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The Transfer Of Genetically Modified Organisms (GMOs)

A Greenpeace Investigation

A report prepared by
Greenpeace International
Genetic Engineering Campaign

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The Transfer Of Genetically Modified Organisms (GMOs)

Greenpeace has demonstrated that Genetically Modified Organisms (GMOs) - including bacteria, viruses, plant cells and seeds - can easily be mailed to an address anywhere in the world.

In theory, various regulations exist to control the mailing of any disease-causing organisms. In practice these regulations are not enforced. Meanwhile, organisms capable of causing other types of harm are not even subject to regulation at all.

The Dangers

- * GMOs are living organisms with the potential to survive and multiply.
- * Many of them are engineered in ways that make them a threat to natural species.
- * GMOs possess the potential to displace natural, indigenous species, erode biological diversity and harm human health.
- * The transport of GMOs in insecure packaging makes their accidental release into the environment highly likely.
- * Lack of monitoring and control of GMOs in transit could also result in misappropriation
- * GMOs can be used in the manufacture of biological weapons.

The Object of The Investigation

The aim of the Greenpeace initiative was to expose the lack of control surrounding the international transport of GMOs. The method was to use regular postal services to send ostensibly dangerous packages around the world.

The ease with which this was achieved exposes a widespread lack of awareness, concern and control on the part of international authorities and postal services.

The Experiment

- * A total of 18 packages were mailed on various dates in 1994/5 from Washington DC and Switzerland.
- * Their destinations were 9 different countries in Europe (including the UK, Germany and Switzerland), the US, Latin America, Africa and the Far East.
- * Each package contained standard baker's yeast mixed with water.
- * Eight were labelled as containing genetically modified materials.
- * The rest were labelled as containing biological materials.
- * Packaging varied.

The Outcome

- * The US, Russian, German and Swiss postal service unquestioningly delivered packets labelled 'genetically modified materials' to various private addresses.
- * Three packets were leaking when they arrived in Germany, Switzerland and Brazil. This prompted no action or apparent concern from any of the postal services.
- * Two packets disappeared in the post and have never been seen since.

The Solution

GMOs can pose severe and irreversible harm to other species, human health, biological diversity and the integrity of ecosystems.

There is therefore an urgent need for an international protocol to control and monitor:

- * genetic engineering activities in general
- * the transport of GMOs in particular.

Until such regulations are in place, there must be a world-wide moratorium on the development, transport and release of such materials into the environment.

Transporting GMOs: A Dangerous Game With Too Few Rules

There are no export statistics available for the transfer of GMOs. This is because no national or international body exists to monitor them.

Where regulations do exist they are fragmentary, muddled and inconsistent - and rarely enforced.

The primary trigger for regulation is whether an organism is pathogenic or infectious. But many organisms which do not fit these categories have the potential to cause harm. This includes many bacteria commonly engineered to produce drugs or hormones.

The EU

In the EU the transfer of GMOs between laboratories falls under the Contained Use Directive (90/219/EEC) where it is considered to be:

- a) work practice, and
- b) subject to risk assessment.

The actual risk assessment is left to individual researchers. On the available evidence it is impossible to know if this is carried out properly or at all.

Even new legislation is confused. The Transport of Hazardous Substances Directive is to be adopted by EU Member States by 1st January 1997. This will cover the carriage by road of some, but not all, GMOs.

There is no specific EU legislation which deals with import of GMOs. It is up to individual countries to impose their own rules. This inevitably leads to inconsistencies.

- * In the UK, for example, a licence to import biological material is only necessary if plant, animal or human pathogens and pests are involved. This categorisation excludes many GMOs.
- * Switzerland has no legislation at all to control or monitor the import and export of GMOs.

The US

In the US, the export of GMOs falls under a bewildering number of regulatory agencies. These include the Environmental Protection Agency, the Food and Drug Administration and the United States Department of Agriculture. Many different standards are applied. However, none of them is particularly stringent and few appear to be enforced.

International Carriers

The international transport of GMOs is a complex and confused business, with few unified standards, poor regulation and widespread reliance upon the discretion of individuals.

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The International Air Transport Association (IATA) requires only that: "The bacteria should be placed in a water-tight container. This container should be placed in a second water-tight container. The first container should be surrounded by enough absorbent material to soak up the entire contents. The entire package should carry the warning label: 'Health risk due to genetically modified material (Biohazard)'"

The US Postal Service permits GMOs to travel through its mail system (and so enter international systems) virtually unregulated. A 1988 bid to ban all potentially infectious agents being sent through the US mail was rejected by the House Subcommittee on Postal Personnel and Modernization. Private carriers generally adopt the IATA requirements. United Parcel Systems (UPS) additionally prohibits plants and seeds.

