



**RAFI**

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**MORE ON THE TERMINATOR TREND...**

**... AND NOW, THE "VERMINATOR"!**

**FAT CAT CORP. WITH FAT RAT GENE CAN KILL CROPS**

Europe's answer to the American Home "Monster" Terminator Technology is the Verminator, a new chemically activated seed killer. The Verminator kills seeds - in one of the invention's claims - by switching on rodent fat genes that have been bioengineered into crops. Zeneca BioSciences (UK) is vying with the "Monster" (Monsanto) to become Top Cat in the global seed industry even if it means playing cat and mouse with farmers and destroying their age-old practice of saving and breeding crop varieties.

Zeneca, the life industry spin-off of the old ICI (Imperial Chemical Industries), says it will apply for patents in 58 countries for its invention that renders it impossible for farmers to save "protected" seed from growing season to growing season (WO 94/03619). The technology, which activates a "killer" gene (or prevents the expression of genes crucial to normal plant development), weighs in whenever a chemical "trigger" is applied to seed at a desired point during plant maturation. For example, genetically engineered seed could be produced that would not germinate unless exposed to Zeneca's private chemical trigger. Or, plants growing in the field could be genetically programmed to become stunted, not properly reproduce, or not resist disease(s) unless sprayed with Zeneca's chemical formula.

In the patent description, Zeneca described the source of one such "killer" gene as coming from "mammalian uncoupling protein isolated from the brown adipose tissue of *Ratus ratus*" - or the "Fat Rat" gene. The move by the British firm is hard on the heels of the US patent (US 5,723,765) granted in March to the US Department of Agriculture (USDA) and Delta and Pine Land Company for what RAFI dubbed "Terminator Technology". Within weeks of that patent announcement, the US agrochemical behemoth Monsanto bought Delta and Pine for US\$1.76 billion. Then, in June, Monsanto and American Home Products, one of the biggest cats in the chemical jungle, announced that they would merge. The union instantly created the world's largest pesticide firm, second largest seed enterprise, and a giant that ranks in the top ten in pharmaceuticals and veterinary medicines. Zeneca is currently the world's fifth largest seed company with annual sales of US\$437 million in 1997. It is also an important crop chemical and drug company.

"The Verminator is a broader and more pervasive variation on the Monster's Terminator," says Pat Mooney, Executive Director of RAFI. "It looks like Zeneca can either choose to sell seeds that are already incapable of replanting - or trigger the "killer" by chemical spraying at a later date." RAFI's Edward Hammond adds, "Zeneca may also be in a position to attach its genetic 'bomb' to destroy specific genes or gene sequences within the plant. This could allow the seed to be regrown while still eradicating key genetic traits."

A major objective of both the Verminator and the Terminator (which Monsanto euphemistically describes as a "Technology Protection System") is to provide a technological platform (or Trojan Horse) upon which any number of proprietary genes can rest with impunity. The traits will function for the bought seed but either not rejuvenate (in the case of both Verminator and Terminator) or (for Verminator alone) not function in subsequent generations.

Camila Montecinos, an agronomist coordinating the Latin America-wide Community Biodiversity Development and Conservation (CBDC) Programme based in Temuco, Chile, is incensed. "The patent absurdly suggests that the Verminator will benefit farmers by being a 'container' for genetically-engineered varieties or by preventing seed sprouting before harvest," she says (seeds of small grain cereals like wheat or rice sometimes germinate on the plant when conditions are too hot or humid or the harvest is delayed. This can lead to a loss of market quality.) "But the real goal is to hook farmers on genetically 'mutilated' seed that does not properly reproduce. Farmers will lose their 12,000 year-old right to save seed. This is biological warfare."

The UN Food and Agriculture Organization (FAO, Rome) estimate that 1.4 billion poor people depend on farm-saved seed for their food security. The farmers involved often grow their food under unfavourable conditions of little commercial interest to global seed companies. Thus, the farmers adapt or breed their own varieties that meet their own conditions and needs. Verminator and Terminator can make it impossible for these farmers not only to save seed but to create the varieties they need to feed people.

Half a world away, Monica Opole of Kenya, the CBDC's project coordinator in that country, agrees. "The flexibility of the Verminator is scary," Opole says, "In practice, farmers could buy seed believing it can be reused a second season

only to find that it cannot or that it is debilitated by inherited Verminator genes. Worse still, the farmer could find that their neighbor bought the Verminator and it outcrossed into their field, leaving them with dead seeds. The farmer loses her crop, the family loses their food. Who knows how the Verminator will interact with nature, especially as it spreads out over time and inevitably crosses with farmers' varieties. This kind of patent is a threat to family food security."

In her office in the suburbs of metro Manila, Neth Daño, executive director of SEARICE (Southeast Asian Regional Institute for Community Education) is furious. "Monsanto and Zeneca have a large chunk of the global seed industry. Where they lead, others will follow. Farmers are under attack. Acting like God, these companies are pulling farmers to their knees to pray 'Give us our daily bread' by forcing them to buy seeds every season. This is grossly immoral and perverse! Our governments have got to come to our defense. Both the Terminator and the Verminator should not be accepted for patenting on the grounds that they violate *ordre public*."

RAFI's research director, Hope Shand has been tracking the Terminator Trend for some time. "It's not just these two technologies," Shand asserts, "Monsanto and Pioneer are also developing new wheat hybrids they believe can take over the market." Hybrids are the "Terminator Rex" of crops. The second-generation seed will either not breed true - or it will be sterile. Until recently small grain cereals such as wheat and rice were difficult to commercially hybridize. "Now, that seems to be changing," says Shand, "The opportunity to force farmers back to buy seed every season has led the multinationals to focus on hybrid terminators too."

"With hybrids, the critical technology is CMS - cytoplasmic male sterility," Rolf Johnsson of Sweden's Friends of the Earth reports. "The Terminator Trend is becoming so wide spread, we need to form a global coalition to fight for the right of farmers to save seed." When studying the Terminator, Johnsson spotted an oblique reference to the Verminator and alerted fellow NGOs to the patent. Together with a large number of civil society organizations, RAFI is studying a number of other patents and technologies associated with the Terminator Trend.

For background on the Trend and on the activities of the global seed trade, please visit RAFI's homepage at <http://www.rafi.ca>.

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**CBDC** is the Community Biodiversity Development and Conservation Programme, a research network of rural civil society organizations with plant breeding and agricultural biodiversity work in 13 countries in Africa, Asia, and Latin America. The network is coordinated in Temuco, Chile. Financial support for the network comes from Swedish and Dutch aid agencies and from the International Development Research Centre in Ottawa, Canada.

**RAFI** is a non-profit international civil society organization headquartered in Canada. For more than twenty years, RAFI has worked on the social and economic impact of new technologies as they impact rural societies.

**SEARICE** is the Southeast Asian Regional Institute for Community Education, headquartered in Manila, Philippines but with programme activities throughout Southeast Asia. SEARICE has a long history of national, Regional and international policy and programme work related to the conservation and utilization of agricultural biodiversity, biopiracy, and biotechnology issues.'

**FOE** is Friends of the Earth (Sweden) one of the oldest and best-known environmental networks with extensive experience in addressing policy issues.