



Changes phosphorus associated to phosphatase activity because of application of carbon, nitrogen and manure

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The Chilean Andisols are of great importance in the economy of southern Chile supporting the bulk of agricultural production. The major characteristics of Chilean volcanic soils are the high adsorption capacity of P with a concomitant low P availability to plants. Studies preliminary using dairy cattle dung suggest that we can improve P availability using organic P sources within the soil because of microorganism. Phosphorous solubilization by microorganisms is a complex phenomenon, which depends on many factors such as nutritional, physiological and growth condition of the culture. The principal mechanism for mineral phosphate solubilization is the production of organic acids where the enzyme phosphatases play a major role in the mineralization of organic phosphorous in soil. The objective of this study was to evaluate changes in soil phosphorus fractions due to application the cattle dung, glucose, nitrogen (N) and phosphorus (P). In this experiment we incubated soil samples with 300 g of cattle dung, 30 mg kg⁻¹ of N and P and 1000 mg glucose kg⁻¹. The soil samples were moistened to field capacity and incubated in plastic bags to room temperature by different time. The changes in P forms in soil were monitored through the Hedley fractionation procedure and phosphatase activity.

Our preliminary results indicated that the application of cattle dung, glucose nitrogen and phosphorus, caused the increased phosphatase activity until to 7 days and then apparently return to normal values. Interestingly, we observed a rise in the inorganic P fraction extracted by NaHCO₃ in the same period. In summary, the increase biological activity by carbon and nitrogen increase P availability.

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