

DESIGN, DEVELOPMENT AND TESTING OF LOWLAND POWER WEEDER

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Rice is one of the major important crops, which impacts most of the people in the world especially in the Eastern countries including Sri Lanka. Weed management is one of the major constraints in paddy cultivation worldwide. Water management, biological strategies, manual, chemical and mechanical methods are commonly used weed controlling methods in rice cultivation in Sri Lanka. Most of the weed controlling methods are not preferred by farmers due to high water demand, low efficiency, high labour requirement and environmental and health risks. Mechanical method is the only preferred method despite there is no highly effective weeder for medium and large scale cultivations. The effectiveness of existing power weeders is also low due to the associated rotary mechanism. Therefore, this research was aimed to introduce appropriate lowland power weeder, especially for medium and large scale paddy farmers in Sri Lanka through design, development and testing. Newly designed and fabricated power weeder consists of a frame, weeding unit, power transmission system, handle with controlling unit and front wheel, which are facilitated to bare the activated load, burying the weeds, achieve the required forward speed and weeding unit speed, machine control and road & field travelling. The latest modified version showed relatively higher field performance such as 0.603 km h⁻¹ forward speed, 0.0542 ha h⁻¹ field capacity, 88.95% field efficiency and 90% weed destroying percentage. This device consists of good ergonomics and safety status. Thus, this machine could be introduced as an appropriate machinery for weeding in medium and large scale, paddy farming. However, the total weight of the machine is 142.8 kg, which is difficult to handle in lowland field conditions. Therefore, it is suggested to utilize low weight materials and components.

Keywords: Machine testing, Puddle soil, Weed controlling