

“give me thousand acres of tractable land and all the gang members that exist and you’ll see the authentic alternative lifestyle, the Agrarian one...”
Bob Dylan

Terminator Technologies ETC Group www.etcgroup.org

1. Definition

Terminator technology refers to plants that have been genetically modified to render sterile seeds at harvest, in the second generation. It is also called Genetic Use Restriction Technology or GURTS. Terminator technology was developed by the multinational seed/agrochemical industry and the United States. Terminator has not yet been commercialized due to widespread opposition to this technology by governments, farmers and civil society. Nonetheless, some tests are currently being conducted in greenhouses in the United States.

Terminator technology runs counter to the peasant conception of life and work by creating genetically modified crops that have seeds that poison themselves and become sterile, so that farmers cannot save the seeds produced in the harvest and sow them again. They will be forced every year to buy new seeds from the companies (or, as we shall discuss later, in the case of the Transcontainer technology, to buy another product from the companies to “activate” the seeds).

2. How does it work?

It refers to technologies that, in their design, provide a mechanism to switch introduced genes on or off, using external inducers like chemicals or physical stimuli such as heat shock (called an inducible system). This mechanism allows for restricted use or performance of transgenes. There are two types of GURT technologies that rely on the same mechanism, variety-related or V-GURTs and trait-related or T-GURTs. V-GURTs aim to control reproductive processes to result in seed sterility, thus affecting the viability of the whole variety; T-GURTs aim to control the use of traits such as insect resistance, stress tolerance or production of nutrients. The ability to switch the GURT mechanism on or off externally would, theoretically, enable control over the viability of seeds or over traits. (Source: EcoNexus www.econexus.info)

The terminology surrounding genetic seed sterilization is confusing. The term GURTs -- genetic use restriction technology -- is a general term that refers to genetic engineering technologies that are designed to switch on or off the expression of a plant’s genetic traits. When we speak about Terminator, we are referring specifically to V-GURT, the technology that restricts the reproductive viability of an entire plant variety.

3. Why is Terminator a problem?

The top 10 largest seed companies control half the world’s commercial seed market. If Terminator is commercialized, corporations will likely incorporate sterility genes into all their seeds. That’s because genetic seed sterilization would secure a much stronger monopoly than patents — instead of suing farmers for saving seed, companies are trying to make it biologically impossible for farmers to re-use harvested seed.

Three-quarters of the world’s farmers routinely save seed from their harvest and exchange seed with their farm neighbors.

Seed selection and plant breeding are the foundation for local food security.

Terminator technology is an assault on food sovereignty because it has the potential to restrict the food producing capacity of farmers, and it threatens biodiversity.

The seed industry responds by saying that farmers will not be forced to buy Terminator seeds -- if the product does not bring farmers increased prosperity, they don't have to buy it.

Let me explain why that argument doesn't make sense given current market realities.

Based on 2006 revenues, the top 10 seed corporations account for \$13,014 million or 57% of the commercial seed market worldwide.

The top 3 seed companies account for \$9,000 million – or 39% of the commercial seed market worldwide.

The top 4 seed companies account for 44% of the commercial seed market worldwide.

The world's largest seed company, Monsanto, accounts for 20% of the world's commercial seed market.

Terminator and or Transcontainer are intended for commercial seeds, their major economic consequence would be that nobody have seeds for the next season and would have to buy them, from Monsanto, of course, the company that since august 2006 owns the Terminator Technology owned by Delta and Pine Land.

Of course, genetically modified Terminator seeds are not relevant to the needs of resource-poor farmers – and they can't afford to buy them. But that doesn't mean poor farmers won't find Terminator seeds in their fields if they are commercialized.

If imported grain contains Terminator genes and farmers unknowingly plant it as seed, it would not germinate. Similarly, farmers who depend on humanitarian food aid risk devastating crop loss if they unknowingly use food aid containing Terminator genes as seed.

We are talking about a huge number of people, with their communities, territories, histories and languages. Community selection and improvement of crops are the basis of local food security.

4. Terminator and the CBD context / History

In 1998, ETC group (then RAFI) discovered Terminator patents. In 1999, in response to the avalanche of public opposition, two of the world's largest seed and agrochemical corporations, Monsanto and AstraZeneca (now Syngenta), publicly vowed not to commercialize Terminator seeds. In 2000, the United Nations Convention on Biological Diversity adopted a de facto moratorium on Terminator seeds. As a result, many people believed that the crisis had passed, and the issue faded from public view. Unfortunately, Terminator is still being developed and is being heavily promoted.

In 2000 the CBD adopted Decision V/5 -- the de facto moratorium on GURTs that recommends against field testing and commercialization of the technology. But that didn't stop suicide seed technology. The seed industry continued to invest in R&D and win new patents, and the International Seed Federation has adopted a pro-Terminator position paper.

