Application Note 148: Regional Oil and Moisture Calibration for Canola Seeds

Introduction:

Oil and moisture are the two major parameters measured in Canola Seeds. The Cropscan 2000B Whole Grain Analyser is designed for measuring a wide range of cereal grains and oil seeds, including Canola. This study looks at the calibration for oil and moisture in Canola Seeds taken from southern NSW and Victoria during the 2009 harvest.

Procedure:

Samples of canola seeds were collected from a grain receival depot in southern NSW. The samples were analysed for oil and moisture using an Infratec 1241 and then bagged in sealed plastic bags in order to maintain the moisture content. With a few days the samples were scanned using a CropScan 2000B using an 8mm pathlength sample cell. 10 Near Infrared Transmission scans were collected for each sample across the wavelength range from 720-1100nm. Each sample was repacked and scanned in duplicate.

The spectral data was imported into NTAS, NIR Technology Analysis Software, and a Partial Least Squares regression analysis was performed to develop calibrations for both oil and moisture.

Results:

Figure 1, shows the NIT spectra, over the wavelength range of 720nm to 1100nm, for canola seeds.

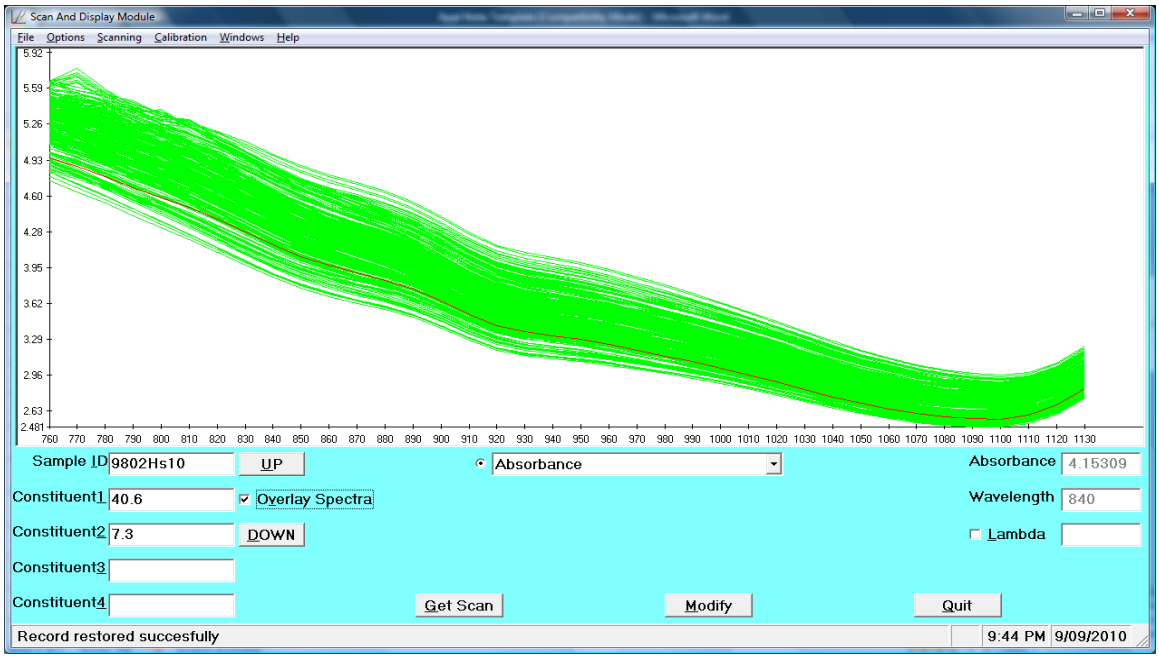


Figure 1: Plot of NIR Spectra for Baitfish.

Figure 2 shows the calibration plot for oil and figure 3 shows the calibration plot for moisture.

