

Why we need Risk Management

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The New Zealand Society for Risk Management recently issued a press release¹ expressing disappointment that the Royal Commission on Genetic Modification “did not follow recognised best practice in risk management”. This article takes a closer look at one of the Report’s ‘major’ recommendations, the use of “sterility technology” as a risk management tool.²

The major theme of the Royal Commission’s Report was ‘preserving opportunities’. An approach which recommended the ‘cautious release’ of genetically modified organisms into the environment. Critical to this recommendation was the requirement to successfully implement risk management tools “in order to reduce the risk of cross-contamination of other production systems, including the use of physical barriers and separation distances, and the adoption of sterilising technology”.³

The Report recommended adoption of an untested genetic modification tool [sterilising technology] to manage contamination risks caused by the use of genetic modification technology. There is a certain irony in the fact that the adoption of the tool may in effect compound the risk rather than reduce it.

This being the case, one would have expected such a highly debated tool, also commonly referred to as ‘terminator technology’ because it renders seeds sterile and unable to germinate, to be substantially investigated and reported on in the Report. However this was not the case. The discussion of “sterilising technology” is on page 178 of the Report. It concluded, “the Commission considers an increasing variety of techniques is available to limit the effects of genetically modified crops on the environment and to control the escape of the modified genes.”⁴ Lets look at the supporting evidence.

1. ACRE⁵ discussion paper (UK)

The first supporting evidence was incorrectly referred to as “the ACRE report”⁶. It was in fact a “Discussion Paper” (as stated in the bibliography) called the “Guidance on Best Practice in the Design of Genetically Modified Crops”, published October 2000.⁷ The subgroup met four times and had a core membership of plant and microbial geneticists.⁸ The discussion paper was reviewed and an overview of responses was published.⁹ The resulting report was materially altered when finally published in March 2001.¹⁰ What is extremely relevant is that these alterations clearly moved to reduce the availability, acceptability and applicability of the tool ‘sterility technologies’ to manage the risks of contamination. The material alterations and explanations are as follows.

- The new title “Guidance on Principles of Best Practice in the Design of Genetically Modified Plants” added the term ‘Principles’ “to emphasise the aim of not being prescriptive, but of promoting thinking in this area.”¹¹ Some respondents considered the discussion paper title misleading because (i) some of the techniques described were speculative, with considerable uncertainty surrounding their effectiveness, practicability and safety and also (ii) the philosophy was considered too narrow and gave no consideration to the

wider socio-economic and ethical assessments. In particular, there was considerable concern about the terminator and other similar technologies.¹²

In addition the resulting ACRE report [2001] clearly states that seed sterility “requires further development”¹³ rather than being considered an “emerging technology”¹⁴ [as stated in the October 2000 discussion paper].

“Some respondents, particularly from industry but others too, were concerned that the guidance gave an optimistic sense of availability and breath of applicability of some of the technologies described that may lead to unrealistic expectations on time-scales of adoption.”¹⁵ ACRE goes on to acknowledge “that some of the approaches listed are not widely applicable at the current time and that some need further development.”¹⁶

- ACRE acknowledges in the 2001 Report summary “that broader socio-economic and ethical definitions of best practice are important” but “ACRE has approached best practice from a scientific and technological perspective”.¹⁷

The material alterations are absolutely critical, as they call into question the availability, acceptability and applicability of sterility technologies tools and therefore the ability to ‘cautiously release’ GMO’s.

2. University Professor’s paper (NZ)

A second paper, titled “The Current Uses of Genetic Modification”, was written by Professor Bellamy for the Royal Commission.¹⁸ This paper ends with one long paragraph, “GM can generate sterile crops”. It states, “the apparent aim of the plant breeder is to protect the commercial value of the intellectual property” and “although there are potential moral and ethical implications in such an approach, the scientific concepts involved are not new.” I consider the purpose of this paper was “to outline the technologies”¹⁹, rather than to identify feasible scientifically robust genetic modification tools that are safe to use in the environment.

3. AgBioForum Article (US)

A third article referred to by the Royal Commission as evidence supporting sterility technology is from AgBioForum.²⁰ AgBioForum is “a quarterly on-line magazine devoted to the economics and management of agricultural biotechnology” and “publishes short, non-technical articles reporting on current research”²¹. Although Professor McGloughlin’s 1999 article “Ten Reasons Why Biotechnology Will Be Important To The Developing World” is an interesting counter-argument to a previous paper published in AgBioForum, it is neither a timely nor a comprehensive technical review of “sterility technologies”. This article should not form the basis for New Zealand adopting “sterility technologies”.

