To evaluate the efficiency and effect of paddy weeder on the yield and economics of rice crop

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Abstract: An On Farm Trial was initiated in the Narayanpur village of Garhwa. The On Farm Trial was planned in the Rabi of 2008. Source of technology selected was Japanese weeder and cono weeder. Grain yield harvested was significant in all the treatments. The maximum grain yield of 41 q/ha were recorded in treatment 2 wherein weeding was done with Japanese weeder followed by three treatment these which weeding was done with cono weeder (34q/ha). The least grain yield of 20.5q/ha was recorded under farmer’s practice in which hand weeding was done. In terms of energy efficiencies, cost to benefit ratio noticed, and higher grain yield output, weeding with Japanese weeder was considered to be successful on farm trial followed by weeding with cono weeder.

Key Words: Efficiency, Paddy weeder, Yield, Economics, Rice,


Article History: Received : 25.01.2013; Accepted : 16.05.2013

Rice is one of the major food crops. It feeds more than 60 per cent of the world’s population. Out of 79 lakh hectares geographical area of Jharkhand state, the net cultivated area is around 22 lakh hectares. In Kharif season, major problem faced by farmers of this region besides soil erosion is the problem of weed intensity (Moorthy and Das, 1992). In traditional method of rice cultivation, weeds are mostly removed from the field in a manual process as they are seen more as a negative factor for crop growth. Generally the farmers of hilly tracts area practice hand weeding of the Paddy crop with Khurpi, which is more labour intensive and time taking (Choudhury, 2003). Presently there are many types of weeders available from simple to complex and motorized weeders. Finger weeder, Japanese weeder, cono weeder and conostar weeder work very well in low land with water depth upto 5-10 cm. These weeders can only be used in line sown or line transplanted crop In upland peg weeder, wheel hoe and finger weeder can be used (Krishnaiah,1999). But except Khurpi and hoe other improved implements are not available in rural areas. Looking the feasibility of application of paddy weeder in line sowing of rice crop, this OFT was planned in farmers field to evaluate the efficiency and effect of paddy weeder on yield and economics of rice crop in Garhwa District of Jharkhand.

The OFT was planned in the Rabi of 2008. For this a 500m² plot in a preselected village in Garhwa district of Jharkhand and was screened out after carrying out rapid roving survey of the area. The experiments were replicated ten times in different farmers fields of the same village keeping the plot size and sample size and the technologies selected same. The soil was sandy loam type having pH 5.8, available nitrogen, P₂O₅ and K₂O were of 200, 15.5 and 250 kg/ha, respectively. The seed rate adopted was 40 kg/ha under direct seeded condition. Initially land was ploughed 2-3 times in dry condition and pulverized. After that, the field was levelled to bring the soil to a fine tilth and suitable for sowing of seeds and to provide favorable condition for germination. Irrigation was provided to field immediately after sowing and 3 days after sowing. Thinning and gap filling was done 15 days after sowing. Recommended dose of fertilizers i.e., 80: 60: 40: 25 kg N: P₂O₅: K₂O and ZnSO₄ kg ha⁻¹ were applied during crop period. Half the dose of nitrogen, full dose of phosphorus and 75% of potash and full dose of zinc were applied basally and remaining
dose of N in two splits (25% N at active tillering and 25% N along with 25%, potash at panicle initiation stage) were applied in main field. Source of technology selected was Japanese paddy weeder, Cono weeder and was compared vis a vis with hand weeding practice followed traditionally. Test crop was paddy variety Arize 6444 and there were three treatments as per the technologies selected which is given below:

Details of technology selected:

<table>
<thead>
<tr>
<th>Treatment:</th>
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<tr>
<td>T&lt;sub&gt;1&lt;/sub&gt; - Farmer practice (hand weeding)</td>
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<tr>
<td>T&lt;sub&gt;2&lt;/sub&gt; - Japanese paddy Weeder</td>
</tr>
<tr>
<td>T&lt;sub&gt;3&lt;/sub&gt; - Cono paddy weeder</td>
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Design of experiment: Randomized Block Design:

Field tests were conducted to evaluate the performance of three different types of weeders vis a vis indigenous method of hand weeding. The improved technology in the form of Japanese weeder, cono weeder which was intended to be introduced among farmers, was the main focus of the technology to be demonstrated among the farming community. Different parameters selected were cut in number of mandays, per centage decrease in weed population, grain yield q/ha, and C:B ratio.

Soil volume disturbed depends on the effective capacity and the depth and width of cut. In this parameter, Japanese weeder and Cono weeder shown significant results. As per results presented in Table 1, weeding with cono weeder achieved highest soil disturbance. Over 33% rise in depth and width of soil cut was recorded over hand weeding. The results also indicated that higher efficiency of operation by cono weeder and Japanese weeder affected soil volume disturbed positively. Over 15% energy saving could be achieved by following treatments 2 and 3 over hand weeding. Other parameters tested although were not statistically significant but higher efficiencies were observed in the treatment 2 and 3. Grain yield harvested was significant in all the treatments. The maximum grain yield of 41 q/ha were recorded in treatment 2 wherein weeding was done with Japanese weeder followed by three treatment in which weeding was done with cono weeder (34q/ha). The least grain yield of 20.5q/ha was recorded under farmer’s practice in which hand weeding was done. Cost benefit ratio calculated was significantly higher in the treatment two and three. Among different technology indicators the maximum C : B ratio of 1:2.8 was recorded in treatment 2 wherein weeding was done with Japanese weeder followed by treatment 3 in which weeding was done with cono weeder. Treatment of hand weeding recorded C:B ratio which was lowest among all the technology tested (Table 1). Parida and Das (2004) research studies have amply demonstrated that there is positive correlation between weeder use and crop yields. In the experiments conducted by Srivastava and Panwar (1985) compared the use of rotary weeder (five times with ten days interval from 20 days after transplanting till booting stage) with the conventional hand weeding (three times) for wet season and chemical weeding and two times hand weeding for dry season. In both the seasons, mechanical weed control significantly increased grain yields.

References


