LAW·COMMISSION
TE·AKA·MATUA·O·TE·TURE

Study Paper 14

Liability for Loss Resulting from the Development, Supply, or Use of Genetically Modified Organisms

May 2002
Wellington, New Zealand

The Law Commission is an independent, publicly funded, central advisory body established by statute to undertake the systematic review, reform and development of the law of New Zealand. Its purpose is to help achieve law that is just, principled, and accessible, and that reflects the heritage and aspirations of the peoples of New Zealand.

The office of the Law Commission is at 89 The Terrace, Wellington
Postal address: PO Box 2590, Wellington 6001, New Zealand
Document Exchange Number: SP 23534
Telephone: (04) 473–3453, Facsimile: (04) 471–0959
Email: com@lawcom.govt.nz
Internet: www.lawcom.govt.nz

Liability for loss resulting from the development, supply or use of genetically modified organisms.
(Study paper (New Zealand. Law Commission) ; 14)
ISBN 1-877187-92-5
1. Transgenic organisms—New Zealand. 2. Liability (Law)—New Zealand. 3. Genetic engineering—Law and legislation—New Zealand.
I. New Zealand. Law Commission.
343.9307866065—dc 21

Study Paper/Law Commission, Wellington, 2002
ISSN 1174–9776 ISBN 1–877187–92–5
This preliminary paper may be cited as: NZLC SP14

This study paper is also available on the Internet at the Commission's website: http://www.lawcom.govt.nz

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Terms of reference

Genetically Modified Organisms and Liability for Loss

THE LAW COMMISSION will consider and report on issues surrounding liability for loss resulting from development, supply, or use of genetically modified organisms. The fundamental issue to be investigated is:

> The adequacy of current statute and common law for dealing with issues of liability for loss from genetically modified organisms. If the current law is not considered adequate, what options exist for specific liability regimes and what are their advantages and disadvantages?

If a specific liability regime is thought to be worthy of consideration, the Law Commission will set out options, along with a preliminary assessment of their respective strengths and weaknesses.

The following topics may need specific investigation and report:

- Whether liability should lie where it falls in accordance with orthodox liability criteria or whether there should be an alternative compensation scheme.
- The adequacy of current legal approaches to causation in the particular situation of proving the causal link between claimed harm and a genetically modified organism.
- The difficulties of accurate actuarial assessments.
- The problems of enforcement because of the time which may elapse between act or omission and a claim of loss.

The Law Commission will report to the Minister Responsible for the Law Commission by 17 May 2002.

1
Introduction

1 THE ROYAL COMMISSION ON GENETIC MODIFICATION (the Royal Commission) was established to report to government on the options available to New Zealand to deal with genetic modification and to advise on appropriate changes to the current legal framework. The Royal Commission report was released on 27 July 2001 and concluded that New Zealand should preserve opportunities by allowing the development of genetic modification whilst minimising and managing risks.[1]

2 One of the issues considered in the Royal Commission report was liability – who is, and who should be, liable for damage caused by genetic modification. The Royal Commission report concluded that the existing liability regime of tort and statute is sufficient and that "the common law … [is] well able to mould new remedies for novel situations … From a legal liability perspective we have not been persuaded there is anything so radically different in genetic modification as to require new or special remedies".[2] Since the release of the Royal Commission report a number of papers have addressed this issue.[3]

3 The Law Commission was requested by the Minister Responsible for the Law Commission to consider and report on issues surrounding liability for loss resulting from the development, supply or use of genetically modified organisms (GMOs).[4] The fundamental issue to be investigated is:

> The adequacy of current statute and common law for dealing with issues of liability for loss from genetically modified organisms. If the current law is not considered adequate, what options exist for specific liability regimes and what are their advantages and disadvantages?

4 There are two basic issues. First, are there new challenges presented by GMOs that are not adequately dealt with by the existing liability regime? This paper examines the potential inadequacies of the current regime, discusses possible responses to these inadequacies and assesses the strengths and weaknesses of each of those responses. It also identifies key policy questions in this area.

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1 Royal Commission on Genetic Modification *Report of the Royal Commission on Genetic Modification* (Wellington, 2001) 2.

2 Royal Commission on Genetic Modification, above n 1, 328.

3 Simon Terry and others *Who Bears the Risk? Genetic Modification & Liability* (2 ed, Chen Palmer & Partners and Simon Terry Associates Ltd, Wellington, 2001); Charles River Associates *Review of Chen, Palmer & Partners and Simon Terry Associates, Who Bears the Risk* (Charles River Associates (Asia Pacific) Ltd, Wellington, 2001); Mark Christensen and Paul Horgan "Genetic Modification: The Liability Debate" (unpublished, 2001) <http://www.lifesciencenz.com/Repository/020118_ liability.pdf>.

4 Genetically modified organism is defined in the *Definitions* section below, paras 11–13.

5 Secondly, if there are gaps in our liability regime, are those gaps specific to GMOs? This raises the question of whether any new regime should be developed specifically for GMOs or whether other potentially hazardous human activities or technologies should be included. Although this issue is discussed, the Law Commission suggests that further investigation should be considered.

6 When assessing possible liability regimes for GMOs, we have assumed that the aims include a regime that would:

- allow appropriate development of GMOs to maximise scientific progress and public benefit consistent with public safety;
- provide incentives for developers to install safety precautions;
- provide compensation for victims (and the environment) for any damage caused by GMOs, even if damage is discovered long after it was caused;
- provide transparent and publicly understood provisions for liability for loss; and
- create a framework that would internalise all costs of the genetic modification industry, or accept that some costs will be socialised (that is, borne by "innocent" individuals).

7 A combination of the options discussed in this paper could go some way to ensuring that compensation will be available for damage caused by GMOs. However, a key problem with liability for damage caused by genetic modification is that it is difficult to assess the level of risk posed or the size of the potential damage. Given these uncertainties, the increasing use of genetic modification in New Zealand may cause damage that cannot be covered under any liability regime. If damage is extreme (either in quantity or because it is not compensable for example, loss of biodiversity) the losses will either lie where they fall (that is, the party suffering the loss has no remedy), or the government will have to cover any shortfall.

8 At the heart of this inquiry are substantial policy choices from which varying legal consequences would flow. Government will have to decide how responsibility for any risks of the new technology is to be apportioned among the industry, individuals and the state. The Law Commission has not been asked to address these policy issues, nor advise upon what course of action should be adopted. Neither has the Law Commission been asked to consider the ethical or economic merits of allowing increased development of genetic modification in New Zealand. Consideration of whether to develop a new liability regime and, if so, its content should not be left solely to lawyers. Although these may appear to be legal issues, there are significant ethical and spiritual aspects, as well as questions of public acceptability. The decision as to who should be responsible for any adverse consequences of genetic modification must be widely debated and clearly agreed.

9 The Law Commission has been greatly assisted by Gareth Kayes, Patricia Sarr and Marcus McMillan with research. We acknowledge their work and express our sincere appreciation of their contributions.

2
Definitions

10 A USEFUL STARTING POINT when considering the possibility of a new liability regime is its perimeter. To establish this it is first necessary to define clearly the terminology in the Law Commission's Terms of Reference.

11 The Terms of Reference for the Royal Commission defined genetic modification as:

> the use of genetic engineering techniques in a laboratory, being a use that involves –
>
> (a) the deletion, multiplication, modification, or moving of genes within a living organism; or
>
> (b) the transfer of genes from one organism to another; or
>
> (c) the modification of existing genes or the construction of novel genes and their incorporation in any organisms; or
>
> (d) the utilisation of subsequent generations or offspring of organisms modified by any of the activities described in paragraphs (a) to (c).[5]

12 Excluded from the definition of genetic modification was the generation of organisms or products using modern standard breeding techniques ("including cloning, mutagenesis, protoplast fusions, controlled pollination, hybridisation, hybridomas and monoclonal antibodies").

13 The Royal Commission's Terms of Reference defined a GMO as "an organism that is produced by genetic modification".

14 We adopt the definition of genetic modification[6] and GMO specified in the Royal Commission's Terms of Reference.

15 The Law Commission's Terms of Reference refer to the "development, supply, or use of genetically modified organisms" which is narrower than the Royal Commission's Terms of Reference that encompassed "genetic modification, genetically modified organisms, and products".[7] Genetically modified products not involving live organisms are unlikely to present the same challenges to a liability regime. Therefore, in accordance with the Terms of Reference, the Law Commission has focused on GMOs rather than products derived from genetic modification.

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5 Royal Commission on Genetic Modification, above n 1, 366.

6 We will also follow the Royal Commission in its use of the term "genetic modification" rather than "genetic engineering". However, we acknowledge that some prefer "genetic engineering" because it can be seen as more specific than "genetic modification".

7 The Royal Commission's Terms of Reference defined a genetically modified product as including "every medicinal, commercial, chemical, and food product that (while not itself capable of replicating genetic material) is derived from, or is likely to be derived from, genetic modification". See Royal Commission on Genetic Modification, above n 1, 364, 366.

3
Why focus on genetic modification?

16 THERE ARE TWO BASIC ISSUES when considering liability for GMOs. First, any change to the existing regime requires good reasons, that is, new challenges that cannot be met by the adaptive nature of the common law but can be dealt with by legislative change. The bulk of this paper focuses on the questions which arise from that starting point.

17 Secondly, any liability regime should treat like with like. This is a fundamental premise of our legal system. This has led us to examine the question of whether a regime should be developed specifically for GMOs. What is it, if anything, about GMOs that is unlike any other potentially hazardous human activity or technology, and thus would justify a separate legal regime? If there are gaps in our liability regime, are those gaps specific to GMOs?

18 These questions appear to be a critical preliminary issue for government, preceding any consideration of whether a new legal regime is needed and, if so, what it might look like. The answer will determine whether it is a GMO-specific regime that is needed, or a regime to encompass all human activities or technologies posing similar potential dangers.

WHAT ARE THE SPECIAL FEATURES OF GENETICALLY MODIFIED ORGANISMS THAT AFFECT LIABILITY?

