

Amino Acid and Soil Organic Matter Content of Topsoil in a Long Term Trial with Farmyard Manure and Mineral Fertilizers

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ABSTRACT

Commencing in 1980, a long-term experiment was carried out to compare mineral fertilizers (MIN), composted manure (CM) and composted manure with application of biodynamic preparations (CMBD) at three different fertilizer application rates. With mineral fertilizer, the lowest contents of 0.80% C and 0.069% N, with manure 0.90% C and 0.080% N, and with manure and biodynamic preparations 1.08% C and 0.094% N were achieved in the topsoil. The differences between these treatments were statistically significant. 42.9 to 53.7% of N_t was bound in 18 total hydrolyzable protein amino acids (THAA) including asparagine and glutamine. Amino acid contents in the hydrolyzates of the topsoil were significantly different according to fertilizer type: MIN < CM < CMBD. The higher contents in manure fertilized plots were observed even at the lowest rate of fertilizer application. This indicates that differences between the treatments do not depend only on the amino acid supply from manure, but are also influenced by an altered amino acid metabolism in the soil.

INTRODUCTION

The important role of farmyard manure for SOM maintenance or regeneration has been shown by several studies. Humus contents increased with farmyard manure to a greater extent than with mineral fertilizers in the *Eternal Rye Cropping* trial in Halle, Germany (Garz & Stumpe, 1992) and in other long-term trials in Rothamsted, United Kingdom (Jenkinson *et al.*, 1994), in Groß Kreutz, Potsdam, Germany (Asmus *et al.*, 1987) and in Keszthely, Hungary (Németh &

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