CANBUS data for tractor performance analysis in vineyard treatments

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**Keywords.** Big data, artificial intelligence, machine learning, agriculture.

**Abstract.** Tractors’ working performances in agricultural treatments can be affected by many environmental variables. Such aspects interact with other performance parameters like power take-offs (PTOs) utilization, torque, fuel consumptions and drive system. Since these parameters can have a significant impact on operating costs and business outcomes, understanding the relationship among them can be a reliable tool for machinery performance analyses.

This paper provides a solution for tractor performance analysis based on machinery data that can be collected from tractors right as they carry out their daily activities, by one minute intervals amounting to 60 entries per working hour. Such dataset relies on CANBUS information from tractor’s electronic control unit (ECU) which report data from various on-bord sensors (GPS, wheel speed, temperatures, etc.) and engine parameters (PTO speed, engine speed, oil and coolant temperatures, torque, etc).

The result of data analysis generated a dataset containing comparable information on specific agricultural activities performed at different environmental or working conditions. Comparisons can thus be made on tractor’s field capacity, fuel consumptions, torque, at different moments on the same field, or at the same external conditions on near fields.

Such analysis model can represent a major achievement for farming businesses, allowing finer analysis of previous data and the definition of the most suitable working set-ups for their agricultural machinery based on site-specific environmental and terrain types. Future developments of this work might include performance predictions based on artificial intelligence or machine-learning algorithms.