In 2005 and 2006, Decision V/5 came under attack by the seed industry and a few governments that tried to un-do the moratorium.

In response to worldwide protests from farmers, civil society and indigenous peoples governments at COP8 (2006) unanimously reinforced and strengthened Decision V/5 - the de facto moratorium on Terminator.

The “Ad Hoc Technical Expert Group report on the potential impacts of genetic use restriction technologies on smallholder farmers, indigenous and local communities” was mandated by the United Nations Convention on Biological Diversity. The expert group included representatives from Indigenous peoples’ organizations, civil society and industry. The report found that the potential negative effects of Terminator far outweigh the positive impacts and that the ongoing implementation of the precautionary principle was therefore needed to insure that the rights, safety, and food security of Indigenous and local communities are not threatened. Although the expert group included many scientists, the AHTEG’s mandate was not to provide a scientific/technical assessment of GURTs, but to examine its potential impacts on smallholder farmers, indigenous and local communities who are traditional stewards of biodiversity.

- The AHTEG included diverse representation, including Parties to the Convention, other governments, Indigenous and local communities, international organizations, civil society organizations and the seed industry - including representatives from two companies and one government that hold patents on Terminator.

Decision V/5, III, 23. *"Recommends that, in the current absence of reliable data on genetic use restriction technologies, without which there is an inadequate basis on which to assess their potential risks, and in accordance with the precautionary approach, products incorporating such technologies should not be approved by Parties for field testing until appropriate scientific data can justify such testing, and for commercial use until appropriate, authorized and strictly controlled scientific assessments with regard to, inter alia, their ecological and socio-economic impacts and any adverse effects for biological diversity, food security and human health have been carried out in a transparent manner and the conditions for their safe and beneficial use validated."*

6. Update: Transcontainer

Terminator back on the agenda

After COP8 reinforced and strengthened the *de facto* moratorium on Terminator/GURTs – we didn’t expect to be here today talking about this issue. What has changed since March 2006? Why are we here today talking about Terminator?

1) Transcontainer project Just three months after COP8, the EU began its 3-year, 5 million Euro research project called “Transcontainer Project” – which includes research to advance suicide seed technology.

This battle, it seemed, had been won. But the companies did not give up. Only three months after COP 8, the European Union began a three- year research project called Transcontainer, with a €5 million (US\$7.3 million) budget, to investigate the development of suicide seeds. A month later, in August 2006, Monsanto acquired Delta & Pine Land, the world’s biggest cotton seed company, which owns patents on genetic sterilisation technology and has been conducting Terminator field trials in greenhouses.

ETC Group released a report in June that examines three new areas of research related to suicide seeds. The goal of the EU’s 3-year Transcontainer Project is to develop biological containment strategies that **will allow co-existence** of GE and non-GE crops.

In essence, it’s a **publicly financed initiative to help the biotechnology industry overcome the European public’s rejection** of GM foods and crops.

The researchers who are doing this work insist that their suicide seeds are not designed to prevent farmers from saving seed. The goal is biological containment of transgenes and they will tell you that sterility platforms are a biosafety tool. The point I want to make is that the very same biocontainment strategies that are being developed to prevent the spread of transgenes from GM plants can also be used to control the plant’s reproductive viability and prevent farmers from saving and re-planting harvested seeds.

It is within this context that the European Union is developing the Transcontainer project. Europe is the region of the world where there has been most resistance to GMOs, and this project has been specifically developed to combat European fears of GMO contamination. It states on the official Transcontainer website: The overall goal of Transcontainer is to develop genetically modified (GM) crop plants that are “biologically contained”, in order to reduce significantly the potential spread of transgenes of such GM crop plants to conventional and organic crop plants and to wild or weedy relatives, when such exist.

The project has 13 partners, from both public and private sectors, from eight European countries. Partners include universities, government agencies and seed companies. The project is co-ordinated by Wageningen University in the Netherlands. Along with the Terminator, one of the project’s activities is to develop “reversible transgenic sterility”. The ETC Group calls it “zombie technology”, because the idea is that the seeds will “return from the dead” with the application of an external stimulus, which could be a chemical agent or heat. It means that farmers will be able to restore the fertility of the seeds for each new agricultural season. The companies insist that the aim of the new technology is to promote biosecurity, not to stop farmers from illegally planting patented seeds.

2) Enormous push to promote agrofuels – particularly in the South. There’s a very important link between the push to promote agrofuels and the advancement of sterile seed platforms for biocontainment - I’ll come back to that in a minute.