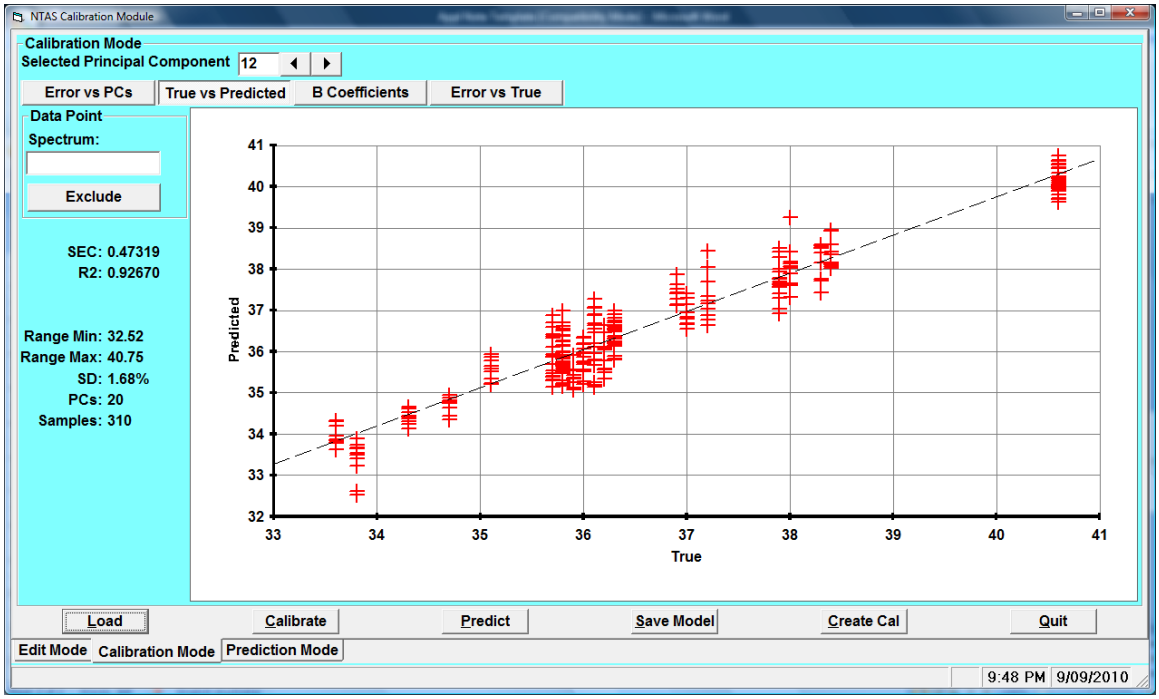
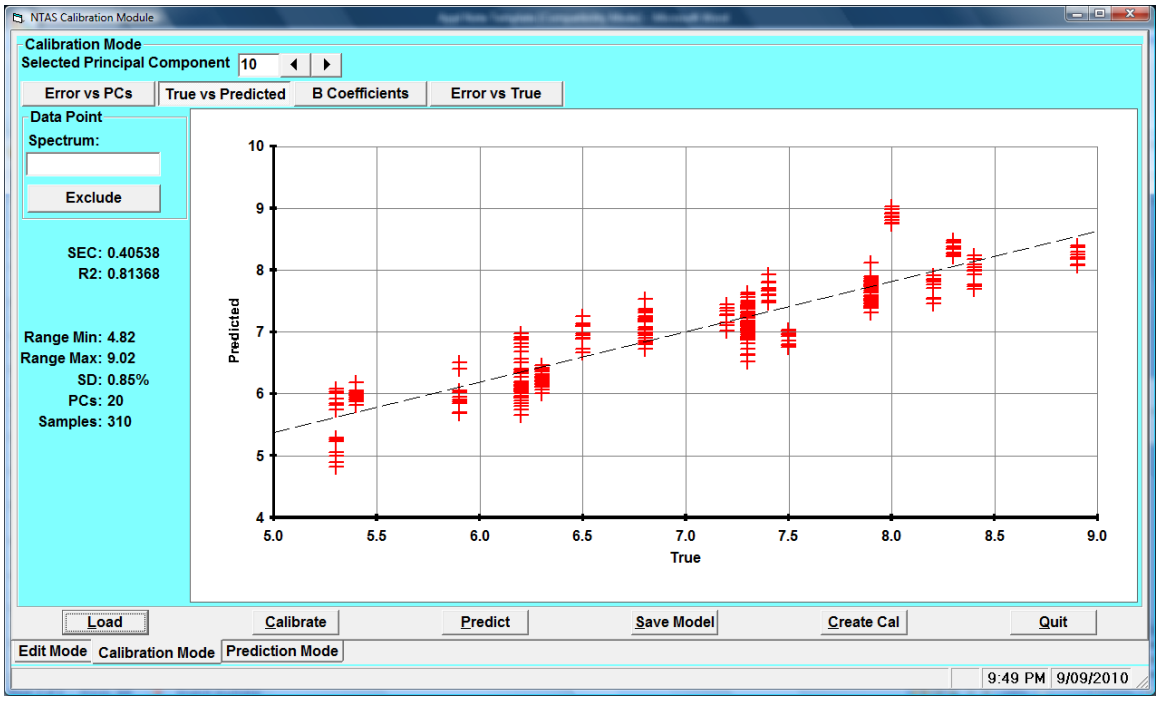


