RESEARCH REGARDING THE GREEN MANURES INFLUENCE ON THE ENZYMATICAL ACTIVITY OF THE SOIL

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Abstract. *Actual and potential dehydrogenase, catalase and nonenzymatic catalytic and phosphatase (measured in unbuffered, acetate buffer and borax buffer reaction mixtures) activities were determined in the 0–10–, 10–20– and 20–30–cm layers of a brown luvic soil submitted to a complex fertilisation (green-manure) experiment. It was found that each activity decreased with increasing sampling depth. The fertilisation with green-manure led to a significant increase in each of the seven enzymatic and nonenzymatic activities determined. The enzymatic indicators of soil quality calculated from the values of enzymatic activities depending on the kind of fertilisers, showed the order: lupinus + rape + oat > lupinus > rape + lupinus > vetch + oat + ryegrass > lupinus + oat + vetch > unfertilised plot. This order means that by determination of enzymatic activities valuable information can be obtained regarding fertility status of soils.*

Keywords: catalase, dehydrogenase, green-manure, phosphatase

1. Introduction

Soil enzymes are the biological catalysts of innumerable reactions in soils. Although some enzymes (e.g. dehydrogenase) are only found in viable cells most soil enzymes can also exist as exoenzymes secreted by microorganisms or as enzymes originating from microbial debris and plant residue that are stabilised in complexes of clay minerals and humic colloides. Since it is difficult to extract enzymes from soils, enzymes are studied indirectly by measuring the activity via assays [14,15]. Nonetheless, studying soil enzyme activities provides insight into biochemical processes in soils and is sensitive as a biological index [1,9].
The effect of green-manure on soil enzymatic activities were studied in many countries, including Romania [2,17,18,19]. In order to obtain new data on the soil enzymological effects of soil management practices we have determined some enzymatic activities in a brown luvic soil submitted to a complex fertilisation experiment at the Agricultural Research and Development Station in Oradea (Bihor county).
The first data regarding the influence of green-manure on this soil were published

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