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Emissions Analytics expands field work to provide real-world fuel economy data for tractors.

Getting to the root of agricultural vehicle emissions, Harper Adams University has teamed up with Emissions Analytics, the leading provider of real-world emissions measurement, to provide the first real-world economy figures for tractors.

This innovative collaboration between Emissions Analytics and the agricultural sector has the potential to allow farmers to save fuel, and reduce harmful emissions, and provides a framework for the future testing of all non-road mobile machinery (N-RMM).

With the aim of the project to investigate the differences between theoretical CO_2 conversion factors and real-world factors for N-RMM, the results have demonstrated the feasibility of using PEMS equipment for such a task.

Traditionally, Harper Adams evaluates agricultural machinery in controlled environments such as a soil hall. However, this doesn't take into account the many variables from working in an agricultural environment.

Working with Emissions Analytics, and supported by agricultural machinery company CLAAS, postgraduate students took a Portable Emissions Measurement System (PEMS) in the field to find the facts.

Testing two CLAAS tractors, the evaluation involved two engine exhaust after-treatment systems commonly used to reduce emissions. These included a CLAAS Axion 830 with a selective catalytic reduction system and a CLAAS Arion 650 using exhaust gas recirculation combined with a diesel particulate filter.

Both tractors were trialled in three conditions: using a dynamometer to add a variable load to the power-take-off shaft; road testing at high speed with a fully laden trailer; and in a field with a subsoiler and power harrow. As with Emissions Analytics' evaluation of road vehicles, the CO, CO_2, NO_x and THC emissions data was combined with vehicle data such as GPS position, engine load and speed to provide a highly detailed measure of efficiency.

The results, analysed by student Miles Metcalfe as part of his MEng Agricultural Engineering course, with supervision by PhD student Rob Fillingham, demonstrated that by using the traditional conversion factors supplied by DEFRA, CO_2 emissions are being over estimated.

'One of the early challenges was gaining sufficiently detailed data, to help us understand how everyday use would impact efficiency,' explained Rob Fillingham. 'We could map Emissions Analytics' emissions information against the tractor's activity, to provide quantifiable and actionable results.'

As regulations change for N-RMM, the value of PEMS to measure compliance will allow Emissions analytics to broaden their research into other sectors N-RMM when fuel economy has be hard to quantify.

Notes to Editors

Emissions Analytics provides on-road vehicle emissions measurement and analysis. Their bespoke services include benchmark tests, product evaluation and real-world running costs. They measure with precision all regulated pollutants, including CO, CO_2, NO, NO_2, total hydrocarbons and particulate matter.

Emissions Analytics' pioneering role as supplier to What Car's break-through True MPG scheme has seen it test over 400 models and makes of passenger cars, providing consumers with an easy and reliable way to assess real-world fuel economy.

As experts in vehicle emissions and fuel consumption, Emissions Analytics supports a range of commercial and publicly-funded organisations. It is currently in partnership with Imperial College, London, studying urban emissions for transport planning and policy.

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