

## Introduction:

The CropScan 2000B Near Infrared Transmission Analyser is designed to analyse whole soy beans, soy bean meal and flour and soy bean oil. In whole seeds, the CropScan 2000B is suitable for measuring protein, oil, moisture and crude fibre. In soy bean meal and soy bean flour, the CropScan 2000B is suitable for measuring protein, moisture and residual oil. In soy bean oil, the CropScan 2000B can be used to measure oil quality parameters such as Free Fatty Acids, Iodine Value and Peroxide Value.

The CropScan 2000B uses a diode array spectrometer to collect the near infrared transmission spectra from 720-1100nm. Within this wavelength region, protein (N-H), moisture (O-H), oil (C-H) and carbohydrates (C-O-H) absorb energy at specific frequencies. NIR light passes through the sample placed into one of three sample cell types, ie, 24mm pathlength grain cell for whole seeds, 5mm pathlength powder cell for meals and flour and a 10mm pathlength liquid cell for oil. The sample cell is driven through the light source and up to 15 scans are collected for each sample and then averaged. The NIT spectra are used in conjunction with reference analyses for protein, moisture and oil to develop calibrations.

These calibrations can be downloaded into the CropScan 2000B and used to analyse samples of bean, meal, flour and oil. This report presents the calibration data and statistics developed for protein, moisture and oil in soy bean meal.

## Procedure:

19 samples of soy bean meal were scanned using the CropScan 2000B with a 5mm pathlength powder cell. 10 scans were collected for each sample. The spectra were uploaded into a PC and NTAS (Near Infrared Technology Analysis Software) was used to perform a Partial Least Squares Regression (PLS) analysis for each constituent.

## Results:

Figures 1. Shows the NIT spectra of soy bean meal.

Figures 2, 3 and 4 presents the calibration plots for protein, moisture and oil respectively.

Table 1. presents the summary for the calibration statistics.

