### **2.53 Mechanical transplanting**

Farmers could use soil alone as a media for raising seedling for rice transplanter with sprouted or dry seeds. tray soil

Dapog method required area is much smaller than conventional nurseries. Leveled seed bed should be made and center of the bed should be slightly higher than the edge to permit water to drain off the surface development and performance evaluation

cost of transplanting was Rs. 1152/ha and energy requirement was 230 MJ/ha. The maximum grain yield was observed in mechanical transplanting followed by manual transplanting, direct dry sowing and direct sprouted sowing. Mechanical transplanting

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significantly increased grain yield by 23%, 37% and 63%; straw yield by 17%, 14% and 22%; and biological yield by 20%, 24% and 39% over manual transplanting, direct dry sowing and direct sowing of sprouted rice in puddled conditions, respectively.

Singh R., A. Kumar and S.S. Singh. 2005. Response of rice cv Pusa Basmati 1 to different planting methods, IRRN, 30

development and performance evaluation

Haytham et al. (2010) studied the preparation of mat – type seedlings for

mechanical paddy transplanter. A plastic box (58 cm × 28 cm × 3 cm) called a nursery box, was used for raising rice seedlings. This conventional soil seedbed system had 47

been a major problem viz., a nursery box filled with soil weighs about 6 kg, high cost of the nursery boxes and heavy and hard work. The seedling mat (120 cm × 28 cm × 3 cm) was established in a layer of treated rice straw arranged on a firm surface and has been developed in the Rice Research and Training Center, Egypt, to save the operation cost. This study showed the potential of SM technology to stimulate agriculture in the region and consequently led to increased productivity.

development and performance evaluation

Mechanical transplanting systems increased yield, improved labor efficiency, ensured timeliness in operation and faster transplanting.

Mechanical rice transplanting method generates employment and alternate sources of income for rural youth through custom services on nursery raising and transplanting. The mechanical transplanting of rice has been considered the most promising option, as it saves labor, ensures timely transplanting and attains optimum plant density that contributes to high productivity.

Mechanical transplanting facilitate for optimum plant spacing Optimum plant spacing ensures the plants to grow properly with their aerial and underground parts utilizing more solar radiation and nutrients.

Mechanical transplanter has high field capacity and farmers can transplant rice seedlings within very short time by using mechanical transplanter. Recently, mechanical transplanter is introduced in our country. As a new technology, this machine needs to be evaluated in different agro- ecological zone and in different rice season.

Techno-economic performance of 4-row self-propelled mechanical rice transplanter at farmers field in Bangladesh

Rice researchers regarded lower plant population as one of the major constraints in enhancing rice production in the area. In order to solve this problem and increasing plant population in rice fields, the Agricultural Department of the Punjab and Farm Machinery Institute of Pakistan Agricultural Research Council are trying to popularising the use of mechanical rice transplanters in this zone. Presently,

the main advantage of the mechanical transplanting reported the farmers was that the nursery plants are firmly pegged into the soil, provided that the field is precisely or laser levelled. In case of poor levelling, uniform transplantation is not possible. So, good transplantation requires;

very precisely levelled paddy

fields, 8-9 inches long nursery plants or at least 25 days old nursery, roots of the nursery plants should be free from pebbles and also not very bushy, and the paddy field should not be too much puddled and it should not be heavily irrigated on transplanting day

Diffusion Possibilities of Mechanical Rice Transplanters

Mechanical transplanting (MT) of rice is considered as a feasible option tominimize huge labour use with timeliness cultivation in rice.

MT of rice is the process of transplanting young seedlings, which have

been grown in a mat nursery using a rice transplanter (Joseph et al., 2015). In conventional manual transplanting (CT), 20-30 people are required to transplant 1 ha/day, but 3 people can transplant approximately 2 ha/day using the rice transplanter. The other advantages of MT include uniform spacing, optimum plant density, less transplanting shock and better employment opportunities for rural youth through the development of custom service business. It is also capable of adjusting desired within row space (WRS), per hill seedling number (PHSN) and planting depth (PD0 according to the seedling age (SA), soil type and the level of puddling done in the field.

