

# Effect of Direct Seeding and Transplanting Methods on the Yield and Quality of Fine Rice Basmati-370

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## ABSTRACT

Investigations to evaluate the effect of direct seeding versus transplanting on yield and quality of fine rice, Basmati-370 were carried out at the Post-graduate Agricultural Research Station, University of Agriculture, Faisalabad during 1998. Experiment comprised; transplanting, direct seeding (dry seed) with drill in "water" condition, direct seeding (dry seed) by broadcast in standing water, direct seeding 24 hours, 36 hours and 48 hours water soaked seed and sown by broadcast in standing water. Yield and yield components such as plant height, number of panicle bearing tillers  $m^{-2}$ , normal kernels, 1000-grain weight, grain yield and harvest index was affected significantly with various planting methods. Transplanting produced significantly higher grain yield ( $3.23 t ha^{-1}$ ) than direct seeding.

**Key Words:** Direct seeding; Transplanting; Rice; Yield

## INTRODUCTION

In Pakistan, rice (*Oryza sativa* L.) occupies second position after wheat and is an important source of foreign exchange earning. But its average yield in our country is much lower than potential yield. Improper planting technique is one of the important factors limiting rice yield. The common method of planting rice in Pakistan is through transplanting nursery, which is not only more laborious and time consuming but also expensive and inconvenient. This method can be replaced by direct seeding. However, different agronomic aspects of direct seeding although well tried at other places (Gutbored, 1986; Dingkuhn *et al.*, 1991; Thakur, 1993; Sharma, 1995; Naklong *et al.*, 1996; Sharma & Ghosh, 1998), are still to be investigated in detail against the transplanting method in Pakistan. This study was designed to compare the production potential of both the direct seeding and transplanting methods under the irrigated environment of Faisalabad.

## MATERIALS AND METHODS

The effect of direct seeding and transplanting methods on the yield and quality of fine rice Basmati-370 was carried out at the Post-graduate Agricultural Research Station, University of Agriculture, Faisalabad, during the year 1998. The experiment was laid out in RCBD with four replications using net plot size of 2 m x 3 m. The experiment comprised; transplanting ( $T_1$ ), direct seeding (dry seed) with drill in "water" condition ( $T_2$ ), direct seeding (dry seed) by broadcast in standing water ( $T_3$ ), direct seeding 24 hours, ( $T_4$ ) 36 hours ( $T_5$ ) and 48 hours ( $T_6$ ) water soaked seed and sown by

broadcast in standing water. A seed rate of  $40 kg ha^{-1}$  was used in direct seeding method. Direct sowing was done on 5th June while nursery was transplanted on 11 July. A fertilizer dose of 67 kg N + 67 kg  $P_2O_5$  and 62 kg  $K_2O ha^{-1}$  in the form of nitrophos and sulphate of potash was applied. All other agronomic practices were kept normal and uniform for all the treatments.

Data were recorded on yield and yield components such as plant height, number of panicle bearing tillers  $m^{-2}$ , normal kernels, 1000-grain weight and grain yield. Data collected were analyzed statistically using Fisher's analysis of variance technique and Least Significant Difference (LSD) test at 5% probability level was applied to compare the differences among treatment means (Steel & Torrie, 1984).

## RESULTS AND DISCUSSION

The plant height was significantly influenced by different sowing methods (Table I). Transplanting ( $T_1$ ) produced the tallest plants (110.2 cm) than other treatments. The minimum plant height (102.6 cm) was obtained in direct seedling by broadcast in standing water ( $T_3$ ). The maximum number of tillers  $m^{-2}$  (178.4) were obtained in transplanting method ( $T_1$ ) which was the highest number compared with all other treatments. However all the other treatments are at par with each other. The highest percentage of normal kernel (89.51%) was found in ( $T_2$ ), which was at par with  $T_1$ , followed by  $T_3$  (87.6%). While the lowest percentage of normal kernel (82.28%) at P 0.05 was recorded in  $T_6$ . 1000-grain weight was significantly higher (23.17 g) in  $T_1$ . There was no difference in 1000-grain weight among treatments  $T_2$ ,  $T_3$ ,  $T_4$ ,  $T_5$ , and  $T_6$ . Like wise,  $T_1$  resulted

**Table I. Effect of direct seeding and transplanting methods on yield of fine rice Basmati-370**

Treatment	Plant height (cm)	No. of tillers (m <sup>-2</sup> )	Normal kernels (%)	1000-grain weight (g)	Paddy yield (t ha <sup>-1</sup> )	Harvest Index (%)
T <sub>1</sub> : Transplanting	110.2 a	178.4 a	89.06 a	23.17 a	3.23 a	32.84 a
T <sub>2</sub> : Direct seeding (dry seed) with drill in "watter" condition	108.2 b	97.0 b	89.51 a	20.25 b	2.22 c	23.63 c
T <sub>3</sub> : Direct seeding (dry seed) by broadcast in standing water	102.6 e	103.6 b	87.60 b	20.30 b	2.87 b	20.87 d
T <sub>4</sub> : Direct seeding (24 hours water soaked seed) by broadcast in standing water.	103.9 d	101.2 b	85.42 c	20.02 b	2.75 b	22.31 c
T <sub>5</sub> : Direct seeding (36 hours water soaked seed) by broadcast in standing water.	105.5 c	96.2 b	85.57 c	20.50 b	2.36 c	28.51 b
T <sub>6</sub> : Direct seeding (48 hours water soaked seed) by broadcast in standing water.	107.1 b	94.0 b	82.28 d	19.62 b	2.22 c	28.02 b
LSD	1.17	21.01	1.01	0.98	0.33	2.50

Any two means not sharing a letter in common differ significantly at 5% probability level

in maximum paddy yield (3.23 t ha<sup>-1</sup>). There was no difference in paddy yield between T<sub>3</sub> and T<sub>4</sub>; and among T<sub>2</sub>, T<sub>5</sub> and T<sub>6</sub>. These results are in line with the findings of Gutbrod (1986) and Thakur (1993). Transplanting method T<sub>1</sub> gave the highest (32.84%) harvest index and followed by T<sub>5</sub> and T<sub>6</sub> which were at par with each other. The lowest harvest index (20.87%) was obtained in T<sub>3</sub>.

## CONCLUSIONS

Transplanting gave significantly higher paddy yield as compared to different direct sowing methods.

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(Received 13 April 2000; Accepted 10 May 2000)

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