

Effect of indirect manuring on the yield of broadcast Rice in Malabar

by

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Introduction: In Malabar for autumn rice, occupying about three lakh acres in double-crop lands, broadcast sowing is the rule in more than 75 per cent of the area. Preparation of the land begins immediately after the harvest of second-crop paddy in January and repeated ploughings are given with the receipt of every summer shower thereafter. The soil is thus brought into a fine tilth before the seeds are sown in April-May, following a soaking rain. This practice precludes raising of a green manure crop on the lands. Other bulky organic manures are also not applied usually, for fear of wash of the added manurial ingredients in the torrential rains of the South-West monsoon. The good tilth that is produced by bringing the soil into a fine state of division by a scrupulous attention to preparatory cultivation, brings in a normal yield, provided the distribution of pre-monsoon showers remains normal. Increased yields are also obtained by top dressing with ammonium sulphate; this practice having come into vogue in recent times.

It will thus be seen that the broadcast crop of autumn rice in Malabar goes without an adequate basal dressing while all the organic manures available in a farmstead are applied to the fields in the second-crop season. A trial was therefore undertaken to find out how far heavy doses of organic matter like green leaf and cattle-manure applied to the second crop would, by way of residual effect, influence the yield of the succeeding broadcast crop in the same fields.

The results of trials carried out at the Agricultural Research Station, Pattambi are outlined in this paper.

Previous work done at the Station: The results of a number of manurial experiments conducted at the station showed that green leaf up to 8,000 lb. did not have any residual effect on the succeeding transplanted crop. In its direct effect green leaf at 5,000 lb. was found to be on a par with cattle manure at 10 tons per acre.

Experimental: The experiment was laid out in split-plot design. Green leaf at 5,000 lb. per acre, cattle manure at 10 tons per acre and 'No manure' were the treatments in the second crop season. For the following broadcast crop, each plot was split for the two

treatments 'Manure' and 'No manure'. The manure consisted of green leaf at 2,000 lb. superphosphate at 150 lb. and ammonium sulphate at 150 lb. per acre. For the transplanted second crop, green leaf and cattle manure were applied a fortnight before planting and for the following broadcast crop, green leaf and superphosphate were applied five days before sowing and ammonium sulphate, two months after sowing. Strain PTB 20 was used for transplanted second crop and strain PTB 2 for the broadcast first crop in all the three seasons. The experiment was commenced in the second-crop season 1950 and concluded in the first-crop season 1953.

The yield data are presented in tables I, II, and III.

It will be seen from the results that in the second crop season cattle manure at 10 tons gave 25.4 per cent increased yield over 'No manure' while green leaf at 5,000 lb. per acre recorded 4.3 per cent increase over that recorded by cattle manure (Table I).

In the first crop season for broadcast crop, an increased yield of 11.2 per cent was recorded by cattle manure as sub-plot treatments (Table II.)

From the figures in table III, it will be seen that cattle manure recorded 22.4 per cent increase by way of residual effect.

Discussion: The results confirm the previous finding that for direct effect a greater bulk of cattle manure than usual is necessary for swamp rice to equal the effect of green leaf at 5,000 lb. per acre and that green leaf had little or no residual effect. The extra cost involved in a heavy application of cattle manure is more than compensated by the remarkable residual effect on the following broadcast crop, resulting in an increased yield of over 20 per cent.

It may be mentioned in this connection that basal manuring of broadcast crop of rice in Malabar has always remained a problem for the cultivator. Previous trials have shown that green leaf could be applied to the soil in the dry state. In the foregoing experiment also, direct manuring of broadcast crop has resulted in an increased yield of about 30 per cent.

But what is found feasible in the case of experimental plots may not lend itself to extensive practice, since green leaves in sufficient quantities become available only after the profuse flush of trees and shrubs during the South-West monsoon period. It is also not

likely that the ryots would give up the practice of broadcasting. More than the non-availability of labour and the resources of the farmers, it is the long-range object of conservation of soil that appears to lie behind this age-long practice. It is a fact that puddling operations carried out during periods of heavy and continuous rainfall result in considerable loss of the fine fractions of soil and organic matter. Transplanting in the first-crop season is therefore confined to low-lying areas where broadcasting will not be possible since one or two showers would be enough to make the soil overmoist, making it impossible to bring it into a friable state. The most appropriate practice would be to manure the transplanted second crop heavily with green leaf and cattle manure for direct and residual effects respectively.

As mentioned already, the cultivators do apply their cattle manure to the second crop, but the quantity available for application is usually too little to be of any residual value. It is here that rural compost looms in importance and its preparation in any quantity would surely benefit the farmer on the West Coast.

Summary: The results of an experiment to find out how far heavy application of organic manures to transplanted crop of rice in the second crop season would influence by residual effect the yield of the following broadcast crop, are presented.

As far as direct effect on swamp rice is concerned it is found that 10 tons of cattle manure have to be applied to equal the effect of 5,000 lb. green leaf, giving an increased yield of about 30 per cent.

Such heavy application of cattle manure leaves a very pronounced residual effect, increasing the yield of the subsequent broadcast crop by about 21 per cent.

The benefit of such heavy applications of cattle manure or compost is explained.

Acknowledgments: Our thanks are due to successive Paddy Specialists at Coimbatore under whose guidance the experiments were conducted.

REFERENCES

1. Madras Agricultural Station Reports 1935 to 36 to 1952 to 53.
2. Abdul Samad, A., and (1952) Manuring of rice in Malabar. (The Madras Sahadevan, P. C. Agricultural Journal, Vol. xxxix, March 1952.)

TABLE I
Pre-season manuring trials

Treatments:

Second crop season.

1. Green leaf at 6,000 lb. per acre.
2. Cattle manure at 10 tons per acre.
3. No manure.

First crop season.

1. Manure: Green leaf at 2,000 lb. superphosphate to supply 30 lb. P_2O_5 — Ammonium sulphate at 150 lb. per acre.
2. No manure.

Layout: 3×4 split-plot design.

Plot size: $36.5' \times 32.5'$.

Combined analysis of the Three Second-Crop Seasons' Results

Particulars	Green leaf	Cattle manure	No manure	G. M.	S. E.	'Z' test	C. D. (P=0.05)
Acre yield in lb.	2003	1936	1544	1828	29.98	Satisfied	61
% on control	129.7	125.4	100.0	118.3	1.94		3.93

TABLE II

Combined analysis of the Three First-Crop Seasons' Results

Particulars	Green leaf	Cattle manure	No manure	G. M.	S. E.	'Z' test	C. D. P: 05
Acre yield in lb.	1749	1885	1695	1776	69.2	Satisfied	138
% on control	103.2	111.2	100.0	104.8	4.08		8.16

TABLE III

For Interactions

Particulars	Manure			No manure			G. M.	S. E.	'Z' test	C. D. P: 0.05
	Green manure	Cattle manure	No manure	Green manure	Cattle manure	No manure				
Acre yield in lb.	2057	2114	2038	1441	1655	1353	1776	98.04	Satisfied	196
% on control	152.0	156.3	150.7	106.5	122.4	100	131.3	7.24		14.48