 1 in the main season (July-August) and *Ragi* Co. 2 in the summer season (December-January). The treatments both in the main and summer seasons were as follows:

Treatments:

1. Farm yard manure at 10 tons per acre
2. (1) Plus 40 lb. N as ammonium sulphate
3. (1) Plus 60 lb. N as ammonium sulphate
4. (1) Plus 40 lb. N plus 20 lb. P_2O_5 as superphosphate
5. (1) Plus 40 lb. N plus 20 lb. P_2O_5 plus 20 lb. K_2O as muriate of potash.
6. (1) Plus 60 lb. N plus 20 lb. P_2O_5
7. (1) Plus 60 lb. N plus 20 lb. P_2O_5 plus 20 lb. K_2O.

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Superphosphate and potash were applied as basal dressings to the concerned plots along with farmyard manure, ammonium sulphate was applied half as basal and the other half as top dressing at the time of hoeing and weeding 25 days after transplanting. The experiment was laid out adopting a simple randomised block design replicated six times. A spacing of 9" x 9" was adopted for both the main and summer seasons

Results: The differences between treatments are significant in both seasons consistently over all the years of trial. In all these experiments, ammonium sulphate at 60 lb. N per acre with or without P_2O_5 and K_2O has recorded markedly increased yields over other treatments.

For an over all review of the results, a pooled analysis of data was carried out for the two cropping seasons. The analysis did not reveal any response to the application of P or K or both but only response to the application of N in both the seasons. The results are furnished in Table 1.

TABLE 1. *Pooled analysis - Comparison of levels of N — Main and Summer season*

Levels of Nitrogen	Acre yield in kg.	
	Main	Summer
Nil	622·5	666·3
40 lb. N	830·3	1129·6
60 lb. N	950·8	1298·9
Standard error :		
Presence *vs.* Absence	39·1	21·5
40 lb. *vs.* 60 lb.	19·6	
Critical Difference :		
Presence *vs.* Absence	82·1	63·9
40 lb. *vs.* 60 lb.	58·2	
Conclusion :	N_2, N_1, N_0	N_2, N_1, N_0

In both the main and summer seasons, there is marked increase in grain yield with each successive increment of N. The response to N is also found to be not influenced by the presence or absence of P_2O_5 and K_2O.

The economics of application of the different manures was worked out. The details are given in Table 2.

TABLE 2. *Economics of Manuring Ragi - Average of four years (1961-'62 to 1964-'65)*

Treatments	Total cost of cultivation* per acre in Rs.	MAIN			SUMMER		
		Yield of grain per acre in kg.	Value of grain per acre in Rs.	Net profit per acre in Rs.	Yield of grain per acre in kg.	Value of grain per acre in Rs.	Net profit per acre in Rs.
1 (Control)	240	623	311·50	71·50	666	333·00	93·00
2	273	842	421·00	148 00	1157	578·50	305·50
3	290	953	476·50	186·50	1327	663·50	373·50
4	292	811	405·50	113·50	1120	560·00	268·00
5	297	836	418·00	121·00	1111	555·50	258·50
6	309	947	473·50	164·50	1312	656·00	347·00
7	314	953	476·50	162·50	1258	629·00	315·00

Note: *Includes cost of fertilizers in Rupees over the cultivation expenses of Rs. 240/- for main as well as summer season.

In both the seasons of trial, the application of 60 lb. of N alone over a basal dressing of 10 tons of farmyard manure has recorded the highest net monetary return.

Discussion: In both the main and summer seasons, each year's trial has indicated the response of the crop in grain yield to the application of N as ammonium sulphate. These consistent results are also borne out by the results of the combined analysis of all the experiments which show that there is significant increase in yield to both the increments of N in both seasons. Thus, the findings of Shetty (1961), Ranganathan (1962) and Kulandaiswamy (1964) are corroborated by these trials. The results have not indicated any response to P_2O_5 or K_2O at the only dose tried, *viz.*, 20 lb. of either. This result agrees with that reported by Michaelraj *et al* (1965). These experiments have further shown that the response to N is not dependent upon the presence or absence of P_2O_5 or K_2O. The results have also indicated more or less conclusively that 60 lb. N as ammonium sulphate over a basal dressing of 10 tons of farmyard manure gives the highest margin of net profit per acre.

Summary: Manurial experiments on irrigated *Ragi* carried out in the Lower Bhavani Project area in both the main and summer seasons over a period of five years have shown consistent crop responses to the application of N as ammonium sulphate over a basal dressing of 10 tons of farmyard manure. No responses were recorded to the application of P_2O_5 and K_2O The highest yields and monetary return were recorded by the 60 lb. dose of N.

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A Selection Index for Lint Yield in Cotton *(G. arboreum L.)**

by

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Introduction: Statistical methods in plant breeding have become a precise tool in the hands of the breeder for efficient selection of new 'forms'. The application of discriminatory statistical methods for tackling the genetical and plant breeding problems has resulted in the refinement of selection techniques. These have enabled the plant breeder to handle his material with confidence and in a thoroughly scientific manner (Panse, 1942). The formulation of selection index is an advance in this direction.

Fisher (1936) developed the discriminant function technique for the formulation of selection index. Smith (1936) was the first to apply this technique to plant breeding. Since then, it is being used for the formulation

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