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Nondestructive Determination of physico-chemical properties in Compost by Near Infrared Reflectance Spectroscopy

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The compost constituents vary widely, however, the physico-chemical properties and the degree of maturity are very important factor in compost quality. So this experiment carried out to determine the rapid estimation of the quality in cattle, pig, chicken and industry waste composts using near infrared reflectance spectroscopy(NIRS). Near infrared reflectance spectra of composts was obtained by InfraAlyzer 500 scanning spectrophotometer at 2-nm intervals from 1100 to 2500nm. Multiple linear regression (MLR) or partial least square regression (PLSR) was used to evaluate a NIRS method for the rapid and nondestructive determination of physico-chemical properties and humic acid contents in composts. The standard error of prediction(SEP) for finely sized sample(<0.5mm) and coarsely sized sample(<2mm) did not show much difference. The NIR instrument of filter type showed the same accuracy of the monochromator scanning type to estimate the compost properties. The results summarized that NIR spectroscopy can be used as a routine testing method to determine quantitatively the OM, moisture, T-N, color, pH, humic acid content in the compost samples nondestructively. Especially, we supposed that absorbance around 2300nm is related to humic acid as a factor of compost maturity. However the NIR absorption approach is empirical, it actually requires many combinations of samples and data manipulations to obtain optimal prediction.