D E F E N D

F O O D S O V E R E I G N T Y

T E R M I N A T E

T E R M I N A T O R

www.etcgroup.org
(formerly RAFI)

What is Terminator technology?

Terminator technology (sometimes called TPS [Technology Protection System] or GURTs [Genetic Use Restriction Technologies]) refers to plants that are genetically engineered to produce sterile seeds. If commercialized, the technology will prevent farmers from saving seed from their harvest for planting the following season. These "suicide seeds" will force farmers to return to the seed corporations every year and will make extinct the 12,000-year tradition of farmers saving, adapting and exchanging seed in order to advance biodiversity and increase food security.

Terminator seeds are not the same as hybrid seeds. Hybrid seeds offer farmers (at least theoretically) the benefits of improved agronomic performance, and, they are *not* sterile. Although second generation hybrid seed does not perform as well as the parent seed, hybrid seeds can be replanted. By contrast, Terminator seeds offer no agronomic benefits. The aim of genetic seed sterilization is to maximize seed industry profits by destroying the right of farmers to save their seeds and breed their own crops.

What is Traitor technology? "Traitor" refers to a technology that allows a plant's genetic traits to be turned "on or off" when a chemical is applied to the plant or seed. (Terminator is a type of Traitor technology in which sterility is chemically induced.) Industry suggests that farmers would be able to activate or deactivate genetic traits such as disease resistance by applying a prescribed (and proprietary) chemical to their plants or seed. But Traitor technologies have far more insidious dimensions. In addition to Terminator seeds, there are especially alarming patents describing genetically modified plants with weakened immune systems that would depend on the application of a chemical to regain their natural defenses against pests and disease. The long-term implications for farmers and food sovereignty are grim. A nation's agricultural production could become wholly dependent upon imports of critical chemical inducers that could be priced or prohibited to further the trading interests of the exporting country.

Terminator and other Traitor seeds lead to "bioserfdom" — they are technologies that threaten to hold farmers hostage to multinational agrochemical corporations — either through sterile seeds or chemically-dependent plants.

Terminator technology is a global threat to food security, to poor farmers, and to biodiversity.

Over 1.4 billion people — mostly the rural poor — depend on farm-saved seeds as their primary seed source. If a farmer loses the ability to save her seed, she cannot continue to select plants that are best adapted to local conditions and needs. Communities that lose control over their seeds risk losing control of their farming systems and becoming dependent on outside sources of seeds and the inputs they require. Without an agricultural system adapted to a community and its specific ecosystem, national food security is impossible. History makes it clear that poor countries cannot rely upon rich nations to secure their food requirements. The use of food as a political weapon — even as a form of economic biological warfare — continues even today. Terminator technology would be a dangerous addition to such an arsenal.

The map shows where monopoly patents on genetic seed sterilization are recognized, and where they have been applied for. Patent owners include major seed and agrochemical corporations and research institutions such as: Syngenta, Pharmacia (Monsanto), DuPont, BASF, Delta & Pine Land, as well as the US Department of Agriculture and Cornell, Purdue, and Iowa State universities.

Who is taking a stand against Terminator?

The genetic modification of plants to produce sterile seeds has been widely condemned by civil society, scientific bodies and many governments as an immoral application of agricultural biotechnology. The following are some of the organizations and individuals who have spoken out against Terminator technology:

FAO's Panel of Eminent Experts on Ethics in Food and Agriculture

"The panel unanimously stated that the 'terminator seeds' generally are unethical, finding it unacceptable to market seeds, the offspring of which a farmer cannot use again because the seeds could not germinate."[1]

Maurice F. Strong, past Secretary General, UNCED

"If the owners of technology, such as big companies, used it to victimize people through methods such as promotion of 'terminator genes', the state should intervene and not leave the task to the market mechanism."[2]

Dr. M.S. Swaminathan, former independent chairman of the FAO Council and recipient of the World Food Prize

"In India where there are nearly 100 million operational holdings, denial of plant-back rights or the use of the terminator mechanism will be disastrous from the socio-economic and biodiversity points of view, since over 80 percent of farmers plant their own farm-saved seeds."[3]

Dr. Jacques Diouf, FAO Director-General

"We are against [terminator genes]. We are happy to see that in the end some of the main multinationals which have been involved in implementing these terminator genes have decided to backtrack."[4]

Rafael Alegría, International Secretariat, Via Campesina, representing over 10 million peasant farmers worldwide

"Terminator is a direct assault on farmers and indigenous cultures, and on food sovereignty. It threatens the well-being of all rural people, primarily the very poorest."

