GeneWatch UK comments on Part C (of Directive 2001/18/EC) notification C/BE/96/01 (MS8xRF3 oilseed rape)

GeneWatch UK supports the Belgian proposal that these GM lines of oilseed rape should not be given consent for cultivation in the EU. However, GeneWatch UK does not support the proposal to allow, with conditions, the importation of GM oilseed rape for processing and use as any other oilseed rape.

GeneWatch is opposed to the cultivation within the EU of this herbicide tolerant GM oilseed rape line because;

- there is a high likelihood of cross contamination with wild relatives. The long term consequences of this are unknown and GeneWatch does not find it acceptable to allow the contamination of the EU's native flora in this way;
- GM oilseed rape fields have been shown to contaminate non-GM oilseed rape fields at greater distances then previously expected;
- cross pollination of neighbouring crops, seed left in fields after harvest and seed spilt seed from trucks after harvest time will give rise to weedy volunteers and feral populations GM oilseed rape. These will be more difficult to control than current oilseed rape volunteers;
- co-existence schemes for oilseed rape to address the above concerns will not be realistic because of the nature of oilseed rape;
- the UK Farm-scale Evaluations found that the use of glufosinate tolerant oilseed rape more detrimental to wildlife than current oilseed rape farming practices.

GeneWatch UK is opposed to the importation of GM oilseed rape line MS8xRF3 because;

- Bayer have not addressed the issue of accidental seed spill from port to processing plant. Whilst vertical gene spread from these seeds will be on a lesser scale than from EU-wide cultivation, many of the concerns are similar and over the longer term will lead to similar outcomes.
- A full safety assessment for human food and animal feed has not been made in line with current EU laws.
- If a GMO fails an environmental risk assessment for Europe (as this GMO has done), it should not be allow to be imported as a whole GMO which may not be contained.

Consent for the cultivation of GM oilseed rape line MS8xRF3 should not be granted.

GeneWatch supports the conclusion of the Belgian Competent Authority that the cultivation of MS8xRF3 should not be granted due to the following concerns.

1. Gene flow to wild relatives

Oilseed rape is a member of the *Brassica*, or cabbage, family, which includes hundreds of different species commonly found in Europe. A recent EU-funded study[1] concluded that oilseed rape can potentially form hybrids under field conditions with wild turnip (*Brassica rapa*), hoary mustard (*Hirschfeldia incana*), wild radish (*Raphanus raphanistrum*), white mustard (*Sinapsis arvensis*) and wild cabbage (*Brassica oleracea*). Whilst the likelihood of these species forming hybrids with oilseed rape varies, the first evidence of a transgene escape to wild turnip during commercial growing of a GM crop, has now been recorded in Canada[2].

A similar situation is likely to emerge here. Research in the UK has revealed that earlier, small-scale research had underestimated the likelihood of gene escape from

GM oilseed rape to wild turnip. The new study showed 32,000 hybrids between oilseed rape and the waterside form of wild turnip could form each year and 17,000 with the weedy populations which are often found in agricultural fields[3]. A Government-funded monitoring project of experimental releases of GM oilseed rape also found that at one field site, 48 per cent of the seeds on a wild turnip plant were GM hybrids[4].

Research has shown that herbicide tolerance genes in do not have a negative impact on survival and that hybrids can be fitter than expected and can regain fitness over following generations[5,6]. Gene flow via pollen to wild turnip and possibly to other species is therefore considered inevitable[7]. The effects of introducing genes from bacteria and viruses remain difficult to predict. GeneWatch does not believe the EU have the right to sanction the contamination of our native flora, without being;

- certain that there will not be a negative impact on those species and the wider ecosystem;
- or that there is a pressing need to take that risk in order to prevent greater damage to the environment or human life.

2. Volunteer weeds and feral populations

Seed may be shed and left in a field to grow in later seasons as 'volunteers'. As combine harvesters move from field to field, leftover GM seed may be spilt if equipment is not cleaned properly. Lorries taking a harvested crop away from a farm may also spill seed near fields where non-GM or organic crops are to be grown. For crops like oilseed rape with very small seeds, losses can be high unless great care is taken. In their study of GM crops and food, the Royal Society of Canada noted in this context [8] *'…. the inherent difficulties in the containment of genetic material in the context of normal farming practices in which literally millions of small seeds are produced and harvested over large areas of the landscape. Industry argues that as long as "good farming practices" are followed, these problems should not occur. This perspective may be unduly naïve.'*

In the UK, 23% of cereal fields, 9% of sugar beet and 9% of potato fields are infested with volunteer rape, and oilseed rape commonly occurs as a weed in semi-natural habitats, such as roadside verges and field margins[9]. Studies have shown that relict plants of oilseed rape persisted for at least 8 years after their last cultivation [10 11], most probably in the soil seed bank, and that long standing feral populations of oilseed rape can persist for at least 10 years[12]. It has been shown that the geographical distribution of such feral populations is partially related to the transport traffic at harvest from the field to the silo. When researchers monitored GM test sites in the UK, GM oilseed rape volunteers were found producing populations for up to the three years (the entire length of the study)[13]. Recent research, modelling the behaviour of oilseed rape volunteers, has shown they may remain and act as sources of contamination of more than 1 per cent in non-GM oilseed rape and for up to 16 years if not properly managed[14.] If volunteers were vigorously controlled, it would take five years for contamination levels to fall below 1 per cent. Control of feral populations, e.g. with herbicides, could adversely affect biodiversity in hedgerows, roadside areas, railway banks which may also be a haven for wildlife.

