Office of the Minister for the Environment

The Chair
Cabinet Policy Committee

THE GOVERNMENT'S RESPONSE TO THE REPORT OF THE ROYAL COMMISSION ON GENETIC MODIFICATION
PAPER 3: RELEASE TO THE ENVIRONMENT AND COEXISTENCE

PURPOSE

1. This paper provides advice on the Commission's recommendations relating to:
    - releasing genetically modified (GM) organisms from research containment
    - maintaining options for people and production systems
    - preserving opportunities for GM and non-GM crops once such releases have been made.

EXECUTIVE SUMMARY

2. This paper examines twelve recommendations related to managing releases of GM organisms from research containment and facilitating the coexistence of a range of production systems, including those using GM organisms.
3. This paper discusses the relative importance of the various agricultural systems. It also considers how the presence of GM organisms could affect New Zealand's image, and noting Cabinet's decision to constrain the release of GMOs for two years, how coexistence might be achieved if a decision is made to allow releases in the future.
4. Officials advise Cabinet to accept the broad intent of all twelve recommendations but that in some cases the actions or detail recommended by the Commission should be rejected because the intent can be met more effectively through other means. More work is required on the actions required to implement some of the recommendations.
5. Officials conclude that coexistence of production systems under certain circumstances could be possible.

BACKGROUND

6. In reaching its major conclusion that New Zealand should keep its options open, the Commission considered various types of impacts from releases of GM organisms:
    - Market impacts – possible detrimental effects on New Zealand's "clean green" image, in both organic and conventional agricultural markets. Also market and economic benefits in terms of innovation, and particularly in primary production, food, and medical applications.
    - Social impacts – ethical and cultural objections to GM technologies, public concerns about post-release monitoring and management, concerns about the uses of genetic modification and the need for the technology; concerns about the potential for loss of individual choice.
    - Health and environment impacts – both potential benefits and possible unknown or unforeseen effects on human health and the environment.

7. The Commission's discussion and a number of its recommendations tend to focus on the use of GM organisms in relation to agricultural and horticultural crops and forestry (particularly pine trees). Much of the evidence presented to the Commission related to genetic modification in primary production, reflecting the importance of agriculture, horticulture and forestry to the New Zealand economy, and the involvement of Crown Research Institutes in research in these areas. However, the same issues arise for all uses of GM organisms (e.g. medical treatment and therapeutics, industrial and marine applications, micro-organisms, insects, fish, and higher animals).

8. Further, although many of the Commission's recommendations appear to have coexistence of production systems as their primary aim, many of the measures, if implemented, should also be used for wider environmental protection.

SUMMARY OF THE COMMISSION'S RECOMMENDATIONS

9. This paper analyses the twelve recommendations relating to managing releases of GM organisms from research containment and, in particular, enabling coexistence of GM and non-GM primary production systems. The recommendations fall into three main groups:

A. Establishing a framework for managing releases of GM organisms, and for coexistence

13.1	HSNO be amended to specifically cover economic impact and possible regional exclusion
13.2	Minister exercise call-in powers under HSNO before first GM crop released

B. Techniques for managing the effects of GM organisms and encouraging coexistence in primary production

7.1	a strategy for preserving the effectiveness of Bt be developed before Bt crops are released
13.4	sterility technologies to be encouraged
7.2	develop a labelling regime for GM seed, nursery stock and propagative material
7.7	MAF develop an industry code of practice for separation distances (case-by-case)
13.3	MAF develop formalised networks for dialogue and provide mediation service
7.3	MAF develop a strategy for GM-free honey and other bee products

C. Providing research to assist in preserving opportunities and protecting the environment (recommendations 6.12, 6.13, 6.14, 7.4)

6.13	provide adequate funding for research into sustainable systems
6.14	research portfolios to include research on socio-economic and ethical impacts of GM organisms
6.12	ERMA require research on environmental impacts before release of GM crops
7.4	that before GM forest trees are released there be a full ecological assessment

Farming systems in New Zealand and the potential for coexistence

10. The Commission recognised three distinct, but sometimes overlapping, production systems (conventional farming, integrated pest management, and organics) currently operating in New Zealand. A strategy to preserve opportunities would need to enable GM technologies to be incorporated into these systems by those wishing to employ them, while preserving the opportunities of those wishing to avoid them. However, this may pose practical difficulties.

