

# canola

GENETICALLY ENGINEERED CANOLA CONTAMINATION CONFIRMED  
ACROSS JAPAN – CANADIAN GE CANOLA THE CULPRIT

REPORT 2005



genetically  
engineered canola  
contamination  
across japan

GREENPEACE

# canola

GENETICALLY ENGINEERED CANOLA CONTAMINATION CONFIRMED  
ACROSS JAPAN – CANADIAN GE CANOLA THE CULPRIT  
PUBLISHED MAY 2005



© MASA HARU KAWAT/GP

<b>Spread of genetically engineered canola contamination confirmed across Japan – Canadian GE canola the culprit</b>	3
<b>I OF URGENT CONSIDERATION...</b>	4
<b>II ORIGINS: IMPORTING GENETIC POLLUTION FROM CANADA</b>	4
<b>III GE POPULATIONS ARE TAKING ROOT IN JAPAN</b>	6
<b>IV NATIONAL REPORT CONFIRMS FINDINGS OF CITIZEN GROUPS</b>	7
<b>V THE CURRENT LEGAL STATUS OF GE CANOLA IN JAPAN IS QUESTIONABLE</b>	8
<b>VI DENIAL AND THE SPREAD OF GE CONTAMINATED PLANT POPULATIONS</b>	8
<b>VII CONTAMINATION IS LIKELY TO PROLIFERATE IN JAPAN AND THERE IS A SERIOUS RISK OF SPREAD TO RELATED FOOD CROPS AND WEEDS</b>	8
<b>VIII CITIZENS OF JAPAN OPPOSE GE CROPS</b>	9
<b>IX CLEAR AND DOCUMENTED DANGER</b>	9
<b>References</b>	10

**GREENPEACE**

**published by** Greenpeace International  
**date** May 2005  
**authors** Akiko Frid and Lindsay Keenan *Greenpeace*  
**editors** Akiko Frid and Lindsay Keenan  
**design & layout** Tania Dunster, kī design, The Netherlands  
**printing** Kinkos, The Netherlands  
**contact persons** [akiko.frid@nordic.greenpeace.org](mailto:akiko.frid@nordic.greenpeace.org)  
[lindsay.keenan@int.greenpeace.org](mailto:lindsay.keenan@int.greenpeace.org)



© LINDSAY KEENANIGP

### **Spread of genetically engineered canola contamination confirmed across Japan – Canadian GE canola the culprit**

In the latest proof that genetically engineered (GE) crops present an uncontrollable danger, Japanese researchers have found that GE canola (oilseed rape / rapeseed) plants have escaped into the wild at major shipping ports along the Japanese coast. The escape of GE canola seeds into Japanese ecosystems results from spillage of the GE canola seeds during importation operations and subsequent transportation.

A recent report from the Japanese National Institute for Environmental Studies (NIES) confirms that herbicide-resistant genetically engineered canola plants were identified in five of the six Japanese ports where samples were collected.<sup>1</sup>

The GE canola strains were engineered to be resistant to herbicides supplied by the GE seed and chemical companies Monsanto and Bayer. Japanese farmers are now facing an uphill battle against herbicide-resistant GE crops growing wild in many regions, and the serious threat of genetic contamination of related crops and weedy relatives.

Japan imported over two million tons of canola seed in 2003, 80% of it from Canada.<sup>2</sup>

GE canola coincidentally accounts for an estimated 80% of all canola grown in Canada. This has resulted in GE contamination of much of the canola seed grown in Canada,<sup>3</sup> which is itself part of a larger problem involving escalation of GE contamination in traditional seed varieties.<sup>4</sup> GE canola has also caused contamination of conventional and organic canola crops in Canada and now it appears to be the cause of GE canola contamination in Japan.

Japan imports canola seeds for crushing into food oil, feed and fertiliser – not for growing. However, GE canola has now been found growing wild around ports and transport routes in Japan, threatening the same and worse contamination as has already been witnessed in Canada.

This report (i) reviews the current status of GE canola contamination in Japan and (ii) outlines the threats presented by GE canola import.