Dr. Gordon Conway, President, Rockefeller Foundation

"The agricultural seed industry must disavow use of the terminator technology to produce seed sterility…The possible consequences, if farmers who are unaware of the characteristics of terminator seed purchase it and attempt to reuse it, are certainly negative and may outweigh any social benefits of protecting innovation."[5]

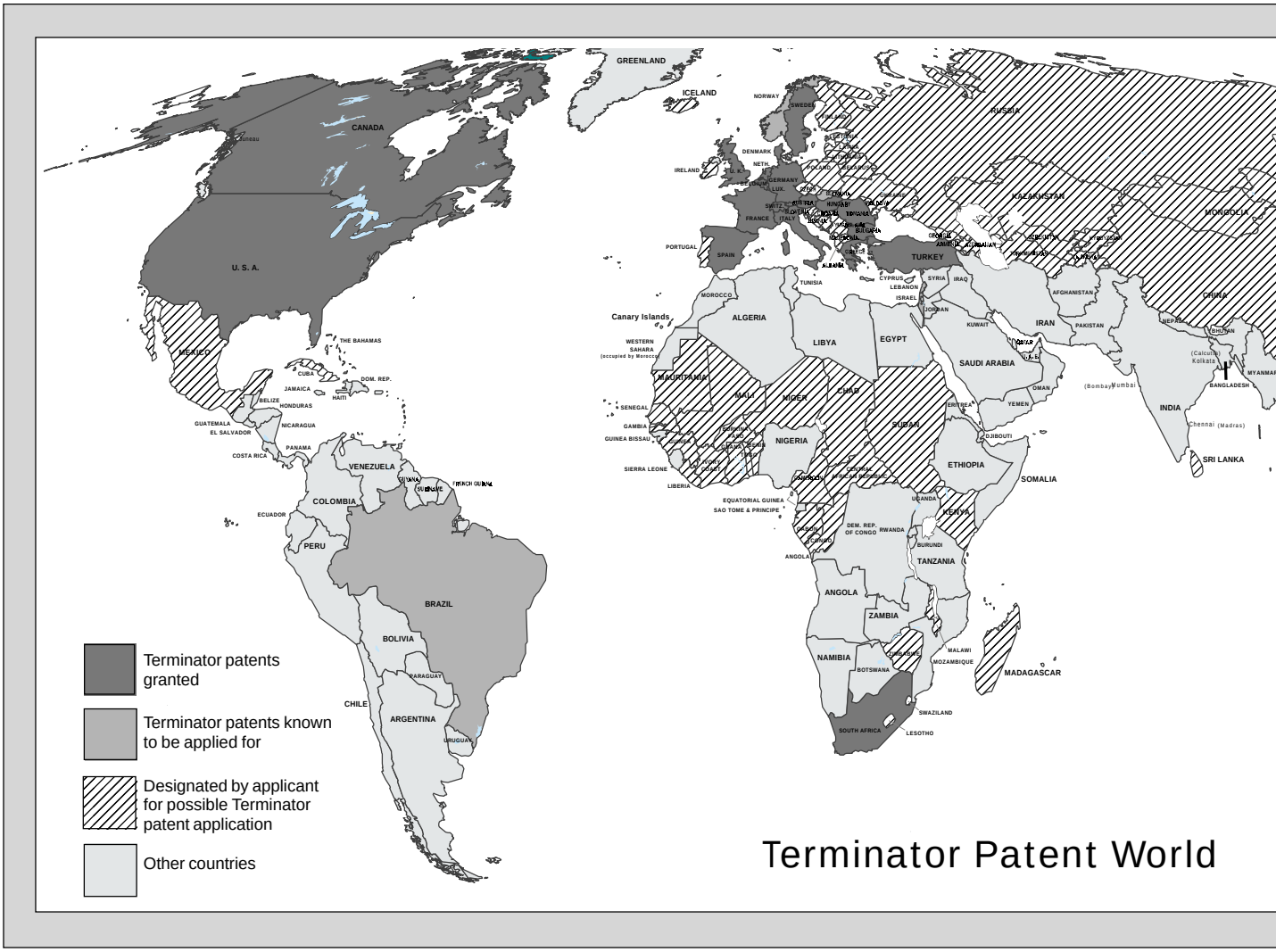
The Consultative Group on International Agricultural Research (CGIAR) adopted the following policy on 30 October 1998:

