

**Development and testing of a cage wheel with retractable lugs for four wheel tractors**

The moisture content of Paddy soil is usually very high. Therefore, four wheel tractors that are operated in the of flooded conditions often require special devices called "Cage wheels" attached to the rear wheels.

Rotating ring type Cage Wheels with Retractable Lugas for four wheel tractors were designed and developed to provide easy road transportation and to improve performance in wetland operations. A pair of cage wheels were constricted after testing first wheel and implementing necessary modifications. The developed wheel consists of an inner ring and an outer cage. The 16lugs were hinged on the inner ring resting on cross bars of outer cage those guide the lugs when the wheel was expending or retracting. The 6 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, travelling 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 developed cage wheels were significantly higher in both locations. Increase in pull and power of the developed cage wheel over conventional was about 1.4 and1.3 in both soil conditions, respectively,