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Research Paper :

Performance evaluation of semi automatic two row rice transplanter

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ABSTRACT

Rice (*Oryza sativa*), one of the three most important food crop in world, forms the staple diet of 2.7 billion people. In Konkan region, rice is an important crop. Transplanting is most labour consuming operation during paddy cultivation. The cost of pudling and transplanting shares 50 % of total production cost. Lots of efforts are made by Dr.B.S.K.K.V, Dapoli to popularize the commercially available eight row self propelled transplanter (Yanji Shakti). The machine works well in literatic soil of the Konkan region. The limitations of the machine are smaller plot size and undulating topography of land. Manually operated four row, six row transplanters could not get much popularity in the region as the operator has to pull the transplanter which involves lots of drudgery. In order to develop two row self propelled transplanter the performance of 2 row pulled type was studied. The transplanter was tested at the Agronomy field of Dr. B.S.K.K.V., Dapoli. Various parameters like plant to plant spacing, planting depth, field capacity, field efficiency, total time of operation, speed of operation were recorded during field evaluation. The field efficiency and field capacity of the transplanter was observed to be 84.5 %. and 0.051 ha/hr respectively.

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Rice (*Oryza sativa*), one of the three most important food crop in world, forms the staple diet of 2.7 billion people. It is grown in all the continents except Antarctica, with total production of 661.3 million tonnes. The paddy production in Asia is 600.4 million tonnes (Anonymous, 2009). Its cultivation is of immense importance to food security of Asia, where more than 90% of the global rice is produced and consumed. Being the staple food for more than 62% of people, our national food security hinges on the growth and stability of its production.

Rice is generally grown by transplanting seedling in flooded field conditions or direct sowing depending upon the availability of water. In Konkan region, wet land cultivation system is followed. The land is ploughed thoroughly and puddle in 3-5 cm standing water. The puddling is largely done by bullock drawn country made plough and wooden planks in the region. In some of the pockets, the power tiller is used for puddling, but the extent is very low.

Transplanting is most labour consuming operation during paddy cultivation. The cost of pudling and transplanting shares 50 % of total production cost. The man days required for transplanting ranges from 50 to 60 man-days/ha. Now a days labour are very costly and scares. The delay in transplanting directly affects the yield. Hence, the transplanting operation needs to mechanize. The efforts are made by Dr.B.S.K.K.V, Dapoli to popularize the commercially available eight row self propelled transplanter (Make : Yanji Shakti). The utility of the machine is limited due to smaller plot size and undulating topography of land. The field efficiency of the machine reduced due to small plot size. It is also difficult to turn the machine in smaller plot. Some imported small size transplanters are made available in the region. In order to develop 2 row self propelled transplanter the performance of 2 row pulled type was studied.

METHODOLOGY

Two row semi automatic pulled type paddy transplanter consists of 1.25 hp engine, float, two transplanting arms, rocker arm, power transmission unit, needle. Transplanting mechanism is operated by engine. Power from engine is transmitted to gear box with the help of belt and pulley arrangement and is then it is transmitted to transplanting arm. Sufficient speed reduction unit is fixed in between engine and transplanting mechanism. During operation, operator has to pull the machine in field. The specifications of the machine are shown in Table 1.