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Assessing the risk of accumulation and leaching of glyphosate and AMPA in soils related to N-fertilization in a long term field experiment

PETIT Stephane[1]

Université du Québec à Montréal (Canada)[1]

Organic or inorganic N-Fertilization is extensively used in order to maintain yields in corn and soy crops. There is evidence that N-fertilization plays a role in regulating pH, soil aggregate stability, soil organic matter or microbial activity but to date there are few studies that have investigated the association with glyphosate and AMPA persistence in soils. One purpose of this study is to assess the extent to which this factors influence degradation or adsorption of glyphosate and AMPA. Despite difficulties, it can be argued that in situ measurements in long-term field experiments are superior over other methods for quantifying impacts of crops technics. This study is conducted at the Centre de recherche sur les grains (CEROM) in the lower plains of the Saint Laurent River (Qc, Canada) where experimental trials were established in 2008. Six plots were managed under different N-fertilization practices (mineral, organic and without fertilization) and two tillage practices (labour and no till) and were sampled in post glyphosate application in 2015 an pre-glyphosate application in 2016 at 0-20, 20-40, 40-60 and 60-100 cm depth. Striking results to emerge from preliminary datas are the differences in glyphosate and AMPA concentrations between plots despite uniform applications of the herbicide since 2008. Further analysis of lignin biomarkers could yield information about the quality and quantity of the SOM and the soil adsorption capacity.

Palavras-chave: glyphosate, adsorption, long term field experiment