Constituent	SEC	R <sup>2</sup>
Protein	.36	.96
Moisture	.18	.97
Oil	.24	.89

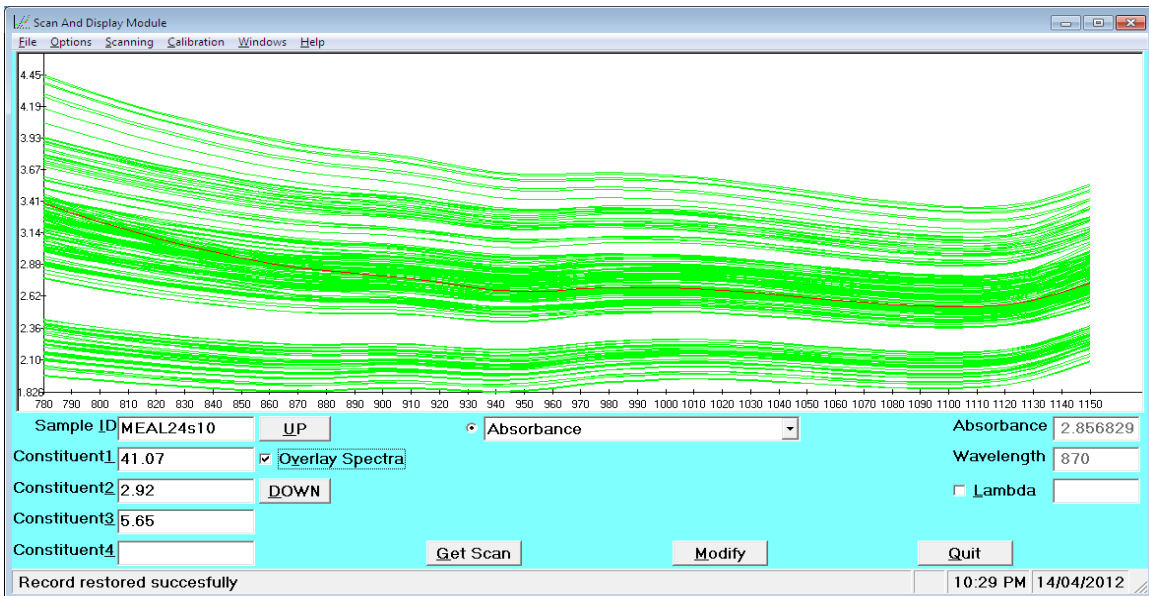


Figure 1. NIT spectra of Soy Bean Meals

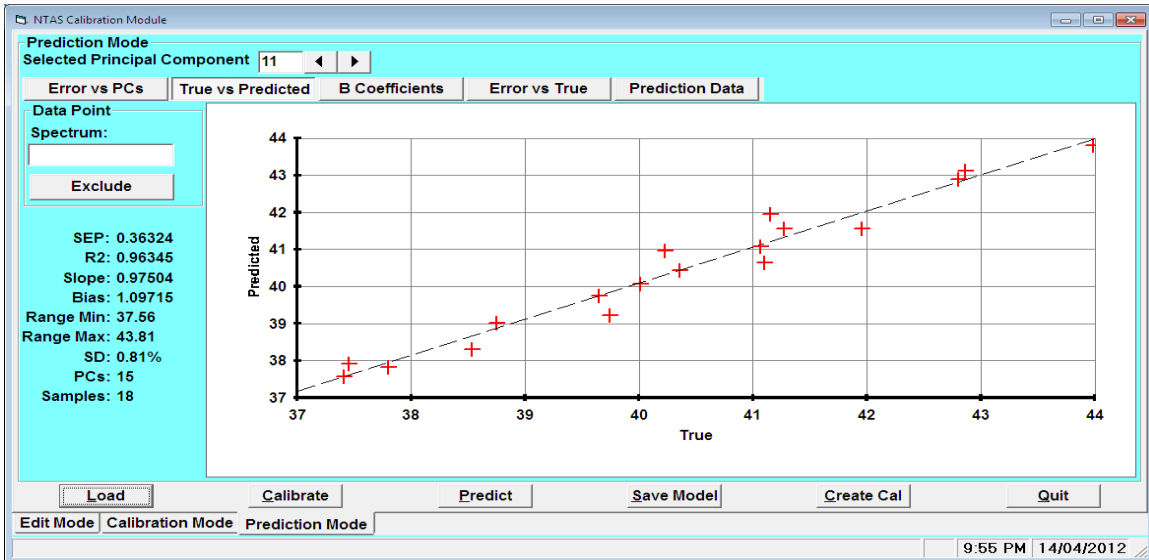


Figure 2. Calibration Plot for Protein in Soy Bean Meal.

