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Economic Dose of Groundnut Cake (as Manure) for Enhancing Yields of Irrigated Ragi

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In the Grow More Food Campaign one of the ways recommended for stepping up production is manuring of crops. *Ragi* is an important crop among millets grown under irrigated conditions and as a staple food crop it is important in districts like Salem, Visakhapatnam, Chicacole and Coimbatore, where the crop is cultivated extensively. This grain crop is usually manured either with farmyard manure, or by sheep penning. But in these methods due to limited availability of the manures, either increasing the dosage or extending the area of application possible beyond is a certain limit. As an alternative groundnut cake is being advocated by the Agricultural Department. since large quantities of the same are available in districts growing groundnut and having oil-extracting mills. With the idea of finding out the economic dose of this manure to *ragi* grown under irrigated conditions, investigations were done at the Sugarcane Research Station, Anakapalle, during the period 1946 to 1949 and the results are summarised in this note.

In Visakhapatnam dirstrict *ragi* is grown in all the three seasons of the year, (viz) "Early" (*Punasa*, May – August) "Main" (*Pedda panta*, August – December) and "late" (*Pyru*, December – April). The first season crop is grown under partly irrigated and partly rainfed conditions taking advantage of the rains received during this season and supplementing by lift irrigation, while the next is entirely grown rainfed. It is only in the "late" season that a purely irrigated crop is raised and therefore the investigations were confined to this season only. Groundnut cake was applied on nitrogen basis at four levels supplying, (1) 50 lb.-N, (2) 40 lb.-N, (3) 30 lb.-N and (4) 20 lb.-N per acre. These were compared with farmyard manure applied in two doses, (1) 10 tons per acre and (2) 5 tons per acre (taking the last as standard, being the rate at which the ryots apply). The experiment was laid out in randomized plots of 44 x 30 links size (net 40 x 25 links or 1 cent), replicated six times. AKP. 3. *ragi* strain was used for planting and seedlings of about a month in age were planted at $\frac{3}{4} \times \frac{3}{4}$ link spacing. The results are summarised below.

The results show that with progressive increase in the dosage of the manure, there was progressive increase in yield as well; 50 lb.-N gave the best yields closely followed by 40 lb.-N supplied in the form of groundnut cake. But the enhancement in yields is not proportionate to the increased dosages of manure. The rates of grain yield per pound of nitrogen applied in the form of groundnut cake or farmyard manure varied from treatment to treatment. Higher levels of nitrogen gave yields at low rates and lower levels of nitrogen gave high rates of grain yields, in both the kinds of manures. Thus, the response to manure was high in the case of lower levels of manure and diminished as the dosage increased. The extra yields got by

additional dosages of manure at higher levels were proportionally low. So at some stage the yields could not compensate the extra cost of manuring. Comparing the net profits got in the case of different levels of manure it can be seen that the margin of profit was the same in both 50 lb.-N and 40 lb.-N treatments and though the former gave higher yields than the latter, the increase of yield was only just sufficient to cover the cost of manure, and left no extra profit. Hence 40 lb.-N supplied in the form of groundnut cake is recommended as the economic dose for irrigated *ragi*, grown under similar conditions as those at Anakapalle. It is considered not profitable to use groundnut cake at higher levels than 50 lb.-N per acre under such conditions.

MANURIAL TRIALS ON RAGI — SUGARCANE RESEARCH STATION, ANAKAPALLE

(1946-'47 to 1948-'49)

SUMMARY OF RESULTS

Grain and Straw Yields in lb. per acre

Treatments (Manure per acre)	1946—47		1947—48		1948—49		Average		Increased grain yield over control (%)	Net profit over control (%)	Grain yield per pound of N. applied (lb.)
	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw			
Groundnut cake										Rs.	lbs.
(A) @ 50 lb. N	2088	3017	1950	2933	1120	1616	1719	2522	42	26	34·4
(B) @ 40 lb. N	1982	2950	1779	3033	1059	1467	1607	2483	33	24	40·2
(C) @ 30 lb. N	1898	2700	1748	2750	878	1217	1508	2222	24	23	50·3
(D) @ 20 lb. N	1676	2300	1671	2633	781	1133	1376	2022	14	16	68·8
(E) Farmyard manure	1751	2733	1573	2917	725	1083	1340	2244	11	5	15·3
(F) F.Y.M. 5 tons (control)	1500	2233	1389	2517	746	1083	1212	1944	...	...	27·7
General mean	1816	2655	1685	2789	885	1267	...	...	...	...	...
Standard Error of the Mean	113	168	115	139	36	71	...	...	...	...	...
If significant by Z test (P=05)	Yes	Yes	Yes	Yes	Yes	Yes	...	...	...	...	...
Critical Difference (P=·05)	328	488	334	...	105	202	...	...	...	...	...