Summary

Taking on board the above points, one must question where the evidence is that proves that “sterility technologies” are available and comprise viable low-risk, high-impact techniques for managing risks. The Royal Commission states that an “increasing variety of techniques is available” [above 4.], whereas they are clearly not yet available, but “require further development” [above 13].

The Report's recommendation to use sterility technology also seriously contravenes the principle of "sustainable management" as stated in the Resource Management Act²², the HSNO Act²³ and the Royal Society of NZ Act²⁴. This conflict was not investigated in the Report, which is exceedingly surprising considering even Monsanto will not "pursue technologies that result in sterile seeds".²⁵

I fail to understand how this risk management tool could be considered appropriate by the Royal Commission considering the above points. Are we not in danger of creating such hype with the 'Knowledge Wave' and the 'Biotech Silver Bullet' that we fail to investigate and peer review the risks and the level of uncertainty involved in both the 'use' and the so-called 'tools' recommended to manage this technology. We need the discipline of risk management to ensure we maximise the benefits of this and other new technologies without harming our health, environment, culture and economy.

¹ New Zealand Society for Risk Management, 3 August 2001 www.risksociety.org.nz/newsinfo.html

² Report of the Royal Commission on Genetic Modification, Recommendation: 13.4 "Sterility Technology: that sterility technologies be one tool in the strategy to preserve opportunities, especially in the case of those genetically modified crops most likely to cross-pollinate with non-genetically modified crops (e.g. brassicas, ryegrass, ornamentals)"

³ Report of the Royal Commission on Genetic Modification: Page 334

⁴ Report of the Royal Commission on Genetic Modification: Page 178

⁵ ACRE [Advisory Committee on Releases to the Environment] is an Advisory Committee of the Department for Environment, Food and Rural Affairs, UK.

⁶ Report of the Royal Commission on Genetic Modification: Page 178

⁷ ACRE: *Guidance on Best Practice in the Design of Genetically Modified Crops – Discussion Paper*. London, 23 October 2000.

www.defra.gov.uk/environment/acre/bestprac/consult/guidance/bp/index.htm

⁸ ACRE: *Advisory Committee Terms of Reference*

www.defra.gov.uk/environment/acre/bestprac/index.htm

⁹ ACRE: *Overview of responses to the consultation on ACRE's proposals for Guidance on Best Practice in the Design of Genetically Modified (GM) Crops*: London, 6 April 2001.

www.defra.gov.uk/environment/acre/bestprac/overview/index.htm

¹⁰ ACRE: *Guidance on Principles of Best Practice in the Design of Genetically Modified Plants*. London, 22 March 2001. www.defra.gov.uk/environment/acre/bestprac/guidance/index.htm

¹¹ Overview (as in 9.) para10

¹² Overview (as in 9.) para 10, 11, 12, 13

¹³ ACRE Report (as in 10.) Heading above para 4.7 and 4.6 (a) (b) and (c)

¹⁴ ACRE Discussion Paper (as in 7.) Heading above 4.7

¹⁵ Overview (as in 9.) para 13

¹⁶ Overview (as in 9.) para 13 and 28 "potentially useful technique"

¹⁷ ACRE Report (as in 10.) Summary

¹⁸ Royal Commission Report: Reference Chap 7: 111, Professor A. Richard Bellamy, University of Auckland. *The Current Uses of Genetic Modification*: August 2000: page 19, point 4.7.

www.gmcommission.govt.nz

¹⁹ As per 18. Page 1

²⁰ Royal Commission Report: Reference Chapt 7: 112: Professor Martina McGloughlin, University of California, Davis: *Ten Reasons Why Biotechnology Will Be Important To The Developing World*. AgBioForum. Vol 2 [Note: not Vol 12 as in the Report Reference], No. 3+4: page 168 Edited at the University of Missouri-Columbia www.agbioforum.org/vol2no34/mcgloughlin.htm

²¹ As in 20. AgBioForum web site: Welcome

²² Resource Management Act 1991, Section 5: Purpose

(1) *The purpose of this Act is to promote the sustainable management of natural and physical resources.*

(2) *In this Act "sustainable management" means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while (a)*

Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and (b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and (c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment.”

²³ Hazardous Substances and New Organisms Act 1996, Section 5, 6 + 7.

²⁴ The Royal Society of New Zealand Act 1997, Section 34, Code of Professional Standards and Ethics – Number 8 “Members shall at all times: (a) seek to observe the principles and practices of sustainable management in relation to needs of future and present generations internationally”

²⁵ New Monsanto Pledge www.monsanto.com