PRODUCTION OF GREENHOUSE GASES WITHIN CULTIVATION OF GARLIC IN CONVENTIONAL AND ORGANIC FARMING SYSTEM

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Abstract

Agriculture and related processes significantly contribute to the production of anthropogenic emissions. Considering the increasing pressure on the environment and an expected expansion of agricultural habitats and intensification of their cultivation, it is important to look for ways to reduce the environmental load, including also the reduction of greenhouse gases emissions. This reduction can be achieved, inter alia, by the proper choice of farming system and by reduction of some processes, especially transport and processing of agricultural commodities. Within the study, garlic growing within the conventional and organic farming system was evaluated. Garlic has been traditionally grown crop in the Czech Republic and now it is massively replaced by imported production from Spain and China. For evaluation, the simplified LCA analysis was used. This is focused on the production of greenhouse gases expressed in the carbon dioxide equivalent (CO2e). Emissions were calculated for agricultural phases - agricultural technology, fertilizers, pesticides and field emissions - using the IPCC methodology. Between conventional and organic farming systems, there are apparent differences in particular processes, where e.g. within the agrotechnical phase, there is a higher load within the organic farming system (0.19972 kg CO2e/kg of garlic as compared with 0.1251 kg CO2e/kg of garlic within the conventional farming system), which is due to different yields and a higher agrotechnical demand of the organic farming system. Conventional farming releases more CO_{2e} within fertilization, pesticide use and filed emissions. The overall results show that, after conversion to one kg of garlic production, organic farming is by 42.39% more environmentally friendly as compared with the conventional one in terms of GHG emissions production.

Key words: greenhouse gases emissions, farming systems, garlic