19 The alteration of the current liability regime will only be necessary or desirable if GMOs have particular features that cannot adequately be dealt with under the existing framework. Features of GMOs relevant to liability that suggest a new regime may be needed include:

- It is *difficult to estimate the level of risk* posed by GMOs because they are a new technology. This has a significant impact on the possibility of insuring against such risks, as will be discussed below.
- The *magnitude of the potential damage is difficult to assess*. Unlike a toxic spill, for example, which involves a defined amount of a particular substance in a limited location, GMOs may have the ability to replicate without limit.[8] In addition, there is the possibility of gene transfer from one species to another. Therefore, "GMOs pose a level of potential clean up cost that is not readily subject to pre-estimation".[9] Dr David Suzuki, a Canadian ecologist, summarised the danger in his evidence to the Royal Commission:

  > The difference with this technology is that once the genie is out of the bottle, it will be very difficult or impossible to stuff it back. If we stop using DDT and

[8] Simon Terry and others *Who Bears the Risk? Genetic Modification & Liability* (2 ed, Chen Palmer & Partners and Simon Terry Associates Ltd, Wellington, 2001) 14.

[9] Terry, above n 8, 14.

> CFCs, nature may be able to undo most of the damage – even nuclear waste decays over time. But GM plants are living organisms. Once these new life forms have become established in our surroundings, they can replicate, change and spread, so there may be no turning back.[10]

- The limits of any liability regime must be acknowledged. Genetically modified organisms have the *potential to create catastrophic levels of harm*. In the face of such loss most liability regimes will be ineffective. Similarly, there may be some damage that would be, for all practical purposes, *impossible to compensate or rectify* such as the loss of biodiversity or the spiritual pollution of traditional foods.[11]
- Although the potential dangers posed by GMOs are difficult to predict, it is likely that *some of the potential negative effects will manifest in the long term and be diffuse in nature*.[12] This result could mean that potential defendants no longer exist when the damage is discovered.
- A potential plaintiff may well face *difficulty and expense in establishing causation and proving the extent of any damage*.[13] This is because of the possible time lapse before damage is discovered and the scientific evidence that would be required to prove causation.

20 In summary, any liability regime for GMOs will need to address the following difficulties:

- unknown level of risk;
- unknown magnitude of potential damage;
- the possibility of catastrophic, irreversible and/or incompensable damage;
- the possible time lapse before damage is discovered; and
- the need to prove causation.

Public concern for safety

21 In addition, there is also a level of public unease about the safety of the new technology. Such public concern becomes a factor if government wants to permit the development of genetic modification. It is important that the public is well informed about the true nature of the possible risks. A new liability regime can play a role in this process.

Ethical and spiritual issues

22 There are also ethical issues raised by genetic modification.[14] For some people genetic modification is not just another scientific technique – it is a significant and irreversible step in human intervention into nature. Such concerns go beyond worries about whether the technology is safe or whether the outcomes

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[10] Royal Commission on Genetic Modification *Report of the Royal Commission on Genetic Modification* (Wellington, 2001) 55.

[11] Royal Commission on Genetic Modification, above n 10, 57.

[12] Royal Commission on Genetic Modification, above n 10, 311.

[13] Royal Commission on Genetic Modification, above n 10, 311.

[14] Some of these are discussed in Royal Commission on Genetic Modification, above n 10, 33–38.

are predictable (although such concerns are keenly felt). Rather, these people question whether there should be any involvement in such fundamental human manipulation of nature.[15]

23 Concerns have also been raised by Māori, which arise from a different belief structure. Although the basis for many of the Māori cultural objections[16] to genetic modification vary among iwi, they are usually based around impacts on whakapapa, mauri, kaitiakitanga, and rangatiratanga.[17] The traditional Māori worldview considers all parts of the natural world to be related through whakapapa. Genetic modification risks interfering with such relationships, and threatens the sanctity of mauri (life principle) and wairua (spirit) of living things. In this way, genetic modification may affect the ability of Māori to be kaitiaki (guardians) of their taonga and, particularly, their ability to care for valued flora and fauna.[18]

24 No liability regime will be able to address ethical and spiritual concerns. However, there are legal obligations to consider Māori concerns, both in specific situations under statute and more generally when government is considering whether and in what ways to allow for the development of genetic modification. Both the Hazardous Substances and New Organisms Act 1996 (HSNO) and the Resource Management Act 1991 (RMA) require that persons exercising powers and functions under the Act take into account the principles of the Treaty of Waitangi.[19] In addition, section 6(d) of HSNO requires decision makers to take into account "the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, valued flora and fauna, and other taonga".[20] If genetic modification offends against fundamental cultural beliefs of Māori or the principles of the Treaty, dialogue with Māori will be needed.

25 In the WAI 262 claim currently before the Waitangi Tribunal the claimants argue that the Crown has failed to protect the rangatiratanga of Māori over their genetic resources and the cultural knowledge linked to those resources. The claim deals with wide-ranging issues including intellectual property, biodiversity, movable cultural taonga, and genetic modification.[21]

26 We have not given detailed consideration to these potential legal and ethical issues.

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15 Agriculture and Environment Biotechnology Commission *Crops on Trial* (2001) <http://www.aebc. gov.uk/aebc/crops.pdf> 30.

16 Māori concerns about genetic modification are, of course, not limited to the impact on their cultural beliefs.

17 Bevan Tipene-Matua "Māori Aspects of Genetic Modification" (Background paper to the Royal Commission on Genetic Engineering) <http://www.gmcommission.govt.nz/publications/Maori_Bevan_Tipene-Matua.pdf> 4.

18 Tipene-Matua, above n 17, 3–4.

19 Hazardous Substances and New Organisms Act 1996, s 8; Resource Management Act 1991, s 8.

20 See also Hazardous Substances and New Organisms Act 1996, s 5(b); Biosecurity Act 1993, ss 57(1)(c)(v), 72(1)(c)(v).

21 Tipene-Matua, above n 18, 1, 15.

TREATING LIKE WITH LIKE

27 We now return to the fundamental question of whether any new liability regime should be restricted to GMOs. The perimeter of any new regime is of pivotal importance. A liability regime specific to GMOs will only cover those activities encompassed by the definition of genetic modification used. It will not address techniques falling outside the definition even if such techniques also carry with them unpredictable risks similar to those of GMOs.

28 There is no general agreement as to which techniques should be included in the term "genetic modification". The definition of genetic modification specified for the Royal Commission did not include all techniques of modern biotechnology and explicitly excluded some techniques whereby genes are modified.

29 The Royal Commission report and the European Directive on the release of GMOs both exclude mutagenesis (the mutation of genes by deliberate use of a virus, chemical or radiation) and cloning.[22] However, the *Draft Animals and Biotechnology Report* of the Agriculture and Environment Biotechnology Commission (UK)[23] includes such techniques in its definition of "GM animals" reasoning that all these are techniques of modern biotechnology and should therefore be included.[24]

30 As discussed, no matter how this perimeter is drawn, GMOs raise ethical and spiritual issues that, for some people, place them in a class separate from any other potentially hazardous human activity or technology. They might well argue that separate regulation is required for this reason, even if the scientific assessment of the potential dangers is similar.

31 If a policy decision is taken that these ethical and spiritual concerns do not mandate separate regulation for GMOs, then the concept of treating like with like suggests that human activities or technologies should only be treated differently when they poses new or greater dangers and not simply because they wear the label "genetically modified". For example:

- One of the fears relating to GMOs is the possibility of creating "superweeds" by the transfer of herbicide resistant genes from genetically modified crops to weedy relatives. However, using canola as an example, there are commercial herbicide tolerant canola varieties that have been developed using both genetic engineering (glyphosate or glufosinate ammonium tolerant) and traditional plant breeding tools (imidazolinone or atrazine tolerant).[25] If the environmental impact of gene flow from each of these

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[22] Article 1, Directive 2001/18/EC of the European Parliament and of the Council on the deliberate release into the environment of genetically modified organisms, 12 March 2001.

[23] The Agriculture and Environment Biotechnology Commission was set up in June 2000 with a remit to provide the UK government with independent, strategic advice on developments in biotechnology and their implications for agriculture and the environment <www.aebc.gov.uk>. The Liability Sub Group intends to publish a report on liability issues at the end of 2002.

[24] Agriculture and Environment Biotechnology Commission *Draft Animals and Biotechnology Report* AEBC/01/20 (February 2002) <http://www.aebc.gov.uk/aebc/aebc0120.pdf> 7–8.

[25] Donald MacKenzie *International Comparison of Regulatory Frameworks for Food Products of Biotechnology* (2000). Prepared for the Canadian Biotechnology Advisory Committee Project Steering Committee on the Regulation of Genetically Modified Foods. <http://www.agbios.com/ articles/2000350-A.pdf> 56.

varieties is the same it would be inconsistent to subject some varieties to a new liability regime but not the others.[26] In this regard, what is important is not the fact that the crops have or have not been genetically modified but whether they have similar environmental impact.

- The introduction of a new organism into New Zealand can have devastating effects on the ecosystem. These effects can be equally damaging regardless of whether the organism is new (in the sense that it has been produced by human intervention via genetic modification) or simply new to New Zealand (as was, for example, the possum). The unpredictable impact that such introduction can have is not dependent on whether or not an organism has been genetically modified.
- There has been an application by Diatranz Limited to undertake a clinical trial involving the insertion of encapsulated living pig cells into the abdomen of patients with type I insulin dependent diabetes. There are fears that the process could result in porcine endogenous retrovirus being transmitted into human cells.[27] This procedure does not involve genetic modification.

32 These examples demonstrate that there is a wide range of activities that could be covered by any new liability regime. It may be productive to investigate carefully whether genetic modification per se poses greater risks than other activities.

33 We suggest that any new liability regime should treat human activities or technologies that pose similar dangers in the same way, rather than treating them differently on the basis of the particular technology used.[28] This approach is adopted by Canada under its regulations for novel food where the focus is on the properties of the final product rather than the process by which it was made.[29] Similarly, the approach of the Proposal for a Directive of the European Parliament on Environmental Liability was to encompass a range of listed

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[26] The Finance and Expenditure Committee reporting on the Hazardous Substances and New Organisms (Genetically Modified Organisms) Amendment Bill 2001 (175–2) stated that (3–4):

> We are informed that it is a natural process for bacteria to share genetic material through [horizontal gene transfer]. This occurs whether or not the bacteria are genetically modified … We were also informed that there is no scientific basis for a view that the DNA in GM organisms is more or less likely to be subject to [horizontal gene transfer]. There is also no reason to believe that bacteria modified by [horizontal gene transfer] from GM plants and animals would have any greater or lesser impact on the environment than bacteria modified with genes from non-GM plants and animals.

