Rape Seed Oil Monitoring with Lab-In-Box

Summary Information:

- Portable, battery powered ATR Spectrometer with Tablet
- Analysis of rape seed oil from crushed grains at Rape Seed Mill.
- Classification into HEAR, HOLL and OO categories.

Background:

Rape seed oils scale in quality and price depending on the concentration of specific saturated and unsaturated fatty acids. Rape Seed Oil classification is detailed in below:

Grade	Application	Oleic Acid % (C18:1)	Erucic Acid % (C22:1)	Linoleic Acid % (C18:3)
OO	Food	50-65	<1	7-12
HEAR	Industrial	10-15	>50	5-7
HOLL	Pharmaceutical	>70	<1	<3

In a typical application, a rape seed mill has a short time to accept grain delivery and has no means of a rapid on-site quality check. The main analytical technique used today to measure the relevant acid concentrations is gas chromatography, which is expensive and has a long lead time. This can lead to the mills accepting below par grain quality.

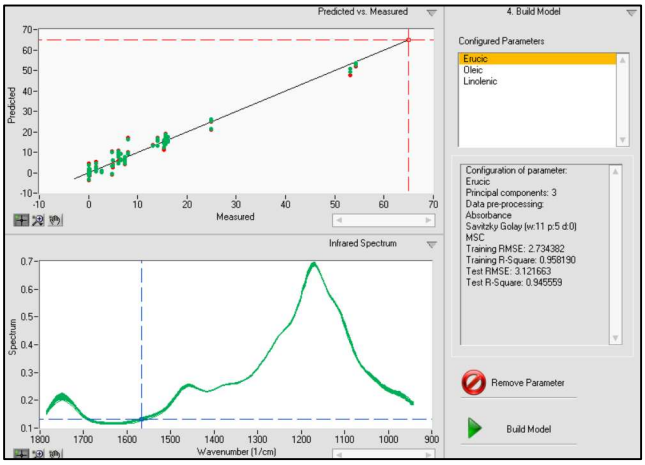
Application:

The Lab-In-Box uses mid-infrared absorption spectroscopy in the ATR mode to measure the concentration of Oleic acid, Erucic acid and Linolenic acid in rapeseed oil in order to accurately categorise the oils. Oil is extracted from the rape seed grains using an electrical oil press then the oil is then filtered syringe. Around 1ml of oil is subsequently placed onto the analyser and the infrared absorption spectrum of the oil sample is measured and analysed. Results are available within 10 minutes of receiving the rape seed grain sample.

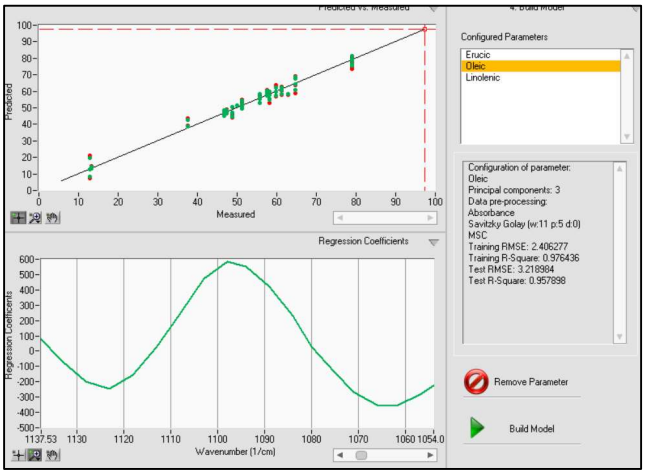
Rape Seed Oil Monitoring with Lab-In-Box

Results & Performance:

The spectrometer analyses the spectra based on a calibration file that is integrated into the software and the relevant fatty acid concentrations of the oil sample are displayed and categorised by the software.
The result are displayed to the user in a very simple table showing the fatty acid concentrations and the resulting category. Below the plots display the high correlation between the Lab-In-Box MIR measurements and the Gas Chromatography lab measurements for Erucic and Oleic Acid.



Erucic Acid PLS model. R^2>0.95



Oleic Acid PLS model. R^2>0.95