



UNIVERSITY OF SASKATCHEWAN

College of Agriculture and Bioresources

DEPARTMENT OF AGRICULTURAL
AND RESOURCE ECONOMICS
AGBIO.USASK.CA

Rm 3D34 Agriculture Building
51 Campus Drive
Saskatoon SK S7N 5A8 Canada
Telephone: 306-966-6512
Facsimile: 306-966-8413

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Dear Mr. Swinbourn,

It is my pleasure to submit, on behalf of my collaborators Dr Peter Phillips and Scott Biden, the following report on the cost of Western Australia's production of genetically modified (GM) canola.

Given Canada's lengthy and profitable adoption of GM canola, we offer some insights based on research undertaken comparing GM canola adoption between both countries. Our research measures the cost of Western Australia's GM canola moratorium, which should be part of the compensation considerations, as Australian canola farmers lost an estimated \$551 million in economic benefits due to the moratorium.

In addition to quantifying the economic damage of Western Australia's GM canola moratorium, we provide evidence from a Saskatchewan legal case where the provincial organic industry sued two technology commercializers over supposedly lost organic canola markets. Upon hearing the presentation of evidence, the case against Monsanto Canada and Bayer CropSciences was dismissed.

This submission is not a confidential submission and can be made publicly available. If the Committee has any questions regarding this submission, we are happy to respond.

Sincerely,



Stuart Smyth signature.pfx

Stuart Smyth, Ph.D.

Assistant Professor & Research Chair in Agri-Food Innovations

Department of Agricultural and Resource Economics
College of Agriculture and Bioresources
University of Saskatchewan
51 Campus Drive, Saskatoon SK
S7N 5A8
Tel: (306) 966-2929
E-mail: stuart.smyth@usask.ca
Webpage: www.saifood.ca

An analysis on the impact of genetically modified canola on non-genetically modified producers in Western Australia and Canada

Prepared by: Scott Biden, Stuart Smyth**, and Peter W.B. Phillips****

**Research Assistant, Department of Agricultural and Resource Economics, University of Guelph*

*** Assistant Professor, Research Chair in Agri-Food Innovation, Department of Agricultural and Resource Economics, University of Saskatchewan*

****Distinguished Professor, Johnson Shoyama Graduate School of Public Policy, University of Saskatchewan*

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Purpose

This submission to the Committee of Environment and Public Affairs inquiry into mechanisms for the compensation of economic loss to farmers in Western Australia caused by the contamination of genetically modified material briefly outlines the development of genetically modified (GM) canola regulation within the Australian and Canadian context, discusses the opportunity costs from Australia's GM canola moratoria and summarizes the judgement of an unsuccessful class action lawsuit in Canada in which organic producers sought compensation for economic loss from the GM canola seed companies of Monsanto Canada Inc. and Bayer CropSciences.

Outline

In examining the issue of compensating non-GM canola growers for contamination by GM material, this submission:

1. discusses policy similarities between Australia and Canada regarding the introduction and adoption of GM canola;
2. presents evidence on the economic and environmental opportunity costs from the moratoria on the introduction of GM canola in Australia;
3. highlights the per hectare impact between the four main canola varieties in Western Australia; and
4. summarizes a relevant court case in Canada in which the Saskatchewan Organic Directorate initiated an unsuccessful class action lawsuit against Monsanto Canada Inc. and Bayer CropScience seeking compensation for organic farmers due to the introduction of GM canola.

Internationally, there has been considerable discussion on mechanisms to compensate farmers for possible adventitious presence of GM material.¹ There has been a strong consensus that regardless of compensation farmers should have the ability to choose to plant the approved crop varieties of their choice. In the USA there has been discussion on mechanisms to compensate farmers for impacts associated with GM crops, all of which have failed to reach agreement. One of the main arguments against any mechanism stem from the economic reality that organic and non-GM crops receive a premium over GM crops, in which case it is up to the grower or distributor to take the steps required to ensure that they meet that standard. The example cited is of identity preserved crops such as sweet corn or low-linoleic acid canola which receive a premium over their bulk commodity alternatives. In these instances, it is up to the grower seeking the premium to ensure that their product meets the required standards and in which the grower knowingly takes on a greater degree of risk compared to the bulk alternative.²