"The CGIAR will not incorporate into its breeding materials any genetic systems designed to prevent seed germination. This is in recognition of (a) concerns over potential risks of its inadvertent or unintended spread through pollen; (b) the possibilities of sale or exchange of viable seed for planting; (c) the importance of farm-saved seed, particularly to resource-poor farmers; (d) potential negative impacts on genetic diversity; and (e) the importance of farmer selection and breeding for sustainable agriculture."

In addition, a number of countries — from India to Ghana to Panama — have taken steps to ban Terminator technology in their own countries.

---

[1] FAO's Panel of Eminent Experts on Ethics in Food and Agriculture, First Session, Rome, 26-28 September 2000.
[2] Maurice F. Strong made the statement in India, April 7, 1999.
[3] Swaminathan, M.S., "Farmers' Rights and Plant Genetic Resources," *Biotechnology & Development Monitor*, No. 36, 1998, p.6-9.
[4] Reuters News, February 8, 2000.
[5] Dr. Gordon Conway, in a speech to the Monsanto Company Board of Directors, June 24, 1999.



Who is developing Terminator technology?

Research on Terminator and other Traitor technologies is not confined to one or two companies. The goal of genetic trait control is industry-wide and spans several continents.

In 1999, two major agrochemical corporations, Monsanto and AstraZeneca, publicly vowed not to commercialize Terminator seeds. Many people believed that the crisis had passed. Unfortunately, this is not the case. Monsanto and AstraZeneca have each merged with other companies since they pledged not to commercialize suicide seeds. In August 2001 the US Department of Agriculture announced that it had licensed its Terminator patents to Delta & Pine Land, the world's largest cotton seed company. Delta & Pine Land has publicly stated its intention to commercialize Terminator seeds. Ultimately, we cannot depend on the goodwill of multinational enterprises to prevent commercialization of Terminator seeds.

The president of Delta & Pine Land, Murray Robinson, said that Terminator seeds could someday be used on over 400 million hectares worldwide (an area that is the size of South Asia). He also said that the technology would provide seed companies with a "safe avenue" for introducing proprietary products into giant, untapped seed markets such as China, India and Pakistan. [6]

Delta & Pine Land has joint ventures or subsidiaries in Turkey, China, Brazil, Argentina, Mexico, Paraguay, South Africa, Mexico, and Australia.

[6] Bill Freiberg, "Is Delta and Pine Land's Terminator Gene a Billion Dollar Discovery?" *Seed and Crops Digest*, March/April, 1998.

nt World

Terminator Patents Granted

Australia
Austria
Belgium
Bulgaria
Canada
Denmark
France
Germany
Greece
Hungary
Italy
Liechtenstein
Luxembourg
Netherlands
Republic of Korea
Romania
South Africa
Spain
Sweden
Switzerland
Turkey
United Kingdom
United States

Terminator Patents Known to be Applied For

Brazil
Israel
Japan
New Zealand
Norway
Slovak Republic

Designated by Applicant for Possible Terminator Patent Application

Albania
Armenia
Azerbaijan
Barbados
Belarus
Benin
Bosnia and Herzegovina
Burkina Faso
Cameroon
Central African Republic
Chad
China
Congo
Cote d'Ivoire
Cuba
Czech Republic
Estonia
Finland
FYRM (Macedonia)
Gabon
Gambia
Georgia
Ghana
Guinea
Iceland
Indonesia
Ireland
Kazakhstan
Kenya
Kyrgyzstan
South Korea
Latvia
Lesotho
Liberia
Lithuania
Madagascar
Malawi
Mali
Mauritania
Mexico
Republic of Moldova
Monaco
Mongolia
Niger
Poland
Portugal
Russian Federation
Saint Lucia
Senegal
Singapore
Slovenia
Sri Lanka
Sudan
Swaziland
Tajikistan
Turkmenistan
Trinidad and Tobago
Togo
Uganda
Ukraine
Uzbekistan
Viet Nam
Yugoslavia
Zimbabwe

Terminator technology is *not* a solution to genetic pollution from genetically modified (GM) crops.