The Greenpeace Investigation

In 1991 a Dutch study (1) of the transfer of GMOs noted:

"We do not know how many genetically modified strains are mailed each year. Even an estimation for the Netherlands is difficult to make. First of all, research groups do not have to keep an account of the strains they send off, and normally they don't. Secondly the exact number of recombinant DNA laboratories is difficult to trace".

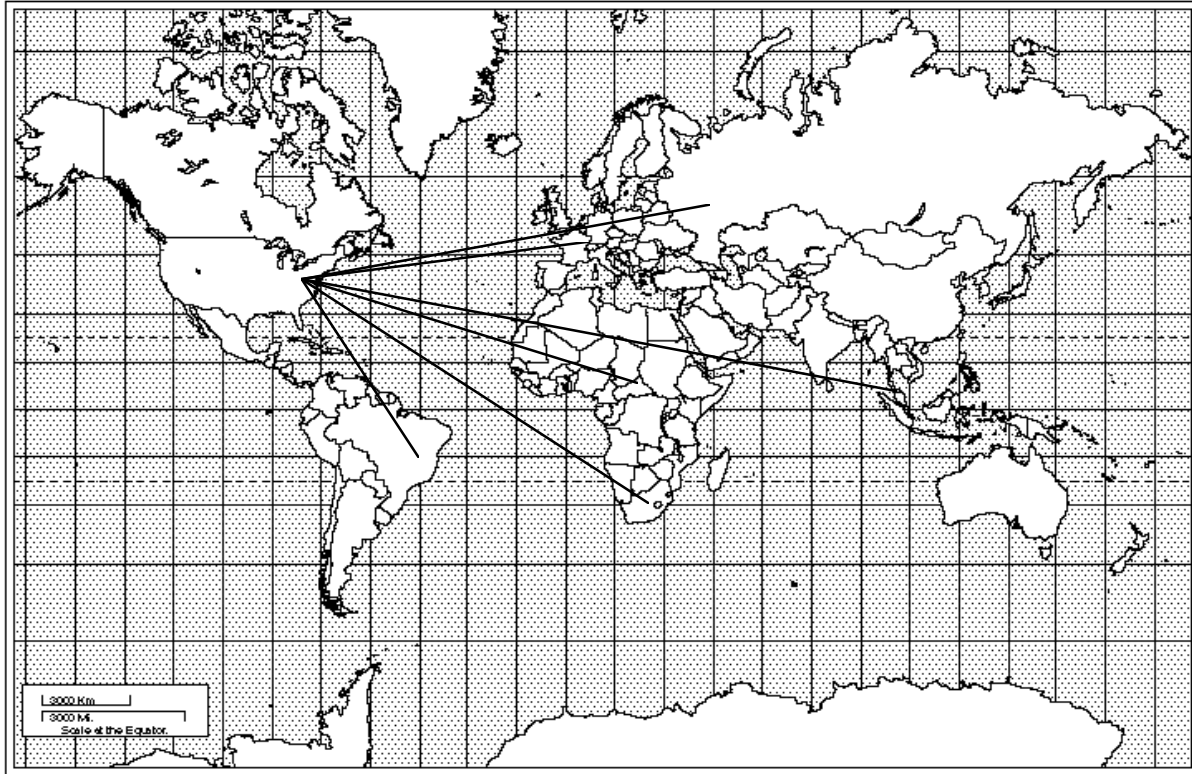
This same study tracked the journeys of several packages. Based on the number that were broken in transit (despite being properly packed) it was estimated that 15 accidental releases of GMOs in the Netherlands is a probable annual figure.

Prompted by the findings of this study, Greenpeace subsequently decided to carry out its own experiment. This took the form of two group mailings of harmless substances purporting to be biohazards.

First Mailing

On November 12th 1994, Greenpeace packed 8 sample containers with simulated GMOs, using a mixture of water and a standard baker's yeast. The samples were packed in a variety of ways, but none had a second air-tight container. The packets were sent out by air mail from Washington DC. They carried different warning labels, or, in some cases, no warning labels at all.