# canola

## GENETICALLY ENGINEERED CANOLA CONTAMINATION CONFIRMED ACROSS JAPAN – CANADIAN GE CANOLA THE CULPRIT

PUBLISHED MAY 2005

### I OF URGENT CONSIDERATION...

- \* Imports of Canadian GE canola are creating genetic contamination in Japan.
- \* Contamination of related species has not yet been demonstrated but may be inevitable given the scale and ongoing nature of the contamination. Although some testing is being conducted, the Japanese government has so far allocated inadequate resources to assess the full scale of the contamination.
- \* Once escaped, GE canola can transfer herbicide-resistant genes to wild plants, creating populations of 'super-weeds' that require increasingly toxic chemicals to control.
- \* Loopholes in Japanese genetic engineering regulatory processes have allowed GE canola varieties to bypass the already inadequate safety approval system. At least two GE canola varieties are now proven to be growing wild around Japan.
- \* In what appears to be an abuse of the Biosafety Protocol's precautionary approach, GE canola varieties previously approved in Japan only for field trials (isolated field cultivation) have been approved for 'Type 1 use' (open field cultivation) without any proper authorisation under an 'interim measure'.
- \* Of the eight GE crop types approved for import by the Japanese government, GE canola poses the greatest threat of genetic contamination because it easily cross-pollinates with crop relatives<sup>5</sup>, many of which exist in Japan.

### II ORIGINS: IMPORTING GENETIC POLLUTION FROM CANADA

Japan imported approximately two million metric tons of canola / rapeseed in calendar year 2003-4, predominantly for use in livestock feed and for cooking oil production. Production of canola within Japan is negligible; the country depends almost entirely on imports.

Canada supplied an estimated 80% of this volume (1.6 million metric tons), Australia supplied 17% (0.34 million metric tons) and France also recently became a supplier of canola to Japan with an estimated 3% (0.06 million metric tons) of the market in 2003-4.

To meet export demand, Canada grows approximately five million hectares of canola annually.<sup>6</sup> Approximately 80% of this canola is genetically engineered to be resistant to either glyphosate herbicide (Roundup Ready) or glufosinate herbicide (Liberty Link) and widespread GE contamination of conventional canola seed in Canada has also been recorded. By contrast neither Australia nor France currently allow commercial growing of GE canola and so are exporting GE-free canola to Japan.

Canadian GE canola exports are therefore by far the most likely culprit for the GE canola contamination in Japan.

The contamination by GE canola in Canada has led to high profile and ongoing court battles against Monsanto and Bayer by farmers<sup>7</sup> whose conventional and organic crops have been contaminated; the bitter experience of Canadian farmers has shown that GE canola cannot be controlled once released into the environment.



© MASAHARU KAWATA/GP

The Canadian Saskatchewan Organic Directorate, for example, has been involved in legal action<sup>8</sup> against both companies because buyers rejected organically grown canola that was found to have been contaminated with GE canola. Now, in a case that highlights the need for strict liability for GE contamination the organic farmers are quite correctly demanding compensation from the two GE seed companies.

Despite predictions that transgene contamination would occur in Canada, the speed of spread surprised the agricultural and scientific communities. In 1998, after only two seasons, resistance to glyphosate and glufosinate herbicides was found in weed populations across Canada. In some cases, 'super-weeds' had developed that were tolerant to multiple herbicides.<sup>9</sup> Super-weeds arise through gene flow between GE varieties, when one herbicide-tolerant variety pollinates another. To control the spread of GE super-weeds Canadian farmers are required to use more toxic chemicals.

'Super-weeds,' the use of more toxic chemicals, contamination of conventional and organic crops, seed contamination and lawsuits; these are some of the problems caused in Canada by the production of GE canola. Now that genetic contamination has been exported to Japan.

The lessons from these demonstrated patterns of transgenic contamination in Canada need to be learned if similar environmental, agricultural and social disasters are to be prevented in Japan. Action needs to be taken now within Japan to both clean up the existing GE canola contamination and to prevent further contamination by GE canola seed imports. Action needs to be taken now within Canada to stop producing and exporting GE canola contamination.



© LINDSAY KEENAN/GREENPEACE

# canola

## GENETICALLY ENGINEERED CANOLA CONTAMINATION CONFIRMED ACROSS JAPAN – CANADIAN GE CANOLA THE CULPRIT

PUBLISHED MAY 2005

### III GE POPULATIONS ARE TAKING ROOT IN JAPAN

Following agreement to implement the Biosafety Protocol, suspicions of possible GE canola contamination in and around ports in Japan prompted the Ministry of Agriculture, Forestry, and Fisheries (MAFF) to launch an initial investigation.