Conventional farming

11. So-called "conventional farming" makes up more than 95% of farming in New Zealand. Conventional systems traditionally use new technologies as they arise, such as new breeds and cultivars, fertilisers, pesticides, etc. There is a general trend towards reducing chemical inputs, but fertiliser remains the biggest input for conventional pastoral farmers because many of our soils are naturally deficient in essential nutrients. In pastoral agriculture, woody weeds can be a major problem, particularly on hill country, and these are generally controlled by herbicides. Another major chemical input is in the form of animal health products such as dips, drenches and vaccines. Conventional farming relies on new varieties of plants and animals developed using a variety of traditional gene technologies, such as cross-breeding and hybridisation, and newer techniques.

Integrated Pest Management (IPM)

12. IPM aims to minimise chemical intervention, using the most environmentally benign chemicals available and only spraying when monitoring indicates the need for it. All commercial kiwifruit in New Zealand is produced using either IPM or organic systems. IPM is also the conventional means of production in the pip-fruit sector. Vegetable, wool and forestry industry associations are also promoting IPM methods, largely in response to trends in consumer demand for lower pesticide residues. Users of IPM are not necessarily opposed to the use of GM organisms.

Organics

13. The organics sector in New Zealand and overseas has grown rapidly in recent years, with some consumers actively seeking out and paying a premium for organic products. This year the value of exports is likely to be around $70 million and total organic production is estimated to be worth $120 million. However, the area of land in organic production still accounts for less than 0.5% of land in agriculture and horticulture and exports this year will only represent approximately 0.8% of total agricultural exports by value. About 80% of organic land is in pastoral agriculture. Organic apple orchards account for about 8% of apple-orchard-land, and organic kiwifruit about 7% of kiwifruit-orchard-land. A little over 1% of beehives are registered as organic.

GM systems

14. It is not known what types of GM organisms might be wanted to be introduced into New Zealand. Companies that multiply crops in NZ (taking advantage of the Southern hemisphere counter season), would like to do the same with GM varieties. New Zealand has already had field tests of GM pine trees, flowers, varieties of vegetables, and fruit with disease-resistance qualities. Industry has indicated that the currently available crops that have been modified to produce the Bt insecticide provide only minimal advantages and are unlikely to be grown in New Zealand. These examples give some indication of the types of GM crops that are likely to be pursued by industry for release in New Zealand.

Coexistence and contamination

15. Whether coexistence is possible depends on how contamination by GM material is defined and managed. Contamination is not a new problem in agriculture – spray drift

from agricultural chemicals has been a difficult issue for many years, and the seed production industry has established mechanisms to deal with potential contamination from pollen and other seeds.

16. There are two main types of potential contamination that might arise from releasing GM organisms in New Zealand:

    - **image contamination** – the effect that releasing GM organisms may have on New Zealand's clean green image, which is used by many industries as part of their marketing strategies.

    - **physical contamination** – where genes from GM organisms spread, mainly by sexual reproduction such as pollination but potentially by other means such as horizontal gene transfer.

17. Several countries (e.g. Argentina, USA, Canada) have both organic and GM-based production systems coexisting, although some organic producers argue that coexistence is not sustainable in the long-term. In Europe, where concerns about GM crops are high, both organic and GM crops coexist[1], and the organic industry is growing rapidly. On the basis that coexistence occurs in other countries, officials consider that coexistence under certain circumstances could also be possible in New Zealand. As part of Cabinet's decision to constrain release for two years it has directed officials to explore the work involved in developing coexistence framework as far as is practicable in the absence of releases.

Image contamination

18. There are claims that any release of GM organisms in New Zealand would damage tourism and agricultural industries (particularly organic agriculture) by undermining marketing strategies based on the "clean green" image. Research confirms that businesses in New Zealand place significant value on the clean green image but it is not clear how much it is worth or whether it would be affected by releasing GM organisms. Some industry sectors (e.g. organic growers) believe that the release of GM organisms is incompatible with the clean green image, while others (e.g. Fonterra) do not see a problem.

19. Overseas experience suggests that clean green image marketing, organic agriculture and the presence of GM organisms in the environment can coexist. For example, Tasmania, which promotes its "clean green" image, announced recently that open research trials of GM poppies and commercial growing of GM carnations will be permitted[2] because the Tasmanian Government feels they pose no threat to their 'clean green' identity. Other countries, including Canada, have similar marketing images but also grow GM crops. Saskatchewan province in Canada estimates its organic industry is growing at about 20% per year[3], despite also being a significant producer of GM canola.

20. Officials believe that to inform further policy work, more detailed analysis is necessary of the various economic risks and opportunities that may arise from GM and non-GM technology. Cabinet directed officials to report to POL by 1 February 2003 with an economic analysis of the risks and opportunities that may arise from GM and non-GM technologies [CAB Min (01) 33/22 refers].