3) The third thing is that **Monsanto, the world’s largest seed corporation, has recently acquired Delta & Pine Land** – the world’s largest cotton seed company. Delta & Pine Land is the company that vowed to commercialize Terminator seeds, and was growing Terminator crops in greenhouses. Delta & Pine Land also holds numerous patents on the technology. All of that now belongs to Monsanto.

Ironically, what’s happening is that society is being asked to accept a new technological fix to mitigate the genetic contamination caused by the biotech industry’s genetically engineered seeds

The companies like to say that farmers will not be forced to use Terminator or Zombie seeds. However, the most likely scenario is that companies will do everything possible to convince farmers to use these technologies. They will offer new transgenic traits that are supposedly more productive, always affordable and are genetically sterile “to prevent accidents”. They will keep the price low, at least at first, to test their product. Once they have trapped farmers into adopting their technology, they can raise the price of restoring fertility as high as they want. This is not a conspiracy theory. It is the inevitable logic of market forces, where a handful of companies is dominant, where public programmes for improving biodiversity have been destroyed, and where there is no such thing as “free choice”.

The researchers in the Transcontainer project insist that their suicide seeds are not designed to stop farmers saving seeds. They say their objective is the biological containment of GMOs and that the sterility is a biological safety tool. However, it seems undeniable that these same biocontainment strategies that are being developed to avoid the escape of GMOs will make it difficult for small- scale farmers to go on keeping and using the seeds collected from their harvest. To quote again the Transcontainer website: Will GURT’s or biological containment strategies not decrease the possibility for European farmers to save seeds from crops they grow on their farm for planting in the next season? Not necessarily. Transcontainer will study and develop technologies that prevent transgene spread from GM crops, while at the same time their fertility can be restored. Moreover, Transcontainer is specifically targeted at European agriculture and European crops, and European farmers do not generally save seeds from crops they grow.

6. What is the deep meaning of Terminator?

Terminator is a major violation of the rights of farmers to save and reuse their own seeds. Terminator means the end of agriculture as we know it. Terminator seeks to put an end to the vital flux of life that occurs with seed exchange, with the pollination through wind, bees, or the migration of the crops... Just think about the this technological idea applied to human life: we all would have to buy our fertility from

a company. To buy the right to have offspring. This is how Terminator is seen by the indigenous peoples, for example, peoples that consider the maize, the rice, or other crops like part of their family. This is a technology that was developed to penetrate new seed markets -- especially in the global South.

Back in 1998, the president of Delta & Pine Land was interviewed by a seed industry trade journal, and he explained that Terminator technology would offer seed companies a "safe avenue" to introduce their proprietary seeds in developing countries. He mentioned that wheat, rice, cotton and soybeans are among the primary target crops -- and he predicted that Terminator seed technology could someday be used on over 400 million hectares worldwide.

7. Getting to the bottom line: What are GURT's really about?

Over the past 9 years, the industry has repeatedly tried to re-invent Terminator. The goal of genetic seed sterilization became morally unacceptable to most people --so the seed industry began to argue that Terminator offers a biosafety tool for containing unwanted gene flow from genetically modified plants. They argue that if genes from a Terminator crop escape, the seeds produced from unwanted pollination will not germinate -- they'll be sterile.

Will biocontainment work? It is important to realise that biocontainment based on genetic sterility is NOT a trustworthy mechanism to avoid the escape of transgenes. It is perfectly possible that something will go wrong in such a complicated system and that these crops will introduce new biotechnological dangers. In the question-and-answer session on the Transcontainer website, the question is asked: "Will biological containment strategies always be entirely fail-safe?" The answer: "Possibly, but in reality the complete, hundred per cent prevention of transgene spread cannot be proven scientifically. One can experimentally determine only that transgene spread is lower than a certain frequency." In other words, molecular biocontainment based on the sterility of genes is NOT a mechanism that can be trusted to avoid genetic flux.

Terminator began as "Technology Protection System", the invention of Delta and PineLand to protect their transgenic technology from being used without buying it. Companies have long presented the Terminator as an environmentally friendly tool that can prevent GMO contaminations. Today agro-industrial giants and oil companies are joining forces to promote the idea that, in the face of the threat posed by climate change, the world needs a new generation of genetically modified crops and trees to produce agrofuels more efficiently. The industry clearly wants to present the environmental crisis as a single, overwhelming argument in favour of the new GMOs. Terminator technology, they say, will ensure the "safe" production of both agrofuels and crops designed to produce industrial drugs and chemicals.