1. Canadian and Australian Policy Regarding GM Canola Approval

Canada was at the forefront of GM crop adoption with the approval of two herbicide tolerant GM canola varieties in 1995 under a scientific, evidence-based framework within the existing government departments of the Canadian Food Inspection Agency (CFIA) and Health Canada. Monsanto's GT73 glyphosate-tolerant Roundup Ready™ canola and Bayer's HCN92 glufosinate-tolerant LibertyLink™ were assessed for risk to humans, animals and the environment prior to approval and found to be equivalent to existing canola varieties.^{3, 4} The herbicide tolerance allows farmers to spray their canola fields with Roundup or Liberty, improving weed control without damaging the canola plants.⁵

After approval of these two new GM canola varieties, there were export trade concerns related to Japan and Europe, where GM canola varieties were still being evaluated. As a result, the canola industry came together and established a self-imposed system of identity preservation until Japan's approval in 1996.⁶ After Japan approved GM canola, the system ended as Europe was not a key export market. Having an approach developed by the canola industry rather than the government, resulted in no large trade impacts; Canada continues to be the world's largest canola exporter with approximately 60-70% of the global export market,⁷ in spite of the fact that 95% of canola produced in Canada is GM.⁸

Australia took a substantially different approach to GM canola regulation and adoption. In 2000, after evaluating regulatory systems in other countries, Australia decided to establish a new office dedicated to evaluating gene technology – the Office of the Gene Technology Regulator (OGTR). As in Canada, the OGTR evaluates new GM varieties based on scientific-evidence to protect the safety of people and the environment.⁹ Approval of the same two herbicide tolerant canola varieties, Monsanto's Roundup Ready and Bayer's InVigor, came in 2003 after a three-year risk assessment and risk management evaluation.^{2, 3}

The response from the grain and oilseed industry in Australia, which was less cohesive than the Canadian industry, was to lobby government to impose moratoria due to possible trade impacts from the adoption of GM canola.¹⁰ The Australian canola industry believed that a market for non-GM canola oil would develop. However, this never materialized, largely because of China's decision to approve the importation of GM canola, Japan's open acceptance of GM canola, the fact that Europe produces enough non-GM rapeseed to meet its needs and the EU decision to approve import of GM canola varieties for feed and industrial use.

Australia's GM opponents pushed for a three-year moratorium, arguing that it would allow sufficient time to determine the potential global demand for non-GM canola. This resulted in an amendment to the GM regulation in 2004, allowing Australian state governments to impose moratoriums on "ethical issues relating to dealings with GMOs".⁸ Phillip Glyde, Executive Director of the Australian Bureau of Agricultural and Resource Economics and Sciences, commented that:

[T]he development and adoption of genetically modified (GM) food crops in Australia are being slowed by perceptions of consumer resistance to GM foods in both Australia's domestic and export markets. The view that there could be market disadvantages with GM food crops has led to moratoriums being imposed on the commercial cultivation of GM canola.... *This is despite positive assessments by the Gene Technology Regulator of the safety of two varieties of GM canola, for human consumption and the environment* [emphasis added].⁹

Allowing government policy to be affected by the grain industry's worry of trade impacts, not based on issues of health and safety to humans and the environment, is one example of a socio-economic consideration being incorporated into policy. This is largely the only difference between the Canadian and Australian policy on GM canola.

The moratoriums were eventually repealed in the three largest canola growing states of New South Wales and Victoria in 2008 and Western Australia in 2010, for two main reasons. First, the market and expected higher prices for non-GM canola did not develop the way critics hoped. There were occasional, small premiums for small shipments of non-GM canola in niche markets, but no global non-GM, high-priced market developed. Second, Australian farmers and the canola industry observed the positive benefits of GM canola production that were occurring in Canada and began to pressure state governments to not renew the moratoriums when they expired.¹¹

