

A new mud wheel with retractable lugs for power tiller

In Sri Lanka, land preparation for the cultivation of paddy land is done mainly using the Power Tiller. The moisture content of Paddy soil is usually very high. Therefore, Power tillers that are operated in the saturated or flooded conditions often require special devices called “Mud wheels” in place of wheels.

Rotating ring Cage Wheels with Retractable Lugs for Power Tillers were designed and developed to provide easy road transportation and to improve performance in wetland operations. A pair of cage wheels was constructed after testing first wheel and implementing necessary modifications. The developed wheel consists of an inner ring and an outer cage. The 12 lugs were hinged on the inner ring resting on cross bars of outer cage those guide the lugs when the wheel was expanding or retracting. The 4 pulleys were provided on the inner side of the inner ring to rotate it smoothly when the wheel diameter was changed.

Two experiments were conducted in two locations (dry and wet soil conditions) to compare the performance of the developed wheels with conventional cage wheels. Effective field capacity, time per hectare, traveling speed, travel reduction, the pull developed at 100% slip and wheel cost were considered in evaluation.

From the results, it was observed that the performance of designed cage wheels were significantly higher in both locations. Increase in pull and power of the developed cage wheel over conventional was about 1.5 and 1.6 in both soil conditions, respectively.