However, the Committee also heard submissions that horizontal gene transfer may not occur naturally at all, or that, if it does, it has minimal impact. Also, the fact that horizontal gene transfer does not occur often may serve to hide the long-term impacts of gene flow from genetically modified crops (see Agriculture and Environment Biotechnology Commission *Looking Ahead* (December 2001) <http://www.aebc.gov.uk/aebc/horizon_scanning_report.html>).

[27] Commentary from the Finance and Expenditure Committee reporting on the Hazardous Substances and New Organisms (Genetically Modified Organisms) Amendment Bill 2001 (175–2) 18–19.

[28] This possibility was discussed by the Agriculture and Environment Biotechnology Commission, Environmental Liability Development Group in their meeting of 18 January 2002, <http://www.aebc. gov.uk/aebc/liability_meetings_180102_minutes.html> 1.

[29] Donald MacKenzie, above n 25, 4. See also the statements supporting the validity of the "product-based" approach, 56.

activities that posed the possibility of causing environmental damage, rather than only addressing one activity (such as genetic modification).[30] In New Zealand, the existing relevant statutes tend to treat GMOs as only one type of new organism,[31] new food,[32] or new medicine[33] with no exclusive legal requirements for genetic modification.

34 The Law Commission is not suggesting that the risks posed by GMOs and those posed by other potentially hazardous human activities or technologies are the same. Nor are we saying that there is no difference between genetic modification and standard breeding techniques. We do not have expertise in these areas. However, such differences need to be investigated and considered. It is important to avoid creating different liability regimes for human activities or technologies that involve different processes but have the same possibility of hypothetical problems.[34]

35 There are four broad possibilities:

1(a) GMOs are substantially different – the process by which GMOs are created means they are more likely to cause unexpected and damaging results. However, the existing liability regime is adequate to deal with the risks posed by this new technology.

1(b) GMOs are substantially different – the process by which GMOs are created means they are more likely to cause unexpected and damaging results. The existing regime is inadequate to deal with the risks posed by this new technology.

2(a) GMOs are no different from other potentially hazardous human activities or technologies. No change is required to the current regime.

2(b) GMOs are no different from other potentially hazardous human activities or technologies. However, the current regime does not deal adequately with liability for damage caused by all such activities and should be changed for all (and not just genetic modification).

36 Although the remainder of this review focuses on GMOs in accordance with our terms of reference, the preliminary questions suggest a broader investigation with a more scientific focus might be considered.

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[30] Commission of the European Communities "Proposal for a Directive of the European Parliament and of the Council on environmental liability with regard to the prevention and remedying of environmental damage" COM (2002) 17 final, 2002/0021 (COD) (Brussels, 23 January 2002) Art 3.

[31] Hazardous Substances and New Organisms Act 1996, s 2A; Biosecurity Act 1993, s 2.

[32] Food Act 1981 and A18 of the Food Standards Code 1987.

[33] Medicines Act 1981, s 3.

[34] Agriculture and Environment Biotechnology Commission, above n 28, 5.

4
Summary of the current liability regime

TYPES OF DAMAGE

37 ANY DAMAGE from GMOs is likely to fall into the following categories:

- personal injury (for example, allergenicity, toxicity);
- property damage (such as loss resulting from GMO contamination of land, crops, processed foods and other products);
- financial or economic loss (such as loss of organic status by a genetic modification-free farmer);
- environmental damage (such as loss of biodiversity); and
- spiritual harm (which would not be covered by the regimes described).

38 The current liability regime has two aspects:

- The private regime – where a person sues another person for damage they have suffered (currently consisting of the common law torts of negligence, nuisance and the rule in *Rylands v Fletcher*[35]).
- The public regime – where the state takes action rather than an individual (for example, by punishing an individual for their wrongful activity and/or requiring the individual to rectify the consequences). A public regime can be effective at establishing regulatory control (for example, by creating inspection and enforcement powers). It is also likely to be more effective than private actions in responding to widespread damage where effective remedy requires a co-ordinated approach (such as the eradication of a pest).

THE PRIVATE REGIME

39 The private remedies available currently to injured plaintiffs are provided by the common law torts of negligence, nuisance and the rule in *Rylands v Fletcher*.

Negligence

40 Generally, a plaintiff can bring an action in negligence in cases of damage to personal property or of personal injury not covered by the accident compensation scheme (discussed below). A plaintiff needs to show that:

- the defendant owed the plaintiff a duty of care (that is, the risk of damage was foreseeable);

[35] (1866) LR 1 Ex 265 (Ex Ch) affirmed in (1868) LR 3 HL 330.

- the defendant breached that duty;
- the breach of duty caused the loss to the plaintiff; and
- the loss suffered was not too remote.[36]

41 It may also be possible for approval authorities (such as the Environmental Risk Management Authority (ERMA)) to be held to have been negligent in giving approval if damage subsequently occurs.[37]

Nuisance

42 If damage is caused to land, a plaintiff can rely on the tort of nuisance, which imposes more stringent duties on the defendant. Nuisance is available when the defendant uses their own land to carry out an activity that causes something harmful or offensive to affect the land of a neighbour.[38] The activity may either cause actual damage or may unreasonably interfere with the plaintiff's enjoyment of their land. For example, an action in nuisance could result from the spread of genetically modified plants from one farmer's land to the land of a farmer growing genetic modification-free crops.

43 If an occupier is responsible for creating a nuisance, their liability is strict, that is, proof of negligence is not needed and it is no defence that the occupier took all reasonable precautions.[39] However, as with negligence, the harm caused must be foreseeable.[40] This may be difficult to prove with a new technology such as genetic modification.

44 An action for public nuisance may also be possible. The tort of public nuisance has been defined as an interference "which materially affects the reasonable comfort and convenience of life of a class of Her Majesty's subjects".[41] Unlike private nuisance, the Attorney-General has standing to sue, on behalf of a community, to restrain a widespread nuisance, rather than leaving private individuals to initiate proceedings.[42] Although the tort still exists,[43] few cases come before the court because this area has, in large, part been superseded by specific statutory measures aimed at conduct that poses a threat to public health or safety,[44] and an expanded tort of negligence.[45]

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[36] Stephen Todd (ed) *The Law of Torts in New Zealand* (3 ed, Brookers, Wellington, 2001) 142.

[37] Stephen Todd "Liability issues involved, or likely to be involved now or in the future, in relation to the use, in New Zealand, of genetically modified organisms and products" (Submission to Royal Commission on Genetic Modification) 14–18.

[38] Todd, above n 36, 10.

[39] Todd, above n 36, 11.

[40] *Cambridge Water v Eastern Counties Leather* [1994] 2 AC 264; *Hamilton v Papakura District Council* [2000] 1 NZLR 265 (CA) and [2002] UKPC (28 February 2002) (PC).

[41] *AG v PYA Quarries Ltd* [1957] 2 QB 169, 184 per Romer LJ (CA) cited in Stephen Todd (ed) *The Law of Torts in New Zealand* (3 ed, Brookers, Wellington, 2001) 535.

[42] Todd *The Law of Torts*, above n 36, 542.

[43] *AG v Abraham and Williams Ltd* [1949] NZLR 461 (CA).

[44] For example, Health Act 1956, ss 29–35; Crimes Act 1961, s 145; Summary Offences Act 1981, ss 32–38; Resource Management Act 1991, ss 322, 323, 326–328 cited in Todd *The Law of Torts*, above n 36, 536.

[45] Todd *The Law of Torts*, above n 36, 535.

The rule in *Rylands v Fletcher*

45 Nuisance principles tend to arise when there is continuing or intermittent harm caused by the defendant.[46] For cases of isolated escape, liability is covered by the rule in *Rylands v Fletcher*.[47] The rule covers the isolated escape of something harmful to the plaintiff's land when the defendant is making "non-natural" use of their land.

46 Like nuisance, liability under the rule is strict and it is no defence that the defendant took all reasonable precautions. However, as with nuisance, the escape must have been foreseeable, even if the immediate cause of the escape was not.[48]

47 Courts may be reluctant to decide whether producing GMOs is a "non-natural" use of land (under *Rylands v Fletcher*) or is an unreasonable interference (under nuisance). This choice could involve the courts in policy decisions that go to the heart of the genetic modification debate. As discussed, people have differing views as to whether genetic modification is merely another form of breeding technique or whether it is technology of an entirely new kind.[49]

48 The operation of these tort actions are discussed in detail in the Royal Commission report[50] and in Professor Stephen Todd's paper "Liability issues involved, or likely to be involved now or in the future, in relation to the use, in New Zealand, of genetically modified organisms and products".[51]

THE PUBLIC REGIME

49 There are a number of statutes that potentially impact upon the production and use of GMOs. Unlike the private regime, none of these statutes focus on compensating individual plaintiffs, however, they may provide a process whereby damage caused could be rectified.

Hazardous Substances and New Organisms Act 1996

50 The purpose of the Hazardous Substances and New Organisms Act is to "protect the environment, and the health and safety of people and communities, by preventing or managing the adverse effects of hazardous substances and new organisms".[52] Genetically modified organisms are included in the definition of new organisms under the Act.[53] The Hazardous Substances and New Organisms Act establishes the Environmental Risk Management Authority that is responsible for granting or withholding approval for:

- importing any new organism into containment;

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46 Stephen Todd, above n 37, 11.

47 (1866) LR 1 Ex 265 (Ex Ch) affirmed in (1868) LR 3 HL 330.

48 Todd, above n 36, 12.

49 Justine Thornton "Genetically Modified Organisms: Developing a Liability Regime" [2001] 6 Env Liability 267, 269.

50 Royal Commission on Genetic Modification *Report of the Royal Commission on Genetic Modification* (Wellington, 2001) 317–318.

51 Todd, above n 37, 10–14.

52 Hazardous Substances and New Organisms Act 1996, s 3.

53 Hazardous Substances and New Organisms Act 1996, s 2.

- developing any new organism in containment;
- conducting contained field tests of any new organism; and
- releasing any contained or imported new organism.[54]

Only those who meet the controls and standards set out in the Act are eligible for approval. The Act creates penalties for breach of these conditions. The Act does not provide for any controls on new organisms once they have been approved for release into the environment.