2. Australian Opportunity Costs of GM Canola Moratoria

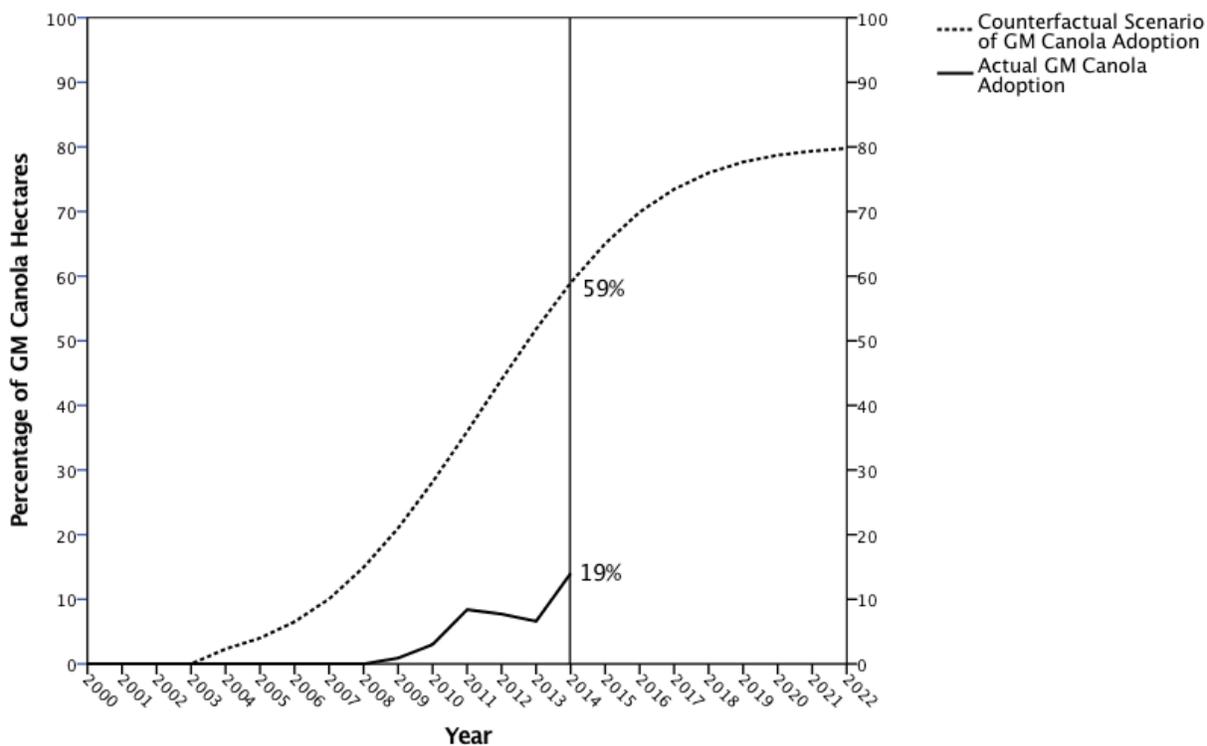
Fifteen years ago, Australia joined the ranks of nations approving GM crops for cultivation. Yet, because of public concerns and trade worries, the nationwide adoption of GM canola was hindered by a variety of moratoriums enacted by state governments. As a result, the nation has lost hundreds of millions of dollars in economic benefits, while losing a chance to cut herbicide use and greenhouse gas emissions related to canola production.

The moratorium movements started in 2004, lasting until 2008 in Victoria and New South Wales and 2010 in Western Australia, the three largest canola producing states. Moratoria remain in place in the other canola growing states despite recommendations of removal from independent observers.

This research uses Canada's experience with GM canola adoption and Australian post GM canola commercialization surveys to estimate the potential adoption rate of GM canola had the moratoria had not been imposed. Figure 1 illustrates a conservative GM canola adoption rate of 59% could have been achieved by 2014, compared to the actual 19%. The opportunity costs of the moratoriums are measured as the gap between potential adoption (the dotted line) and the actual adoption (the solid line). Between 2004 and 2014, a cumulative area of 4.6 million hectares would likely have adopted GM canola had the moratorium not been implemented.

The economic and environmental impacts in this analysis are developed through annual survey data collected in the first three years post GM canola adoption. The survey was conducted between 2008 and 2010 in New South Wales and Victoria and 2010 to 2012 in Western Australia.

Figure 1: Australian canola adoption, potential and actual



The economic factors of changes in variable costs of weed control, yield and the contribution margin indicate that GM canola possesses economic benefits greater than non-GM canola (Table 1). The yield impact from the moratoria resulted in an opportunity cost of 1.1 million tonnes of foregone canola production. Pricing this foregone canola production based on the Australian delivered price for canola per metric tonne from 2004-2014, the foregone yield benefit is approximately AU\$551 million in lost revenue to the Australian economy.