The biotechnology industry, the US government and some scientific bodies are promoting Terminator as a tool that will minimize genetic pollution from genetically modified plants. They argue that engineered sterility offers a built-in safety feature for GM plants because if genes from a Terminator crop cross-pollinate with related plants nearby, the seed produced from unwanted pollination will be sterile — it will not germinate.

There is growing evidence that escaped genes from GM plants are causing genetic contamination around the world – even in Third World centers of genetic diversity (that is, the areas of the tropics and sub-tropics where our major food crops originate or where genetic diversity is greatest).

The rationalization that Terminator technology is beneficial as a biosafety tool that will prevent the spread of GM genes is a tacit admission that genetically engineered crops are not environmentally safe. *Food security for poor people must not be sacrificed to solve the industry's genetic pollution problems.*

It is erroneous and irresponsible to suggest that agriculture is dependent on genetic seed sterilization as a method for containing unwanted pollination from GM plants. This is like bringing home a tiger to catch a house mouse. In promoting Terminator as a "green" solution to GM pollution, industry is pushing its most profitable and monopolistic option by off-loading the whole GM burden on farmers while increasing corporate control. If GM seeds are unsafe they should not be used. If they have polluted, the clean-up costs should rest with the companies. Aside from these fundamental points, there are other new techniques for genetic modification, among them, chloroplast engineering, that are being developed that do not allow the transfer of genes through pollen.

Terminator technology will become a commercial reality unless governments take action to prevent it.

Action by national governments will determine the future of Terminator and other Traitor technologies. Intergovernmental organizations have a critical role to play in raising global awareness and recommending actions to ban the technology:

■ **FAO/World Food Summit Five Years Later:** Most of the over 800 million malnourished people on this planet live in rural areas and depend upon farm-saved seed for their survival. Member nations of the Food and Agriculture Organization should follow the leadership provided by FAO's Ethics Panel and its Director-General and pass a resolution condemning Terminator technology.

■ **The Convention on Biological Diversity (CBD):** The Fifth Conference of the Parties (COP) to the Convention on Biological Diversity recommended a moratorium on the field-testing and commercial use of genetic use restriction technologies (GURTs). At the Sixth COP in The Hague, April 2002, delegates should formally call for a ban on the field-testing and commercial development of GURTs.

■ "The Right to Food," to be reviewed by the **UN Human Rights Commission** in 2002, must include the inalienable right of farming communities to save, exchange and develop plant varieties without restriction. Terminator technology should be condemned as an offense against the Right to Food.

■ **The World Summit on Sustainable Development,** September 2002 in Johannesburg**,** should take whatever additional steps are necessary to enforce a complete ban on Terminator technology and to begin negotiations for an International Convention on the Evaluation of New Technologies (ICENT) to ensure that new technologies are fully reviewed in the context of the Precautionary Principle.

■ **The Biological and Toxin Weapons Convention** now under review in Geneva should specifically acknowledge that Terminator technology can be a form of economic biological warfare and should be banned accordingly.

■ The biotech industry, universities and other public or private breeding institutions that have Terminator patents should surrender these patents to the control of the UN Food and Agriculture Organization. As an act of good faith they should agree not to develop this technology themselves nor allow others access to their technologies.

The Action Group on Erosion, Technology and Concentration, formerly RAFI, is a non-profit, international civil society organization based in Canada. The ETC group is dedicated to the advancement of cultural and ecological diversity and human rights.

ETC group
action group on Erosion, Technology and Concentration

For more information:
Website: www.etcgroup.org
Email: etc@etcgroup.org
ETC group International Office
P.O. Box 68016 RPO Osborne
Winnipeg, Manitoba
R3L 2V9 Canada
Tel: 204 453-5259
Fax: 204 284-7871

JANUARY, 2002