

## COMPARISON BETWEEN TRANSPLANTING AND DIRECT-SEEDING METHODS FOR CROP ESTABLISHMENT IN RICE

Transplanting, which is the popular method of crop establishment in rice particularly during rabi season, demands more quantity of labour and hence increases the cost of production and also often results in delay in planting due to labour scarcity. It would be advantageous, if transplanting could be substituted by a low-cost method of crop establishment.

Field experiments were conducted at the Regional Agricultural Research Station, Pattambi for three rabi seasons consecutively from 1996-97, to study the feasibility of substituting transplanting by direct seeding in rice. Transplanting of seedlings, broadcasting and line-seeding of sprouted seeds were tested under two weed management practices viz., manual and chemical weeding, for the first two years. Experiments were laid out in randomized block design with three replications. During 1998-99, direct seeding of sprouted seeds by 'DRR wet-seeder' was also tested along with other methods. The DRR wet-seeder consists of four rotating drums with circular holes around at the two edges. On pulling the seeder, seeds are placed on the soil surface in eight rows at a distance of 20 cm between rows and at about 12.5 cm between plants. The field was ploughed twice, puddled and then levelled. The test variety used was Jyothi. Line-seeding was done at a spacing of 15 cm x 10 cm, manually. For broadcasting, a seed rate of 80 kg ha<sup>-1</sup> was followed. Nursery for transplanting was raised

on the same day of direct seeding and transplanted on 18<sup>th</sup> day (random planting or at a spacing of 15 cm x 10 cm as per the treatments). For seeding with DRR wet-seeder, seeds with radicle just emerged was used. In treatments where hand weeding was involved, the plots were kept weed-free up to maximum tillering stage. All other management practices other than the treatments were done as per the recommendations of the Kerala Agricultural University (KAU, 1996).

The details of treatments and the data on grain yield are given in Table 1. In the first two years of the study (1996-97 and 1997-98), there was no significant difference in grain yield between the treatments. Averaging over the crop establishment methods, during 1996-97, transplanting, broadcasting and line-seeding recorded an yield of 6091 kg ha<sup>-1</sup>, 5848 kg ha<sup>-1</sup> and 6061 kg ha<sup>-1</sup>, respectively. During 1997-98, the corresponding values were 3045 kg ha<sup>-1</sup>, 3006 kg ha<sup>-1</sup> and 3391 kg ha<sup>-1</sup>. During 1998-99, random planting + hand weeding gave the highest yield. However, it was on par with DRR wet-seeder + butachlor. The treatment, line-planting + butachlor recorded the lowest yield. Between other treatments, there was no appreciable difference in terms of grain yield. The overall results indicate that the labour intensive and costly method of transplanting could be substituted by direct-seeding with no sacrifice in productivity, if effective water

Table 1. Effect of methods of crop establishment and weed control practices on grain yield of rice

| Treat. No | Treatments   | Grain yield (kg ha <sup>-1</sup> ) |         |         |
|-----------|--|------------------------------------|---------|---------|
|           |  | 1996-97                            | 1997-98 | 1998-99 |
| 1         | Random planting + hand weeding   | 6273                               | 2958    | 2754    |
| 2         | Line planting + butachlor @ 1.25 kg ha <sup>-1</sup> 4-6 DAS   | 5909                               | 3131    | 1921    |
| 3         | Broadcasting seeds + hand weeding  | 5848                               | 3333    | 2219    |
| 4         | Broadcasting + butachlor @ 1.25 kg ha <sup>-1</sup> 4-6 DAS  | 5848                               | 2679    | 2335    |
| 5         | Line seeding + hand weeding  | 6182                               | 3926    | NI      |
| 6         | Line seeding + butachlor @ 1.25 kg ha <sup>-1</sup> 4-6 DAS  | 5939                               | 2857    | 2242    |
| 7         | Seeding with DRR wet seeder + butachlor @ 1.25 kg ha <sup>-1</sup> 4-6 DAS   | NI                                 | NI      | 2223    |
| 8         | Seeding with DRR wet seeder + butachlor @ 1.25 kg ha <sup>-1</sup> 4-6 DAS fb 2,4-D @ 0.80 kg ha <sup>-1</sup> at 21 DAS | NI                                 | NI      | 2535    |
| CD (0.05) |  | NS                                 | NS      | 375     |

DAS = Days after sowing; fb = followed by; NI = Not included during the year

control is possible. Similar results have been reported by IRRI (1997). The weed menace associated with the direct seeding system could be overcome by application of herbicides. Considering the advantages of getting adequate plant population, desired crop geometry and easiness in weeding, placement of seeds by the

wet-seeder would be a better technology for direct seeding rice. However, it warrants detailed investigations on direct seeding with respect to seed rate, spacing, variety suitability, weed management, water control, land preparation and other associated management aspects.

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