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[1] Figures from the European Commission show the number of releases into the environment approved in Germany is 109, France 484, United Kingdom 203, Netherlands 113, Ireland 4, and Denmark 39.

[2] Australasian Science, September 2001, p28-29; Gene Technology Policy, Tasmanian Department of Primary Industries, Water and Environment, July 2001.

[3] http://www.agr.gov.sk.ca/Organics.asp?firstPick=Organics

Physical contamination

21. There are two main routes for physical contamination in plants: sexual reproduction e.g. cross-pollination (vertical gene transfer), and horizontal gene transfer between unrelated species.

22. Cross-pollination between crops has always occurred but at present is mainly a problem for seed producers aiming for high standards of purity. Physical contamination could also occur through GM animals breeding with non-GM animals, or GM micro-organisms used in animal and human vaccines (such as live GM bacteria in cholera vaccine and GM viruses in foot and mouth vaccine) reproducing with non-GM micro-organisms. Various methods can be used to prevent mixing of GM and non-GM organisms.

23. Horizontal gene transfer refers to the transfer of genes to species other than those affected by sexual reproduction. Such transfer has been found to occur in nature between micro-organisms. There is only limited evidence of genetic material moving between plants and bacteria, and plants and fungi naturally. It is unclear how important horizontal gene transfer would be in terms of GM organisms released to the environment, but it has been suggested that it would only occur at a very low frequency. The Commission highlighted this as an area where more research is required.

24. Organic standards recognise that some level of environmental contamination may be unavoidable. The standard developed by the International Federation of Organic Agriculture Movements (IFOAM) has the following general principles:

    All relevant measures should be taken to minimise contamination from outside and within the farm. In case of risk or reasonable suspicion of risk of pollution, the certification body / standardising organisation should set limits for the maximum application levels of heavy metals and other pollutants. Accumulation of heavy metals and other pollutants should be limited.

    The Bio-Gro standard in New Zealand says

    ...it is not a guarantee that the product is free of all environmental pollution residues, as background contamination is now so widespread that such an assurance would be misleading.

25. However, the Commission heard evidence from organic growers that any amount of contamination by GM material would prevent a product being certified as being organic. They suggest that since no guarantee could be given that cross-contamination would not occur, any presence of GM crops in New Zealand would have a significant adverse effect on commercial organic production. It is currently up to certifying bodies to decide whether testing for GM presence is required.

    The IFOAM standard says,

    Genetic engineering has no place in organic production and processing. Certification bodies/ standardising organisations shall set standards and make every effort including relevant documentation to ensure that no genetically engineered organisms or products thereof are used in organic production and processing. The certification bodies/ standardising organisations should set standards for how different farming systems can be clearly separated in production as well as in documentation, and the standards should determine how to prevent a mix up of input factors and products.

26. With respect to Maori responsibilities as kaitiaki (guardians) of the environment, there are concerns about GM contamination of indigenous and introduced flora and fauna. Some groups, e.g. Ngai Tahu, argue that releases of GM organisms should not be contemplated if this country's approach is to be truly precautionary. Of relevance also is the Maori view

that genetic modification involving cross-species manipulation is culturally offensive. Treaty of Waitangi and Maori issues are discussed in more detail in Paper 6.

27. Ultimately, compatibility rests on both cooperation between growers, and the possibility of tolerance levels for contaminants, whether set or implied. If organic certifiers demand a zero tolerance for contamination by GM material, then GM and organic crops are likely to be incompatible at the regional level. However, if there are tolerance levels for GM contamination similar to those accepted in international organic standards for pesticides, fertilizers and heavy metals, then there is a potential for compatibility.

Gaps in primary production coverage by the Commission

28. The Commission did not look at how GM technology could be applied in the marine environment or to aquaculture. The issue of GM salmon has already arisen here and it needs to be acknowledged that there are unique containment issues associated with introducing organisms into the marine environment.

29. Any changes to the regulatory framework will affect all new organisms. The full range of organisms and release environments will be taken into account when legislative changes are considered.

ANALYSIS OF THE COMMISSION'S RECOMMENDATIONS

A: Establishing a framework for managing releases of GM organisms, and for coexistence

30. The Commission made several suggestions as to how the system of management of GM organisms in the environment could be improved. They recognised the public's desire to have more stringent monitoring and post-release management, and suggested the creation of a new category of approval for release, which they called 'conditional release' (Recommendation 6.8). They also recommended that the Minister for the Environment use the call-in provision under the HSNO Act to make the decision on the release of the first GM crop (Recommendation 13.2) and suggested amendments to the methodology under the Hazardous Substances and New Organisms (HSNO) Act 1996 as a mechanism for managing coexistence (Recommendation 13.1).

