

Evaluation of different methods of direct sowing of paddy

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■ **ABSTRACT** : This study was conducted to evaluate the performance of different methods of direct sowing of paddy with broadcasting (T_1), inclined plate planter (T_2) and conventional seed cum fertilizer drill (T_3) in district Hoshiarpur of Punjab. The seed rate of paddy was highest (14kg/acre) in T_1 as compared to T_2 and T_3 (10 kg/acre). The paddy sown with inclined plate planter yielded more (24.3 q/acre) as compared to conventional seed cum fertilizer drill (24.1 q/acre) and broadcasting (24.0 q/acre). The direct sown paddy saves about 25 per cent irrigation water as it avoids puddling and enhanced irrigation intervals. There was a net saving of Rs. 13,000/ha in crop establishment due to direct sown paddy as against the conventional puddled transplanted rice.

■ **KEY WORDS** : Direct sowing of paddy, Inclined plate planter, Puddling

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The manual transplanting after repeated wet tillage (puddling) is the common method of rice cultivation, which is cumbersome and labour intensive. Puddling is done by extensive tillage in standing water which creates impervious layer 10-15 cm below soil surface. Puddling is done to reduce percolation losses and moist conditions enhance the herbicide use efficiency. Puddling, however, has been reported to destroy soil structure, which affects growth and development of succeeding upland crops in the rotation, thereby reducing system productivity (Hobbs *et al.*, 2002). Rice occupied an area of 28.02 lakh ha in Punjab during 2009-10 (Anonymous, 2011) and has enforced the farmers to convert their centrifugal pumps to submersible pumps which not only has increased the electricity consumption but also caused huge investment affecting the economy of farmers. In addition, higher labour demand during lean period of transplanting leads to delay in sowing and increasing the cost of cultivation. These factors warrant the attention of farmers to shift towards direct seeding, which requires less water, labour, ensure timely sowing and do not disturb the soil structure. The present study was undertaken to compare the different methods of direct sowing of paddy in Hoshiarpur district of Punjab

■ METHODOLOGY

Farmer participatory trials on direct sowing of paddy were conducted at villages Todarpur and Bhuno in Hoshiarpur

district of Punjab. The soil texture of these villages was medium to heavy textured. Following methods of direct sowing of paddy have been adopted by the farmers :

Broadcasting:

Farmers sow rice by broadcasting the seed at higher seed rate @ 14 kg/acre in well tilled soil. Farmers used higher seed rate because lower seed rate resulted in lower establishment of rice crop.

Inclined plate planter:

These machines are fitted with inclined plate metering mechanism having inverted T type furrow openers and capable of maintaining the seed to seed and row to row spacing with little breakage of seed. These planters have been adjusted in such a way that seeding is accomplished into fine seed bed at a depth of 2-3 cm at a row spacing of 20 cm. The planter was adjusted at seed rate @ 10 kg per acre. Fig. A shows the direct sowing of paddy with inclined plate planter in moist seed bed.

Conventional seed cum fertilizer drill:

In these drills, there is continuous flow of seed in furrows at uniform rate. It has fluted type seed metering mechanism which receive seeds into the longitudinal grooves from the seed box and passes to the seed tube. These machines are capable of maintaining row to row spacing of 20 cm. Shovel



Fig. A : Direct sowing of paddy with Inclined plate planter in moist seed bed

type furrow openers are used in these types of drills. The drill was adjusted at a seed rate @ 10kg/acre for direct sowing of paddy. Farmers mixed the paddy seed with fertilizer so that there was less breakage of seed. Fig. B shows the direct sowing of paddy with conventional seed cum fertilizer drill in moist seed bed.



Fig. B : Direct sowing of paddy with conventional seed cum fertilizer drill in moist seed bed

RESULTS AND DISCUSSION

All the fields under study were laser levelled which ensured uniform application of water. The uniform application of water resulted in the better establishment of paddy crop. It further enhanced the use efficiency of herbicides and nutrients. The field had been prepared well pulverized at the time of sowing for uniform germination and better root growth. The direct sowing of paddy had been done in the first fortnight of June. The plants were well merged and established before the arrival onset of monsoons which reduced the mortality of seedlings. The paddy variety of PR-115 was used for direct sowing of paddy because it is a short duration variety and highly suitable for direct sowing of paddy.



