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Tests of Various Compost Inoculum on Rate of Decomposition and Food Production

As universities work to reduce their carbon footprints, campuses are composting, rather than landfilling, food waste. Unfortunately, few studies of composting outcomes exist, and there are even fewer studies analyzing compost methods. This study analyzed 3 methods for treating food waste at various concentrations. Bokashi is a compost inoculum, which uses a wheat bran-type substrate hosting "effective microorganisms". Here we report the results from a three-phase compost study of pre-consumer food waste. Five food waste treatments included a no inoculum control, and single or 3-layer treatment, of Bokashi or soil. For Phase 1, we fermented the food waste in five-gallon buckets, measuring the headspace carbon dioxide (CO2). The CO2 to soil ratios declined from approximately 300 to approximately 100 over 4 weeks showing little variation between treatments. For Phase 2, compost decomposition completed in the field, measured by soil respiration rates, showed a large initial spike (above 150 micromoles of CO2/meter2/second), then declined over a 6-week period. For Phase 3, the compost was dried and ground, then used as a nutrient amendment to grow lettuce. Biomass increase occurred for all amended treatments, surprisingly, the largest increase (150%) was found for the food-only compost treatment. Our results suggest Bokashi and soil amendments provide little to no additional benefit compared to food-only compost. Future work should assess emissions produced through these types of composting efforts, to more quantitatively evaluate the benefits of composted food waste versus potentially avoided greenhouse gas emissions (e.g., methane and nitrous oxide) associated with landfilled food waste.