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Canadian Update on Production and Research

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The Canadian canola industry realized a record crop from both an acreage and a seed production perspective in 1994. There were 14.3 million acres of canola planted across western Canada and Ontario, representing a 41% increase over the previous record of 10.14 million acres harvested in 1993. Near ideal growing conditions across much of the western prairie resulted in a high quality crop that totalled 7.4 million tonnes, a 35% increase over the 1993 record total of 5.48 tonnes.

Nutritional trials utilizing tail-end dehulled canola meal products are now being conducted, and an economic assessment of the technology will be completed in the near future. The high-protein, low-fibre fraction has been examined for energy and protein utilization in poultry, swine, fish and ruminant rations, and the high-fibre, lower-protein fraction has been similarly tested in ruminant rations. Tail-end dehulling is differentiated from front-end dehulling in that oil extraction occurs prior to mechanical dehulling, minimizing the economic loss of a portion of the seed oil content. Although tail-end dehulling produces a final product with slightly lower protein and higher fibre content than does front-end dehulling, preliminary feeding trial results indicate appreciable improvements in energy and amino acid availability relative to traditional canola meal. The Canadian canola industry will decide during 1995 whether dehulling will be incorporated into their crushing facilities on a long-term basis.

The Agriculture Canada Saskatoon Research Centre has been engaged in research designed to drastically lower the total glucosinolate levels in canola seed. Dr. Gerhard Rakow has led the effort to identify genetic material with very low levels of indole glucosinolate and has crossed this material with canola germplasm containing very low levels of aliphatic glucosinolates. The resultant germplasm contains essentially zero glucosinolates. Once sufficient seed has been produced, it will be crushed to produce zero-glucosinolate canola meal to be tested in various animal species. In particular, the industry is anxious to feed high levels of this meal to laying hens, the species most susceptible to the effects of glucosinolate breakdown products. If enhanced animal performance can be demonstrated, it is likely that the entire Canadian canola crop will eventually produce zero-glucosinolate seed for Canadian crushing facilities.

Two different transgenic *B. napus* strains and one mutant, that express tolerance to the herbicides glyphosate (Roundup), glufosinate ammonium (Liberty, Ignite or Basta) and imazethapyr (Pursuit), respectively, will likely be put forward for variety registration in February 1995. Recommendations to support or reject these genetically modified herbicide tolerant lines will depend on their agronomic and quality characteristics. Work is also under way to transfer these herbicide tolerances to adapted *B. rapa* (= *B. campestris*) varieties.

Field studies to evaluate the potential of gene transfer from *B. napus* to the wild relatives *Raphanus raphanistrum* (wild radish), *Erucastrum gallicum* (Dog mustard) and *Diplotaxis muralis* is under way. Data to date suggest such crosses would not occur in nature in Western Canada. In addition, *R. raphanistrum* and *Diplotaxis* are not common weeds of western Canada.

Dr. Ben Leandry, of the Agriculture and Agri-Food Canada Research Centre in St-Jean Quebec, reports that DNA markers have been linked in *B. napus* to the following traits ; blackleg resistance, glucosinolate content, self-incompatibility, the restorers for *ogu, pol* and *nap* cytoplasmic male sterility systems, microspore culture response, maturity, lodging and yellow seed color.

Microspore culture to produce doubled haploids in *B. napus* is now routine for many breeding programs but response in the *B. rapa* and *B. juncea* species has been low. Dr. W. Keller of the Plant Biotech Institute in Saskatoon reports that an efficient system for *B. rapa* has now been developed and that *B. carinata* is the most responsive of all the oilseed Brassicas. Mr. D. Males of the Saskatchewan Wheat Pool also reported that they have developed a highly efficient microspore system for *B. juncea.*

Calgene in cooperation with the Saskatchewan Wheat Pool in Saskatoon is pursuing the development of speciality oils and are encouraged by the approval by the FDA in the United States of their high laureate B. napus modified oil.

Dr. M. Maloney of the University of Calgary has transformed *B. napus* plants to produce in the seed the pharmaceutical hirudin, a blood anti-coagulant. Hirudin is bound to the oleosin proteins and in that form is inactive. An efficient system for extracting the hirudin-oleosin complex has been developed and the process to recover pure hirudin established.

Canadian regulations for the environmental release of genetically modified *B. napus* have now been published and will likely come into force about April 1995.

Limagrain Canada recently established a canola breeding facility in Saskatoon, Saskatchewan. While located temporarily in the Atrium Building at Innovation Place, just north of the University of Saskatchewan campus, a new facility is being built in close proximity. The canola breeding team from King Agro in Chatham, Ontario (recently purchased by Limagrain) will soon move to the Saskatoon offices and begin canola breeding in western Canada. Limagrain will focus their efforts on both traditional canola breeding as well as the development of cultivars with specialty oil characteristics.

Cargill Ltd. has made two recent moves to establish themselves as a significant part of the Canadian canola industry. While having in the past been involved in the industry as a terminal elevator operator and seed exporter, Cargill recently announced plants to build a new canola crushing plant in western Canada. The precise location of the facility has as yet to be determined. Cargill also announced the purchase of the U.S. based Inter Mountain Canola Company, a company dedicated to the production of specialty oils. The company will be known as IMC Cargill. While breeding efforts by IMC Cargill will initially be located in Fort Collins, Colorado, it is expected that a significant breeding effort will also be located somewhere in western Canada. With these announcements, Cargill has made it clear that their commitment to the Canadian canola industry will now expand to all aspects of the trade.

A severe infestation by the insect *Mamestra configurata* (bertha armyworm) was widespread in the southeast canola production area of Western Canada in 1994. It is expected that this infestation could be more severe and widespread in 1995 and preparations are being made to try and ensure effective control.