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Comparative Evaluation of Direct Seeded Low Land and Transplanted Paddy

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An experiment was conducted on paddy during *kharif* 1991 to 1993 at Regional Rice Research Station, GAU, Vyara, Gujarat to study the comparative performance and economics of two leading varieties under two methods of planting (direct seeding and transplanting). Direct seeding of sprouted seeds in puddled soil on the day of nursery sowing was equally productive and 37% more remunerative than transplanted crop. The differences in varieties were not significant.

Majority of the low land paddy in the country is grown by transplanting method and so is in South Gujarat. Transplanting being a time bound and labour intensive operation, occasionally suffers inordinate delays due to either delayed onset of monsoon or prolonged drought after pre-monsoon rains and because of acute scarcity of labourers during this period, seldom the recommended plant population and spacings are adopted. Transplanting cost is another serious issue needing attention as the same has risen to Rs. 1300 per hectare. Direct seeding, on the other hand, eliminate nursery raising and transplanting. Besides, the crop matures early (Mitra *et al.*, 1992). Equal performance of direct seeding and transplanting methods has been reported by Kundu *et al.* (1993).

A field experiment was conducted during *kharif* season from 1991 to 1993 at Regional Rice Research Station, GAU, Vyara (Gujarat). The soil of experimental field was clayey containing 0.39% organic carbon, 56 kg/ha available P_2O_5, 450 kg/ha available K_2O and 7.0 pH. Six treatments comprising of 2 varieties, namely, GR-3 (V_1) and GR-103 (V_2) and two methods of planting viz., transplanting (M_1) and direct seeding of sprouted seeds with 2 dates in case of direct seeding i.e. day of nursery sowing (M_2) and day of transplanting (M_3) were tried in factorial randomized block design with 6 replications.

The nursery for transplanting treatments was sown on 29th, 27th and 30th June in the consecutive years. The corresponding dates of transplanting were 20th, 23rd and 24th July. These dates were considered as base for direct seeding. Transplanting method involved 30 kg/ha seed rate and 20 x 15 cm spacing, while direct sowing

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TABLE 1

Effect of varieties and methods of planting on paddy yield and its economics.

Treatment	*Grain yield (q/ha)*			*Pooled*	*Cost of cultivation*	*Gross realization (Rs./ha)*	*Net realisation (Rs./ha)*
	1991	*1992*	*1993*				
Varieties							
GR-3	52.12	28.10	33.24	37.82	8103	13690	5587
GR-103	50.55	32.06	32.01	38.21	8684	15131	6447
C. D. at 5%	NS	2.58	NS	NS	—	—	—
Methods of Planting							
Transplanting	52.38	33.05	34.26	29.90	10057	15155	5098
Direct seeding of sprouted seeds on the day of nursery sowing	45.44	33.48	35.88	38.27	7562	14571	7009
Direct seeding of sprouted seeds on the day of transplanting	56.20	23.73	27.74	35.89	7562	13505	5943
C. D. at 5%	3.69	3.16	3.09	NS	—	—	—

was carried at 30 cm spacing between the rows using 60 kg/ha seed. Recommended doses of fertilizers i.e. 80 kg N and 40 kg P_2O_5/ha for GR-3 and 120 kg N and 60 kg P_2O_5/ha for GR-103 were applied through urea and single super phosphate. Nitrogen was applied in 2 equal splits. The crop received 800, 1556 and 1435 mm total rainfall during 1991, 1992 and 1993, respectively.

Grain yield

Effect of varieties

The yield differences between GR-3 (V_1) and GR-103 (V_2) varieties were not significant in first and third years as well as pooled analysis (Table 1).

Effect of methods of planting

The differences in grain yield due to methods of planting were significant in the individual years (Table 1). While in 1991 direct seeding of sprouted seeds in the day of transplanting (M_3) was significantly superior over direct seeding of sprouted seeds on the day of nursery sowing (M_2) and transplanting (M_1), the reverse was true in 1992 and 1993. Poor performance of direct seeding on the day of nursery sowing (M_2) in 1991 was due to setback caused by low rainfall (68 mm) and that of direct seeding on the day of transplanting (M_3) in 1992 and 1993 was because of heavy to very rainfall (383 and 318 mm, respectively) during the crop establishment period. The pooled analysis, however, indicated no difference among the three methods. These results indicated that direct seeding of sprouted seeds was as good as transplanting. The findings are in accordance with those of Mitra *et al.*, (1992) and Kundu *et al.*, (1993).

The interaction between variety and method was significant in the individual years, but not in pooled analysis.

Economics

GR-103, which is a fine grain variety gave significantly higher net return i.e. Rs. 858/ha more than GR-3. This was basically due to differences in market price. Among the methods of planting, direct seeding of sprouted seeds on the day of nursery sowing (M_2) with net realization of Rs. 7008/ha recorded the highest net profit and was significantly superior over direct seeding of sprouted seeds on the day of transplanting (M_3) and transplanting (M_1). Between the later two, M_3 was significantly superior over M_1. It can, therefore, be inferred that direct seeding with sprouted seeds is superior than transplanting in terms of net return per hectare. Higher net return in direct seeding could be ascribed to saving of the cost of nursery raising and transplanting, which account for about 30% of the total cost of cultivation in transplanted paddy.

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