Application Note 80: Fat Analysis in Ground Corn

Introduction:

Corn has an oil content of between 0.5 to 2%, which is considered to be at the low end of analysis for the Cropscan 2000B. Four finely ground corn samples and 7 coarsely ground samples with oil contents from 0.47 to 2.02% according to wet chemistry were scanned into the Cropscan 2000B using a 20mm sample cell. 10 scans were taken across the sample cell and the results were downloaded into NTAS software. Figure 1 shows the absorbance spectrum within the 720 to 1100 nm range.

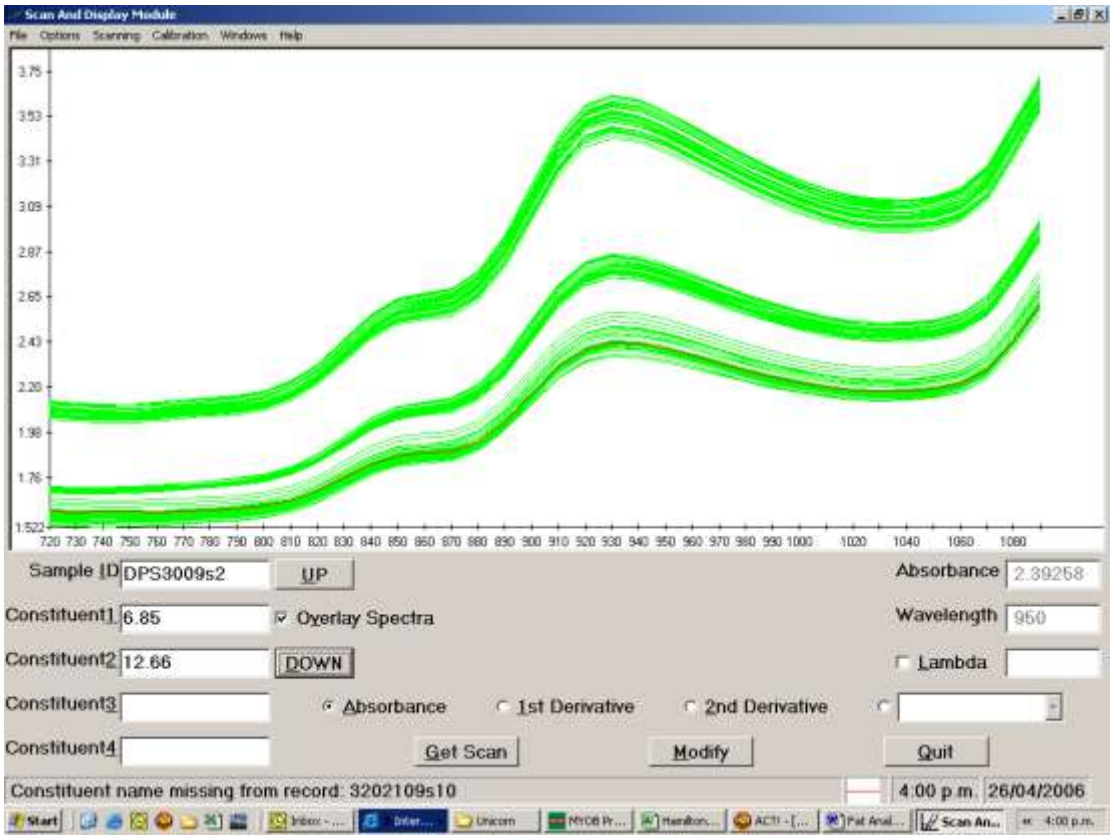

Figure 1: Absorbance spectrum of ground corn

The calibration plot in figure 2 shows a low error and good correlation. In order to confirm the validity of the calibration the same dataset was used as a prediction set (Figure 3). Again good linearity and low error was achieved. Most prediction values come close to the true value (Figure 4).

