

Summer ploughing for rice crop in the Tambraparni Basin*

by

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Synopsis: A trial was laid out in the year 1957-'58 with the local ryots' practice of ploughing the fields repeatedly during summer till a fine tilth was obtained and broadcasting *kar* varieties, and the departmental recommendation of puddling the field after receipt of water in the irrigation system and transplanting as the two treatments. The results indicated that either the "ryots' method" or the "departmental method" had no advantage over the other.

Introduction: Summer ploughing the rice fields repeatedly with the seasonal showers right from the harvest of the previous crop is a very common practice adopted by the cultivators of the Tambraparni tract. Summer ploughing, which serves as the preparatory cultivation for the succeeding *kar* crop of rice, helps to bring the soil to a fine tilth where the *kar* varieties are sown broadcast with the rains. The experimental results reported in this paper deal with a trial designed to test the scientific significance of such a practice as compared with the departmental recommendation of flooding and puddling the land before transplantation.

Review of Literature: Ramiah (1953) has summarised the findings from the different research stations representing different soil types in the following words: "While in lighter soils, repeated ploughings, either in dry or wet condition may be beneficial, too many ploughings are unnecessary or may even be harmful in heavy soils". Trials laid out at the Agricultural Research Station, Samalkota between the years 1911 and 1915 with early preparation of land as one of the treatments revealed that yields were reduced from 10 to 30 per cent in fields ploughed or dug in a dry condition. These results were confirmed from another experiment conducted during 1909 to 1913 which showed that harmful effects could not be corrected by subsequent applications of green leaf and bone meal at puddling time but there was an indication that puddling before transplantation of rice can moderate the evil effects to some extent. There was a 10% loss in yield when the fields were dry ploughed at the Agricultural Research Station, Aduthurai. Although the application of 4000 lb. green leaf and 112 lb. super phosphate remedied the defect slightly, the treatment could not better the yields obtained from unmanured and puddled plots. At Palur, where the soil type is lighter, there was no adverse effect on the succeeding rice crop. The harmful effects were more keenly felt only when the rice crop was

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grown wet rather than as a dry crop. The fact that summer ploughing and dry cultivation can increase the yields from 25 to 35% was shown by another experiment in Samalkota.

Materials and Methods: A trial was initiated in the year 1957-'58 with the local ryots' practice of ploughing the fields repeatedly during summer till a fine tilth was obtained and broadcasting *kar* varieties, and the departmental recommendation of puddling the fields after receipt of water in the irrigation system and transplanting, as the two treatments. The experiment was laid out in the *kar* season (May - June to September) with eight replications. The lay out was according to the paired plot technique. The experiment had run for four seasons ending with 1961-'62 as it could not be conducted during 1958-'59 since the lands could not be ploughed because of excessive rains. The strain ASD.1 was grown in the trial and the yield data from the plots were gathered in all the seasons. Besides analysing the data every year, pooled analysis for all the four seasons was also made.

In the "ryots' method", the lands were ploughed eight to ten times, till a fine tilth was formed, during the summer months of April - May and the seeds were sown broadcast with the advent of pre-monsoon showers and in the "departmental method" seedlings were raised and transplanted after puddling the fields with water from the channel. The seed rate for the former treatment ranged between 120 - 150 lb. per acre while for the latter it was only 40 lb. per acre. Plots in the "ryots' method" received 20 cart loads farm yard manure per acre while those in the "departmental method" were manured with 5000 lb. green leaf per acre. The supply of artificials like super-phosphate at 150 lb. per acre and ammonium sulphate at 150 lb. per acre was common to both the treatments.

Results and Discussion: During 1957-'58, the yield from the "ryots' method" plots was significantly lower than in the "departmental method" plots and the difference in the yields was nearly 450 lb. per acre. The second year i.e., 1959-'60, confirmed the findings of the first year in that the difference increased to 560 lb. per acre in favour of the "departmental method" and the difference was statistically significant. There was a turn in the trend of the results during 1960-'61 as the yield difference did not attain the level of statistical significance even at 5 per cent level. But indication was obtained to show that the "ryots' method" was better than the "departmental method" as it had given an increased yield of 3.4 % over the latter. This trend, namely, the "ryots' method" giving more yield than the "departmental method" was more marked in the *kar* season of 1961-'62 as the "ryots' method" was significantly superior to the other and it had

registered an extra yield of 1154 lb. to the acre. This worked out to an increase of 33.7 per cent over the departmental method. The yield data gathered and the results of analysis are presented below :