Biosecurity Act 1993

51 The Biosecurity Act contains broad powers for the exclusion, eradication and management of pests and other unwanted organisms in New Zealand. A GMO would be classed an unwanted organism if:

- the Environmental Risk Management Authority had declined approval to import the organism;
- the Environmental Risk Management Authority had given containment approval for the organism, but the organism had escaped from the containment facility;
- after an approved general release, the Chief Technical Officer believed that the organism was capable of causing unwanted harm to any natural and physical resources or human health.[55]

52 The Biosecurity Act also allows for the creation of national or regional pest management strategies for organisms capable of causing adverse effects in relation to:

(i) New Zealand's economic well-being;

(ii) the viability of threatened species of organisms, the survival and distribution of indigenous plants or animals, or the sustainability of natural and developed ecosystems, ecological processes, and biological diversity;

(iii) soil resources or water quality;

(iv) human health or enjoyment of the recreational value of the natural environment; or

(v) the relationship of Māori and their culture and traditions with their ancestral lands, waters, sites, waahi tapu, and taonga.[56]

53 The Biosecurity Act appears to be the most effective existing statutory tool for dealing with a GMO that escapes or, after general release, turns out to be detrimental to human health or the environment.

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[54] Hazardous Substances and New Organisms Act 1996, s 27.

[55] Biosecurity Act 1993, s 2.

[56] Biosecurity Act 1993, ss 57(1)(c), 72(1)(c).

Resource Management Act 1991

54 The Resource Management Act provides the framework for management of use of the environment in New Zealand. The Ministry for the Environment administers the RMA and it operates through consent authorities (such as regional, district and city councils) that grant permission by way of resource consents to use or develop a natural or physical resource and/or carry out an activity that affects the environment.

55 It is possible that environmental damage caused by GMOs could be dealt with under the RMA. Section 17(1) states that "[e]very person has a duty to avoid, remedy, or mitigate any adverse effect on the environment arising from an activity carried on by or on behalf of that person, whether or not the activity is in accordance with a rule in a plan [or] resource consent …". That duty is not itself enforceable, but in Part XII of the RMA there are powers to issue an abatement notice or an enforcement order requiring a person to:

- cease or prohibit anything likely to be noxious, dangerous, offensive or objectionable to such an extent that it has or is likely to have an adverse affect on the environment; or
- do something that is necessary in order to avoid, remedy, or mitigate any actual or likely adverse effect on the environment caused by that person.[57]

The person is also responsible for any reasonable costs and expenses incurred by any other people in avoiding, remedying, or mitigating any adverse effect.[58]

56 These powers are broad and their potential applicability to GMO damage has not been tested.

Personal injury and the accident compensation scheme

57 The accident compensation scheme also falls into the public remedy category because it removes the private right to sue, replacing it with state compensation. Personal injury caused by GMOs will most likely be covered in part by the Injury Prevention, Rehabilitation, and Compensation Act 2001. An individual might suffer personal injury by, for instance, consuming GMOs that were either toxic or that caused an allergic reaction. It is likely that this would be covered by section 25(1)(b) of the Injury Prevention, Rehabilitation, and Compensation Act, which provides that "accident" means:

> … the inhalation or oral ingestion of any solid, liquid, gas, or foreign object on a specific occasion, which kind of occurrence does not include the inhalation or ingestion of a virus, bacterium, protozoa, or fungi, unless that inhalation or ingestion is the result of the criminal act of a person other than the injured person.

58 This would cover the ingestion of a GMO on one occasion but not over time (as this would not be ingestion "on a specific occasion"). If not covered by the accident compensation scheme, a plaintiff would have to rely on the normal tort remedies.

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[57] Resource Management Act 1991, ss 314, 322.

[58] Resource Management Act 1991, s 314(d).

59 Harm caused by medical misadventure and harm that is work related would also be covered by the legislation.[59]

Others

60 Other Acts that may be relevant (such as the Food Act 1981, the Food Standards Code and the Medicines Act 1981) are summarised in Chapter 2.1 of Appendix 1 to the Royal Commission report.[60]

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[59] For medical misadventure see Injury Prevention, Rehabilitation, and Compensation Act 2001, ss 32–34. For work-related harm see Injury Prevention, Rehabilitation, and Compensation Act 2001, s 30. See generally, Stephen Todd above n 37, 7–8.

[60] Royal Commission on Genetic Modification, above n 50, appendix 1, 53.

5
Problems with the current regime and a range of possible responses

61 CURRENTLY, an individual who has suffered damage (other than personal injury) caused by another person's GMO, if they are not in a contractual relationship with that other person, will have to rely on the torts of negligence, nuisance, and the rule in *Rylands v Fletcher* to obtain a remedy.

62 The Royal Commission report concluded that the existing liability regime of tort and statute is sufficient and that "the common law … [is] well able to mould new remedies for novel situations … From a legal liability perspective we have not been persuaded there is anything so radically different in genetic modification as to require new or special remedies".[61]

63 In evaluating this assessment it is necessary to identify the instances where these torts and statutory obligations will fail to provide a remedy because of the special features of GMOs discussed previously (paragraphs 19–20). The following table summarises the potential issues that arise in relation to the current regime and possible responses by both the private and public regimes:

Table 1: Summary of potential issues in relation to current liability regime and possible responses in private and public regimes

Issue	Private regime	Public regime
Harm caused is unforeseeable	Remove requirement to prove forseeability	Consider whether forseeability must be proven
Difficult to prove causation	Alter the burden of proof	Consider level of proof required
Person responsible for damage has inadequate funds	Require insurance or bonds, or create compensation fund	Require insurance or bonds, or create compensation fund
Person responsible for damage no longer exists	Tort ineffective	Create compensation fund or rely on state compensation
Damage is widespread or diffuse	Tort less effective	Create compensation fund or rely on state compensation
Damage is catastrophic or irreversible	Tort ineffective	Rely on state compensation, or no effective remedy

[61] Royal Commission on Genetic Modification, above n 50, 328. See also Mark Christensen and Paul Horgan "Genetic Modification: The Liability Debate" (unpublished, 2001) <http://www. lifesciencenz.com/Repository/020118_liability.pdf> 11: "the existing liability regime is capable not only of dealing with, but also of guarding against, actual and potential adverse effects from the use, development and release of GMOs".

64 If any new regime were to be adopted, it is likely that a combination of responses would be most effective.

65 The Law Commission has not identified any liability regime that could ensure that all damage that might be caused by GMOs would be compensated. Genetically modified organisms pose the two possibilities of a low-probability but catastrophically damaging event, and of damage that is very slow in appearing. None of the existing mechanisms are able to guarantee compensation for either circumstance because nothing is likely to be able to compensate catastrophic or irreversible damage, and few remedies will be available for liability claims which may take decades to surface. In either of those situations, the options are that the losses lie where they fall, or that government steps in.

6
Altering the private regime

66 WE FIRST CONSIDER the possibilities for altering the private remedies available in this area by the creation of a new statutory tort. A number of factors are considered:

- fault-based or strict liability;
- the burden of proof;
- who will be liable;
- defences; and
- limitations periods.

FAULT-BASED OR STRICT LIABILITY?

67 The general rule is that a plaintiff who has suffered loss needs to prove that the defendant was responsible for the damage caused. To succeed in negligence, the plaintiff must prove that the defendant failed to exercise the care and skill expected of a reasonable practitioner in that field.[62] The loss suffered by the plaintiff must also be foreseeable. In nuisance and the rule in *Rylands v Fletcher* proof of negligence is not needed but the defendant will still only be liable if the harm was foreseeable.

68 Given the unpredictable nature of the possible harm that could by caused by GMOs, the need to prove negligence or foreseeability of harm may prevent some injured parties from receiving compensation. One way to address this problem would be to create a new statutory tort specifying, for example, that "[a]nyone who sells or uses any genetically modified organism is subject to liability for physical harm, damage or economic loss to property caused by that organism".[63] This would remove the requirement to prove foreseeability from nuisance and the rule in *Rylands v Fletcher*. In cases of negligence, it would remove the requirement to prove fault, replacing it with a "no fault" regime.

69 A fundamental policy issue arises: should those in the genetic modification industry be held liable only if they are at fault (a fault-based regime), or should they be held liable for any loss caused (a strict liability regime)?

Fault-based

70 In general, if a GMO developer complies with all the statutory requirements, is not negligent, and takes all measures to prevent any harm that was reasonably

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[62] Todd, above n 36, 9.

[63] Simon Terry and others *Who Bears the Risk? Genetic Modification & Liability* (2 ed, Chen Palmer & Partners and Simon Terry Associates Ltd, Wellington, 2001) 88.

foreseeable, then the GMO developer is not legally "at fault" and is unlikely to be held liable for any damage that may be caused. This may mean that some of the losses caused would not be able to be compensated – the risks would be "socialised". The question that arises is whether there is good reason to hold GMO developers to a higher standard of care than others working with potentially dangerous substances.

Strict liability

71 On the other hand, there is an argument that a person who is carrying out an inherently hazardous activity should bear the risk if damage is caused by them, rather than the victim or society at large.[64] Genetic modification is a new technology with unknown risks. Companies or individuals enter the genetic modification industry knowing of this and they should therefore be responsible for all damage, even if it was not specifically foreseeable or preventable. This line of reasoning leads toward a strict liability regime.

72 Such a regime seeks to ensure that the costs of the genetic modification industry are borne by the industry itself – the "polluter pays" principle.[65] Arguments for such a regime include that:[66]

- the industry will be provided with incentives to take effective preventive measures to avoid causing damage;
- the industry costs will be "internalised" (that is, the industry would be responsible for all damages from the product, and could spread the costs of the possible harm through higher product prices); and
- plaintiffs' claims will not fail merely because the harm was not foreseeable, or because the defendant was not at fault.

