ENZYME ACTIVITY OF ACID AND ALKALINE PHOSPHATASE IN THE CERRADO SOIL UNDER MAIZE CULTIVATION IN TWO MANAGEMENT SYSTEMS

Authors Guieiro, C. S.M. [1], Camilo, B. G.[1], Campanha, M. M. [2], Neto, M. M.G.[2] , Paiva, C.A.O.[1,2], Marriel, I. E. [1,2]

Institutions 1 UNIFEMM - University Center of Sete Lagoas (Av Marechal Castelo Branco, 2765, Santo Antônio, CEP: 35701-242, Sete Lagoas - MG.), 2 EMBRAPA CORN AND SORGHUM (Rod MG 424 Km 45, Zona Rural, 35701-970, Sete Lagoas - MG)

The agricultural sector accounts for about 22% of emissions of greenhouse gases in Brazil, making it a challenge for research and development of more sustainable agricultural models. Proper management of agricultural soils contributes to the improvement of its biological quality and thus to mitigate the negative environmental impacts of agriculture. Soil quality can be monitored by microbiological indicators such as enzymes important in nutrient cycling. The aim of this study was to evaluate the activity of acidic and alkaline phosphatase enzymes, involved in phosphorus dynamics in cerrado soil under two management and contrasting levels of nitrogen systems. They used soil samples collected in long-term field experiment in the area of Embrapa Maize and Sorghum, Sete Lagoas, in order to monitor the carbon balance and dynamics of greenhouse gases in grain production system in the cerrado biome. The treatments analyzed (no-tillage and conventional tillage, in the absence and the presence of nitrogen fertilization were arranged in a randomized block design with three replications. An area under natural bushland was considered as a reference. The planting was made one fertilization based on 400 kg / ha of NPK 4-28-16 formulation. The nitrogen in coverage, 225 kg / ha was applied in two tranches, at 27 and 49 days after planting. The activity of the enzymes acid phosphatase and alkaline phosphatase were evaluated at 15, 32 and 56 days after planting, using the colorimetric method, which is based on the quantification of p-nitrophenol resulting from hydrolysis p-nitrophenyl phosphate. For both enzymes, there were significant differences in terms of management and evaluation time system, being non-significant interactions. The acid phosphatase activity was around 19% higher than observed for alkaline. Observed If greater activity in soil samples under no-tillage system, at 56 days after planting. These data, in part, can be explained mainly by higher energy source availability for your cellular metabolism. In this case, the activity of phosphatases helpful as bioindicators of biological soil quality.

Key words: tillage, soil bio-indicators, phosphorus

Development agency: CNPq, EMBRAPA Maize and Sorghum