	Treat- ment A	Treat- ment B	Percentage on control		Percentage on general mean			'T' Test	SE	C. D. (P=0.05)
			A	B	A	B	GM			
1957-1958	3428	3880	88.7	100.0	93.8	106.0	100.0	Yes	116.0	290
1959-1960	3290	3850	85.5	100.0	92.2	107.8	100.0	Yes	75.7	302.8
1960-1961	4344	4201	102.4	100.0	101.6	98.3	100.0	No	111.1	...
1961-1962	4580	3426	133.7	100.0	114.4	85.6	100.0	Yes	104.8	247.8

NOTE: Treatment A: Ryots' method. Treatment B: Departmental method.

Main Plots (Seasons):

Particulars	1957-'58	1959-'60	1960-'61	1961-'62	SE.	CD. (P=0.05)
Acre yield of grain in lb.	3656	3372	4360	4104	188.0	391.2

Conclusion: 1960-'61; 1961-'62; 1957-'58; 1959-'60.

Interaction: (Seasons × Treatments):

Particulars	1957-'58 (1)		1959-'60 (2)		1960-'61 (3)		1961-'62 (4)		SE.	CD. P=0.05
	A	B	A	B	A	B	A	B		
	Acre yield of grain in lb.	3432	3884	3292	3852	4436	4284	4692		

Conclusion: 4A, 3A, 3B, 1B, 2B, 4B, 1A, 2A.

From the results, it can be seen that the yields obtained were not similar in all the seasons as one method was found to be good in 2 seasons and the other in the other two seasons. The results as obtained in the four seasons do not admit of drawing of any conclusions except that the methods as such do not have any marked influence in increasing the yield.

Although there is no large difference in the matter of grain yield, certain other considerations like cheapness of broadcasting and saving in labour when its availability is scarce may induce the cultivators to choose the "ryots' method". But the initial advantage is lost when the weeding

charges increase in the "ryots' method" as dry sowing favours the growth of weeds. Besides, some loss is incurred by using a heavy seed rate of 120 to 150 lb. per acre. The overall cost of cultivation per acre by the two methods, as shown in the table below, shows that the "departmental method" involves Rs. 37.85 less in expenditure than the "ryots' method", though the difference is narrowed by another Rs. 10.80 due to a slight increase in the yield of grain in the "ryots' method"

Ryots' Method		Departmental Method	
<i>Preparatory Cultivation:</i>		<i>Preparatory Cultivation:</i>	
	Rs. nP.		Rs. nP.
8 ploughings, digging corners, etc.	79 77	4 ploughings, digging corners, etc.	58 77
<i>Manures and Manuring:</i>		<i>Manures and Manuring:</i>	
20 cart loads of FYM. @ Rs. 3/- per cart load, cost of applying and covering, cost of artificials (super & ammonium sulphate)	118 35	Cost of 5,000 lb. green leaf, cost of artificials & charges for applying	68 35
<i>Seeds and Sowing:</i>		<i>Seeds and Sowing:</i>	
Cost of 120 lb. seed & sowing charges and covering	24 75	Cost of 40 lb. seeds, cost of raising nursery and cost of transplanting	64 90
<i>After cultivation</i>	37 88	<i>After cultivation</i>	30 88
<i>Irrigation</i>	1 28	<i>Irrigation</i>	1 28
<i>Harvesting etc.</i>	59 31	<i>Harvesting etc.</i>	59 31
Total expenses	321 34	Total expenses	283 49

Receipts		Receipts	
	Rs. nP.		Rs. nP.
Cost of 3911 lb. grain at Rs. 42/- per 280 lb.	586 50	Cost of 3839 lb. grain @ Rs. 42/- per 280 lb.	575 70
Cost of 2165 lb. straw @ Rs. 2/- per 100 lb.	43 30	Cost of 2165 lb. straw @ Rs. 2/- per 100 lb.	43 30
Total receipts	629 80	Total receipts	619 00
Less expenses	321 34	Less expenses	283 49
Profit per acre	308 46	Profit per acre	335 51

Summary: "The ryots' method" of summer ploughing and broadcasting *kar* varieties or the "departmental method" of puddling and transplanting has no advantage over the other but there is some saving in the total expenditure for raising a crop over an acre. The use of any one of these methods seems to be a matter of choice and convenience to the individual ryot concerned.

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