

DESIGN DEVELOPMENT AND TESTING OF A PADDY TRANSPLANTER M.M.J.B. Yapa, P

.D. Kahandage, G.A.S. Ginigaddara

*Department of Agricultural Systems, Rajarata University of Sri Lanka Puliyankulama,
Anuradhapura, Sri Lanka.*

Rice is grown either by direct seeding (broadcasting, row seeding) or transplanting (in rows and random) where transplanted rice offer higher yield and facilitate the effective control of weeds. The Mark II six rows rice transplanter which was initially introduced was not popular among Sri Lankan farmers due to its operating difficulties. This study was conducted with the objective of designing, developing and testing of an efficient transplanter in order to enhance efficiency of transplanting in rice. The machine was designed with a complete drawing which was made using AutoCAD software and fabricated in the engineering workshop of the Faculty of Agriculture, Rajarata University of Sri Lanka. Machine consists of seedling tray, planting fork, drum marker, leveling board and power transmission system. Performance of the machine was tested and found to be easy in operation by a single man and simple in manufacturing and repairing at village level small scale workshops. The weight of the machine is 23 kg hence the transportation from place to place is feasible. Suitable average forward speed

for better operation was 0.1028 kmh⁻¹. Though the designed within row and between row spacing of the machine was 21 x 21 cm, the actual average spacing were 23 cm and 21 cm respectively. Although the machine was designed for one plant per hill, only 30% of the hills were planted one plant per hill. Percentage of two plants per hill, three plants per hill and more than three plants per hill were 40%, 20%, 10% respectively.

The theoretical and actual field capacities were 0.0043 hah and 0.0033 hah respectively while field efficiency was 76%. Actual field capacity of manual transplanting was 0.0031 hah. Damaged plants were 6.32%. Therefore, the transplanter would be well suited for transplanting paddy in Sri Lankan conditions.

Key words: Field capacity, Field efficiency, Manual transplanting, Row transplanting, Paddy transplanter