73 It is moot whether a strict liability regime will necessarily achieve the first two aims. While a liability regime should, ideally, encourage investment in precautions,[67] the problem with GMOs in this regard is that the nature of possible harm and the level of risk may be unknown. If the likely harm is not foreseeable, it is difficult to see how strict liability would have any advantage over fault-based liability in encouraging preventive measures.[68]

74 Some commentators suggest that strict liability may actually provide perverse incentives, leading to reduced expenditure on preventive measures. This is because strict liability takes no account of investment in precautions, therefore, an efficient response may be to minimise such investment so as to maximise short-term profits.[69]

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64 Directorate-General for the Environment *White Paper on Environmental Liability* COM (2000) 66 final 9 February 2000 <http://www.europa.eu.int/comm/environment/liability/el_full.pdf> 18.

65 Terry, above n 63, ii.

66 Terry, above n 63, 28.

67 Charles River Associates *Review of Chen, Palmer & Partners and Simon Terry Associates, Who Bears the Risk* (Charles River Associates (Asia Pacific) Ltd, Wellington, 2001) 3.

68 Charles River Associates, above n 67, 3.

69 Charles River Associates, above n 67, 3.

75 Similarly, because the potential for, or likely costs of, damage caused by GMOs is difficult to predict, the genetic modification industry has no means to internalise these costs through higher product prices.

76 Creating a new statutory tort would not relieve the plaintiff of any difficulties in proving causation. However, it would make the plaintiff's case easier by removing the need to prove fault or foreseeability.

Conclusion

77 Whether to create a new statutory tort or not is ultimately a policy decision. Staying with the existing tort regime is more likely to encourage the development of genetic modification in New Zealand. Alternatively, the adoption of a new statutory tort that imposes strict liability may dissuade developers, but is likely to cover a broader range of potential damage.[70]

THE BURDEN OF PROOF

78 Potential plaintiffs could face difficulty and expense in establishing causation and proving the extent of any damage caused by GMOs.[71] This is due to both the time that may elapse before damage is discovered and the scientific evidence that may be required to prove causation. For example, if damage is caused by the combined effects of a number of GMOs in a particular environment over a period of time it may be difficult, or impossible, to establish that any individual or group of GMOs caused the damage.[72]

79 Plaintiffs who have suffered damage will be left without a remedy if they are unable to prove causation. Similarly, plaintiffs may be dissuaded from commencing a suit if they perceive that the evidential problems will be overwhelming, or the costs of taking the action prohibitive.

80 One way to redress the difficulty of establishing causation would be to shift the burden of proof onto the defendant. For example, there could be a presumption of causation (that the defendant's activity caused the harm) where there is solid prima facie evidence of its probability – such as known causal connections or

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[70] Submissions from ERMA to the Royal Commission summarise the competing arguments (p 32):

> Philosophically, there are two approaches that can be taken to the issue of liability in this regard. The first is to argue that by creating the HSNO framework ie requiring those wishing to develop, test or release GMOs to obtain a formal approval, the State is effectively relieving those people of liability for unexpected results. The nation as a whole takes the risk. The previous Minister for the Environment, Hon Simon Upton, has referred to this as "socialisation of risk". The second approach is to argue that the intervention of the State through the regulatory process notwithstanding, those wishing to develop, test or use GMOs are most likely to gain any immediate benefits from that, and also can reasonably be expected to have good knowledge (perhaps better than the regulator) of the risks. It is therefore not unreasonable that the operator should retain some liability.

Cited in Terry, above n 63, 26.

[71] Royal Commission on Genetic Modification *Report of the Royal Commission on Genetic Modification* (Wellington, 2001) 311.

[72] Justine Thornton "Genetically Modified Organisms: Developing a Liability Regime" [2001] 6 Env Liability 267, 272.

apparent absence of alternative causes.[73] Once the plaintiff has established a prima facie case for liability it would be up to the defendant to prove on the balance of probabilities that they were not responsible.[74] Another possibility is that, in a case with multiple defendants, if the plaintiff proves that some of the defendants have indeed caused harm, but cannot reasonably prove which are actually responsible, then the burden of proof could be shifted so that the individual defendants must prove that they were not responsible.[75]

81 The advantage of placing the burden of proof on the defendant is that the defendant may be more familiar with the possible effects of the GMO than the plaintiff. On the other hand, it is always difficult to prove something negative, for example, that the GMO did not cause the damage.[76]

82 One example where the burden has been altered is the German Act on Genetic Engineering. Under that Act, in order to relax the burden of proof for the plaintiff, there is a rebuttable presumption that any damage a GMO causes is the result of its biotechnology-induced characteristics, and not the organism's "natural" traits.[77]

Conclusion

83 Two general observations are appropriate. Causation difficulties with GMOs may not be any greater than those faced by other claimants in other areas. Secondly, whatever regime is adopted the injured party will still have to establish a right to the remedy sought. As stated in the Royal Commission report, "[d]evising a new form of liability will not, however, resolve the difficulty [of causation]; it is inherent in whatever kind of liability regime is adopted".[78]

84 The choice of whether or not to alter the burden of proof involves yet another policy decision. The disincentive to GMO developers from introducing a novel legal responsibility has to be weighed against the possible advantage of lessening the difficulties of proving causation for a plaintiff who has suffered loss.

WHO WILL BE LIABLE?

85 There are a number of different groups that could be held liable for damage caused by GMOs, including producers, suppliers and users (such as farmers who grow genetically modified crops).

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[73] Chris Clarke "Update Comparative Legal Study" Study Contract No 201919/MAR/B3 <www.europa.eu.int/comm/environment/liability/legalstudy.htm> 26.

[74] Mark Christensen and Paul Horgan "Genetic Modification: The Liability Debate" (unpublished, 2001) <http://www.lifesciencenz.com/Repository/020118_liability.pdf> 7.

[75] American Law Institute *Restatement of the Law – Torts: Liability for Physical Harm (Basic Principles)* Tentative Draft No 2 (2002) 95.

[76] ERM Economics *Economic Aspects of Liability and Joint Compensation Systems for Remedying Environmental Damage: Summary Report* (March 1996) <http://www.europa.eu.int/comm/environment/liability/el_full.pdf> 45.

[77] BGBl 1 1990, 1080, s 34. See also the Austrian Gene Technology Law (BGBl 510/1994) s 79d, which has the same provision.

[78] Royal Commission on Genetic Modification, above n 71, 318.

86 Under tort law there is unlikely to be any basis to distinguish between the producers, suppliers or users. All would be liable if they have breached their relevant duty.

87 However, in other fields, legislation has been passed to ensure only some parts of a dangerous industry can be sued. For example, in the United States' nuclear industry there is a channelling of liability to the installation operator.[79] Another possibility is that a person's liability could differ depending on their role. Some environmental liability regimes impose more onerous duties on those who produce or dispose of hazardous substances than those who merely carry them. This could be mirrored in the genetic modification area by, for instance, placing a higher standard of care on those who develop GMOs, and a lesser standard on the farmers that grow them.[80]

88 Thus, if liability is not channelled to one party, or if there are a number of parties responsible for damage, then the regime needs to have a means of apportioning liability.[81] Two possibilities could be considered:

- proportionate liability – where each defendant is only responsible for the damage that the plaintiff can prove was caused by that defendant; or
- joint and several liability – where, in the event that other defendants cannot be identified or are not worth suing, each defendant is liable for the full amount of the damage caused.

89 In Europe, the most common rule for apportioning liability for environmental damage (not limited to genetic modification damage) is joint and several liability, qualified by encouragement of division on equitable grounds in relation to the amount of damage caused by each individual.[82] However, there is an argument that liability should be proportionate because this is more consistent with the "polluter pays" principle.[83]

90 An additional question to be considered is whether any new liability regime should be made retrospective. Given the novelty of the release of GMOs in New Zealand it seems unnecessary to make any new regime retrospective in its effect because it is unlikely that anyone has suffered damage at this stage.

Conclusion

91 It is a policy decision as to who will be held liable under any new liability regime.

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79 Omer Brown II *Nuclear Liability: A Continuing Impediment to Nuclear Commerce* (The Uranium Institute 24th Annual International Symposium 1999) 2.

80 Thornton, above n 72, 267, 273.

81 The plaintiff may face difficulties even identifying the responsible defendant. One possibility for easing the difficulty of linking a GMO to a liable defendant would be to require genetic markers to be placed in all GMOs. See AB Endres "GMO: Genetically Modified Organism or Gigantic Monetary Obligation? The Liability Schemes for GMO damage in the United States and the European Union" (2000) 22 Loy LA Int'l & Comp L Rev 453, 487.

82 Chris Clarke, above n 73, v.

83 ERM Economics, above n 76, 44.

DEFENCES

92 Any proposal for a new liability regime would need to include what defences would be available. For example, the proposal from the European Commission for a Directive on Environmental Liability recognises defences in:

- an act of war;
- an act of God;
- deliberate acts of third parties;
- an event authorised by law; and
- activities that were not considered harmful according to the state of scientific and technical knowledge at the time when the activity took place.[84]

Other possibilities include a "state of the art" defence in which a defendant would not be liable for unforeseeable risks if the defendant had taken state of the art precautions, and contributory negligence.[85]

93 The defences that are made available need to be considered carefully so as not to undercut the purpose of any new regime. For example, if one of the reasons a new liability regime is created is to remove the need for a plaintiff to prove foreseeability it would be pointless to create a defence that the defendant's activity was not considered harmful at the time. Similarly, to allow a defence if the activity was authorised by law would make any new regime very similar to our current one where there are no statutory penalties if the statutory requirements are complied with.

Conclusion

94 It is a policy decision as to what defences will be available if a new liability regime is preferred.

LIMITATION PERIODS

95 Some kinds of harm caused by GMOs may only emerge after an extended period of time. Therefore, any claims may be barred by the expiry of the relevant limitation period (usually six years for civil claims, and two years for personal injury with the possibility of an extension). The Royal Commission suggested that, in most cases, time would run from discovery of the harm, rather than from the date the harm was caused.[86] The Law Commission has previously recommended introducing a discoverability principle, with a 10-year cut off from the date the cause of action accrued, defined as the date when all facts necessary

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[84] Article 9, Commission of the European Communities "Proposal for a Directive of the European Parliament and of the Council on environmental liability with regard to the prevention and remedying of environmental damage" COM (2002) 17 final, 2002/0021 (COD) (Brussels, 23 January 2002) 42.