The contribution margin, an evaluation of revenue minus the variable costs of production, calculated the per hectare trade-off of GM canola production versus non-GM canola. This margin includes the average revenue, calculated using yield and the average canola price between 2004 and 2014 and the variable cost of production, consisting of the variable cost of weed control, seed and segregation costs. GM canola carries the additional variable costs of a technology access fee, for the use of the patented trait, and a cost for the on-farm segregation of GM seed. The impact of the contribution margin indicates a \$486 million opportunity cost of foregone producer benefits associated with the moratoria.

The aggregate environmental impacts follow a similar story line to the economic impacts. The environmental opportunity costs assess the impacts of herbicide and fuel use. The environmental impact of herbicides is based on the amount of active ingredients applied and the toxicity, measured through the environmental impact quotient (EIQ)¹² — an evaluator developed

at Cornell University to assist in understanding the impacts chemical applications have on humans, consumers and the ecology. Fuel use is used to measure GHG emissions from additional field machinery passes.

Table 1: Australia's opportunity cost of moratoria, 2004- 2014

Impact Category	Actual with Moratoria	Counterfactual without Moratoria	Moratoria's Cost (Actual - Counter)	Foregone Change
Yield (metric tonnes)	25 million	26 million	- 1.1 million	4.2% increase
Contribution Margin	AU\$10.7 billion	AU\$11.2 billion	- AU\$485.7 million	4.5% increase
Herbicide Active Ingredients (kg)	53 million	46.5 million	6.5 million	12.3% decrease
Environmental Impact	1.1 billion	944 million	158 million	14.3% decrease
Field Equipment Passes	104 million	97 million	7.1 million	6.8% decrease
Fuel (litres)	202 million	194 million	8.7 million	4.3% decrease
GHG and Compound Emissions (metric tonnes)	561,800	537,600	24,200	4.3% decrease

The 4.6 million hectares that would have adopted GM canola, had the moratoriums not been imposed, required an additional 6.5 million of herbicide active ingredients to control weeds. Farmers who use GM seeds end up using lower volumes of herbicides, as weed control is more effective with those seed varieties.

The foregone reduction in chemical application resulted in an additional 14.3% environmental impact for Australian consumers, farmworkers and the ecology. Had GM canola not been banned under the moratoriums, farm workers would have been exposed to fewer chemical applications, consumers would have had a reduction in chemical run off exposure and the chemicals applied would have been less toxic.

In addition to the environmental impact of increased chemical applications, there also is additional fuel used to make those applications, resulting in higher GHG emissions. Over 7 million extra machinery passes were made in Australia, burning 8.7 million litres of diesel fuel. Each of these 7 million passes resulted in the needless emission of GHGs due to the moratoriums. As a result, 24,200 metric tons of GHG emissions were emitted, equivalent to approximately 5,000 cars being taken off the road in the USA for one year.¹³

3. Western Australia's Canola Varietal Impacts

As the evidence above has shown there has been a large negative cost to Australia from delayed access to GM canola. But it is not enough to see the Australian impacts. In addition, we have disaggregated and included the Western Australian per hectare impacts as shown in Table 2.

Table 2. Western Australia impact per hectare, 2010-2012

Impact Category	Conventional	TT	Clearfield	RR (GM)	Non-GM*
Yield (metric tonnes/ ha)	1.263	1.012	1.325	1.297	1.046
Variable Cost (AU\$/ha)	\$64.09	\$68.01	\$73.95	\$56.63	\$68.19
Contribution Margin (AU\$/ha)	\$540.50	\$396.95	\$559.34	\$545.20	\$417.44
Herbicide Active Ingredients (kg/ha)	2.56	3.43	1.44	1.35	3.25
Environmental Impact (EIQ/ha)	50.76	74.06	26.64	24.01	69.62
Machinery Passes (/ha)	4.77	6.32	4.57	4.01	6.12
Fuel (litres/ha)	4.407	6.215	4.173	3.517	5.980
GHG and Compound Emissions (kg/ha)	12.23	17.25	11.58	9.76	16.60

This disaggregation allows an evaluation into the per hectare compensation required for each type of canola grower and the weighted non-GM canola basket. In evaluating the compensation for non-GM growers in Western Australia we observe that there is an aggregate higher yield and lower variable cost as compared to non-GM canola. We assume a constant price for GM and non-GM canola, in which there has been no evidence to indicate that there is a premium for large scale, bulk exports of non-GM canola.

