

Present state of research on narrow wheels: a prerequisite for traction studies on non-lug narrow wheels

ABSTRACT

The use of narrow wheels as traction members of simple agricultural machinery and equipment has been investigated. This equipment can be easily acquired and maintained by low income earners and the rural dwellers whose occupation is predominantly farming. The off road performance of these narrow wheels in terms of rolling resistance, coefficient of rolling resistance, and the net traction ratio as they affect the tractive efficiency are discussed. The various factors such as the wheel diameter, inflation pressure, axle load and the operating speed on different soil conditions as they affect the off road performance are also highlighted. The size of the wheel and its weight is a good measure to combat the negative effects of soil compaction on agricultural soils. Existing models describing the tractive performance of agricultural wheels are stated and analyzed and the generalization of such models for predicting the tractive performance is discouraged.

Keyword: Narrow wheel; Net traction ratio; Off road performance; Pneumatic wheel; Rigid wheel; Rolling resistance; Tractive efficiency