[85] Chen Palmer & Partners suggest that force majeure, in the sense of natural disasters such as earthquakes, tsunamis, civil strife and so forth, should be an absolute defence to liability. They also suggest a defence of contributory negligence. See Simon Terry and others *Who Bears the Risk? Genetic Modification & Liability* (2 ed, Chen Palmer & Partners and Simon Terry Associates Ltd, Wellington, 2001) 86, 88.

[86] Royal Commission on Genetic Modification, above n 71, 320.

to establish the claim are in existence, whether or not their existence is known to the claimant. Claims after that date would become barred irrespective of knowledge.[87]

Conclusion

96 It is a policy decision as to the appropriate limitation period for actions based on GMO damage under any new liability regime.

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[87] New Zealand Law Commission *Tidying the Limitation Act* (NZLC R61, Wellington, 2000) cited in Royal Commission on Genetic Modification, above n 71, 320–321.

7
Altering the public regime

97 THE PRIVATE TORT REGIME will not provide remedies against all damage. As noted by Professor Stephen Todd in his report to the Royal Commission:

> Some forms of "environmental" damage are not, or not easily, remediable through a regime of individual liability. For a tort action to lie there needs to be an identifiable defendant (or defendants), quantifiable damage, and a causal connection between the defendant and the damage. Where damage is widespread and diffuse and the possible sources and their contribution to the damage uncertain, finding a remedy is no longer a matter for disputation between citizens.[88]

98 In such situations a public law regime can be more effective at establishing regulatory control and in responding to widespread damage. In New Zealand the principle statutes that regulate GMOs are the Hazardous Substances and New Organisms Act 1996, the Biosecurity Act 1993 and the Resource Management Act 1991 (see paragraphs 50–56). The Hazardous Substances and New Organisms Act and the Biosecurity Act impose restrictions on the introduction and creation of GMOs in New Zealand. The Hazardous Substances and New Organisms Act provides no ongoing controls over a GMO once it has been approved for general release, but the Biosecurity Act does provide a mechanism to eradicate or control a GMO if it escapes containment or if, after release, it is found to be likely to cause harm. In addition, recourse to the RMA may also be possible if environmental damage is caused. Therefore, there is a structure to deal with GMOs during their creation and containment and to deal with any adverse effects after their release. How effective the statutes will be in practice at dealing with GMO damage is not clear. The Ministry for the Environment is currently co-ordinating and implementing the government's response to the Royal Commission report, including consideration of possible statutory amendments.

99 The current statutes do not focus on compensating individuals for damage suffered. Instead, their focus is providing an effective regulatory regime with powers to rectify any damage caused. The statutes could be amended to change this focus if it was felt necessary for the public regime to deal with compensation. Other possible public law remedies that could be considered to address this issue include the creation of a compensation fund (discussed below) or the backstop of the state guaranteeing to compensate persons for damage caused by the GMO industry.

100 In Europe it is common for liability regimes to distinguish between "traditional" damage (personal injury and property damage) and "environmental" damage (contaminated sites and biodiversity damage). Environmental damage is largely

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[88] Stephen Todd "Liability issues involved, or likely to be involved now or in the future in relation to the use, in New Zealand, of genetically modified organisms and products" (Submissions to the Royal Commission on Genetic Modification) 22.

addressed by public law with strict liability. Traditional damage tends to be addressed by the private law, with a mix of fault-based and strict liability.[89]

101 An example of such an approach is the proposal from the European Commission for a Directive on Environmental Liability.[90] Under the Directive, operators would be held strictly liable for environmental damage caused by designated activities.[91] Such activities include any contained use, including transport, of GMOs and their deliberate release into the environment.[92]

102 Under the proposed Directive:[93]

- The competent authority may require an operator to take necessary preventive measures or shall itself take such measures to avoid environmental damage.[94]
- The competent authority may require the operator to take restorative measures, financed directly by the operator, or can complete the restoration itself and recover costs from the liable operator.[95]
- Operators are jointly and severally liable for costs.[96]
- If no operator can be held liable, or the operator has insufficient funds, Member States must adopt all necessary measures to ensure preventive or restorative measures are financed.[97]
- Member states are to encourage the use by operators of appropriate insurance.[98]

103 The proposal does not cover "traditional" (private) damage because it was considered that this could continue to be regulated through civil liability.[99] The proposed Directive covers environmental damage in general, and not only damage caused by genetic modification.

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89 Chris Clarke "Update Comparative Legal Study" Study Contract No 201919/MAR/B3 <www.europa. eu.int/comm/environment/liability/legalstudy.htm> iii–v.

90 Article 1, Commission of the European Communities "Proposal for a Directive of the European Parliament and of the Council on environmental liability with regard to the prevention and remedying of environmental damage" COM (2002) 17 final, 2002/0021 (COD) (Brussels, 23 January 2002) 36.

91 Environmental damage includes biodiversity damage, water damage, and land damage that creates serious harm to public health as a result of soil contamination. See Article 2(18), Proposal for a Directive on Environmental Liability, above n 90, 38.

92 Annex I, Proposal for a Directive on Environmental Liability, above n 90, 50.

93 These duties are subject to a number of defences discussed above n 90, para 92.

94 Article 4(1), Proposal for a Directive on Environmental Liability, above n 90, 40.

95 Article 5, Proposal for a Directive on Environmental Liability, above n 90, 41.

96 Article 11, Proposal for a Directive on Environmental Liability, above n 90, 43.

97 Article 6, Proposal for a Directive on Environmental Liability, above n 90, 41.

98 Article 16, Proposal for a Directive on Environmental Liability, above n 90, 45.

99 Proposal for a Directive on Environmental Liability, above n 90, 17.

Conclusion

104 It is a policy decision as to what damage should be covered by the private regime, or the public regime, or both. As discussed, the public regime will often be most effective in cases of widespread damage, or damage that requires a co-ordinated approach to rectify. Again, the issue of treating like with like is relevant. Government will need to consider whether new public law liability for GMO damage is justified or whether GMO damage should be addressed along with other types of damage of a similar kind, as is the approach to environmental damage under the proposal from the European Commission for a Directive on Environmental Liability.

8
Blood from a stone and bouncing cheques?

105 EVEN IF A PLAINTIFF SUCCEEDS in obtaining judgment against a defendant, or the state fines a liable defendant, the remedy is ineffective if the defendant does not have sufficient funds. Possible responses to this problem include:

- insurance;
- bonds; and
- a compensation fund.

COMPULSORY INSURANCE

106 It has been suggested that private insurance cover should be required as a condition for securing ERMA consent for either experimentation or release of GMOs.[100] Without insurance, the person responsible may be unable to compensate those whom they have damaged and, thus, the liability regime would prove hollow. As noted by Balkin and Davis in *Law of Torts*:

> If the principal aim of tort law is to provide compensation for many of the losses suffered through our modern life, that compensation will scarcely ever be effective unless the defendant is insured against his liability.[101]

107 In general, insurance removes the financial risks associated with the occurrence of events that are unpredictable for the individual but are predictable across the population as a whole. In a large pool of insured parties, the risk faced by each party can be reduced if the risks posed by each party are independent and uncorrelated.[102]

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[100] Simon Terry and others *Who Bears the Risk? Genetic Modification & Liability* (2 ed, Chen Palmer & Partners and Simon Terry Associates Ltd, Wellington, 2001) iv. Compulsory insurance is required in Germany (BGBl 1 1990, 1080, s 36) and Austria (BGBl 510/1994, s 79j). See also Article 12 of the European Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment 1993 (ETS 150) which compels signatories either to require individuals to carry adequate liability insurance or make payments into national compensation funds. Like the European Proposal for a Directive on Environmental Liability it focuses on environmental harm in general but includes the production, handling or release of GMOs in the definition of dangerous activities (Art 2(1)(b)). As at 11 March 2002, Cyprus, Finland, Greece, Iceland, Italy, Liechtenstein, Luxembourg, Netherlands, and Portugal had signed the Convention.

[101] R Balkin and J Davis *Law of Torts* (Butterworths, Sydney, 1991) 7.

[102] Charles River Associates *Review of Chen, Palmer & Partners and Simon Terry Associates, Who Bears the Risk* (Charles River Associates (Asia Pacific) Ltd, Wellington, 2001) 6.

108 Genetically modified organism liability poses two fundamental problems for the insurance industry. First, not enough is known about the likelihood or possible magnitude of the damage posed by GMOs for insurers to be able to assess the level of risk. Thus, insurers cannot set efficient premiums, nor can they spread the risk by reinsurance.

109 Secondly, the risks posed by GMOs are unlikely to be independent and identically distributed. Rather there will likely be a cluster of associated claims. In such a situation the various risks will not be offsetting and the efficiency of insurance will be called into question.[103] This situation is especially difficult given the limited capacity of the New Zealand insurance market.

110 From helpful informal discussions with Mr Chris Ryan, Chief Executive of the Insurance Council of New Zealand, it appears that insurers would be unlikely to provide cover because of the inability to quantify the risk and the difficulty in assessing the magnitude of the liability.[104] Even without specific exclusion clauses, current insurance policies would be unlikely to cover damage caused by GMOs unless the risks of such projects had been explicitly disclosed to the insurer.

111 In submissions to the Royal Commission, the Commissioner for the Environment stated that genetic engineering is not normally listed as an insurance exclusion in the current New Zealand insurance market.[105] An industry spokesperson cited in the submissions suggested that in the future, when more is known, all liability cover for GMOs may become a specific exclusion, similar to nuclear risks. The Commissioner for the Environment submitted that, at present, it would be unlikely that insurers would intentionally take on the GMO liability risk without fully understanding the issues – "[t]here is a general feeling amongst the industry that the risks involved with GMOs in the environment are just too great for insurance companies to accept".[106]

112 These statements echo those from insurers in other jurisdictions:

- The largest insurance company for the UK farming community, NFU Mutual, has been reported as stating that it will not insure against genetic contamination or damage.[107] A spokesperson for NFU is reported as saying that "these are a new and unknown quantity and until there is more scientific evidence and legal information it is impossible for any insurance company to provide cover".[108]
- In its report on the insurance issue Swiss Re (a reinsurance company) drew attention to the unknown and unknowable risks of GE and commented:

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[103] Charles River Associates, above n 102, 7.

[104] Phone conversation, 22 March 2002.

[105] Parliamentary Commissioner for the Environment [IP70] Submissions to the Royal Commission 14.

