

3300H On Combine Analyser

... Closing the Yield Gap

CropScan 3300H Calibration for Oats:

The CropScan 3300H On Combine Grain Analyser is commonly used to measure Protein and Moisture in wheat and barley as well as Oil in canola, soybeans and corn, however this technology can be used for virtually all cereal grains and oil seeds, including oats.

A large North American manufacturer of breakfast cereals has installed the CropScan 3300H in several of their combine harvesters. Their objective has been to measure Protein, Moisture and Oil in oats and thereby management the application of Nitrogen fertilizer to optimise the Yield and Protein.

Four hundred samples of oats including different varieties and growing regions, were scanned on 2 CropScan analysers which were setup on a bench to simulate how samples would be analysed in the field. The Near Infrared Transmission (NIT) spectra of the oats samples were collected and uploaded to the NTAS Software (NIR Technology Analysis Software). Partial Least Squares Regression analysis was used to develop calibrations for Protein, Moisture and Oil.

Results:

Figure 1. shows the NIT spectra for the oats samples, covering the wavelength range from 720-1100nm. Ten sub-scans were collected for each sample and were averaged. The reference data for Protein, Moisture and Oil were entered into the spectra data set using Microsoft Excel.

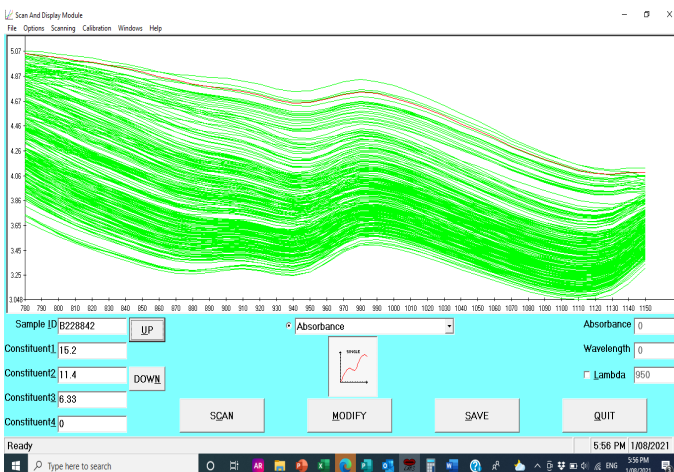
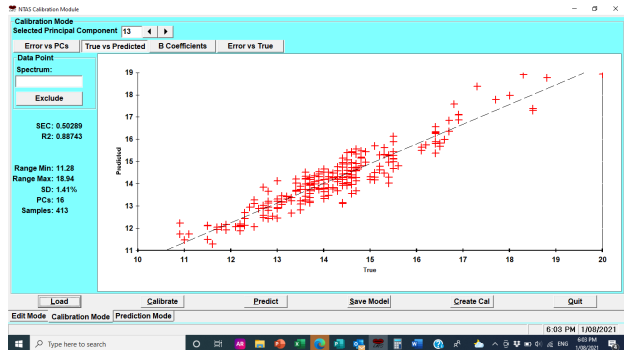
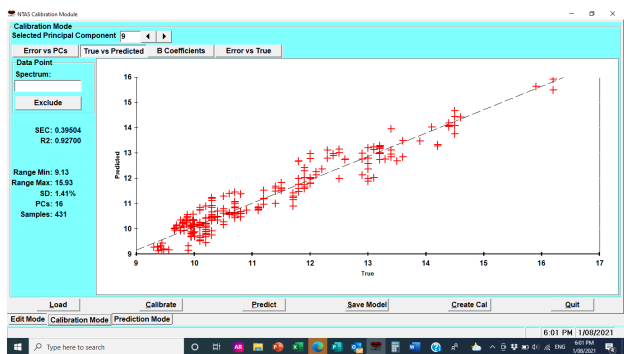


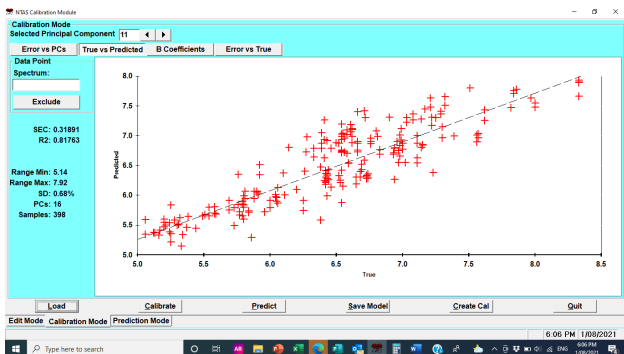
Figure 2. shows the calibration plots for each constituent.



Protein Calibration Plot



Moisture Calibration Plot



Oil Calibration Plot

Discussion:

Oats are a more difficult seed to analyse since they vary in length and they tend to jam in the flow cell. To improve the flow of the grain through the CropScan 3300H analyser, the pathlength was increased to 24mm. The net result was that robust calibrations could be developed independent of the variety or growing region.