

FIELD EVALUATION OF NEWLY DESIGNED LOWLAND POWER WEEDER IN SRI LANKA

M.K.A.L. Jayawardena¹, G.V.T.V. Weerasooriya¹, D.M.D. Dissanayake² and
N.A.R.J. Perera³

¹*Department of Agricultural Engineering and Soil Science, Faculty of
Agriculture, Rajarata University of Sri Lanka, Puliyankulama, Anuradhapura,
Sri Lanka*

²*Department of Plant Sciences, Faculty of Agriculture, Rajarata University of
Sri Lanka, Puliyankulama, Anuradhapura, Sri Lanka*

³*Farm Mechanization Training Centre, Puliyankulama, Anuradhapura,
Sri Lanka*

Weeds are the major problem in lowland rice cultivation and weed competition reduces the rice yield. The chemical method of weed control is more prominent in Sri Lanka than manual and mechanical methods. Since, its adverse effects on the environment are significant and adopting of alternative method of weed control such as mechanical weeding in lowland rice is imperative. However, unavailability of the appropriate weeder for medium and large scale paddy farmers is a major problem in mechanical weeding. There are several types of weeders having rotary mechanism which do not control weeds efficiently. Even though a research was carried out at Rajarata University of Sri Lanka to design and fabricate a new power weeder by developing the weeding mechanism of Asakura wooden clogs, it was not properly evaluated yet. Thus, this study was aimed to confirm the adaptability of newly designed power weeder to practical farming conditions. This weeder consists of three weeding clogs, small engine, front wheel, rear skidders and handle with controlling unit. The weight, row spacing, and the ground clearance of the weeder were 62 kg, 30 cm and 33 cm, respectively. The dimension of the weeder was 150 x 80 x 78 cm. The practical field tests were carried out as per the RNAM test code and procedures, at the average field conditions of 41.5% moisture content, 3.30 cm depth of standing water, 1.26 g/cm³ bulk density, 88.5 kN/m² cone index, 259 weeds/m² weed density, 25.9 cm height of weed, 176 plants/m² plant density, and 47 cm height of plants in North Central Province of Sri Lanka during *Maha* 2015/16. The weeder showed higher field performances such as 7.6 m/min¹ traveling speed, 4.6 cm depth of cut, 0.03 ha/hr field capacity, 55.5% field efficiency, 67% width cover percentage, 85% weeding efficiency, 6.3% plant damage percentage, 33.2 man-hr/ha labour requirement and Rs. 7671/ha operation cost while receiving 22 tillers/hill and 6968 kg/ha net plot yield. Further, no practical difficulties or ergonomics defect were reported in the test period. Thus the weeder could be identified as an appropriate machinery for the local condition and introduced to medium and large scale paddy farmers. However, it is suggested to improve steering mechanism of the weeder for increasing the field efficacy.

Keywords: Evaluation performances, Lowland rice, Power Weeder, Mechanical weeding, Weeds