In 2002, the Ministry of Agriculture, Forestry, and Fisheries (MAFF) chose Kashima port in Ibaraki prefecture for the first major investigation into spillage of imported GE canola. Tests were conducted for two years at forty-eight locations within a five-kilometer radius of the Kashima port.

*The initial investigation revealed that canola seeds were growing wild at twenty-five of the forty-eight locations.*

*In 2003, the Ministry of Agriculture, Forestry, and Fisheries (MAFF) investigation was repeated and possible GE canola reseeding was found at seventeen of the forty-eight sites.*

Japanese domestic laws in accordance with the Cartagena Protocol on Biosafety to the Convention on Biological Diversity came into force on 19 February 2004.

However it was not until **June 2004** that the Biotechnology Safety Division Research Council of the MAFF announced the result of these investigations in a report titled: “Regarding the survey on seeds spillage of imported genetically modified western oilseed rape (canola) for raw material.”<sup>10</sup>

The MAFF report confirmed that GE seeds were growing wild in Kashima port and gave alarming detail of the spread of the GE canola. However publicly they maintained that the escaped GE seeds posed very little threat of genetic contamination, commenting that there was “no need to worry about environmental impact.”<sup>11</sup> Skeptical of the government’s analysis, concerned citizen groups across Japan began to mobilise.

Around the same time the Ministry of Environment under the framework of the Ministry’s Biodiversity Project for year 2004 commissioned the National Institute for Environmental Studies (NIES) to conduct a pilot study regarding the spread of genetically engineered genes with relation to imported GE crops.

### Canola import ports

According to the customs trade statistics there are ten major ports where canola is imported from Canada into Japan and it was around many of these ports that citizens groups started conducting their own investigations.

CANOLA IMPORT PORTS		
PORT	REGION	GE CANOLA FOUND
Chiba Port	Chiba Prefecture	Yes
Hakata Port	Fukuoka Prefecture	Yes
Kashima Port	Ibaraki Prefecture	Yes
Kobe Port	Hyogo Prefecture	Yes
Mizushima port	Okayama Prefecture	No finding so far
Nagoya Port	Aichi Prefecture	Yes
Shimizu Port	Shizuoka Prefecture	Yes
Yokkaichi Port	Mie Prefecture	Yes
Yokohama Port	Kanagawa Prefecture	Yes
Uno Port	Okayama Prefecture	No finding so far

SOURCE: CUSTOMS TRADE STATISTICS



©MASAHARU KAWATA/GP

In July 2004 the “GM Watch Citizens Network” held its first-ever gathering and decided to start monitoring GE crops at ports all over Japan.

Since July 2004, citizens’ groups have been conducting their own investigations into the GE canola growing in Japanese ports and along transport roads.<sup>12</sup> They have been carefully taking samples, conducting genetic ‘strip-tests’ to reveal the presence or absence of GE DNA or proteins and they have been carefully documenting their work with written records, charts and pictures of the GE canola they have found.

Their findings revealed herbicide-resistant GE canola growing wild in or on transport routes coming from many of the other ports across Japan and included findings of glyphosate resistant (Roundup Ready - RR) GE canola as previously demonstrated in the MAFF investigation, but also of glufosinate resistant (Liberty Link - LL) GE canola that had not previously been revealed.

One of the member groups, “No GM Chubu Association,” conducted investigations in Yokkaichi port in Mie Prefecture and found both (RR) GE canola and (LL) GE canola growing wild. Another, the “Stop GM Seeds Network,” conducted investigations in Yokohama port in Kanagawa Prefecture and found RR GE canola growing wild. Investigations in Nagoya port in Aichi Prefecture found (LL) GE canola growing wild and in Kobe port in Hyogo Prefecture more (LL) GE canola was discovered. Similar findings were revealed in Chiba port in Chiba Prefecture, and in Hakata port in Fukuoka Prefecture. In Shimizu port in Shizuoka Prefecture (RR) GE canola was growing wild; the local group also worryingly recorded finding both RR GE soybeans and Bt GE maize also growing wild.<sup>13</sup>

Apparently GE canola pollution was spreading without any control. Japanese consumer and environmental organisations reacted with serious concern to the news of the contamination and citizens started themselves to clean up the worst of the GE canola that they found. In Chiba port, for example, citizens reportedly filled a small truck with Roundup-Ready GE canola growing wild.

