

How to manage risks and benefits of genetic modification in processes intended to improve the performance and practices of the soy sector?

🌐 Opposing insights impede debate

A polarised debate has evolved around genetically modified (GM) soy production. Triggered by increasing world demand for vegetable proteins and biofuels, soy production has been expanding rapidly during the past decade, especially in North and South America. A large and increasing part of this production is genetically modified.

Genetic modification is highly controversial. Opponents emphasise the unknown long-term environmental and health risks of GM crops. They also claim that GM soy boosts further expansion and other negative impacts of soy and that farmers are increasingly dependent on a handful of companies when it comes to obtaining seeds and crop protection. Proponents of GM crops argue that GM technology poses no threat to human or environmental wellbeing. Instead, they contend that it reduces the need for pesticides and increases yields. Due to their often radical positions, there has been little constructive dialogue between proponents and opponents of GM soy.



Soy is one of the most widespread GM crops.

Process organisation

The GM Soy Debate was carried out within the framework of the Development Policy Review Network (DPRN) by:

- Aidenvironment
- Plant research International (PRI) - Wageningen University and Research Centre (WUR)

They were advised by an independent Steering Committee, consisting of professionals from the North and South.

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aidenvironment

Solidaridad



🌐 Unbiased knowledge and constructive dialogue

In 2008, Plant Research International (PRI) at Wageningen University and Research Centre (WUR) and AidEnvironment initiated the GM Soy Debate in response to the highly polarised debate on the pros and cons of GM soy production.

The first objective of the process was to perform research and then create a common and unbiased knowledge base as a response to key stakeholder concerns. This knowledge base

provided a basis for constructive stakeholder dialogue about the possible impacts of GM soy and the promotion of responsible decision-making. Finally, the process delivered consensus-based recommendations on how to manage the risks and benefits of GM soy.



Large tracks of (often deforested) land are reserved for the production of GM soy.

🌱 Research outcomes: neither peril nor panacea

Together with the University of Buenos Aires and EMBRAPA, the Brazilian parastatal company for agronomic research, PRI conducted an extensive literature study on the agro-ecological impacts, risks and opportunities of GM soy production in Argentina and Brazil. The research was intended to clarify and validate stakeholders' claims regarding the agro-ecological risks and opportunities of GM soy in Argentina and Brazil.

The report contains useful recommendations on preventing some of the identified agro-ecological risks of GM soy, such as the development of herbicide-resistant weeds, herbicide drift affecting biodiversity, and mingling of GM soy with GM free soy in neighbouring plots.

Importantly, the researchers found no evidence that GM soy produces yields that are structurally different from those of conventional soy. What is more, GM soy does not

Twelve claims regarding GM soy

Research carried out during the process shows that:

1. Differences in yield between GM soy and conventional soy are usually small. There is no evidence that GM soy produces yields that are structurally different from those of conventional soy.
2. GM soy does lead to a strong change in the spectrum of herbicide use. The environmental impacts of the herbicides used on GM soy are probably comparable to or higher than those of the herbicides used on conventional soy.
3. The introduction of GM soy probably contributed to the development of herbicide resistant weeds.
4. There is no evidence that GM soy causes problems in the control of volunteer crops.
5. GM soy encouraged the adoption of zero tillage, although it was already in wide use before the introduction of GM soy.
6. Evidence of the role of GM soy in facilitating mono-cropping is inconclusive.
7. GM soy probably has a different impact on biodiversity in and around fields than conventional soy.
8. The cultivation of GM soy does not pose a threat to nearby farms that want to cultivate GM-free soy. Appropriate measures should be taken to minimise out-crossing and herbicide drift, and to avoid mixing of seeds during field operations and in post-harvest activities.
9. It is highly unlikely that GM traits in soy spread and persist outside agricultural fields.
10. GM soy may encourage the expansion of soy into particular natural areas during the initial years after their conversion into farmland.
11. There is no evidence that GM soy has affected the genetic diversity of soy in Latin America.
12. GM soy probably facilitated an increase in the scale of farming, but the availability of GM soy was not a decisive factor in this process.

seem to result in lower levels of pesticide use either. Based on the literature review, the GM Soy Debate issued a publication accessible to a larger audience addressing twelve claims related to GM soy. The report is available in English, Spanish and Portuguese.



