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Model of CO emission level of exhaust gases in tractor engines fed with biofuels

[\(get PDF\)](#) J. Wawrzosek ¹, W. Piekarski ²¹ Department of Applied Mathematics, University of Agriculture, Akademicka 13, 20-934 Lublin, Poland² Department of Vehicles and Engines, University of Agriculture, Akademicka 13, 20-934 Lublin, Poland

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abstract The article presents results of research on the levels of emission of carbon monoxide (CO) in exhaust gases emitted by the S-4002 engine of an agricultural tractor depending on two variables: the horsepower N_e developed by the engine and the percentage of RME (rapeseed methyl ester) contained in the fuel mix with fuel oil. In this experiment six different mixtures of mineral oil and RME were used. They included 0, 20, 40, 60, 80, and 100% of RME, respectively. The differences of the levels of CO emissions produced by the S-4002 tractor-engine, at two different workload values (at maximum torque speed nM_{omax} of 1600 r.p.m. and at maximum power output speed nN_{emax} of 2000 r.p.m.) were examined. Following the multiple regression analysis using the method of backward elimination for the 120 measurements made during the research, two regression equations were obtained for the per cent ratio of CO (N_e , RME) in the emitted fuel gases, in relation to the horsepower N_e developed by the engine and the RME biofuel content in the mix.

keywords fumes, biofuel, rapeseed methyl ester, statistical inference