Under increasingly critical media attention and pressure from citizen groups, MAFF recommended to the Japan Oilseeds Processors Association<sup>14</sup> (JOPA) in August 2004 to clean up ports where canola is imported, but took no further action.<sup>15</sup> The request however appears to have done little to halt the GE canola contamination.<sup>16</sup>

#### IV NATIONAL REPORT CONFIRMS FINDINGS OF CITIZEN GROUPS

In February 2005, the National Institute for Environmental Studies (NIES) published the findings of its investigation, which was initiated in June 2004. This report confirmed the findings of the citizen groups that GE canola was growing wild in and around many of the ports where Canadian canola was imported to Japan.

The study, commissioned by the Ministry of the Environment, concluded that GE canola plants were found growing at five of the six canola-unloading ports where samples were collected.<sup>17</sup>

The NIES report also confirmed that the GE canola was spreading along transport routes coming from the ports when, for example, it identified GE canola growing on a canola transport route thirty kilometers away from the Kashima port.<sup>18</sup>



©MAKIKO IRISAWA/GP

# canola

## GENETICALLY ENGINEERED CANOLA CONTAMINATION CONFIRMED ACROSS JAPAN – CANADIAN GE CANOLA THE CULPRIT

PUBLISHED MAY 2005

### V THE CURRENT LEGAL STATUS OF GE CANOLA IN JAPAN IS QUESTIONABLE

Japanese domestic laws in accordance with the Cartagena Protocol on Biosafety to the Convention on Biological Diversity came into force on 19 February 2004.

Under these new laws, no GE canola varieties have been approved for Type 1 Use (Release to the Environment) as at April 2005.<sup>19</sup>

However through an 'interim measure', fifteen GE canola varieties have been given a new status in which they are "regarded as having obtained approval" and can therefore be released into the environment BEFORE an official decision on their application for approval has been made.

These 15 GE canola varieties "are regarded as having obtained approval" and "considered as safe for environmental releases," while no official decision on their application for approval has been made and when presumably the potential dangers of their release are still being evaluated.

At the time the GE canola contamination was first being investigated and before the new domestic biosafety law came into force only two varieties of glyphosate resistant (Roundup Ready - RR) GE canola had been approved by the Japanese government for open field cultivation.<sup>20</sup>

Thirteen other GE canola varieties, the majority of them genetically engineered for tolerance to the chemical glufosinate (Liberty Link - LL), were previously only approved for isolated field trials in Japan. However under the 'interim measures' contained in the new biosafety law these appear to have been approved, at the stroke of a pen, for release into the environment.

The detail of the 'interim measures' can be found in the Law Concerning the Conservation and Sustainable Use of Biological Diversity through Regulations on the Use of Living Modified Organisms (Law No. 97 of 2003) under 'Supplementary Measures,' page 24, Interim Measures, article 2 subsection 3.<sup>21</sup>

In short, the current regulatory system provides no little or no assurance for the environmental or biodiversity safety of GE organisms released in Japan.

### VI DENIAL AND THE SPREAD OF GE CONTAMINATED PLANT POPULATIONS

Both MAFF and the Ministry of the Environment refuse to acknowledge any problem with the GE release, maintaining that "even if spilled GE seeds grow wild and crossed with local varieties, such plants will have low fertility, therefore there is no possibility that GE seeds will spread and disturb the native species."<sup>22</sup>

Empirical research has shown otherwise. GE varieties may be as fertile or fecund, or even more, than wild relatives.<sup>23</sup> No differences in seed production or pollen fertility were detected between non-GE rapeseed and contaminated rapeseed plants that had acquired an herbicide-resistance gene – even in the absence of herbicide spraying.<sup>24</sup> Reproductive success of wild plants can even improve after acquiring GE traits.<sup>25</sup> For example in sunflowers, 55% greater seed production was found in wild sunflowers that expressed a transgene<sup>26</sup>. Although the full effects that the spread of GE traits among wild plants will have are not yet fully understood,<sup>27</sup> it is clear that the introduced genes irrevocably alter the natural gene pool and that there will be evolutionary consequences.

