

# Workshop : Analysis of Canola and Rapeseed in Value-Added Payment Systems

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## 1 - The Situation in Canada

James K. DAUN

Head, Oilseeds Chemistry, Canadian Grain Commission,  
Grain Research Laboratory, Winnipeg, Manitoba, Canada, R3C 3G8.

### Introduction. The Current Situation :

In recent years, Canadian canola production has varied from about 3,3 million tonnes to 4,5 million tonnes. This seed is produced by about 50,000 growers and is delivered in about 5 tonne lots to about 1,500 delivery points across Western Canada. These delivery points include privately operated and farmer owned co-operative elevators feeding into the railway grain handling system as well as the 8 crushing plants located in Western Canada.

Farmers sell Canadian canola on a free market system to Grain Handling Companies including both Canadian canola processors and companies selling to the export seed market. Canada's exports of canola, over the past 5 years have averaged just under 2 millions tonnes annually, mostly to Japan, while the domestic crushing industry, including 2 processors in Southern Ontario, has handled between 1,2 and 1,6 million tonnes per year.

In terms of quality, canola seed in Canada is sold on the basis of grade and dockage using the grading system developed by the Canadian Grain Commission. The grading system includes separate grade schedules for both rapeseed and

canola with canola being considered seed grown from canola varieties registered in Canada. For the export trade, the grading system has provided a sufficient means to ensure consistent quality in exports. The overall averaging effect of the handling system ensures the smoothing out of variations in oil and protein content as well as variations in erucic acid content, glucosinolate content, and chlorophyll content which may occur in individual farm deliveries as each export cargo is made up of many thousands of farm deliveries from across the growing region.

Statistics on the quality of exported canola, as well as on the quality of harvested canola are collected and published by the Grain Research Laboratory through its crop surveys. These statistics allow exporters to estimate whether export shipments are likely to fall within quality specifications established in international contracts. Although provision is made for the certification of oil content, protein content, erucic acid content, and glucosinolate content of canola cargoes, this certification is rarely required as customers are aware of the effectiveness of the Canadian system in providing a uniform quality of canola. The vast majority of exported canola is sold basis grade and dockage only.

## A Proposed System for Payment based on Quality

Recent economic trends leading to extremely tight crushing margins have led the Canadian crushing industry to consider a price premium system based on direct measurement of quality parameters. At least, a part of the impetus for the development of this system came from the Canadian Grain Commission's proposal to modify the grading procedure for canola by replacing visual assessment of immaturity (green seed determination) with a direct assessment of chlorophyll using NIR instrumentation. Although the proposed grading change was tabled at the request of a joint industry committee, the discussions associated with the proposed introduction of an instrumental determination of a quality factor, coupled with a perception of decreased emphasis on oil and protein content by the agronomic and plant breeding communities, led the Western Canadian Canola Crushers Association to consider a payment system based on oil content, protein content, moisture content and chlorophyll content.

Under one a proposed system, 10-year average values from the Grain Research Laboratory, harvest surveys would be used as base levels for oil and protein content. Price adjustments would be as follows :

- for oil content: + or - 1% for each percentage oil up to 2% from the base and a further + or - 1,5% for each additional percentage oil above or below the base

- for protein content : + or - 1% for each percentage protein above or below the base

- for chlorophyll content : no premium or discount for seed between 23 and 30 mg/kg, + or - 0,5% for each of the next two ranges of + or - 5 mg/kg, - 15% for seed in the range 41 - 70 mg/kg, - 30% for seed with more than 70 mg/kg

- for moisture content : nor premium or discount for seed in the range 8% to 10%, + 1 % for seed 7,9% or less, - 2,5% for seed in the range 10,1 % to 10,5 % and an additional - 0,5% for each additional percentage moisture up to 20,0%.

Assessment of damage factors such as heated, damaged, and admixtures would continue to be based on visual assessment as set out in the Canada Grain Grading Guide.

## Analytical Aspects

It was proposed that oil, protein and chlorophyll content be measured by NIR-instrumentation. The Canadian Grain Commission supplies official table for determination of moisture content using capacitance based moisture meters. Oil content was to be measured on an 8,5% moisture basis; protein content on an oil-free, 8,5% moisture basis, and chlorophyll content on an 8,5% moisture basis and moisture on a wet basis.

After two round-robin studies, the crushers group realized that it was impractical to try to develop their own uniform methods for oil and protein content determination. They also established that the different methods used by the different crushers led to widely varying results.

In order to establish a uniform reference sample set for calibration of NIR instruments, a series of 69 samples of canola seed, ranging in oil content from 36% to 49% (dry basis) and in protein content from 18% to 33% (dry basis, N x 6,25) were collected by the crushing plants and the Canadian Grain Commission. These samples were tested for oil and protein content in blind duplicate pairs by two private laboratories. The mean values for these tests were assigned to the samples which were divided and sent to the crushers involved in the project to utilize in calibrating their NIR instruments. Instruments were to be calibrated for oil and protein according to the protocol in the British Standard Method BS 4289 : Part 6:1989. A separate set of samples for calibrating chlorophyll content was made available by the Canadian Grain Commission. In cases of dispute, analyses would be carried out by one of the private laboratories used for testing the calibration set.

Difficulties in receiving and analyzing the reference samples prevented implementation of the payment system on the proposed starting date of August 30, 1990. The current upheaval in the Canadian crushing industry has further delayed implementation of a unified system of payment based on direct assessment of quality. Individual crushers remain free to use their own methods of payment and some individual crushers have paid premiums for oil content.