

## **DESIGN, FABRICATION AND PERFORMANCE EVALUATION OF A PULL TYPE SINGLE ROW MAIZE SEEDER**

**D.R.P. Ranasingha, P.D. Kahandage, and E.J. Kosgollegedara**

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

Maize (*Zea mays*) is the second most widely grown cereal crop in Sri Lanka and high labor cost in cultivation is major problem in reducing the farmer profit. Most of the farmers reluctant to use available mechanical seeders due to high initial cost and some operating drawbacks of them. Therefore, this study intended to introduce a user friendly and affordable maize seeder with a high field capacity and efficiency. It has several components such as seed hopper, seed metering mechanism, seed tube, furrow opener, furrow closer, ground wheels, power transmission system and handle. The material cost for the production was only LKR4500 making it affordable for small scale farmers. The total weight was 5.65Kg facilitating the operation by a single operator. The actual and theoretical field capacities, efficiency, number of seeds per hill, planting depth and spacing of the seeder were tested for both completely prepared fields (with primary and secondary tillage) and incompletely prepared fields (only with secondary tillage) using male and female labors, separately with three replicates. The suitable forward speed for better operation was  $0.164 \text{ ms}^{-1}$ . Average number of seeds per hill and average planting depth were 2 and 3.7 cm, respectively. The within row spacing is properly maintained by machine itself. The results manifested that, the actual field capacities for female and male labors at completely prepared fields were  $0.0327 \text{ hah}^{-1}$  at 90% efficiency and  $0.0329 \text{ hah}^{-1}$  at 91% efficiency respectively. Corresponding values in incompletely prepared fields were  $0.0321 \text{ hah}^{-1}$  at 89% efficiency and  $0.0323 \text{ hah}^{-1}$  at 90% efficiency, respectively. Data were analyzed using ANOVA with 95% confidence intervals. The results showed that, type of land preparation and gender of labor have no effect ( $p>0.05$ ) on the efficiency of the machine. Due to the affordability, user friendliness, higher capacity and efficiency, the machine can be recommended for maize cultivation.

**Keywords:** Field capacity, Field efficiency, Single raw maize seeder