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Changes in grassland chemical soil properties four years after cessation of long-term fertilization with compost and slurry

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Statement of the Problem: There is an advantage of organic fertilizers which lays in the fact, that their application positively influences the soil organic carbon content. Microorganisms play a key role in organic matter decomposition, nutrient cycling and other chemical transformations in soil. It follows that; there should be a long-term residual effect of organic fertilizers' application which was, however, only rarely investigated in grasslands. Moreover, additions of organic matter from various sources can differ in the effects on soil organic matter and biological activity. Generally, the composts are slowly decomposed in the soil. The aim of our study was to investigate the impact of the long-term application of different types and doses of organic fertilizers on the chemical soil properties of grasslands.

Methodology & Theoretical Orientation: A long-term small plot trial was established in 2004 in locality of Rapotín, Czech Republic. During 2004-2013, the experiment was fertilized with compost and slurry, both with the range of stocking rates 0.9, 1.4 and 2.0 livestock units (LU)/ha (corresponding to 54, 84, and 120 kg N/ha), and control without any fertilizer. The plots were cut 2-4 times per year depending on given dose of fertilizer. During 2013-2016, the regular management was ceased and the grasslands were not fertilized anymore.

Findings: Chemical soil parameters such as total organic carbon, total Kjeldahl nitrogen, humic acids and fluvic acids were determined. Based on the data about the soil chemical parameters from two investigated years (2011 and 2016) our results suggested significant effect of the grassland management (type of organic fertilizer) and also significant effect of the year.

Conclusion & Significance: Our findings indicated that additions of organic matter from various sources differ in the effects on soil organic matter and other chemical soil parameters, including the ratio of humic acids and fluvic acids.

Biography

Marie Stybnarova has her expertise in evaluation of grassland management and its effects on the floristic composition, forage yield and quality (determination of organic matter digestibility by *in vitro* tests), solving projects based on the experiments with different grasslands management, attending conferences with active results presentations, publication activity.

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