

Comparative study of three different methods of paddy cultivation

by

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Synopsis: An experiment to find out the merits and demerits of Chinese method of rice cultivation was conducted at four centres in the State. The local improved method of rice cultivation and the Japanese method of rice cultivation were compared against it. The economics of different methods of rice cultivation is worked and the merits and demerits of the three methods of cultivation is discussed in this paper.

Introduction: It was claimed that the Chinese method of paddy cultivation gave very high yield in China i.e. about 65,000 lb. per acre. Narasinga Rao (1951) had reported that the average yield of paddy in China as only 3,000 lb. per acre. However, to verify their claim, the Indian Council of Agricultural Research proposed that experiments should be conducted in the important paddy growing areas of the country. Accordingly, a programme of experiments to compare Chinese method with Japanese method and Local improved method was drawn up by a specially constituted committee. It was proposed that replicated trials may be laid out at 31 research stations in the important paddy growing tracts. In Madras State four centres viz., (1) Paddy Breeding Station, Coimbatore, (2) Agricultural Research Station, Aduthurai, (3) Rice Research Station, Tirurkuppam and (4) Rice Research Station, Ambasamudram were selected to conduct this experiment. The details of the Chinese method of paddy cultivation were formulated on the basis of the recommendations made by the Indian Delegation which visited China during 1956 and on the basis of the information supplied by the Indian Embassy in China.

Materials and methods: The experiment was laid out during the cropping season of 1959. The high yielding blast resistant high fertility strain CO 25 was used for this experiment. At each centre a randomised block experiment with six replications was conducted. The three treatments were 1. Chinese method, 2. Japanese method and 3. Local improved method. The gross plot size was 30' x 30' for all the three treatments. The net plot size slightly varied for each treatment and for Local improved method it was 28' x 26 $\frac{2}{3}$ ' for the Japanese method it was 26 $\frac{2}{3}$ ' x 26 $\frac{2}{3}$ ' and for the Chinese method it was 21' x 28'. The net plot size was calculated by leaving two rows of plants on all the four sides of the plots.

Chinese method: The main features of the Chinese method are: (1) The seeds should be dried under sun for two days and then soaked in 4-8% solution of sodium bicarbonate for two days before sowing. (2) A seed rate of 669 lb. per acre

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of nursery was used. The nursery was manured at the rate of 1340 lb. of farm yard manure per acre. (3) The main field should be dug to a depth of 3' in six inches layers. The soil removed during the digging operation should not be placed in the plots under other treatments. It should be heaped in the non experimental area left between replications for this purpose. The pits should be filled in the same order along with farm yard manure at the rate of 20 tons per acre. The digging and filling of the pit were completed two months before transplanting. After filling, the soil was pressed by human labour and by a roller and water was let into the plots twice to compact the soil. (4) Twenty-five days old seedlings were dipped in 0.5% solution of ammonium sulphate before planting and two healthy seedlings were planted at 6" x 6" spacing. A total number of 3,721 clumps was planted in each plot. (5) At the time of puddling, 40 lb. of K_2O in the form of Potassium sulphate and 40 lb. of P_2O_5 in the form of super phosphate were applied as basal dressing. One hundred pounds of nitrogen in the form of ammonium sulphate was applied in three split doses, namely, 40 lb. N at puddling time, 40 lb. N one month after planting and 20 lb. N just before flowering.

Japanese method: The Japanese method had the following feature: (1) Raised nursery bed 3" above ground level, 4' wide and 25' long, (2) farm yard manure applied at 30 lb. per plot of 4' x 8' area, (3) compost $\frac{1}{2}$ " thickness spread over the beds and also a thin layer of ashes, (4) a pound of mixture of ammonium sulphate and super phosphate for every 4' x 8' of seed bed area, (5) treating the seed with salt water, (6) sowing at 2 lb. of seed per cent of nursery, (7) seeds treated with Agrosan G. N. and (8) covered the seed beds with $\frac{1}{2}$ " of fine earth and pressed lightly and water allowed in.

The main field was manured with 6,000 lb. of green leaf per acre, 6 cartloads of farm yard manure per acre, 200 lb. of super phosphate and 200 lb. of ammonium sulphate per acre. Ammonium sulphate and super phosphate were applied in two split doses, one half at the time of planting and the balance one month after planting. Four seedlings at the sixth leaf stage were planted at 10" x 10" spacing and 1,369 clumps were planted in a plot.

