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Res. Agr. Eng.

J. Homola, B. Groda

Analyzing the production of limited

from mobile sources of energy in agriculture

Res. Agr. Eng., 52 (2006): 136-144

An expert estimate of the weight of emissions produced in agriculture has been up to now made only through a final counting to the total REZZO 4 emission balance in the category of " other mobile sources" The existing situation is however unbearable since a proper methodology to determine the production of emissions in agriculture, i.e. in the department with a considerable consumption of fossil fuels, is still missing. The solution consists in a more precise specification of the weight of generated limited pollutants (CO , NO_x , SO_2 , PM and VOC including CO_2) in the department of agriculture on the basis of the measured annual consumption of fuels in agriculture and with using the emission factors of fuels. Calculated results are compared with the original values finally counted for the REZZO 4 category of " other mobile sources" in 2000 and 2001 (Adamec 2002; Adamec

et al. 2003). The calculation revealed that the weight production of individual pollutants in 2000 and 2001 reached only 28% and 27% for CO, 52% and 50% for NO_x, 69% and 66% for SO₂, 87% and 83% for PM, and 26% and 24% for VOC of the original estimates with final counts and was therefore much lower. The share of agriculture in the weight production of emissions from mobile sources in 2000 and 2001 was 3.1% and 3.1% for CO, 11.5% and 11.5% for NO_x, 19.8% and 18.8% for SO₂, 38.3% and 34.6% for PM and 3.5% and 3.6% for VOC. The development of weight production for individual pollutants in the period from 1995– 2005 is expressed by means of regression equations. Coefficients of reliability indicate that the measure of reliability of the interval determined by calculation is much higher than that of the reliability interval determined by values estimated through final counting that appear incidental. There are increasing efforts today focused on the replacement of diesel oil as a traditional fossil fuel in agriculture with biodiesel oil as a more environment-friendly fuel. The second

part of results includes a monitoring of the impact of biodiesel oil emissions in cases where diesel oil was replaced by this ecological fuel in agriculture in the period from 2000– 2005. It follows from the analysis that the weight production of pollutants in 2000– 2005 would have been reduced by 4% in CO, by 28% in SO₂, by 52% in PM and by 4% in VOC while an increase by 20% and 32% would have been recorded in CO₂ and NO_x, respectively. Regression equations are used to express the development of the weight production of individual diesel oil and biodiesel oil pollutants in the period from 2000– 2005. Reliability coefficients that are of constant character indicate that the development of the weight of pollutants from diesel oil replicates the