



Small sized local vs. large sized national calibration sets and their combination for farm scale predictions by NIR

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It is often suggested and shown that local NIR calibrations at small geographical scales are superior to general calibrations at a provincial scale or larger. However, with few exceptions, these local calibrations are based on a large number of known samples, which require extensive reference analysis and undermines most of the advantages with NIR-spectroscopy. In this study the possibility to predict a number of important soil characteristics at the farm scale with as few as 25 samples was compared with using a calibration made on 400 agricultural soil samples from all over Sweden. In addition the 400 national scale samples were spiked with 5,10,15,20 and all 25 farm scale samples for combined calibrations. The experiments were performed on four 75-100 ha farms of different soil types in Sweden. Validations were performed on approximately one sample per ha. The general trend was that calibrations based on the national scale samples performed better with spiking than without and in some cases the effect was large, reducing prediction errors with more than 50%. The reduction could largely be explained by reduced bias. Compared to calibrations based on the 25 farm scale samples only, spiked national scale calibrations improved prediction errors in only a few cases, most systematically for clay content with reduction of prediction errors with up to 15%. Occasionally also predictions for soil organic carbon, pH and plant available P improved slightly, but never for silt and sand.