Figure 2: Plot NIR Predicted Protein value vs. Reference Protein value.



The Standard Error of Calibration for oil is 0.47% with a correlation (R^2) of 0.929.
The Standard Error of Calibration for moisture is 0.4% with a correlation (R^2) of 0.91.

16 further samples were collected and analysed using the calibrations developed above.
Figure 4. Shows the prediction plot for oil in the 16 samples of canola.

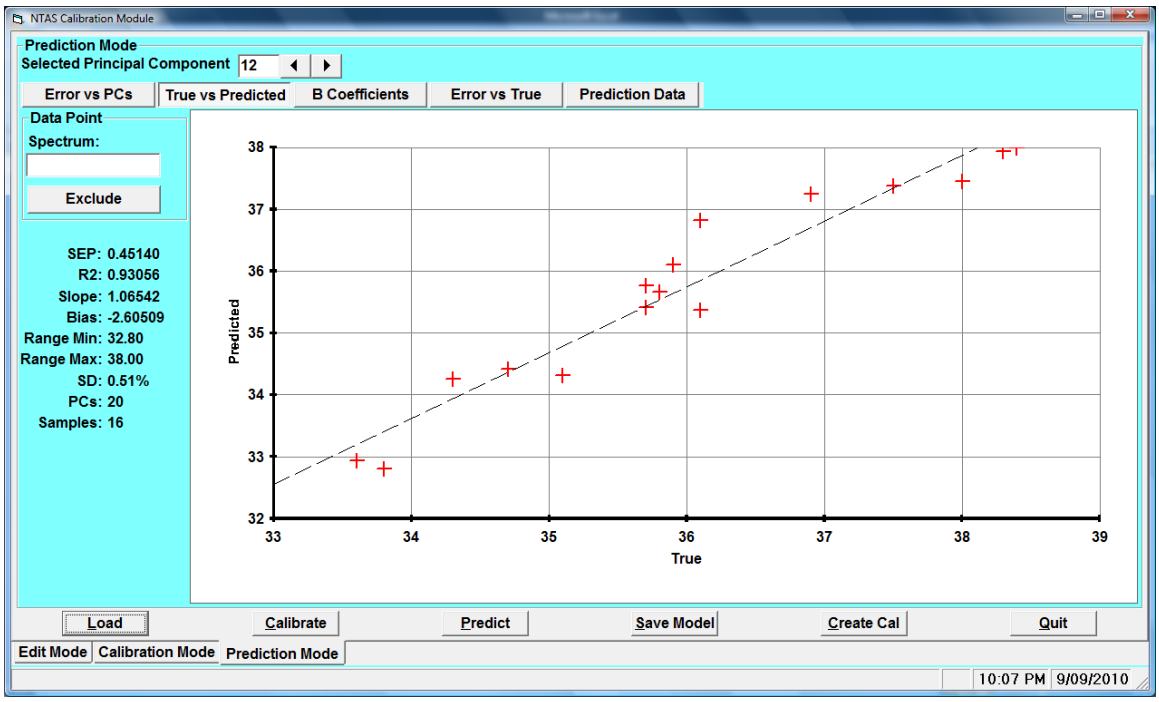


