Cowpost Chemistry: The Effect of Ruminant Stomach Contents on the Buffering Abilities of Compost

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Soil buffering is the ability of soil to resist pH change, either towards the acidic or alkaline ends of the spectrum. The effects of certain factors on soil buffering are unknown: when a local landfill creates compost utilizing plant matter taken from the stomachs of slaughtered cattle, will the finished soil buffer in the same way as regular soil? An experiment has been designed to determine whether this unique compost does in fact, have a better buffering ability than standard soil and to what extent. The experimental hypothesis was that the compost would have a greater buffering ability than potting soils and sand against basic solutions, but not acidic solutions. To test this, pure solutions of the compost, sand, and two separate potting soils were each mixed with 400 mL of pure water and 25 mL of HCl solution and compared to observe the changes in pH. The same technique was used with sodium hydroxide (NaOH) solution in place of hydrochloric acid (HCl) to test changes in pH when basic solutions were added. Buffering ability was determined based on the difference in pH of the soil before and after the HCl or NaOH was added. The compost proved to have a greater buffering ability than the sand and both potting soils when either bases or acids were added. The experimental hypothesis was partially supported because the compost buffered against acids as well as bases. This unique form of composting represents a ripe field for future evaluation in the search for a practical soil able to resist natural pH change.

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