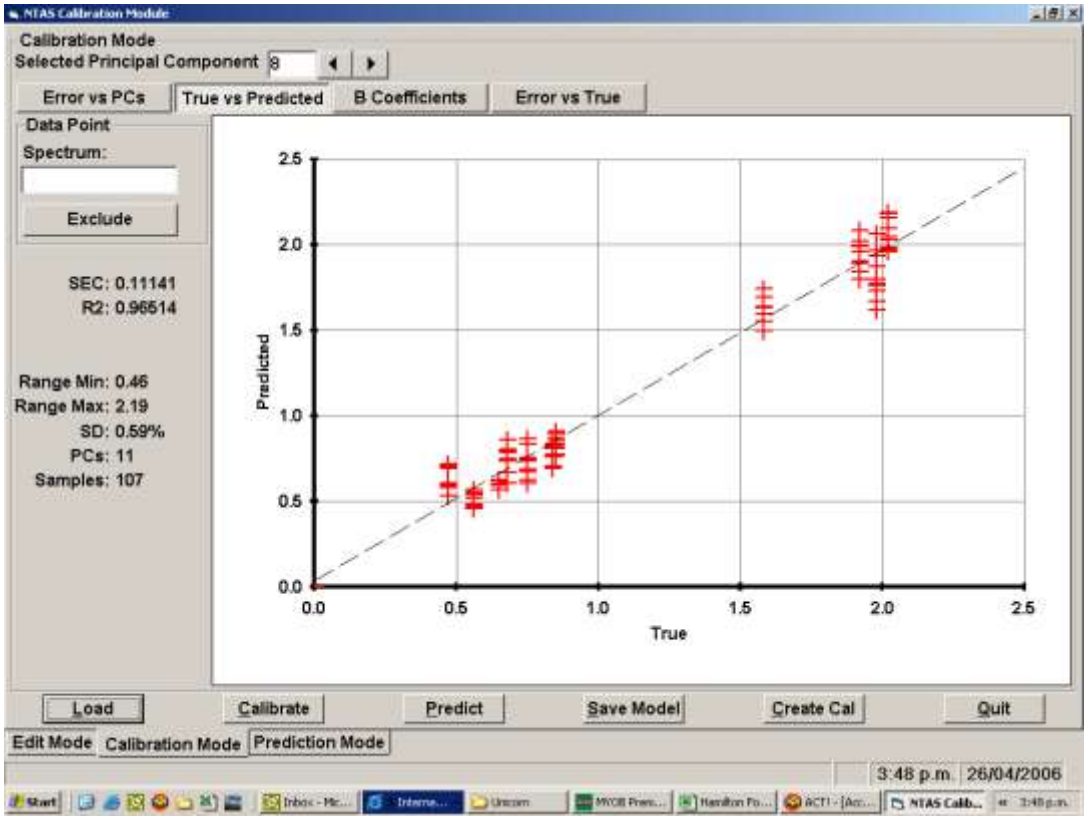

Figure 2: Calibration plot

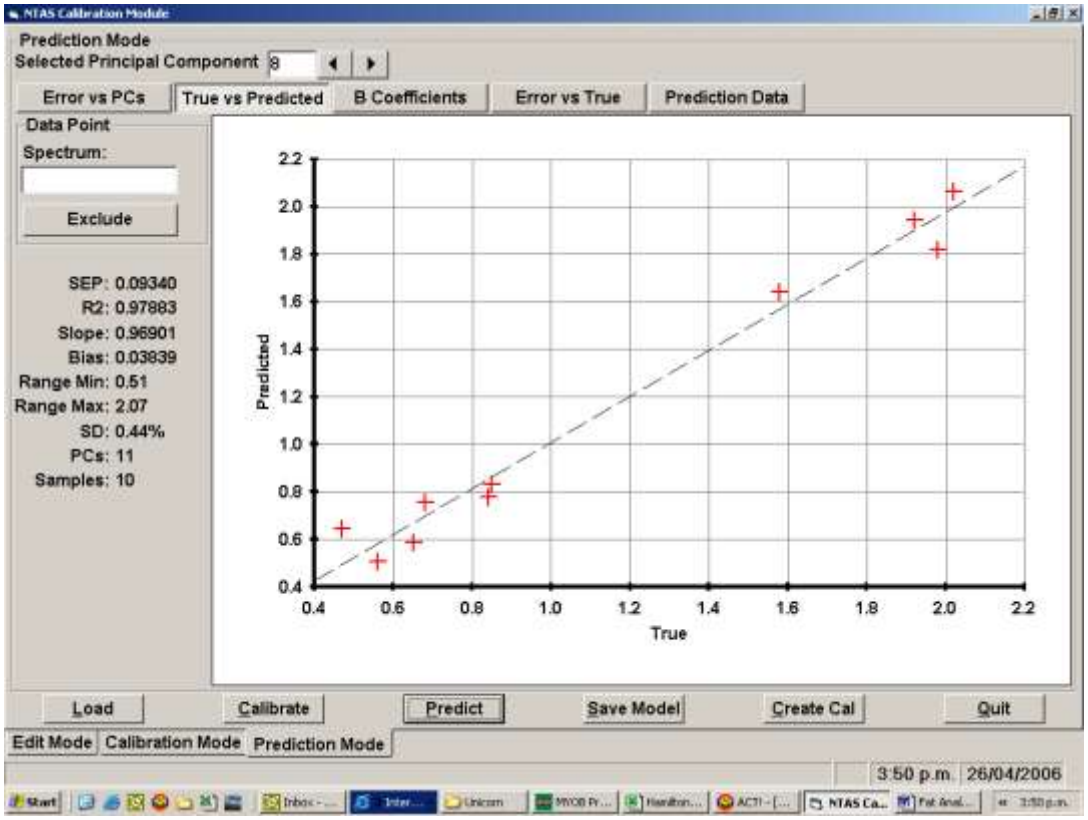

Figure 3: Prediction plot

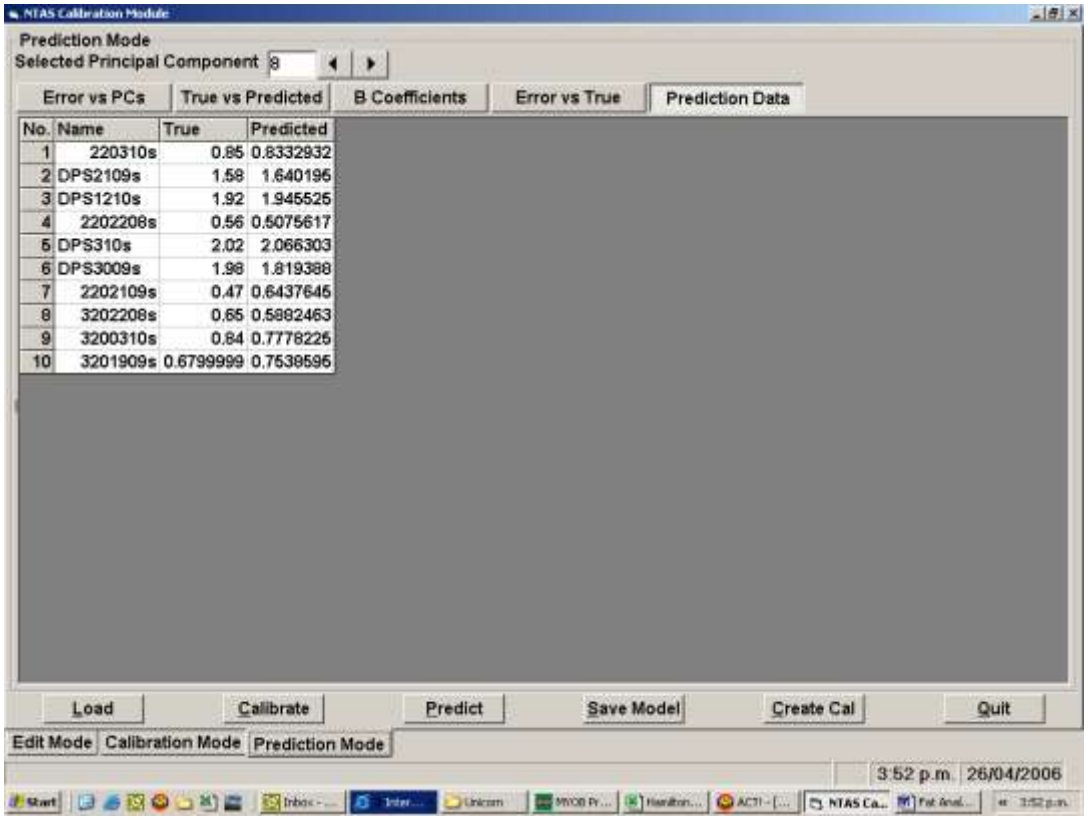

Figure 4: Prediction data

Conclusion:

This preliminary trial shows that even at the lower end of detection the instrument can be calibrated for oil in corn. One has to take into account the small sample set and the fact that the set was made up of coarsely and finely ground samples. Therefore it may be possible that the prediction data can be improved by adding more samples to this set or maybe creating 2 sets one for fine and coarse corn.

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