World prices for canola tend to follow the Canadian export price, outside of some seasonal variation; Canadian canola is regarded in aggregate as there is little evidence to indicate a willingness to pay for non-GM canola.

Table 2 shows a strong economic advantage to planting GM canola—\$128 per hectare, compared to non-GM canola. This largely stems from the dominant market share of Triazine Tolerant varieties which accounted for over 75% of canola hectares planted in Western Australia during this period. This market share is illustrative of the prevalent weed problem and the high demand for herbicide tolerant canola, in which producers are willing to accept the 10-30% yield decrease associated with Triazine Tolerant canola to have effective weed control.¹⁴

In addition to GM canola's per hectare economic benefits there is an associated benefit through the number of machinery passes per hectare. This benefit in a decreased number of machinery passes on GM canola hectares is also illustrative of a time savings and is associated with an increase in off-farm income.

In addition to the monetary benefits of GM canola there is also an associated decrease in the non-monetary, environmental impact. GM canola has been shown to use less than half the amount of active ingredients per hectare, delivering an environmental impact to farmers, consumers and the ecology that is 66% less than non-GM canola.

The evidence shown here indicates that there is a significant economic benefit in producing GM canola compared to non-GM canola. Thus, any mechanism to compensate canola growers should take into account the foregone economic benefit per hectare from the years when non-GM canola growers assisted in the imposition of a moratoria on GM canola.

4. Canada's Organic Class Action Suit Against Monsanto and Bayer

The Saskatchewan Organic Directorate sought to bring forward a class action suit on behalf of the organic grain farmers in Saskatchewan. The allegations were initiated against Monsanto Canada Inc. and Bayer CropSciences for their introduction of GM canola.

The initial proceeding judged the allegation on 5 criteria:

1. Is the Court satisfied that the pleadings disclose a cause of action?
2. Is the Court satisfied that there is an identifiable class?
3. Do the petitioners represent a class with common issues?
4. Is a class action the preferable procedure?
5. Adequacy of the representative plaintiffs.

On Criterion 1, the court evaluated general considerations such as negligence, nuisance, trespass, the Environmental Management and Protection Act and the Environmental Assessment Act. The Court concluded that the pleading in negligence had insufficient evidence to prove that the losses claimed were foreseeable, and that no facts were presented to indicate that there was a direct relationship in impact between the proximity of organic and GM canola producers.

In regard to nuisance, there was insufficient evidence that the GM canola varieties had escaped given that they are not a 'dangerous substance' and that their unconfined release was approved under their approved Canadian application as a Plants with Novel Traits. It was further indicated that there was a very remote possibility that the claim of nuisance could be linked to Monsanto or Bayer for a failure to comply with the environmental protection requirements.

On Criterion 2, the Court evaluated evidence on two types of loss: 1) to see if organic producers suffered a loss of market for organic canola; and 2) to see if organic grain farmers suffered a loss as a result of GM canola volunteers on organic farmland.

In assessing the loss of the EU market after 1995 there is significant evidence that the vast majority of change in economic circumstances was the result of internal market forces in the EU and not due to the introduction of GM canola. In spite of the loss of that market, there are no significant measurable producer losses due to the change in markets. One organic canola producer noted in a survey on possible economic losses from GM canola that "the cost of freight has made our canola expensive as compared to the Eastern European product" (p.122).¹ There is, however, significant evidence that the introduction of GM canola has generated large producer, industrial and social benefits. These gains must be weighed against any perceived losses.

As there have not been any analyses on the price impacts to Canadian farmers from the loss of the European market, a similar study has been done by to assess the impact if Canada lost access to Japan, Canada's biggest external market.¹⁵ The study found it would cost Canadian seed producers only about C\$0.40 per tonne in lost returns, equal to the cost of redirecting trade to the next best market, which is about a 0.2% decline in prices. The Court found that there was no evidence to indicate that there was a loss of markets to organic canola farmers.