Presently,

Impact of varieties, spacing and seedling management on growth and yield of mechanicaly transplanted rice

In Asia, a number of different transplanters are now being used to establish rice crops. Machines are manufactured in China, Japan, Korea and Taiwan with varying levels of complexity. Machines range in size from a two‐row, walk‐behind models to eight‐row, ride‐on models. Land must be well prepared for machine transplanting. The soil needs to be level and have sufficient bearing strength to carry the machine and support the planted seedlings. Fields may need to be drained one or two days longer than they are for hand transplanting to stop seedlings floating. Most mechanical transplanters place seedlings in rows either 20‐30 cm apart with in‐row spacing determined by ground speed or head speed of the tra

Rice Production Manual

Mechanical transplanting in rice involves transplanting specifically raised younger seedling of rice as a mat (mat type nursery) using a self-propelled mechanical rice transplanter at pre- determined and desired spacing. Machine transplanter was first developed in Japan in 1960s, whereas the earliest attempt to mechanize rice transplanting dates back to late 19th century. In Japan, development and spread of rice transplanters progressed rapidly during 1970s and 1980s. They also developed new technologies of seedling raising for rice transplanter (Tasaka et al., 1996). In

disseminate this technology, with the following objectives: ? Ensure quality seedlings in proper time by raising seedlings in the tray under plastic shade

? Ensure uniform spacing and planting depth of transplanted rice

? Save time and cost during periods

Seedling establishment in tray: needed for mechanical

of peak-labour demand

transplanting of rice

? Create new forms of employment through creation of seedling nursery entrepreneurs and transplanting service providers ? Improve farmers socio-economic conditions

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machine transplantation resulted in earlier maturity of the crop (by 15 days) and 9% increased production compared to manual transplantation. Besides higher yield, 25-30% production cost was reduced by using machine transplanter.

The

Transplanting Rice Seedling Using Machine Transplanter : a Potential Step

Firstly it was seen that the area required to establish a paddy nursery is very small. Secondly the Kubota/ Hayleys demonstrations clearly showed that with proper nursery management and mechanized transplanting it will bring about as much as a 50% saving on seed paddy(compared to the broadcasting method). Furthermore, currently the formal seed paddy sector is only able to supply 30% of the seed paddy requirement to farmers. Therefore farmers are compelled to “grow” their own seed paddy which may be of poor quality and bring about a reduced yield at the time of the harvest. This saving will greatly contribute to the Agriculture Department’s endeavours to ensure that farmers have adequate supply of high quality seed paddy in the future. The

Without any doubt, the main reason that guarantees and proves a greater return on investment in the case of Kubota rice transplanter is the increase yield. Hayleys Agriculture has conducted many trials island wide including the Rice Research Institute at Bathalagoda and Samanthurai. These trials have proved that yield could be increased as much as 10-20% due to higher tillering per hill (20-25) when compared to the traditional broadcasting method.

Due to the benefits mentioned above, the government should encourage the adoptation of this technology by the farming community and perhaps provide loans/leasing facilities at concessionary interest rates through the financial institutions to the farmers

Hayleys Agriculture plants seeds of greater productivity through mechanized Rice Transplanter Saves on seed paddy, reduce weedicide usage and guarantees a greater yield

Mechanical transplanting improves labor efficiency, ensures timeliness in operation, faster transplanting and attains optimum plant density that contributes to high productivity (Islam et al., 2016 and Manjunatha et al., 2009). Seedlings raising is a

Mechanical transplanting improves labor efficiency, ensures timeliness in operation, faster transplanting and attains optimum plant density that contributes to high productivity (Islam et al., 2016 and Manjunatha et al., 2009). Seedlings raising is a crucial part of mechanical transplanter. Farmers do not know how to raise seedlings suitable for mechanical

Effect of row spacing of Rice transplanter on seedling requirement and grain yield