The public report in Spanish.

🌱 Stakeholder dialogue

The GM Soy Debate organised an international Stakeholder Conference on 9 December 2008. The preliminary results of the PRI study were shared with stakeholders, which provided an excellent basis for discussion. One important recommendation of the conference was to widen the scope of research to include the socioeconomic impacts of GM soy production (e.g. related to food safety and ethics).

The conference, attended by 74 people, reflected the controversial nature of the debate from the start. Some organisations used the meeting as an opportunity to campaign against GM soy production. Even though many of these opponents formally distanced themselves from the debate, they later decided to participate in the discussion. This represented an important step forward in the dialogue about GM soy.



The stakeholder conference of the GM soy debate was used as an opportunity to campaign against GM soy, for example by A SEED Europe (Source: <http://www.aseed.net>).

Contacts between the organisers of the GM Soy Debate and the Ministry of Housing, Spatial Planning and the Environment (VROM) and the Ministry of Agriculture, Nature and Fisheries (LNV) intensified during the process. The ministries became interested in the development of socioeconomic criteria for admitting GM crops into the EU and invited the process organisers to share lessons at an EU conference on the issue.

🌱 Recommendations

The discussion on sustainable soy production is related first and foremost to the scale or type of cultivation practices (i.e. mono cropping, large-scale cultivation, tillage practices) and the expansion of soy production into areas which are environmentally sensitive or rich in biodiversity. Whether or not the soy is genetically modified hardly plays a role as regards these aspects of soy cultivation.

The environmental effects of the GM construct itself also appear to be irrelevant to the debate on the ecological impact of GM soy. The co-existence of GM and conventional soy production can be achieved in the field if appropriate measures are taken to avoid admixture, cross pollination and herbicide drift. It is therefore recommended that the GM soy discussion fo-

cuses on the use of herbicides and the environmental impact of these herbicides in the long term, specifically in relation to the build-up of herbicide resistance in weeds associated with current GM soy varieties and varieties to be released in the near future with comparable features.

Herbicide application rate and the environmental impact of these herbicides in a major production region in Argentina were found to be higher in GM soy than in conventional soy. These findings warrant further research into, and debate on, the environmental effects of herbicide applications in GM soy in the long term. A range of options can be introduced to limit accumulating environmental impact from herbicide applications such as:

- Decision support and extension services (operating independently of any involved actor in the chain) could inform farmers about best management practices.
- Governments can install rules and regulations to which the use and application of herbicides, and other agro-chemicals for that matter, should comply.
- A mix of crop varieties with tolerance to herbicides other than glyphosate could be integrated into the production system to diversify the use of herbicides as a strategy to slow down build-up of weed resistance.
- Rotating soy with other crops offers opportunities to diversify the weed management strategy and slow down the build-up of herbicide resistance.

Follow-up

The process outcomes were presented at the 8th World Soybean Research Conference in Beijing, China, in August 2009. They also played a role in discussions of the Round Table of Responsible Soy (RTRS), which is an initiative of producers, industry, retail, financial institutions and civil society organisations to develop voluntary standards to mainstream responsible

soy production and reduce the adverse impacts of soy production.

The process organisers have been looking into the possibilities for more research on the socio-economic impacts and institutional aspects of GM (soy) cultivation and PRI has obtained government funding for a second phase of research.

Process output

The 'GM soy debate' included research with stakeholder involvement (through steering committee advice and a stakeholder conference) and the publication of popular reports based on the study.

This resulted in the following publications:

- Research report: 'Agro-ecological impacts of genetically modified soy production in Argentina and Brazil'.
- Public reports: 'Agro-ecological impacts of genetically modified soy production in Argentina and Brazil: An analysis of twelve GM soy claims'. Available in English, Spanish and Portuguese.
- Statement by the chair of the GM soy Debate Steering Committee.
- DPRN process report.
- GM Soy Debate Brochure.

All publications are available on the website:
<http://gmsoydebate.global-connections.nl>

This infosheet was made by DPRN. With a view to stimulating informed debate and discussion of issues related to the formulation and implementation of development policies, DPRN created opportunities to promote an open exchange and dialogue between scientists, policymakers, development practitioners and the business sector in the Netherlands and Flanders from 2003–2011.