[106] Parliamentary Commissioner for the Environment, above n 105, 15. The Royal Commission received confirmation of these views from the Insurance Council of New Zealand (see Royal Commission on Genetic Modification *Report of the Royal Commission on Genetic Modification* (Wellington, 2001) 321 and fn 21, 405).

[107] Mr Alan Simpson, UK *Hansard* 15 November 2000, 356, column 941.

[108] Rob Edwards "Farmers Told GM Crops Are 'Too Dangerous to Insure'" *The Sunday Herald* (Scottish Media Newspapers Ltd) 10 March 2002.

> The risk profile of genetic engineering is extremely diversified and very difficult to anticipate. There is no clear conception of the risks accepted, so how can genetic engineering risks be insured? … It is currently not possible to give an answer to this question.[109]

- In 1999, the Insurance Council of Australia submitted to the Standing Committee on Primary Industries and Regional Services in Australia that:

> [There] is a perception amongst insurers that genetic engineering is dangerous characterised by an extremely diversified risk profile of a new technology. General insurers are reluctant to accept incalculable risks where it is difficult to predict what loss scenarios will arise.[110]

113 In the United States there is little evidence of specific insurance for GMO-related liabilities because, principally, insurance is not required of agricultural operations growing genetically modified crops.[111]

114 However, there is evidence that in the United Kingdom insurance may be available for some, but not all, genetic modification projects. The Agriculture and Environment Biotechnology Commission (UK) discussed the availability of insurance with Mr Tim Humphreys, Association of British Insurers.[112] Mr Humphreys stated that a niche market was gradually developing that covered environmental damage, including that caused by GMOs. However, Mr Humphreys stated that the insurance position would be very different if the United Kingdom moved from research to commercial growing of GMOs, because this would no longer be a niche insurance market but potentially a substantial one, and such insurance would require a reinsurance market larger than the one that exits currently.

115 In summary, it seems unlikely that insurance would be available for all GMO development and use. Instead, it may be that some projects will be able to obtain cover (such as contained laboratory experiments) whilst others will not (such as general release of a GMO).[113] Thus, requiring compulsory insurance is likely to block the approval of some projects that might otherwise have received ERMA consent.

116 Some commentators argue that if the insurance industry is not prepared to insure a project, this may be a good indication that the project is too risky and should not be approved. Thus, requiring compulsory insurance would provide a "market" check on ERMA's classification procedures.[114] The argument continues with the observation that rejecting compulsory insurance without explicitly proposing

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[109] Swiss Re "Genetic engineering and liability insurance: The power of public perception" (1998) 10.

[110] Insurance Council of Australia, submission to Mr Ian Dundas Committee Secretary House of Representatives Standing Committee on Primary Industries and Regional Services 4 November 1999 cited in Greenpeace [LE 2 IP82] Submissions to Royal Commission 7.

[111] James Boyd "A Market-Based Analysis of Financial Assurance Issues Associated with U.S. Natural Resource Damage Liability" (Resources for the Future, 10 October 2000) <www.europa.eu.int/ comm/environment/liability/insurance_us.htm> 58.

[112] Agriculture and Environment Biotechnology Commission, Environmental Liability Development Group Minutes, 20 December 2001. <http://www.aebc.gov.uk/aebc/liability_meetings_201201_ minutes.html> 2–3.

[113] Terry, above n 100, 39–40.

[114] Terry, above n 100, 41.

who will bear the risk will lead to socialisation of the risk by default (that is, individuals will suffer uncompensated damage).[115] Thus, the argument concludes, uninsurable risks should not be authorised unless government agrees specifically to provide the balance of any liability cover over and above what the GMO developer can secure in the market.

117 Another possibility is that the insurance industry may be prepared to insure GMO projects if the liability of those involved were capped, either with the government accepting liability for any damage suffered over the level of the cap, or such additional loss lying where it falls.[116] Although this arrangement would not help the insurance industry estimate appropriate premium levels, it would ensure they were only exposed to claims of limited size. For example, in the United States the liability of individual nuclear power plants is capped at US$200 million. If an accident occurs at any plant causing damage exceeding this amount, then all reactor operators are each required to contribute US$88 million, creating a fund totalling around US$9.3 billion.[117] However, even under this scheme, the maximum liability of the nuclear power plants is less than 2 per cent of the estimated financial cost of a catastrophic accident.[118]

118 The capping of liability could help encourage the insurance industry in New Zealand to cover GMOs. However, because of the unpredictable nature of GMO damage it would be difficult to assess the level at which liability should be capped. Further, capping liability would reduce the application of the "polluter pays" principle.

119 If insurance can be obtained two further problems emerge. First, compulsory insurance may reduce incentives to install safety precautions because it is the insurer who will have to pay out if damage is caused and not the company. Some incentive will be created if premiums are structured to reflect an assessment of the safety mechanisms in place.[119] However, some commentators argue that insured defendants are unlikely to be greatly deterred by the prospect that, if there is damage caused, they will lose a no-claims bonus or face an increase of premium on renewal of their policies.[120] Regardless, insurance would increase the likelihood of adequate compensation for the plaintiff, and such benefit may well outweigh this incentive problem.[121]

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[115] Terry, above n 100, iv. We note that this occurs often in everyday life motivating individuals who are risk-adverse to obtain first-party insurance.

[116] In Germany plaintiff recovery is limited (Act on Genetic Engineering BGBl 1 1990, 1080, s33) and in Austria there is compulsory insurance with capped liability (Gene Technology Law BGBl 510/1994, s79j cited in AB Endres "GMO: Genetically Modified Organism or Gigantic Monetary Obligation? The Liability Schemes for GMO damage in the United States and the European Union" (2000) 22 Loy LA Int'l & Comp L Rev 453, 475.

[117] Omer Brown II "Nuclear Liability: A Continuing Impediment to Nuclear Commerce" (The Uranium Institute 24th Annual International Symposium 1999) 2.

[118] *Public Citizen* "The Price Anderson Act: The Billion Dollar Bailout for Nuclear Power Mishaps" (10 October 2001) 2.

[119] Charles River Associates above n 102, 6.

[120] RFV Heuston and RA Buckley *Salmond and Heuston on the Law of Torts* (20 ed, Sweet & Maxwell, London, 1992) 27–28.

[121] Terry, above n 100, iii.

120 Secondly, the Royal Commission noted that, even if insurance could be obtained, the substantial premiums would act as a penalty to GMO producers, deterring them from investing in genetic modification.[122] Others respond that requiring insurance is not a penalty, it simply means that the risks of genetic modification remain with the industry itself.[123]

Conclusion

121 Given the current stage of the genetic modification industry, full insurance is unlikely to be available for all projects that might be approved by ERMA. Insurers are likely to be deterred by the absence of information on which sensible underwriting decisions can be made (lack of claims history, uncertainty of future claims). As the genetic modification industry develops and experience is gained, insurance may become more available, but because of the pace of the biotechnology industry, such delay may often be tantamount to a prohibition.[124] Therefore, requiring compulsory insurance is likely to block some projects that would otherwise have received ERMA consent.

122 Compulsory insurance does not deal with some of the earlier problems identified with GMO liability:

- There may be a considerable period of time between the act or omission on which the claim is based and the claim being made. The insured company may no longer exist or have ceased paying premiums. It would be difficult to create a regime guaranteeing payment under insurance policies years after the event. Few insurance companies would provide ongoing cover for a company that has ceased to operate and that may well have become insolvent. Similarly, the insurance company itself may no longer exist.
- The insurance industry is unlikely to be able to cover the liability if catastrophic damage is suffered.[125] There is also the possibility of irreversible or incompensable loss being suffered.

123 If there is a desire for the genetic modification industry to develop, at least some projects might have to proceed without insurance. However, this would mean that in the event that damage is suffered, a plaintiff may be left without an adequate remedy if the defendant does not have sufficient funds. It is a policy issue as to whether this is acceptable and, if not, who should take responsibility if such loss is suffered.

BONDS

124 Bonds provide another means of ensuring that those involved in the genetic modification industry have access to funds to cover damage claims against them.

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[122] Royal Commission on Genetic Modification *Report of the Royal Commission on Genetic Modification* (Wellington, 2001) 323.

[123] Some argue that failing to require insurance would in fact constitute an implicit subsidy by the public of the genetic modification industry. See Terry, above n 100, 41.

[124] Mark Christensen and Paul Horgan "Genetic Modification: The Liability Debate" (unpublished, 2001) <http://www.lifesciencenz.com/Repository/020118_liability.pdf> 9.

[125] Although the use of "catastrophe bonds" (financial instruments issued and traded on capital markets) and reinsurance could partly alleviate this problem. See Terry, above n 100, v.

125 The simplest form of performance bond requires the potentially liable party to deposit a specified amount of money for the period that the risk is expected to remain real. In the event of damage some or all of the fund would be forfeited. The rationale is that having to provide such a bond would create incentives for the GMO developer to act carefully, provide a check on the financial security of the developer involved,[126] and create a fund from which to meet any damage claims.

126 Currently, resource consents under the RMA may impose conditions requiring that:

- a bond be given in respect of the performance of any one or more conditions of the consent;
- a financial contribution be made; or
- works or services be provided to restore a site.[127]

127 The Ministry for the Environment, in submissions to the Royal Commission, proposed amending the RMA to provide for the bonds to be extended beyond the period of the consent order so as to deal with problems arising later. Similarly, the Ministry for the Environment proposed that bonds should be able to be imposed on any approval for developing or trialling a release of GMOs.[128]

128 Problems with any bond scheme include:

- The bond would have to be retained until it was assessed that the GMO posed no danger. Because of the possible time lapse before damage caused by GMOs is discovered, the bond may act more as a fee than as a bond in the true sense.
- Accurately setting the amount of the bond. This will be difficult given the lack of information about levels of risk and likely outcomes: it is hard to set the level of the bond without knowing the likelihood or scale of potential damages. The setting of the bond at too high an amount would penalise the GMO developer, setting the bond too low would provide insufficient cover.
- The Royal Commission concluded that the substantial premiums involved would make any required bond a penalty to GMO developers.[129] The appropriateness of the term "penalty" has been discussed above in relation to insurance (paragraph 120). This balance, between making GMO developers responsible for the potential costs of genetic modification and making the market attractive to encourage investment and development, is a policy decision that has already been noted.
- If bonds were required they would most likely be underwritten by an insurance company.[130] As discussed above in relation to insurance, it is questionable whether insurers would be prepared to issue bonds involving all risks from genetic modification.