Similarly, in evaluating the evidence of losses incurred by organic grain farmers from GM volunteers the Court found insufficient evidence to indicate a general loss inflicted upon all organic farmers which would be necessary for a class action. There has been no evidence to indicate that there is a wide spread loss, but rather specific cases in which there is evidence of adventitious presence of GM canola having been blown over from a neighbouring field, which is best evaluated on an individual basis.

Criterion 3 establishes and evaluates the Common Issues, a more detailed evaluation of the issues presented in Criterion 1, such as negligence and nuisance. The Court found that impacts from the issues raised were determined to best be served on an individual basis as they were not common across the broadly defined class of organic farmers. The ruling found that such a class action would require a more defined class that could only be defined upon individual inquiry after an incident had occurred.

With respect to Criterion 4, the court concluded that the proposed class action was not an appropriate procedure, and that the defendants of Monsanto Canada Inc. and Bayer CropScience Inc. have done all that was expected of them in obtaining governmental approvals.

Finally, it was determined on Criterion 5 that the representatives of the plaintiffs were not the appropriate representative plaintiffs as the class action was too broad to define common issues across all organic growers.

In addition to the results of this court case the impacts to the organic industry from the adoption of GM crops may not be negative nor straight forward. The adoption of GM crops may actually offer a benefit to organic growers through increased demand for organic products by consumers who do not wish to consume products that contain GM ingredients.¹⁶ For some consumers of organic products, all other things equal, there is no indication that these consumers would have purchased organic if GM crops had not been commercialized.

The complexity of markets and the interplay of variables affecting demand may actually result in positive benefits to non-GM producers since the adoption of GM crops. In China the advantages from GM Bt cotton have been shown to have a positive externality on all producers through a net reduction in bollworm infestations and reductions in pesticide use from 40 kg/ha to 10 kg/ha across GM and non-GM crops.¹⁷ In the US the adoption of GM corn has been associated with the area wide suppression of corn borers, with approximately 75% of the economic benefits, US\$2.4 billion, going to producers that have not adopted GM corn.¹⁸

Conclusion

This ruling on the class action of organic producers against Monsanto Canada Inc. and Bayer CropSciences Inc. has broad applications to this submission on a mechanism for compensating non-GM canola growers for the adventitious presence of GM material. Creating a compensation mechanism for the losses to farmers across such a broad group of producers will inevitably run into problems in finding common issues.

Coupling the Canadian court ruling with previously presented evidence that indicates Western Australian GM canola growers suffered a loss from the delayed adoption of GM canola due to Western Australia's moratorium, through the forced continuation of conventional varieties during the periods of 2003-2010, the authors of this submission believe that there is not a significant justification for a compensation mechanism to Western Australian farmers for economic losses due to adventitious presence of GM material.

The absence of a price premium for non-GM canola, the lower yielding conventional varieties with less effective weed control, and the likely inability to define specific losses incurred across the broad class of Western Australian farmers indicate that this compensation mechanism is the result of rent seeking behaviour by farmers that wish to exploit the incidences of adventitious presence of GM material that occur to a very small number of farmers. It is suggested that instead of a broad compensation mechanism that any events of adventitious presence be dealt with on a case by case basis, rather than in a broadly defined group that incorporates a series of farmers that have observed no negative impacts.

Currently the Australian grain trade already deals with the adventitious presence of a range of materials in grain shipments by setting standards which are the basis of grain contracts. Therefore, where it does occur it is the grain trade that manages the issue; if buyers and traders cannot agree then the case is managed through processes which are overseen by Grain Trade Australia. Further, if this fails there are legal channels that determine the legitimacy or otherwise of such claims, which can be settled on an individual case basis.

Further considerations on a compensation mechanism should consider that the adventitious presence of unwanted material does not solely apply to GM vs non-GM crops, it applies to any activity that one farmer may undertake that impacts another (e.g. spray drift). If compensation is warranted within the current framework then there are legal processes that are already established through the courts that can deal with it.

If it is decided that there will be a mechanism to compensate non-GM producers for the adventitious presence of GM material this sets a very dangerous precedent that could become a major disruption for trade and farming operations. For example, if a neighbour has a major outbreak of Blackleg in a canola crop which is located along a neighbouring fence and the Blackleg infects and significantly reduces the yield of the neighbour's canola crop, will a broad compensation mechanism be discussed on the Blackleg contamination of otherwise Blackleg free canola?

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