Transcontainer maybe only a propaganda campaign, but is totally out of the question the fact of trying to justify acceptable forms of Terminator

What do they really want to control? Seeds are the first link in the food chain. The companies want to control them because this is how they can ensure their power along the whole chain. This is why manipulation of seeds has so many implications, and why the genetic diversity of crops threatens company profits. The companies want to eliminate genetic diversity so that their GMOs are the only seeds available. The greater the presence of GMOs in a country, the easier it is to criminalise farmers' varieties. Evil laws increasingly make the latter illegal and hand over control to the big chemical, pharmaceutical and seed companies.

Terminator and Transcontainer are not about controlling GMOs. They are about controlling farmers, restricting their rights and eliminating the practice of saving, exchanging and enriching peasant seeds. What is at stake is not only the impact of the Terminator on our health and the environment but also what it means for food policy: who is to be in charge of this policy, the people or the companies? Companies say that GMOs have higher yields and that they will solve the problem of hunger, cure new

diseases, counter climate change and improve the food we eat. Until now, however, the only quality possessed by 80 per cent of GMOs produced and marketed in the world is resistance to herbicides. The only thing they feed is company profits.

8. Fighting Zombie and Terminator seeds

I. Ban Terminator Campaign

(Purpose) The Ban Terminator Campaign seeks to promote government bans on Terminator technology at the national and international levels, and supports the efforts of civil society, farmers, Indigenous peoples and social movements to campaign against it.

(Origins) The Ban Terminator Campaign was initiated in response to recent efforts by governments and corporations to push for Terminator field trials and commercialization. Despite widespread opposition, in February 2005, the Canadian government attempted to overturn the CBD's international de facto moratorium on Terminator technology. The Ban Terminator Campaign was formed in response, following discussions initiated by Canadian-based civil society organizations (ETC group, Inter Pares, National Farmers Union, and USC Canada). In March 2006 at the CBD COP8 meeting, Governments upheld the global moratorium on Terminator. Some governments continue to support Terminator however and some corporations continue to develop and push the technology. Patent offices around the world continue to approve patents on Terminator technologies.

The Ban Terminator Campaign's steering committee:

ETC Group (Action group on Erosion, Technology and Concentration) www.etcgroup.org

GRAIN www.grain.org

Indigenous Peoples Council on Biocolonialism www.ipcb.org

ITDG (Intermediate Technology Development Group) www.itdg.org

Pesticide Action Network – Asia and the Pacific www.panap.net

Third World Network www.twinside.org.sg www.biosafety-info.net

Via Campesina www.viacampesina.org

Ban Terminator

recognize the work of different groups and countries in the campaign like Via Campesina and MST, and how they influenced the final outcome in favor of the moratorium in COP8

Peru Indigenous communities had an important community consultation. There were protests in Germany at the Canadian Embassy, and in Spain in Granada all this happened simultaneously during the 8j meeting in Spain, 3 months prior to the COP8.

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Terminator in COP9

“The results of Transcontainer will contribute to an informed decision whether the moratorium should be continued or modified in the context of supporting EU coexistence measures”. This suggests that the industry will argue that sterile seeds are not a problem because sterility is reversible. It is clear that the moratorium is fragile. After two or three additional arguments and more pressure we could find the technology on the market before we know it. **Transcontainer website**

Even though seems like there is no reason why Terminator would come up in relation to GE Trees in the context of where it is in the negotiations (and there is no other context in which it can come up) If governments do not react and ban Terminator, the technology will become available on the market. Brazil and India have already tried to take this step. Not all the news is bad: a bill banning the Terminator was sent to the Canadian Parliament in June 2007. COP 9 should move in this direction, strengthening the moratorium on GURTs and completely banning the Terminator.

Unmodified seeds have passion and speak to the people who sow them and work the land. They are the starting point for achieving the food sovereignty and the food security that make countries stronger. A technology that reduces the capacity of farmers and peasants to produce food, and that puts an end to their age-old right to save the best seeds threatens food sovereignty, food security and biodiversity. It is a danger to crops and therefore to people. From an ethical and logical point of view, genetic sterility is not in any way "safe" or "acceptable". Public money should not be used to subsidise company programmes. It is clearly important for activists to defend the moratorium at the Convention on Biological Diversity (CBD) during COP9, outside and inside the conference hall, as occurred in Curitiba in 2006.

However, in the last resort, it will be national bans that will make companies pause for thought before they descend like vultures on peasant seed varieties and technological packages in our countries. the workshop has 2 good news - the other is the moratorium on Terminator was strengthened in COP8 and Canada, for example, will not be speaking out for a little while anyway

9. Sources

www.etcgtoup.org

www.econexus.info

http://www.etcgroup.org/en/issues/terminator_traitor.html

Terminator the Sequel: http://www.etcgroup.org/en/materials/publications.html?pub_id=635

<http://www.banterminator.org/>

<http://www.terminarterminator.org/>