### VII CONTAMINATION IS LIKELY TO PROLIFERATE IN JAPAN AND THERE IS A SERIOUS RISK OF SPREAD TO RELATED FOOD CROPS AND WEEDS

With each shipment of GE canola imported into Japan, genetic contamination may increase. Once these genes escape into the environment, they cannot be controlled. GE pollen can disperse over long distances, either by wind or pollinators. Gene flow from GE canola pollen has been detected three kilometers from source fields<sup>28</sup> and it has been estimated that tens of thousands of hybrids



© TOYOHISA ISHIKAWA/IGP

are created each year from gene flow among oilseed relatives.<sup>29</sup> Previous studies have demonstrated that spontaneous hybridizations can occur between oilseed rape and wild radish, wild turnip, wild cabbage and hoary mustard.<sup>30</sup>

There are a number of closely related species that grow and are eaten in Japan including rapeseed, cabbage varieties including Chinese cabbage, turnip, brown mustard and other mustards. Therefore GE canola contamination is likely to proliferate in Japan and to contaminate popular food crops.

The National Institute for Environmental Studies (NIES) report acknowledged that this cross contamination can easily occur and that although this cross contamination has not yet been found there is a clear need for further investigation.

#### VIII CITIZENS OF JAPAN OPPOSE GE CROPS

Consumers in Japan have mobilised to say No to GE foods since their introduction back in 1996. Japan made the decision to require labelling of GE foods in April 2001.<sup>31</sup> However, consumers' demands are being neglected by a 5% threshold in labelling standard,<sup>32</sup> which allows producers to use a non-GE label on a product that contains less than 5% GE ingredients, and which provides a loophole for most of the GE ingredients that are being consumed daily in Japan. Oils, including canola oil, are exempt from the GE labelling regulation. In reaction to this policy, consumers in Japan are continuously demanding the consumer's right to know about all GE ingredients.

Citizens groups have launched a nation-wide campaign to stop the GE canola contamination. Organisations such as Stop GM Seeds Network, No GM Chubu Association, GM Watch Citizens Network, and Safety Foods Network, have initiated investigations to document the escape of GE canola seeds into the environment and are taking action to uproot the GE canola wherever they find it.

"The spread of the rapeseed (Canola) may damage conventional rapeseed and other agricultural products," says Stop GM Seeds Network.<sup>33</sup> The Japanese government would do well to support

their efforts, or more relevantly, to stop the import of GE canola. So long as the GE canola imports continue, the contamination will certainly be repeated and can be predicted to have a negative impact on biodiversity and ecosystems in Japan.

It will be impossible for the food industry to gain consumer confidence on GE foods. In May of 2004, the Japanese Food Safety Commission conducted a poll on the public's opinion of GE foods: 74.7% of respondents were concerned about GE foods.<sup>34</sup> The public is demanding a change to the Japanese government's policy. In Tsukuba city, the center of GE crop trials, guidelines restricting GE cultivation were adopted by the city council in the spring of 2004. In winter of 2005, the local government of Hokkaido, a major region of agriculture, put forth a bill to regulate commercial and field trials of GE crops. The draft law, the first of its kind in Japan, will come into effect in January of 2006.<sup>35</sup> There is a clear public understanding concerning the inherent dangers caused by GE crop cultivation.

#### IX CLEAR AND DOCUMENTED DANGER

Lessons from Canada and Japan unequivocally demonstrate that once released GE crops cannot be controlled. GE canola originating from Canadian GE canola imports is now spreading as a weed across Japan, threatening to contaminate related weeds and food crops.

Loopholes in safety regulatory processes within Japan combined with official complacency have allowed this GE canola contamination to continue relatively unchecked. It is so far the actions of concerned citizens and environmental Organisations that are providing the main defense against the flood of GE canola sweeping into the food and fields of Japan.

