THE CARBON FOOTPRINT OF MINERAL FERTILIZERS

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Environmental threats associated with the intensification of agricultural production are currently becoming a significant factor determining production and application of fertilizers. The use of existing fertilizer and/or implementation of new ones require appropriate tools for evaluating how they interact with their environment. One of these tools is a Life Cycle Assessment (LCA), which can be used to identify, quantify and evaluate the total potential environmental impact of the product at the industrial production level and during their application in agroecosystems [Brentrup and Pallière, 2008; Dawson and Hilton, 2010].

The paper presents an assessment of the carbon footprint of mineral fertilizers based on life-cycle assessment (LCA) principles.

Production of mineral fertilizers increases greenhouse gas emissions (GHG), mainly carbon dioxide and nitrous oxide. The amount of emissions varies depending on the type of fertilizer, the raw materials used and the use of technology for CO_2 recovery. Fertilizer transport also contributes to GHG emissions (37 Tg CO_2 eq globally) (Brentrup, 2012; Brentrup and Pallière, 2008; Fertilizers, Climate Change and Enhancing Agricultural Productivity Sustainably, 2009). The results of the analyses indicate that the global warming potential of mineral fertilization is mainly determined by emissions of nitrous oxide, and to a lesser degree by carbon dioxide. Effective GHG reduction strategies in agroecosystems should attempt to 'seal' the nutrient cycle [Skowrońska and Filipek, 2014].

Keywords: carbon footprint, mineral fertilizers, LCA, GWP

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