Figure 4. Prediction plot for oil in canola.

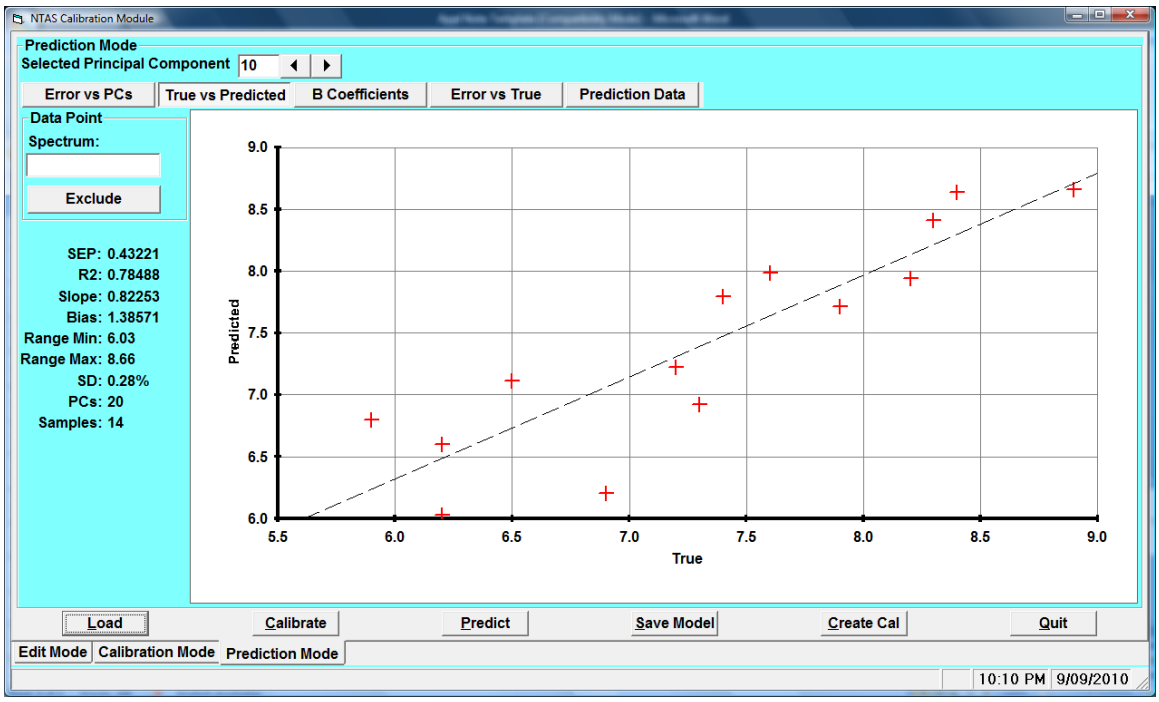


Figure 5. Prediction plot for moisture in canola.

The Standard Error of Prediction for oil is 0.43% with a correlation (R^2) of 0.93.
The Standard Error of Calibration for moisture is 0.43% with a correlation (R^2) of 0.79.

Conclusion:

The above data demonstrates that the Cropscan 2000B can be calibrated for oil and moisture in canola.

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