

North Central Canola Research Program Project Update (November, 2007-March, 2008)

Project Title: Developing an NIR Calibration for Fatty Acid Profiles and Chlorophyll for the Rapid Screening of Canola Seeds.

Lead Principal Investigator and Institution: Clifford Hall III, North Dakota State University

Co-Principal Investigator(s): Mehmet Tulbek, Northern Crops Institute

Mailing Address of Lead PI: 210 Harris Hall, Fargo ND 58105

Email Address of Lead PI: Clifford.hall@ndsu.edu

Phone Number of Lead PI: 701-231-6359

Research Objective

To develop a rapid analytical methods for determining fatty acid profiles and chlorophyll in canola using near-infrared (NIR) spectroscopy.

Summary of Progress

The primary focus of this project is to develop fatty acid and chlorophyll calibration curves for the Perten NIR instrument. Before the samples could be evaluated on the NIR instrument, wet chemistry methods have to be developed. Thus, the initial focus of this project was to develop an analytical method for the analysis of chlorophyll. The major efforts thus far focused on the development of the high performance liquid chromatographic method using chlorophyll standards. The separation on a RP18 column (Phenomenex) and a mobile phase of acetone/ethanol/water (70/17/13 v/v/v) allowed for the separation of chlorophyll standards. Detection with a spectrofluorimetric detector (Waters) using an excitation $\lambda= 413$ nm, and an emission $\lambda= 669$ nm proved successful. In contrast to the determination of the chlorophyll standards, the extract protocol originally presented was not successful. The major difficulty has been in the co-extraction of components such as lipids. Because chlorophyll has oil solubility, removing the chlorophyll from the canola lipids has been difficult using solvent liquid extractions. However, we aim to eliminate this problem by using the purification method of Hall (1996), which utilized a column chromatographic method to purify chlorophyll. We are now undertaking this approach to aid in characterization of the chlorophyll. Upon resolution of the chlorophyll method, we will then start the development of the NIR calibration curve on the Perten NRI instrument.