

# 3<sup>RD</sup> GLOBAL FOOD SECURITY, FOOD SAFETY & SUSTAINABILITY CONFERENCE

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## Embedded systems for validation of traction models on farm use

**Ashok Kumar Arudra**  
College of Agricultural Engineering, India

A mechatronic based embedded system was designed and developed to measure and display the dynamic wheel axle torque and tractive force of different tractor-implement combination. It includes a special transducer to measure drive wheel torque of tractor, an embedded telemetry digital system to receive process and record the data in SD card module. The developed system was rigorously tested under laboratory and actual field conditions and found satisfactory results. The results obtained from the developed dynamic wheel axle torque values under various tillage operations with different implements were compared with the theoretical calculated values using traction models such as Brixius (1987), Wismer and Luth (1973) and Tiwari and Pandey (2009) to find the best model for Indian soils. The obtained results were compared using gross traction ratio and motion resistance ratio. A maximum variation of +35% was observed between the developed system and the theoretical calculated values using Brixius (1987) and Wismer and Luth model (1973), whereas the maximum variation of +14% was observed with the Tiwari and Pandey model (2009).

arudra.ashok@gmail.com

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