

Design of Suitable Power Transmission System for Development of 4WD Tractor Mounted Paddy Transplanter

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ABSTRACT

The manual rice transplanting method gives the desired result but the labour requirement is very high. Mechanical transplanting requires a special method of raising nursery either in tray or mat type seedlings. Moreover, the price of machine is very high and majority of the farmers cannot afford to buy. In view of this a cheap, simple and effective indigenous transplanter is needed under Indian conditions. The VST Mitsubishi Shakti 4-wheel drive 22 hp tractor and China make Yanji Shakti 8-row paddy transplanter were identified for design and development of 4-wheel drive tractor mounted paddy transplanter. To transplant paddy seedlings within optimum hill to hill spacing, a transmission system/reduction gear box is required. To get optimum hill to hill spacing, the range of planting rpm was considered as 120-250. During the laboratory evaluation, it was noted that the paddy transplanting mechanism rpm increases with increasing the engine rpm at both PTO₁ and PTO₂. The recommended RPM range i.e., 120-250 was found from 1750- 3000 and 1250-2500 engine RPM for PTO₁ and PTO₂ respectively. During the evaluation on hard surface, it was observed that the hill spacing of 10.5, 15.6, 34.0, 6.8, 10.9 and 24.7 cm was obtained at P₁G₁, P₁G₂, P₁G₃, P₂G₁, P₂G₂ and P₂G₃ PTO gear settings respectively. During the laboratory evaluation on hard surface, it was found that by increasing the engine RPM, the operating speed and transplanting speeds also increases which will not effected on the spacing.

Keywords: *Paddy Transplanter, 4WD Tractor, Reduction Gear box, Tractor mounted Paddy Transplanter .*