Local improved method of Modified Japanese Method: In the local improved method the wet nursery was manured at the rate of 10,000 lb. of green leaf per acre. Sprouted seeds were sown at 3 lb. per cent in the nursery bed. The main field was manured at the rate of 5,000 lb. green leaf, 150 lb. of super phosphate and 150 lb. of ammonium sulphate per acre. Ammonium sulphate was applied in two doses one half as basal dressing and the other half, two months after planting. Two seedlings were planted per hole at 10" x 6" spacing. A total of 2257 clumps were planted per plot.

The grain and straw yields per acre, along with the economics of Chinese method of paddy cultivation as compared to the Japanese method and local improved method of rice cultivation are presented in the table.

TABLE

Economics of Chinese method as compared to the Japanese and local improved methods of rice cultivation

Sl. No.	Particulars	Chinese method	Japanese method	Local improved method
A. Paddy Breeding Station, Coimbatore:				
1.	Cost of cultivation per acre	Rs. 6,485.50	639.84	441.58
2.	Receipt per acre	Rs. 706.88	654.04	585.88
3.	Profit or loss per acre	Rs. — 5,778.62	+14.20	+144.30
4.	Straw yield per acre	lb. 8,508	7,142	4,808
5.	Grain yield per acre	lb. 3,889	3,866	3,584
6.	Percentage over local improved method	108.5%	107.9%	100%
B. Agricultural Research Station, Aduthurai:				
1.	Cost of cultivation per acre	Rs. 7,001.54	314.12	241.84
2.	Receipt per acre	Rs. 535.47	451.73	501.10
3.	Profit or loss per acre	Rs. — 6,466.07	+137.61	+259.26
4.	Straw yield per acre	lb. 7,560	7,562	7,312
5.	Grain yield per acre	lb. 3,910	3,577	3,815
6.	Percentage over local improved method	102.49%	93.8%	100%
C. Rice Research Station, Ambasamudram:				
1.	Cost of cultivation per acre	Rs. 2,683.05	544.50	520.14
2.	Receipt per acre	Rs. 617.02	640.25	612.18
3.	Profit or loss per acre	Rs. — 2,066.03	+95.75	+92.04
4.	Straw yield per acre	lb. 9,936	6,595	6,796
5.	Grain yield per acre	lb. 3,630	4,512	4,142
6.	Percentage over local improved method	87.4%	108.9%	100%
D. Rice Research Station, Tirurkuppam:				
1.	Cost of cultivation per acre	Rs. 3,956.68	661.06	457.86
2.	Receipt per acre	Rs. 683.25	584.27	728.66
3.	Profit or loss per acre	Rs. — 3,273.43	— 76.79	+270.80
4.	Straw yield per acre	lb. 7,921	5,572	5,929
5.	Grain yield per acre	lb. 3,358	2,939	3,717
6.	Percentage over local improved method	90.3%	79.1%	100%

Results and Discussion: At Coimbatore the Chinese method and Japanese method recorded 8.5% and 7.9% more grain yield respectively than the local improved method. Straw yield from Chinese method was twice that of local improved method. The results at Aduthurai showed that the Chinese method had recorded 8.5% more yield than the local improved method and the Japanese method recorded 6.2% lesser yield than the local improved method. At Ambasamudram the Japanese method had recorded 9% more yield than the local improved method and the Chinese method recorded 8.4% lesser yield than the local improved method. At Rice Research Station, Tirurkuppam the local improved method had recorded the highest grain yield followed by the Chinese method and Japanese method. The Chinese method recorded 10% lesser yield than the local improved method while Japanese method recorded 21% lesser yield than the local improved method.

The results of these experiments show that very high application of N. i. e. 100 lb, 40 lb. of K_2O and 40 lb. of P_2O_5 per acre does not give more yield than the Japanese and the local improved methods and it confirms the findings of Srinivasan and Rajagopalan (1956) and Abdul Samad *et al.* (1956) that manuring beyond an optimum dose viz. 150 lb. ammonium sulphate, 150 lb. super phosphate and 5,000 lb. green manure is decidedly uneconomical. The cost of cultivation of Chinese method is also prohibitive.

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RETIREMENT

Shri C. K. Ramachandran, B. sc. (Ag.), retired from the post of cotton Specialist on 24-2-1964 after serving a term of one year of re-employment.

Shri C. K. Ramachandran was a very good sportsman and was captain of the Hockey team, a cricket player and the College champion while a student of the Agricultural College, Coimbatore. He entered service in 1933 as a research assistant in Cotton and was first gazetted in 1950.

During his service in the Department, he had served in various capacities in the Cotton research and extension schemes and finally as the Cotton Specialist. He had contributed a number of very valuable papers on cotton research and extension. As a member of the Managing Committee of the M. A. S. U. during 1962, he was very helpful in the affairs of the Union. The Union takes this opportunity to wish him a happy retired life.