Science Societies

Optimizing soil mass yields better estimates of biological activity

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Lab technician, Erin Silva, prepares soils in different mass/volume treatments to test soil biologi

Lab technician, Erin Silva, prepares soils in different mass/volume treatments to test soil biological activity as a soil health indicator. Photo courtesy of Alan Franzluebbers, USDA-ARS

Soil-test biological activity is becoming increasingly popular as an indicator of soil health. It signals the quality of the microbial habitat and nutrient cycling as well as the potential for organic carbon sequestration. Researchers currently use a variety of laboratory approaches to make this assessment, but the different approaches can lead to varying estimates for the same soil sample. Standardization of this methodology would create more consistent interpretations of soil health conditions.

A new article in the *Soil Science Society of America Journal* reports on an experiment conducted on five different soils varying in physical and organic matter characteristics. The effect of 10 different soil mass and volume combinations on soil

biological activity estimates was determined. The author found that an intermediate mass of soil in a defined volume produced the best estimate of central tendency and minimized random variation to a low level. Variation in estimates due to two lab technicians performing titration was relatively low. Incubation of less than 50 g of soil resulted in the highest random variation.

The article encourages soil-testing labs to standardize protocols for soil-test biological activity. The study also demonstrates that a minimum of 50 g of soil should be used for the most consistent and reliable results. These findings will benefit commercial and research soil-testing laboratories and the clientele they serve.

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Franzluebbers, A.J. (2020). Soil mass and volume affect soil-test biological activity estimates. *Soil Science Society of America Journal*, 84. https://doi.org/10.1002/saj2.20038

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