***Urgent action needs to be taken by the Japanese Government to clean up the existing contamination and to prevent any further spread of GE canola.***

***Urgent action also needs to be taken to halt damage being caused by the export of GE canola from Canada.***

# canola

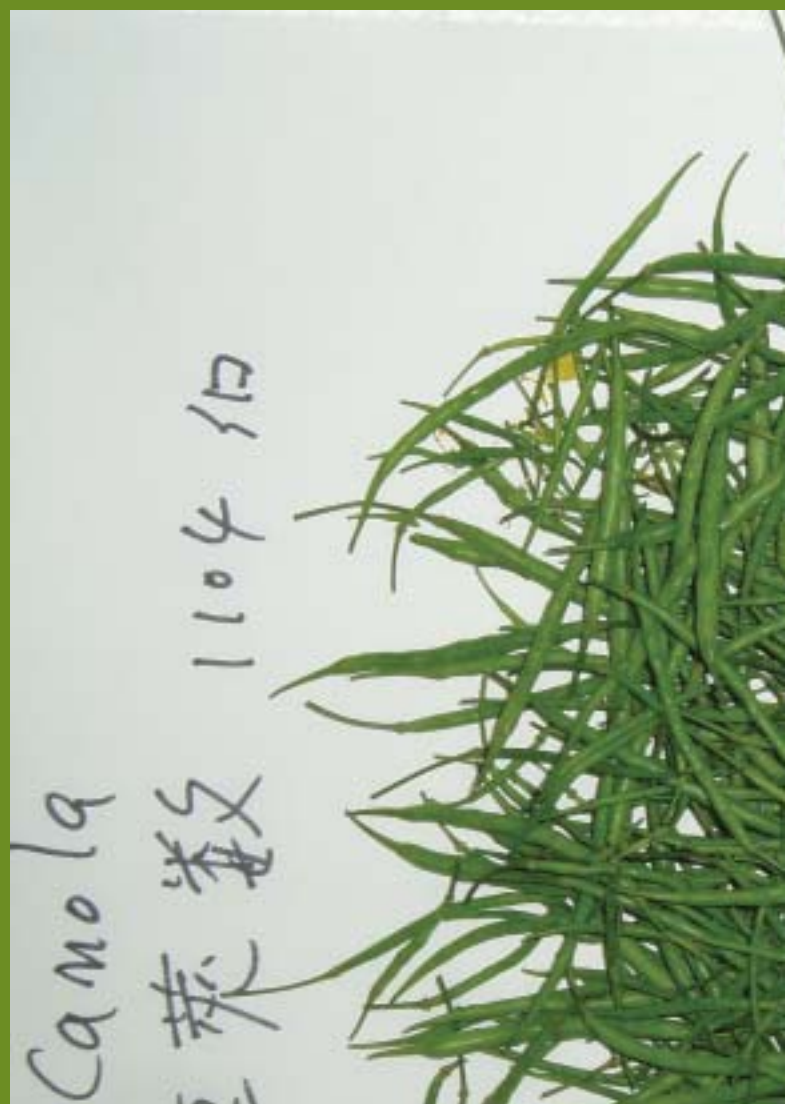
## GENETICALLY ENGINEERED CANOLA CONTAMINATION CONFIRMED ACROSS JAPAN – CANADIAN GE CANOLA THE CULPRIT