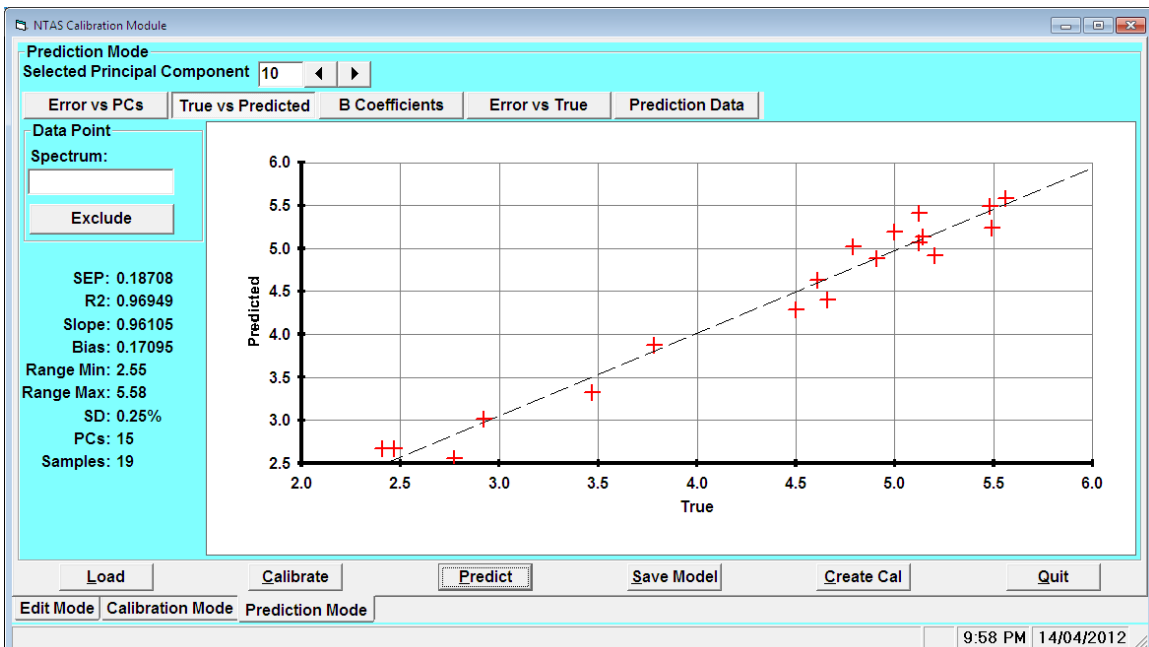


Figure 3. Calibration Plot for Moisture in Soy Bean Meal.

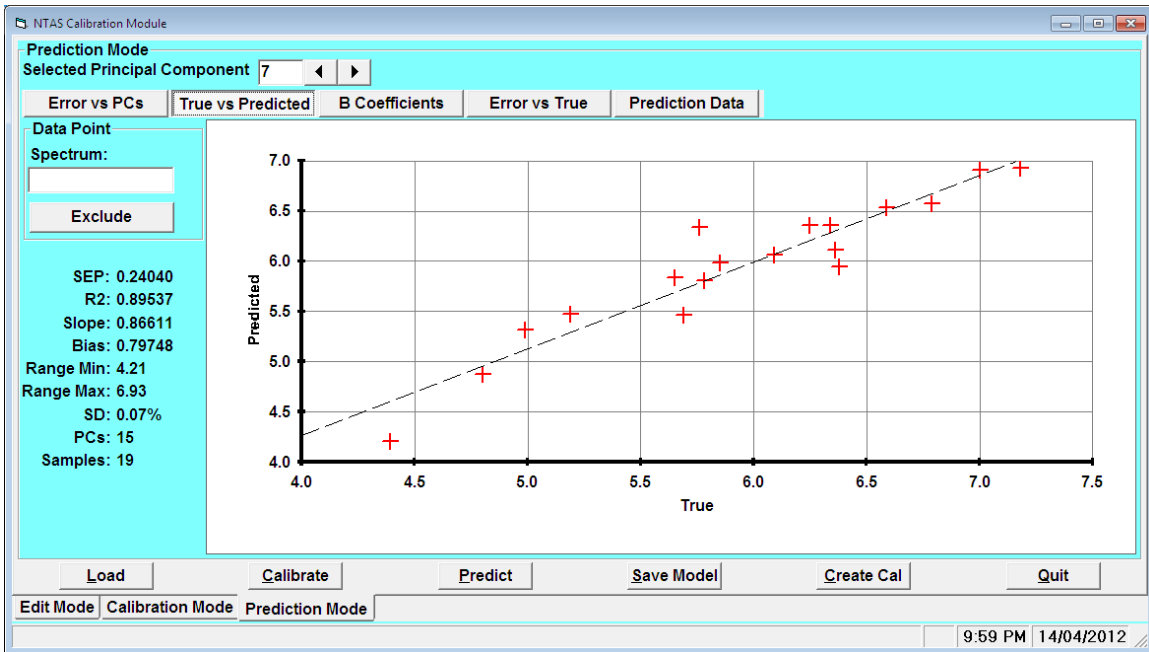


Figure 4. Calibration Plot for Oil in Soy Bean Meal.

## Conclusion:

The data presented above shows that the CropScan 2000B can be used for the analyses of soy bean meal. Other studies are available to show the suitability for measuring soy beans and soy bean oil.