Broadcasting



DSR Drill



Conventional seed cum fertilizer drill

Fig. 1 : Paddy crop stand sown with different methods

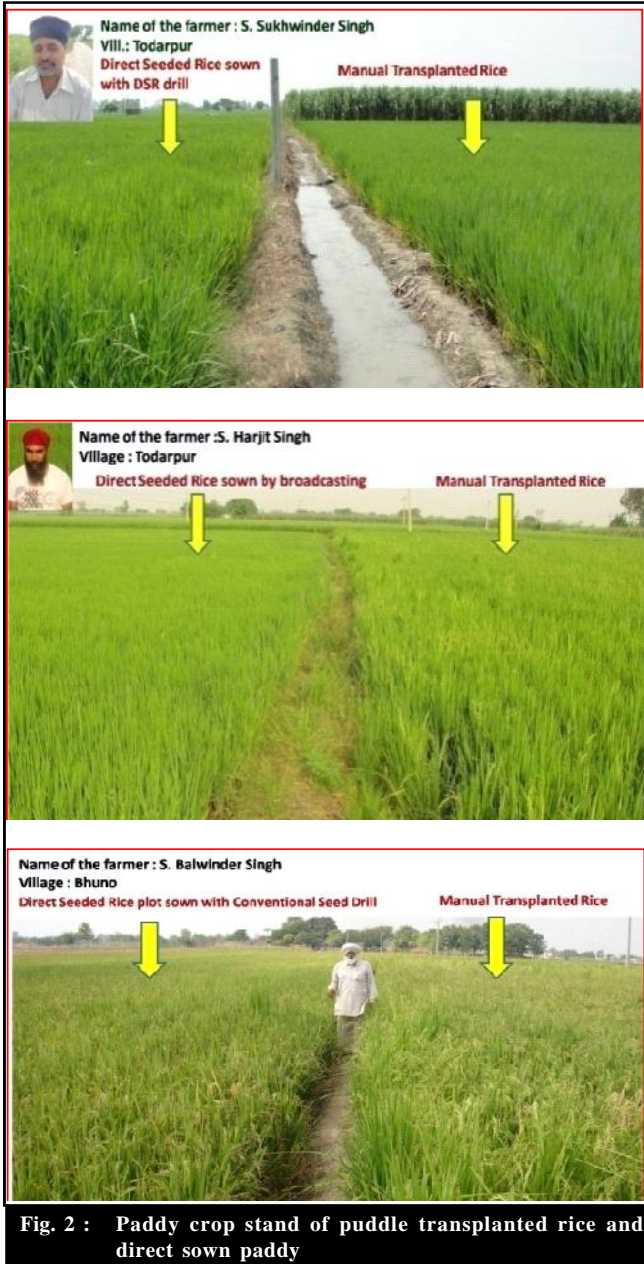


Fig. 2 : Paddy crop stand of puddle transplanted rice and direct sown paddy

Table 1 : Average yield of paddy from different methods of direct sowing of paddy

Method of direct sowing of paddy	Average yield (q/acre)
Broadcasting	24.0
Inclined plate planter	24.3
Conventional seed cum fertilizer drill	24.1

The nitrogen application to direct sown paddy fields had been made in four equal splits at 2,4,7 and 10 weeks after sowing which corresponds to 1-2 leaf stage, tillering, before flowering and panicle initiation stages of rice plant. For effective weed management, stomp 30 EC (pendimethalin @ 1.0 l/acre) had been applied with in 2 days of sowing followed by nominee gold 10 EC (bispyribac) @ 100 ml/acre at 30 to 35 days after sowing. Before spraying, the standing water from the fields had been drained out. Fig. 1 shows the paddy crop stand sown with different methods. Fig. 2 shows the direct sown paddy and puddled transplanted rice at farmers’ field.

The paddy sown with inclined plate planter yielded more (24.3 q/acre) as compared to conventional seed cum fertilizer drill (24.1 q/acre) and broadcasting (24.0 q/acre) as shown in Table 1. There was a net saving of Rs. 13,000/ha in crop establishment by direct sowing as against the conventional puddle transplanted rice. The farmers are suggested to shift the some area of transplanted rice to direct seeded rice to reduce the cost of cultivation, ensure timely sowing and water saving.

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