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No go-ahead for cultivation of herbicide tolerant crops in Europe

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Earlier this year the European Commission issued opinions on herbicide tolerant (HT) genetically modified (GM) crops for cultivation in the European Union. The latest opinion concerns the glyphosate tolerant GM soybean '40-3-2', more popularly known as the Roundup Ready soybean, which is tolerant to the world's biggest selling herbicide, Roundup.

The cultivation of this soybean in the USA and South America is linked to increases in herbicide use, herbicide resistant crops, the extension of mono-cultural farming practices, and increasing environmental problems. Nevertheless, the European Food Safety Authority (EFSA) has given the soybean a positive assessment and concluded that the cultivation of herbicide tolerant GM crops would not cause risks to the environment in Europe. EFSA referred to private contracts between farmers and biotech companies to manage potential risks.

Increased use of pesticides due to glyphosate tolerant crops in USA

Most herbicide tolerant crops are grown in the USA, Brazil and Argentina. Data from the US Department of Agriculture shows that between 1994 and 2006 glyphosate (the active component of the herbicide Roundup) use per hectare of soybeans more than doubled, from 0.58 to 1.49 kilograms per hectare per year.¹ Between 1996 and 2006 the glyphosate dose used increased by 97% per hectare of soybean per year.² Glyphosate has not replaced other herbicides. In the period 2002 to 2006 the use of the herbicide 2,4-D on soybean fields in the US more than doubled.³ Similar developments can be observed in Brazil where 65-70% of the soy being grown is GM soy. Between 2003 and 2008 Brazilian herbicide use in soy cultivation increased substantially from 2.8 kilograms per hectare to 4.2 kilograms per hectare.⁴

¹ Friends of the Earth International: Who Benefits from GM Crops? The rise of pesticide use. January 2008. <http://www.foei.org/en/resources/publications/pdfs/2008/gmcrops2008full.pdf/view>

² Benbrook, C. M. 2009. Impacts of genetically engineered crops on pesticide use in the United States: the first thirteen years. The Organic Center. November. <http://www.organic-center.org/reportfiles/GE13YearsReport.pdf>

³ Friends of the Earth International: Who Benefits from GM Crops? The rise of pesticide use. January 2008. <http://www.foei.org/en/resources/publications/pdfs/2008/gmcrops2008full.pdf/view>

⁴ Meyer D. E., Cederberg Ch. 2011. Pesticide Use and Glyphosate Resistant Weeds – a Case study of Brazilian Soybean Production. Swedish Institute for Food and Biotechnology. <http://www.biosafety-info.net/article.php?aid=815>

In its assessment of the GM Roundup Ready soybean EFSA assumes: *“It is also expected that the introduction of glyphosate in GMHT soybean will replace or reduce the use of other herbicidal active substances used pre-emergence or post-emergence of the crop.”*⁵

This EFSA statement is not backed by official data and is not based on statistical and empirical evidence. A GM crop that increases the use of pesticides should not be authorised for cultivation in Europe.

Major changes in agricultural practices expected

Directive 2001/18 frames the legal requirements for the environmental risk assessment of genetically modified organisms including, *“changes in management in agricultural practices”* (Annex II).

EFSA confirms that the cultivation of the Roundup Ready soybean is *“a substantial change in the cultivation and management of this soybean compared with conventional soybean”*.

Despite this acknowledgement, EFSA has failed to fully assess the risks associated with the changes in agricultural practices and simply recommends that any risks should be monitored – after approval – by private contractors. Evidence from other parts of the world shows clearly that changes to the cultivation and management of herbicide resistant crops cause environmental harm that needs to be fully assessed in a European context.

Impact on weeds caused by cultivation of glyphosate tolerant crops

The continuous use of glyphosate on herbicide tolerant crops changes weed diversity on fields. EFSA states that where the Roundup Ready soybean is grown, *“repeated application of glyphosate based herbicides will cause changes in the weed flora and will favour evolution and spread of glyphosate resistant weeds...it is to be expected that sooner or later tolerance to the active ingredient of glyphosate-containing herbicides will develop in the weed flora”* (p. 56)

Despite these conclusions, EFSA assesses the Roundup Ready soybean as safe and recommends to authorise it for cultivation in Europe.

Lessons learnt from the USA and South America are clear. Problems with resistant weeds are escalating, with 23 weed species known to have become tolerant to glyphosate leading to the use of more toxic herbicide management practices.⁶

For these reasons glyphosate tolerant soybean and other herbicide tolerant GM crops must not be authorised for cultivation in Europe.

Potential harm of the nitrogen-fixing capacity of soybeans

Soybeans are legumes and have the capacity to fix nitrogen from the air with their roots in symbiosis with soil bacteria. This specific trait of legumes is damaged and reduced by the use of glyphosate, potentially resulting in lower yields and the need for increased fertiliser use than for conventional soybeans. This impact is acknowledged by EFSA which states, *“there is potentially also an indirect interaction between the use of glyphosate-containing herbicides and nitrogen-fixing symbiotic partners of the soybean, which could lead to a*

⁵ EFSA (2012) scientific opinion on herbicide tolerant genetically modified soybean 40-3-2 for cultivation

⁶ <http://www.weedscience.org/Summary/UspeciesMOA.asp?lstMOAID=12>

reduction in harvest yield. To compensate, potential increased application of nitrogen fertilizer might be necessary with the cultivation of HT soybeans”.

Soybeans and other legumes have the potential to reduce the use of external nitrogen fertiliser, contribute to soil health, and reduce greenhouse gases emissions. The disruption caused by the introduction of herbicide tolerance indicates likely further changes in farm management leading to new environmental impacts.

Private contracts as management tools

Despite acknowledging a number of significant risks and unknowns, EFSA still recommends that glyphosate tolerant soybeans be authorised.

EFSA's solution to mitigate these confirmed hazards and risks is a private contract between the applicant and farmers who want to grow GM soybeans. With this contract all risks should be managed and mitigated: *“The applicant ... will develop a Technology Use Guide for the EU soybean 40-3-2 markets. This guide will provide detailed weed control recommendations on soybean 40-3-2 to ensure that farmers adhere to good agricultural practices. It will therefore cover recommendations on minimum and maximum application dose rates, herbicide mixtures and herbicide rotation in cropping systems.”* (p. 59)

The legal framework for GMOs in Europe defines national governments and the European Commission as risk managers. The approach of relying on post-approval monitoring and of transferring this responsibility to private companies does not comply with GMO laws. European decision makers should give socio-economic impacts a prominent role in the approvals process.

The polluter pays principle and a liability regime must be established in order to ensure that those who contaminate food, seeds and feed with GMOs are held responsible and pay compensation for the economic damage caused by such contamination.

Conclusions

Public opposition to genetically modified crops should be reason enough for Europe to oppose further authorisations, but refusal of these crops is backed by European law. If Europe is to protect its biodiversity and environment from increased pesticide use, contaminated water systems, and glyphosate resistance in weeds, it must not make the same mistakes as the USA and South America. EFSA's risk assessment identifies clear problems with the herbicide tolerant soybean Roundup Ready. Relying on post-approval monitoring and private contractors is not in the spirit of the legislation. The wider implications of growing this soybean, and herbicide tolerant crops in general, need to be fully investigated and compared with alternative agro-ecological approaches.

- **Member states should oppose any authorisations of herbicide resistant crops.**

Instead of risky and unnecessary techniques, Friends of the Earth Europe calls for food and farming solutions that provide livelihoods and healthy food for people, protect biodiversity, and don't pollute the environment.



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