Weedy, volunteer, oilseed rape that is resistant to up to three herbicides is becoming common place in the Canadian prairies where GM herbicide tolerant (GMHT) oilseed rape has been grown since 1995. Volunteer oilseed rape weeds that are tolerant to three herbicides (Liberty, Roundup and Clearfield), were first identified in Canada in1998, only 3 years after GMHT oilseed rape was first grown[15,16]. An Agriculture

Canada project found evidence of gene stacking at all 11 sites it sampled in 1999 with gene flow taking place at distances of up to 800 metres[17].

The emergence of multiple herbicide resistant -weeds in Canada is driving up the use of other, more toxic chemicals. Both 2,4D and paraquat (grammoxone) are being recommended by government agencies to control herbicide tolerant oilseed rape volunteers in Canada[18]. 2,4-D is considered "highly toxic" due to its hazard to eyes[19] and some forms are also highly toxic to fish. English Nature considered that if herbicide tolerance gene-stacking arose in the UK, more paraquat and diquat may be used, which could harm an already threatened and BAP species, the brown hare (*Lepus europaeus)*[20].

3. Contamination of neighbouring crops and cross pollination.

Contamination of non-GM oilseed rape with GM varieties is an important issue. There is consumer demand for non-GM produce and, from April 2005, GM food labelling requirements will include oils and other derivatives as well as 'whole' GMO's at a level of above 0.9%. To enable consumers to continue to access non-GM foods farmers and the seed industry need to be able to avoid the contamination of non-GM crops. Contamination also brings the prospect of adverse impacts on biodiversity, if herbicides have to be used to control affected plants.

Contamination of neighbouring crops may occur as a result of several different factors:

- pollen from a GM crop may fertilise a non-GM crop and result in contamination (see below);
- seed bought as 'non-GM' may prove to have been contaminated by GM;
- 'volunteer' weeds from a GM crop may act as a source of GM pollen contamination;
- GM seeds may be spilt during transport and 'feral' populations of GM oilseed rape established.

Oilseed rape pollen can be carried for long distances, both on the wind and by insects. Early studies showed pollen from GM oilseed rape could pollinate other oilseed rape 2 kilometres away[21] and that small scale experimental trials were poor predictors of what will happen when oilseed rape is grown on a large scale[22]. In Australia, non-GM herbicide tolerant oilseed rape, which was grown commercially for the first time in 2000, was found to cross-pollinate oilseed rape up to 3km from the source fields[23]. The levels of contamination were low (up to 0.07%) but levels did not decline with distance as predicted by small-scale experimental trials. Studies in Canada show similar results, with levels of 0.07% cross-pollination at 800 metres from GM oilseed rape[24]. Levels of over 0.5% contamination were detected at 200 metres in one UK farm-scale evaluation[25]. The most recent study of long-distance pollen movement for rape in Britain, shows that pollen can be carried up to 26km and successfully fertilise other oilseed rape plants at low frequencies[26]. Prior to this study, wind was thought to be the most important determinant of gene-flow in oilseed rape. The new research showed that bees and other insect pollinators were much more important than had previously been assumed in the long-distance movement of oilseed rape pollen.

4. The use of glufosinate with GM oilseed rape has a negative impact on wildlife.

The results of the UK farm-scale evaluations for spring oilseed rape have now been published[27]. The researchers and scientific steering committee concluded:

"1. Growing GMHT beet and spring oilseed rape on a large-scale may disadvantage wildlife, particularly farmland birds, bees and butterflies…
2. Growing GMHT beet and spring oilseed rape on a large-scale may exacerbate long-term declines of flowering weeds, including those that are important food resources for seed-eating birds."

The research team also said[28]:
"*If these trends are maintained under widespread GMHT cropping, then the present herbicide regimes associates with GMHT beet and spring oilseed rape might exacerbate long-term declines of dicot weeds, that include species that are important food resources for many invertebrates, small mammal and bird species*."