PUBLISHED MAY 2005

### References

- 1 National Institute for Environmental Studies (NIES): A monitoring survey concerning the environmental impact caused by Genetically Engineered living organisms (canola), February 2005  
[http://www.bch.biodic.go.jp/download/natane/rapeseed\\_report16.pdf](http://www.bch.biodic.go.jp/download/natane/rapeseed_report16.pdf)
- 2 Japan Oilseeds and Products Annual Report (2004) USDA Foreign Agricultural Service Gain Report (27 May)JA4047: 1-27.
- 3 F. Friesen, Alison G. Nelson and Rene C. Van Acker (2003) Evidence of contamination of pedigreed canola (*Brassica napus*) seedlots in western Canada with genetically engineered herbicide resistance traits. *American Society of Agronomy, J.* 95:1342-1347.  
<http://agron.sci-journals.org/cgi/content/full/95/5/1342>
- 4 Mellon M, Rissler J (2004) Gone to seed: transgenic contaminants in the traditional seed supply. Cambridge, MA: Union of Concerned Scientists.  
[http://www.ucsusa.org/food\\_and\\_environment/biotechnology/page.cfm?pageID=1315](http://www.ucsusa.org/food_and_environment/biotechnology/page.cfm?pageID=1315)
- 5 Lefol E., Danielou V., Darmency H., Boucher F., Maillet J., Renard M. (1995) Gene dispersal from transgenic crops. I. Growth of interspecific hybrids between oilseed rape and the wild hoary mustard. *Journal of Applied Ecology*, 32, 1995, pp. 803-808
- 6 Canadian Canola Industry. Market statistics. <http://www.canola-council.org/acreageyields.html>
- 7 Monsanto vs Schmeiser. <http://www.percyschmeiser.com/>
- 8 Saskatchewan Organic Directorate. <http://www.saskorganic.com/Default.htm>
- 9 Orson, J (2002) Gene stacking in herbicide tolerant oilseed rape: lessons from the North American experience. *English Nature Research Report No. 443*. English Nature. January. <http://www.english-nature.org.uk/pubs/publication/PDF/enr443.pdf>
- Hall, L, Topinka, K, Huffman, J, Davis, L, Good, A (2000) Pollen flow between herbicide-resistant *Brassica napus* is the cause of multiple-resistant *B.napus* volunteers. *Weed Science*. Vol. 48, No. 6, pp. 688-694.  
<http://www.bioone.org/bioone/?request=get-abstract&issn=0043-1745&volume=048&issue=06&page=0688>
- 10 Agriculture, Forestry and Fisheries, Research Council Secretariat, Ministry of Agriculture, Forestry and Fisheries (MAFF): Regarding the survey on seeds spillage of imported genetically modified western oilseed rape (canola) for raw material. 29th June 2004.  
<http://www.s.affrc.go.jp/docs/press/2004/0629/honbun.htm>
- 11 Yoshikawa, M. (2004) Genetically modified canola growing wild around Kashima port, Ibaraki. *Mainichi Shimbun*, 30th June .
- 12 GM rapeseed found around ports. *The Japan Times*, 21st November 2004.  
<http://www.japantimes.co.jp/cgi-bin/getarticle.pl5?nn20041121a9.htm>  
GM corn, soybeans found growing wild. *The Japan Times*, 14th December 2004  
<http://www.japantimes.co.jp/cgi-bin/getarticle.pl5?nn20041214a1.htm>  
Genetically modified grain pollution by Monsanto aggravated - Rapeseed, corn, and soybean grown wild in Shimizu Port in Shizuoka. *Japan Consumer Press online, Nippon shouhisha shinbun* 14th December 2004  
<http://www.jc-press.com/En/Latest%20News/200412/20041214Genetically%20modified%20rain%20pollution%20by%20Monsanto.htm>
- 13 Genetically modified grain pollution by Monsanto aggravated - December 2004. op. cit.
- 14 Japan Oilseeds Processors Association – <http://www.oil.or.jp/index.html>
- 15 Sano, N. (2005) Genetically modified canola in Yokkaichi. *My Town Mie, Asahi Shimbun*. <http://mytown.asahi.com/mie/news01.asp?kiji=7191>
- 16 Trend: Serious GM canola pollution in Kashima port, Ibaraki Prefecture. *Bio Journal*, August 2004.  
<http://www5d.biglobe.ne.jp/~cbic/english/2004/Journal0408.html>
- 17 National Institute for Environmental Studies (NIES): February 2005. op. cit.
- 18 Spread of Genetically Modified Canola Confirmed across Japan. *Japan For Sustainability* 25th December 2004.  
[http://www.japanfs.org/db/database.cgi?cmd=dp&num=915&dp=data\\_e.html](http://www.japanfs.org/db/database.cgi?cmd=dp&num=915&dp=data_e.html)
- 19 LMO of which Type 1 Use Regulation is approved under the Cartagena Law Regarded as having obtained approval as of 25th April 2005.  
[http://www.bch.biodic.go.jp/lmo\\_nosaku\\_list\\_1.html](http://www.bch.biodic.go.jp/lmo_nosaku_list_1.html)
- 20 Biotechnology Safety Division, Research Council Secretariat, MAFF. The Current Status of Transgenic Crop Plants in Japan. May 2003.  
<http://www.s.affrc.go.jp/docs/sentan/guide/edevelp.htm#COLE>
- 21 Law Concerning the Conservation and Sustainable Use of Biological Diversity through Regulations on the Use of Living Modified Organisms (Law No. 97 of 2003)  
[http://www.bch.biodic.go.jp/download/en\\_law/en\\_Law.doc](http://www.bch.biodic.go.jp/download/en_law/en_Law.doc)
- 22 Yoshikawa, M. 2004. op. cit.
- 23 Legere A (2005) Risks and consequences of gene flow from herbicide-resistant crops: canola (*Brassica napus* L.) as a case study. *Pest Management Science*. Vol. 61, No. 3, pp. 292-300.  
<http://www3.interscience.wiley.com/cgi-bin/abstract/109857232/ABSTRACT>
- 24 Snow, AA, Andersen B, Jorgensen R.B., (1999) Costs of transgenic herbicide resistance introgressed from *Brassica napus* into weedy B-*rapa*. *Molecular Ecology* 8: 605-615.  
<http://www.biosci.ohio-state.edu/~asnowlab/snowetal99.pdf>
- 25 Warwick SI, Simard MJ, Legere A, Beckie HJ, Braun L, Zhu B, Mason P, Seguin-Swartz G, Stewart CN Jr. (2003) Hybridization between transgenic *Brassica napus* L. and its wild relatives: *Brassica rapa* L., *Raphanus raphanistrum* L., *Sinapis arvensis* L., and *Erucastrum gallicum* (Willd.) O. E. Schulz. *Theor Appl Genet*. August. 107(3): 528-39. Epub 2003 April 30.  
[http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list\\_uids=12721639](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12721639)  
Spencer, LJ, Snow, AA (2001) Fecundity of transgenic wild-crop hybrids of *Cucurbita pepo* (Cucurbitaceae): implications for crop-to-wild gene flow. *Heredity* 86: 694-702.  
<http://www.biosci.ohio-state.edu/~asnowlab/spencersnow01.pdf>
- 26 Snow AA, Pilsen D, Rieseberg LH, Paulsen MJ, Pleskac N, Reagon MR, Wolf DE, Selbo SM (2003) A Bt transgene reduces herbivory and enhances fecundity in wild sunflowers. *Ecological Applications*. 13(2): 279-286. <http://www.biosci.ohio-state.edu/~asnowlab/snowetal03.pdf>

