



A simple respirometric method to evaluate the degree of stability of compost

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The development of analytical methods for the assessment of compost stability, both reliable and easy to determine, is important for a better control of the compost quality and for the reliability of composting as a strategy for sustainable recycling of organic residues. However, despite the numerous researches performed on the subject, there is, to date, no universally accepted method for the evaluation of compost stability. The aim of this work was the evaluation of a simple method for the determination of compost stability based on the measurement of CO₂ evolution from compost samples incubated under laboratory conditions. Air dried compost samples (7.5 g on dry matter basis) with different degree of stabilization from 3 different composting mixtures were brought to 60% water content and immediately incubated at 22 °C for 5 days. CO₂ evolution from compost samples was measured every 4 hours by means of an automated chromatographic system for gas measurement. Both rate of respiration at the end of incubation period and cumulative CO₂ evolution were utilized as parameters for the assessment of compost stability. Rate and cumulative respiration of samples with different composting time were significantly different and inversely correlated with composting time. Moreover, dynamics of CO₂ evolution provided additional information for the characterization of compost samples in terms of level of transformation of organic matter and presence of organic matter pools with different levels of degradability. For each compost mixture, rate and cumulative respiration were significantly correlated with conventional stability indexes such as C/N ratio, humification index and water extractable C. Results of our work suggest that the proposed technique

could represent an easy and reliable method for the evaluation of compost stability.