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	Label	Mail Date	Receipt Date	Country
1)	Warning: Biological Materials	11/12/94	11/24/94	Central African Republic
2)	Harmless Biological Materials	11/12/94	12/94	South Africa
3)	Health Risk Due To Genetically Modified Material: Biohazard	11/12/94	N/A	Malaysia
4)	No Label	11/12/94	12/94	Brazil
5)	Laboratory Specimens	11/12/94	2/01/95	Russia
6)	Genetically Modified Materials	11/12/94	11/18/94	Switzerland
7)	Genetically Modified Materials	11/12/94	11/16/94	Switzerland
8)	Biological Samples: Non Hazardous	11/15/94	1/95	Brazil

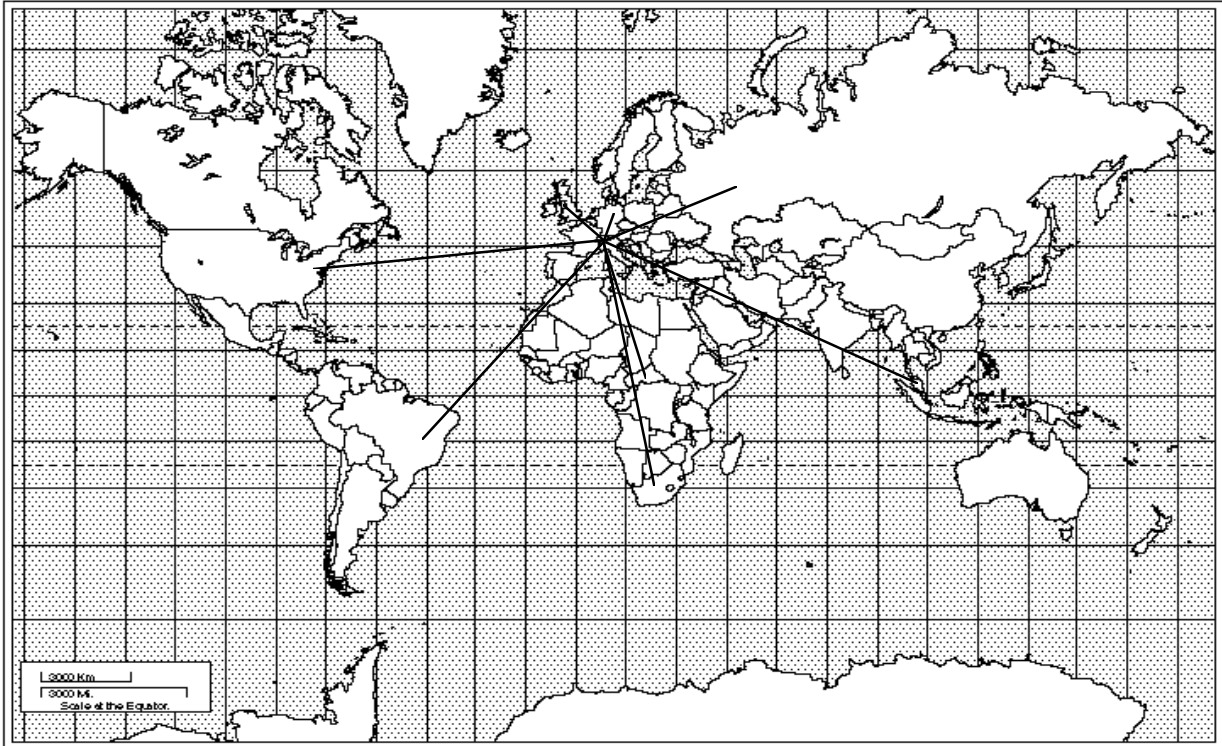
Comments:

- 1) Sent wrapped in absorbent materials. Arrived intact, undamaged.
- 2) Sent unwrapped in packaging foam. Arrived intact, cracked lid.
- 3) Sent wrapped in absorbent materials. Never arrived.
- 4) Sent loosely wrapped in absorbent materials. Arrived damaged, the content leaked and soaked the envelope.
- 5) Sent wrapped in paper. Arrived intact, undamaged.
- 6) Sent loosely wrapped in absorbent paper. Arrived leaking, growth on envelope.
- 7) No packaging precautions taken. Arrived intact, undamaged.
- 8) Sent wrapped in non-absorbent paper. Arrived intact.

Second Mailing

In November 1994 and March/April 1995, Greenpeace mailed a further 10 simulated samples from Switzerland.

Most of these were placed inside a second container and sent by air mail. The UK packet had no second container. The packet addressed to Germany did not go by air mail and had no second container.



