MODIFICATION AND EVALUATION OF FIVE ROW WEEDER FOR WEED CONTROLING IN SYSTEM OF RICE INTENSIFICA TION

A.K.K.D. Rathnasekara, G.V .T.V. Weerasooriya, G.A.S. Ginigaddara P.D. Kahandage

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

Rice is the staple food for about 50 percent of the world's population, which should be increased by 50 percent by 2025 in order to feed the increasing population. Although the System of Rice Intensification (SRI) is a methodology for intensifying the rice production, high labor requirement for weed control makes farmers reluctant to practice. Rajarata University of Sri Lanka has designed and developed a Five Row Weeder to solve this problem. The heavy weight (42 kg) and high paddy plant damage percentage (14%) were identified as two major draw backs of this machine. This study was aimed to modify the Five Row Weeder and evaluate its appropriateness for the weed control in SRI method compared to Single Row Cono Weeder, Double Row Cono Weeder and manual weeding. The weight and damage of plant percentages were reduced from 42 kg to 14.5 kg and 14% to 6% respectively after few modifications such as removing two weeding wheels, re-designing the frame and replacing the parts made out of iron with aluminum parts. Suitable average forward

speed for better operation of modified weeder (Three Row Weeder) was $0.1325\ kmh^{-1}$.
The theoretical and actual field capacities were $0.0065\ hah^{-1}$ and $0.0076\ hah^{-1}$ respectively. Under the same field conditions, actual field capacities of Single Row Cono Weeder and Double Row Cono Weeder were $0.0050\ hah^{-1}$ and $0.0058\ hah^{-1}$ respectively and theoretical field capacities were $0.0066\ hah^{-1}$, $0.0100\ hah^{-1}$ respectively. Field efficiency of Three Row Weeder was 7 6.62% and it is significantly higher compare to Double Row Cono Weeder (65.07%) and there is no significant difference with field efficiency of Single Row Cono W eeder (76.72%) at ($p<0.05$). The draft requirement to operate the machine in the field was 1 28.6N. The Three Row Weeder was re-designed satisfactorily and suitable for weeding process in row planted paddy cultivation in SRI method.

Key words: Irrigated rice, Re-design, SRI method, Three Row Weeder, Weeder