- 27| Wilkinson MJ, Sweet J, Poppy GM (2003) Risk assessment of GM plants: avoiding gridlock? *Trends in Plant Science* 8 (5): 208-212.  
[http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list\\_uids=12758037&dopt=Abstract](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=12758037&dopt=Abstract)
- 28| Rieger MA, Lamond M, and Preston C. (2002) Pollen-mediated movement of herbicide resistance between commercial canola fields. *Science* 296: 2386-88. Written submission from Advanta Seeds UK to the House of Commons Agriculture Select Committee, 10th July 2000.
- 29| Wilkinson MJ, Sweet J, Poppy GM (2003) op. cit.
- 30| Eber, F, Chèvre, A-M, Baranger, A, Vallee, P, Tanguy, X. & Renard, M. (1994) Spontaneous hybridisation between a malesterile oilseed rape and two weeds. *Theoretical and Applied Genetics* 88: 362-368
- 31| Takada, A (1999) Japan label plan seen affecting U.S. GM crop output. *Reuters World Report* 24th August 1999.  
<http://www.planetark.com/dailynewsstory.cfm/newsid/3342/newsDate/24-Aug-1999/story.htm>
- 32| Factbox – Japan’s new rules for biotech crop imports. *Reuters* 29th March 2001.  
<http://www.planetark.com/dailynewsstory.cfm?newsid=10300>
- 33| GM rapeseed found around ports. *The Japan Times*, 21st November 2004.  
<http://www.japantimes.co.jp/cgi-bin/getarticle.pl5?nn20041121a9.htm>
- 34| Food Safety Commission. Food Safety Monitor questionnaire survey. Result of an attitude survey regarding Food Safety. May 2004.  
<http://www.fsc.go.jp/monitor/1605moni-chaousakekka.pdf>
- 35| Bylaw regulating GM crop cultivation being debated in Hokkaido assembly. *Bio Journal*. April 2005.  
<http://www5d.biglobe.ne.jp/~cbic/english/2005/journal0504.html>



© MASA HARU KAWATA/GREENPEACE

# canola

GENETICALLY ENGINEERED CANOLA CONTAMINATION CONFIRMED  
ACROSS JAPAN – CANADIAN GE CANOLA THE CULPRIT

**GREENPEACE**

greenpeace international  
Ottho Heldringstraat 5, 1066 AZ Amsterdam, Netherlands  
t +31 20 718 2000 f +31 20 514 8151  
[www.greenpeace.org](http://www.greenpeace.org)