	Label	Mail Date	Receipt Date	Country
9)	Laboratory Specimens	11/14/94	11/24/94	Central African Republic
10)	Biohazard	11/14/94	12/94	South Africa
11)	Harmless Biological Samples	11/14/94	N/A	Malaysia
12)	Warning: Biological Material	11/14/94	11/22/94	Brazil
13)	Health Risk Due To Genetically Modified Material: Biohazard	11/14/94	95	Russia
14)	Genetically Modified Materials	11/14/94	12/1/94	USA
15)	Genetically Modified Materials	11/14/94	12/29/94	USA
16)	Warning: Genetically Engineered Micro-organisms (Laboratory Specimen)	3/3/95	3/9/95	UK
17)	Health Risk Due To Genetically Modified Material: Laboratory Specimen	3/23/95	3/95	Germany
18)	Biohazard	3/24/95	3/95	Germany

Comments:

- 9) Sent packed in a second container. Arrived intact, undamaged.
- 10) Sent packed in a second container. Arrived intact, undamaged.
- 11) Sent packed in a second container. Never arrived.
- 12) Sent packed in a second container. Arrived intact, undamaged.
- 13) Sent packed in a second container. Arrived intact, undamaged.
- 14) Sent packed in a second container. Arrived intact, undamaged.
- 15) Sent packed in a second container. Arrived intact, undamaged.
- 16) No packaging precautions taken. Arrived intact, undamaged.
- 17) No packaging precautions taken. Arrived intact, undamaged.
- 18) No packaging precautions taken. Arrived leaking.

Findings

- * Of the simulated samples, only two (8 & 16) were sent to university addresses.
- * The others were either sent to private addresses or to a Non-Governmental Organisation.
- * Only one of the addressees was an institution likely to be qualified in, or familiar with, the handling of GMOs.
- * The German, Russian, US and Swiss postal services delivered packages clearly labelled "Genetically Modified Material" to individuals at private addresses.
- * Sample 6, which was sent to Switzerland, arrived damaged. The envelope was soaked with the liquid and the envelope had been opened.
 - The recipient was asked to collect the packet from the post office and was informed that the damage was not the fault of the postal service but that of the sender who had failed to pack it properly.
 - No one at the post office seemed concerned about the contents of the package, despite its clearly visible label: "Genetically Modified Materials".
 - The packet was handed over without question.
- * Sample 18, which was sent to Germany, arrived damaged.
 - The envelope was soaked with liquid.
 - The postal service put it in a transparent plastic bag and delivered it to a private address.
 - This packet was labelled "Biohazard"
- * Samples 14 & 15, sent to the US, were both labelled "Genetically Modified Materials".

Both bore a stamp saying "Passes Free US Customs".

Neither packet appeared to have been opened, although the exact nature of the contents - which could have been seeds, bacteria, viruses or yeasts - was not declared.

- * Two of the packets did not arrive at their destinations at all.

The sender was neither notified of non-delivery nor advised of any problems with the packets.

Conclusions

Clearly packets containing GMOs can be mailed freely around the world with little chance of being controlled, inspected or even, it would seem, noticed. The Greenpeace experiment confirms the implications of the earlier Dutch study: that the danger of breakage means the accidental release of GMOs during transit by mail is probable. The experiment also demonstrates the low general awareness of the potential dangers of GMOs.

The packets that disappeared in transit may have been broken. If so, no one contacted the sender to find out how to deal with them safely.

More ominous lax regulation surrounding the transfer of GMOs also means that they could easily be acquired for use in the manufacture of biological weapons, a growing area of military interest (see Novice & Shulman, 1990).

Despite the apparent obviousness of these dangers, governments world-wide have been slow to act upon the need to control the movement of GMOs. They have even failed to alert postal workers and the public to the dangers.

- * GMOs are living organisms that possess the ability to reproduce.
- * Once released into the environment they cannot be recalled or removed.
- * Biosafety issues obviously extend beyond the conduct of legitimate research to the question of international transportation of GMOs.
- * To regulate such potentially dangerous organisms so ineffectually is alarming.
- * To entrust their carriage to the vagaries of the international mailing systems is a cause for grave concern.

A Need For Urgent Action

Greenpeace is opposed to the release of all GMOs, believing that the risk of unleashing unknown and irreversible harm cannot be justified.

The first practical step must be an international, legally-binding protocol to control and monitor genetic engineering activities. Particular attention must be paid to the transport of GMOs and the risks posed to the environment and human health. The impact of regulation upon the economies of less developed countries must also be addressed, in keeping with the demands of sustainable development.

Until wide-ranging and effective regulations are in place, there must be a world-wide moratorium on the development, transport and release of GMOs into the environment.

To do any less is to leave a Pandora's Box of human and environmental dangers in the care of self-regulating researchers and indifferent postal workers.

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