

Área: Divisão 2 – Processos e Propriedades do Solo: Comissão 2.1 – Biologia do Solo

Título: SOIL BIOANALYSIS (SOILBIO): A SENSITIVE, CALIBRATED, AND SIMPLE ASSESSMENT OF SOIL HEALTH FOR BRAZIL

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Resumo:

In the past 20 years, Embrapa's research group on Bioindicators of Soil Quality (SQ), has been dedicated to the selection of robust SQ/Soil Health (SH) bioindicators to be used in commercial routine soil analyses in Brazil. The main objective is to provide a simple, effective and practical tool able to allow SH monitoring at farm scale. Based on this, farmers would know exactly what, why, how, and when to evaluate SQ/SH and most importantly, how to interpret what is being evaluated. Because of these studies, two soil enzymes, arylsulfatase (ARYL) and β -glucosidase (GLU) (associated to the S and C cycles, respectively), were selected, and interpretative algorithms were developed. The inclusion of these two soil enzymes in routine soil analysis, along with the calculation of Soil Quality Indices (SQIs), were named as soil bioanalysis technology (BioAS in Portuguese; SoilBio 'in English). In the SoilBio approach, soil quality is quantified combining chemical (FERT) and biological (BIO) indicators, in a framework that includes three soil functions: (1) nutrient cycling (based on the activities of GLU and ARYL), (2) nutrient storage (based on soil organic carbon, SOC and cation exchange capacity, CEC) and (3) nutrient supply (based on Ca⁺², Mg⁺², K⁺, P, pH, H+Al; Al⁺³, sum of bases and base saturation). Since 2020, GLU and ARYL have been used in large-scale on-farm SH assessments in Brazil, representing an opportunity to engage producers in soil testing beyond the standard chemical analyses. To make SoilBio available to Brazilian producers, Embrapa offers training to commercial laboratories of soil analysis (Rede Embrapa de BioAS, in Portuguese, Embrapa's SoilBio Network 'in English). Standardization of methods and protocols, along with appropriate proficiency testing, guarantee the quality of the results obtained nationwide.

Palavras-chave: soil quality, soil enzymes, beta-glucosidase, arylsulfatase

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