



Transferring a calibration model and a spectral library to a soil analysis laboratory network

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Near infrared reflectance spectroscopy (NIRS) is known to be a rapid, low-cost, reproducible method which allows the prediction of several soil properties at the same time. Prior to routine application in a network of soil analysis laboratories, a calibration model has to be built and validated. As this usually constitutes an expensive and time consuming step of data acquisition, it is beneficial to develop this model and an associated spectral library in a reference laboratory before testing their transfer to a regional laboratory network differently equipped.

In the Walloon Region (Southern Belgium), the ability of NIRS technique to predict total organic carbon (TOC), total nitrogen (TN), and clay content and cation exchange capacity (CEC) of agricultural soil samples was investigated. Spectra were obtained using a FOSS NIR SYSTEM 5000 instrument. The partial least square local calibration technique was used. As the predictions were accurate, the opportunity of transferring this model and the associated spectral library to the network was tested. As all the laboratories work with a FOSS XDS spectrometer, the spectra data base was first transferred from the NIR SYSTEM 5000 to a master XDS and then between all the XDS of the network.

The results presented here are : (i) all the laboratories can calibrate their equipment with the original models and spectral library to predict accurately the TOC, TN, clay content and CEC in agricultural soils, and (ii) the spectral library may be improved in the future by additions of data from each laboratory, even if NIRS equipment is different from that used in the first calibration step.