PROFICIENCY TEST IN TOTAL SOIL CARBON: COLLABORATIVE NETWORK AND ADEQUACY OF RESULTS

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Abstract

The Soil Carbon Proficiency Test (SCPT) is a pioneering interlaboratory program in Brazil with the purpose of establishing a collaborative network between laboratories for carbon (C) analysis in soil, to subsidize actions and initiatives in the carbon market in structuring in the country. The SCPT established the dry combustion technique by elemental analyzer as a reference for determining C and began on November 24 of 2023 with the sending of four different samples, whose triplicate results were returned by the laboratories by January 12, 2024. The results received were subjected to statistical analysis to eliminate outliers based on the interquartile range, using the lower and upper limits (25 and 75% respectively) to later obtain the designated values and standard deviations. From these values, z-scores were calculated to evaluate participants' performance as excellent ($|z|{\leq}1$), good ($1<|z|{\leq}2$), questionable ($2<|z|{\leq}3$) or unsatisfactory ($|z|>3$), corresponding to scores 100, 75, 50 and 0, respectively, for each sample. Furthermore, the average efficiency index (IE) was calculated from the average scores of the samples and the imprecision index was calculated from the average coefficient of variation of the samples. Participants were classified as proficient when IE$\geq$70 and more accurate the closer the imprecision index is to 0. Results were received from 17 participants and the designated values obtained were: 0.613, 1.269, 2.027 and 1.302% of C for samples 1, 2, 3 and 4, respectively. Of the 17 participants, 14 participants (82%) were considered proficient and three non-proficient. The inaccuracy index revealed that, in general, laboratories are consistent between replicates of the same sample. This shows that the errors observed in the determination are systematic and not random. Characteristics such as equipment calibration curve, mass and type of sample analyzed in the laboratory are points of attention for improving the analytical quality of carbon in the soil.

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- 4-Measuring and modelling carbon on land

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