Application Note 90: Calibration of Moisture in Ground Wheat using a Series 1000 Analyser.

Introduction:

NIR Technology Systems has developed a new instrument called the Series 1000 Analyser. This new analyser was used to develop a calibration for the analysis of moisture in ground wheat.

This study was undertaken to determine the feasibility of measuring moisture on the Series 1000 Analyser.

Procedure:

10 samples of wheat where doctored with additional water and allowed to stabilise before being ground in a 0.5mm grinder. A further 10 samples of unaltered wheat were also ground in 0.5mm grinder giving a total of 20 ground samples. These samples were then placed into the squeeze cell of the Series 1000 Analyser and scanned over the wavelength range of 860nm to 1020nm at a pathlength of 5mm. A total of 5 scans were collected for each sample. The spectra were uploaded into NTAS (NIR Technology Analysis Software) and Partial Least Squares Regression (PLS) was used to develop a calibration for Moisture.

Results:

Figure 1, below, shows the NIT spectra of the 20 samples of ground wheat.

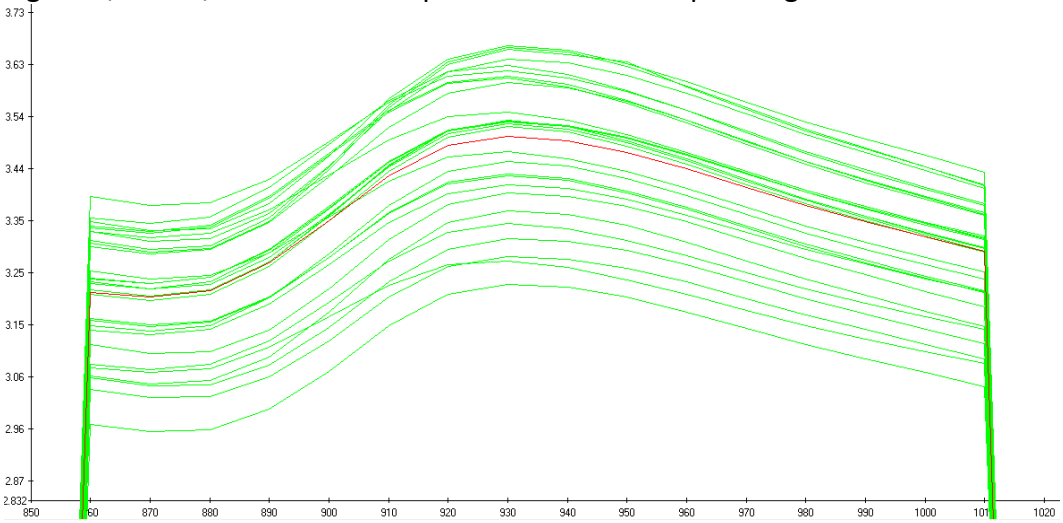

Figure 1: Plot of NIR spectra for scans of ground wheat samples.

Figure 2, below, shows the calibration statistics for the NIR moisture values versus the reference moisture values. The Standard Error of Calibration is 0.21% with a correlation (R^2) of 0.99.

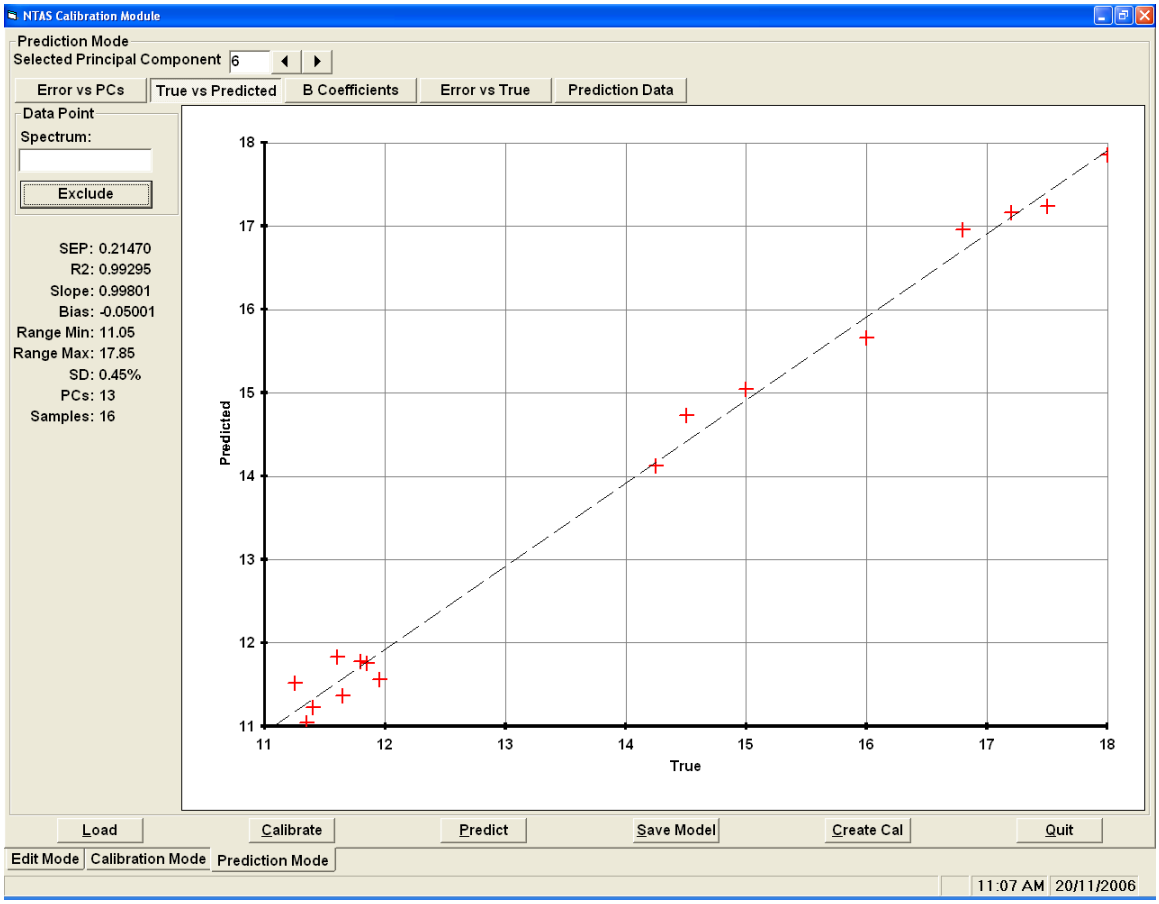

Figure 2: Plot NIR Predicted moisture value vs. Reference moisture value.

Conclusion:

It can be seen in figure 2 that the Series 1000 Analyser can be calibrated to measure the moisture values in ground wheat samples. It is recommended that the sample sets be expanded to include more samples with lower moisture values to improve the robustness of the calibration in future.

Whilst the available samples clearly demonstrate the ability of the Series 1000 Analyser to measure moisture, care must be taken in the packing of the squeeze cell. The cell will need to be consistently packed on each occasion without over or under packing the cell.

NIR Technology Systems
366 Edgar Street, Condell Park, NSW, 2200, Australia
Tel: 612 9771 5444, Fax: 612 9771 5255
Email: nirtech@nirtech.net, Web: www.nirtech.net