Importantly, the FSE results indicate that the rate of decline in the weed seed bank would increase from the current average of 3 per cent to 7 per cent, if GMHT crops were used as a break crop once every five years in a cereal rotation[29]. The result would be a faster loss of food resources for farmland wildlife, including birds. Break crops, like oilseed rape, are thought to be particularly important in maintaining weed seed banks, because weeds are so infrequent in other crops like wheat. Therefore, any effects on the seed bank produced during oilseed rape growing will have a disproportionate effect overall. Evidence emerging through the late 1980s and 1990s had shown that intensive agriculture was having an adverse impact on biodiversity in arable farming systems[30]. Serious declines in bird and plant populations have been recorded in the UK and other parts of Europe[31,32,33] and one of the primary causes of this decline has been the widespread use of herbicides and associated loss of weeds and sees. Modelling studies funded by DEFRA work have suggested that the use of GMHT winter rape could lead to serious declines in the numbers of cirl buntings (*Emberiza cirulus*), unless ameliorating measures such as simultaneous switch from 5% to 10% stubble regime are also introduced[34]. The cirl bunting is a BAP species.

In the FSEs, the later timing of application of herbicide to GMHT crops meant spray drift was greater because the spray boom was higher, leading to more damage to the field margins[35], something which would directly affect the ability to meet commitments made under the Biodiversity Action Plan to enhance the biodiversity of arable margin habitats. In most fields, any remaining species-rich seedbank will be restricted to field edges, so arable plant management will normally be focussed here and any adverse effects in this area are particularly worrying. Fourteen out of the 62 plants listed in the UK Biodiversity Action Plan are exclusive to farmland.

Therefore, as the FSE results have shown, there is potential for the use of GM herbicide tolerant oilseed rape to increase the pressure on threatened plants or to eradicate those plants that are just surviving in agricultural areas at the moment.

Consent for the importation of GM Oilseed rape line MS8xRF3 should not granted

5. Environmental risks of importation

Bayer's post market monitoring plan and environmental risk assessment is entirely focused on the cultivation of MS8xRF3 in the EU. A full assessment of the risks associated with importation should have been provided together with an appropriate post market monitoring plan.

Specifically, GeneWatch is concerned that grain imported into the EU is routinely transported from port of entry using tipper trucks (open trucks with canvas tops) from which seed can easily be spilt. GeneWatch agrees with the Belgian assessment that

"*Bayer must provide a localised case-specific monitoring plan to monitor the presence of feral MS8, RF3 and/or MS8xRF3 oilseed rape at the points of import and processing, and between those locations…"* It is the view of GeneWatch that, as these import and processing areas and the transportation routes will, by and large, be the same each year, feral populations could establish themselves in these areas. Over time contamination of wild relatives and non-GM oilseed rape would occur creating many of the same problems associated with the cultivation of this oilseed rape.

GeneWatch is additionally concerned that the bulk imports of oilseed rape will contain glyphosate tolerant varieties of GM oilseed rape such as GT73 (EC/2001/18 part C notification: C/NL/98/11). There is, therefore an additional risk of feral oilseed rape populations tolerant to both glyphosate and glufosinate herbicides. These hybrids could also then, themselves hybridise with wild relatives.

6. Granting consent for human food and animal feed use will allow MS8xRF3 into the food chain with no further assessment.

In October 1999, AgrEvo (now part of Bayer Crop Science) submitted a notification under EU Regulation 258/97 for the use of processed oil derived from MS8xRF3. This notification relied wholly on the argument that this oil was substantially equivalent to conventional oilseed rape oil. Since then, Regulation (EC) No.1829/2003 on genetically modified food and feed has been agreed upon and will come into operation on 18th April 2003. This regulation explicitly states: *"Whilst substantial equivalence is a key step in the procedure for assessment of the safety of genetically modified foods, it is not a safety assessment in itself. In order to ensure clarity, transparency and a harmonised framework for authorisation of genetically modified food, this notification procedure should be abandoned in respect of genetically modified foods."* Therefore, this GM line of oilseed rape has not been fully assessed for its affects on human health under current EU regulations.

The Belgian Authorities have stated consent for MS8xRF3 under 2001/18/EC should not include the use of the product for human food and animal feed. Furthermore they state that the product must comply with the requirements established under EC Regulation 1829/2003. GeneWatch is in agreement with this.

7. A GMO which is considered unsafe for one use should not be allowed in Europe for other uses unless in an inactive form

Experiences in the USA when a variety of GM maize known as StarLink was found to be present in taco shells being sold for human consumption even though it was not approved for this use and should only have been used for animal feed,[36] have led to a changes in the approval system. It is now not considered appropriate to give an approval for a GMO which is restricted to either food or feed use. GeneWatch believes this principle should be extended to include environmental safety. If a living GMO is considered unsuitable for cultivation, it should not be allowed to be imported into Europe for other purposes. This should only be allowed if it is inactivated or processed such that it is unable to replicate. Without such a safeguard, unintentional or accidental release of the GMO is likely to occur at some time with the potential to cause damage to the environment.

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