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[126] Terry, above n 100, 38.

[127] Resource Management Act 1991, s 108(2)(b).

[128] Royal Commission on Genetic Modification *Report of the Royal Commission on Genetic Modification* (Wellington, 2001) 323.

[129] Royal Commission on Genetic Modification, above n 128, 323.

[130] Royal Commission on Genetic Modification, above n 128, 322–323.

- If insurers are not prepared to underwrite bonds, a GMO producer may be required to put up a substantial amount of money for an indefinite period of time. This may not be feasible, with the result that requiring a bond may block some projects that would otherwise have received ERMA consent.

Conclusion

129 The requirement of performance bonds is another possibility for ensuring that GMO developers have some funds available for compensating damage caused. A real difficulty arises, however, in attempting to set a level that is realistic in this uncertain area. The level of the bond set to ensure compensation for all of those who suffer injury may stifle the development of potentially beneficial scientific processes.

130 In addition:

- because of the likely time lapse before damage caused by GMOs is discovered, the bond may act as a fee; and
- any bond is likely to be insufficient in the face of catastrophic or irreversible damage.

AN ALTERNATIVE POSSIBILITY

131 Rather than requiring compulsory insurance or performance bonds, another method of attempting to ensure that potential defendants are in a position to meet claims would be to require or authorise ERMA, in giving approval to new organisms, to treat as a factor in arriving at its decision the likely ability of the applicant to meet claims. The Environmental Risk Management Authority could have a discretion to require insurance or a bond payment for those cases where the risk is suitably uncertain but still capable of satisfying the purpose of the HSNO Act.[131] This is the position in Australia under the Gene Technology Act 2000.[132] As with earlier options, this would not address the difficulties relating to time lapse and catastrophic or irreversible damage.

A COMPENSATION FUND

132 To be compensated under the current common law tort regime, the potential plaintiff needs to prove damage caused by an existing defendant with the means to pay for any claim. A common difficulty with the insurance and bond schemes is that, because of the possible time lapse, damage may not be discovered until after the responsible party has ceased to exist.

133 If the real concern is ensuring that damaged parties are compensated it may be more efficient to create a compensation fund into which all companies involved with producing GMOs would be legally bound to contribute.[133] The compensation fund could be structured in a number of ways, that include:

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[131] Christensen and Horgan, above n 124, 8–9.

[132] The Gene Technology Act 2000, s 62(3) states that:

> Licence conditions may also include conditions requiring the licence holder to be adequately insured against any loss, damage, or injury that may be caused to human health, property or the environment by the licensed dealing.

[133] Royal Commission on Genetic Modification, above n 128, 323.

- operating as a private insurance pool. GMO producers would contribute to the fund from which compensation could be paid if a GMO producer were found liable but had insufficient funds; or
- being used to rectify damage caused. The state would then take action against individual defendants to repay the funds used (like the "Superfund" discussed in the next paragraph).

134 The Royal Commission report does not discuss the possibility of a compensation fund in great detail, but does not appear to support it. It refers to the United States "Superfund", a trust fund administered by the Environmental Protection Agency to provide funds for the cleanup of chemical waste.[134] The Royal Commission appeared unattracted to such a scheme on the basis of claims that, in practice, the Superfund has "result[ed] in lengthy and expensive litigation, delays and inefficiency in clean ups, waste and even fraud …".[135] An additional problem is that the Superfund is underfunded. In 1991, the fund contained US$8.5 billion, even though the estimated potential demand ranged from at least US$17–24 billion to as high as US$700 billion.[136]

135 Problems of inefficiency may be generally associated with large pooled compensation funds and thus a genetic modification compensation fund would suffer similar problems. Likewise, even a large fund may be inadequate in the face of catastrophic or widespread damage from GMOs.

136 Another example is the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (1971), which establishes a fund to compensate victims of oil pollution. The Fund provides compensation (with a maximum limit per incident) where:[137]

- No liability is triggered under the Brussels Convention.[138]
- A shipowner is unable to meet their obligations under the Brussels Convention.
- The damage caused exceeds the liability limit in the Brussels Convention.

This could provide a model for a GMO compensation fund, although there are limits to the analogy. For example, it may not be as easy to identify an individual GMO "incident" as it is to identify an oil pollution "incident".

137 An additional difficulty with a compensation fund is that without knowing the likely consequences of GMO development and levels of associated risks, it is difficult to assess the amount of the levy that should be paid into such a fund, especially if the contribution of each GMO developer is to be based on the risk that each individual project poses. Unless the financing of funds is proportionate to actual risk, it fails to create efficient incentives for installing preventive

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134 Royal Commission on Genetic Modification, above n 128, 324.

135 Royal Commission on Genetic Modification, above n 128, 324.

136 Bruce Yandle "Rules of Liability and the Demise of Superfund" in Roger Meiners and Bruce Yandle *The Economic Consequences of Liability Rules: In Defense of Common Law Liability* (Quorum Books, New York, 1991) 143, 143–144.

137 Justine Thornton "Genetically Modified Organisms: Developing a Liability Regime" [2001] 6 Env Liability 267, 273.

138 The Brussels International Convention on Civil Liability for Oil Pollution Damage (1969).

measures. But, if proportionate financing is possible (that is, where the risks are known or there is clear causation) there is less need for a joint compensation fund.[139]

138 Companies are likely to be resistant to a compensation fund because it might result in them paying large amounts of money to help rectify damage caused by another company (and perhaps a competitor). This is inequitable and conflicts with the "polluter pays" principle. It would also mean that "clean" companies would pay twice, once when creating effective preventive measures, and again when paying into the fund to compensate for companies with less effective preventive regimes. This would create a disincentive for prevention.[140]

Conclusion

139 A compensation fund would ensure that money was available in the event of damage that could not be compensated under the usual tort regime. There are, however, likely to be problems of inefficiency and difficulty in setting the size of the compensation pool. The requirement of such a levy may act as a disincentive to investment and development in this area.

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[139] ERM Economics *Economic Aspects of Liability and Joint Compensation Systems for Remedying Environmental Damage: Summary Report* (March 1996) <http://www.europa.eu.int/comm/environment/liability/el_full.pdf> 43.

[140] ERM Economics, above n 139, 43, 45.

9
The back stop

140 AS WE HAVE SET OUT IN THIS PAPER, there are two situations where none of the possible liability regime alterations would be effective and those injured by GMOs would be left without a remedy and uncompensated loss would be suffered:

- catastrophic damage of a type or magnitude that the responsible party, its insurance company or even a compensation fund are unable to cover; and
- irreversible damage (such as loss of biodiversity).

141 In the first category, loss will either lie where it falls, or the community, as taxpayers, will have to come to the rescue by providing compensation to all those injured. It is arguable that by allowing the development of GMOs in New Zealand, the government, on behalf of the entire society, must take explicit responsibility for loss suffered that is left uncompensated by the liability regime established.[141] No regime can, however, compensate for irreversible damage such as loss of biodiversity or spiritual pollution.

[141] Under the European Commission's Proposal for a Directive on Environmental Liability (which is not limited to damage caused by genetic modification), if no operator can be held liable, or the operator has insufficient funds, member states must adopt all necessary measures to ensure preventive or restorative measures are financed. See Art 6, Commission of the European Communities "Proposal for a Directive of the European Parliament and of the Council on environmental liability with regard to the prevention and remedying of environmental damage" COM (2002) 17 final, 2002/0021 (COD) (Brussels, 23 January 2002) 41.

10
Conclusions

142 WHEN CONSIDERATION IS GIVEN to altering the current liability regime two fundamental issues arise:

- Are there new challenges presented by GMOs that are not adequately dealt with by the existing liability regime?
- Any new regime should treat like with like. If there are gaps in our liability regime, are those gaps specific to GMOs?

143 Our inquiry suggests that the current statute and common law will not ensure that all damage that could potentially be caused by GMOs will be compensated. It is unlikely that any liability regime could guarantee this.

144 The main difficulties for any liability regime stem from the special features of GMOs (mindful that these features may not be unique to GMOs). These include the fact that:

- it is difficult to estimate the level of risk posed by GMOs;
- it is difficult to assess the magnitude of the potential damage that could be caused;
- genetically modified organisms have the potential to create catastrophic levels of harm;
- genetically modified organisms have the potential to cause irreversible damage;
- some of the potential negative effects of GMOs will likely manifest in the long term and be diffuse in nature;
- plaintiffs may face difficulty and expense in establishing causation and proving the extent of any damage; and
- genetically modified organisms are a source of ethical and spiritual concern for part of society.

145 A range of possible alterations to the existing liability regime have been identified:

- creating a new strict liability tort;
- creating new public law duties;
- requiring insurance or a bond (or ERMA discretion to require insurance or bond); and
- creating a compensation fund.

146 The Law Commission suggests that the development of a liability regime will require three core policy decisions:

- First is the extent to which GMOs are different from other human activities or technologies, either from a scientific or ethical perspective. Should activities with similar risks be treated in similar ways by any new liability regime?
- Second is the extent to which those involved in genetic modification should be held directly accountable for anything that goes wrong. The more onerous the obligation placed upon them the more there will be a curtailment of work in this area and a lessening of the pool of individuals willing to take the risk. Therefore, there is a policy decision to be taken: on the one hand, weighing the protection of the public against uncompensated and potentially significant losses, on the other hand, considering the damage that may be done to a fledgling industry by the costs of a stringent liability regime.
- Third is the possible role of government as guarantor of any damage caused by the genetic modification industry. None of the possible changes to the current liability regime will effectively deal with damage that takes a long time to be discovered, that is catastrophic in its magnitude, or is irreversible. In such cases, the question will be whether the government, on behalf of the entire community, should be providing compensation for those who suffer damage but are unable to receive compensation through any liability regime.

147 Such decisions should not be made by lawyers. The ethical and spiritual issues involved are beyond our mandate. Decisions about who should be responsible for any adverse consequences of genetic modification must be widely debated and clearly agreed upon.[142]

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[142] Justine Thornton "Genetically Modified Organisms: Developing a Liability Regime" [2001] 6 Env Liability 267.

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