31. Cabinet directed officials to report to POL and Cabinet by 30 April 2002 with advice on implementation of a new category of conditional release, including the purpose and scope of the new category, the criteria for conditions and any compliance and enforcement issues. Cabinet also directed officials to explore the work involved in developing co-existence frameworks as far as practicable in the absence of releases, and use that to inform the development of any future conditional release policy. [CAB Min (01) 33/22 refers]

32. Cabinet also noted that the Commission recommended that the Minister for the Environment exercise her call-in power to assess the economic and environmental impacts of the first applications for release of a GMO crop and agreed that the Commission's proposed use of the Ministerial call-in provision is not the appropriate mechanism to implement a 'proceed with caution' approach [CAB Min (01) 33/22 refers].

33. Officials further advise that use of the call-in powers as suggested in Recommendation 13.2 could lead to legal proceedings A decision to call in an application for the first release of a GM crop should be made at the time of the application. If the Government had signalled its intention to call in the first application for release of a GMO before it was received and without assessing whether it meets the relevant criteria in the HSNO Act, there was risk the call-in decision would be challenged through judicial review on grounds of predetermination. Legal proceedings would cause uncertainty, delay in the decision making process, additional expense to the Government and would attract international attention.

34. The Commission made recommendations in relation to the methodology followed by the ERMA when considering the relevant matters set out in Section 6(e) of the HSNO Act.

Recommendation 13.1

that the methodology for implementing HSNO section 6(e) be made more specific to:

- *Include an assessment of the economic impact the release of any genetically modified crop or organism would have on the proposed national strategy of preserving opportunities in genetically modified and unmodified agricultural systems*
- *Allow for specified categories of genetically modified crops to be excluded from districts where their presence would be a significant threat to an established non-genetically modified crop use.*

35. The issue being addressed by this recommendation is that of protecting non-GM industries that could be vulnerable to contamination by GM crops (both image and physical contamination). The Commission heard evidence of the importance of the "clean green" image, and the risks that contamination of non-GM products by GM crops would have significant adverse economic effects, particularly in the international market. The Commission mentioned in particular the potential damage to the kiwifruit, organics and bee products markets. The Commission wanted ERMA to specifically consider possible economic effects of certain GM crops on other agricultural systems, and also wanted ERMA to have the power to impose post-release controls on where specific GM crops could be grown.

36. The current Hazardous Substances and New Organisms (HSNO) Methodology states:

> *When evaluating the assessments of costs and benefits associated with the substance or organism in an application, the Authority must take into account –*
>
> *a) The costs and benefits associated with the application and whether the costs and benefits are monetary or non-monetary; and*
>
> *b) The magnitude or expected value of the costs and benefits and the uncertainty bounds on the expected value; and*
>
> *c) The distributional effects of the costs and benefits over time, space, and groups in the community.*

37. With respect to the first dot point of the Commission's recommendation, officials believe that the Methodology already requires ERMA to consider the issues raised by the Commission and there is no need to make the Methodology more specific. There is a risk that a specific requirement to consider the economic impacts on the proposed national strategy of preserving opportunities would put undue weight on one aspect over other important factors. Officials recommend further policy work to determine the best way to make the Methodology more specific. The further policy work should also consider the generic economic impact work agreed to by Cabinet [CAB Min (01) 33/22 refers], which is due to be completed by 1 February 2003. With respect to the second dot point, officials consider that location controls would be better considered as part of a possible conditional release category, which is to be investigated as a result of the Cabinet decision to direct officials to report with advice on the new category of release [CAB Min (01) 33/22 refers]. Therefore, officials advise that the Government reject this recommendation.

B: Techniques for managing the effects of GM organisms and encouraging coexistence in primary production

38. The Commission made six recommendations relating to operational strategies for managing the effects of GM organisms in the environment.

Recommendation 7.1

that, prior to the release of any Bt-modified crops, the appropriate agencies develop a strategy for the use of the Bt toxin in sprays and genetically modified plants, taking into account:

- *the concept of refugia*
- *limitations on total planted area*
- *home gardener use.*

39. Bt (*Bacillus thuringiensis*) is a common soil bacterium that produces a natural insecticide. It has been used as an insecticide spray for around 40 years in New Zealand and overseas, especially by organic growers, and is the main organic insecticide in use today. Some plants have been genetically modified to produce the Bt toxin in their cells to provide constant protection from insects. There are fears that the constant presence of Bt in GM plants could accelerate the development of resistance. The Commission suggests a strategy to prevent this from happening.

40. Officials consider that the Government should accept the intent of this recommendation and that it is probably best implemented on a case-by-case basis using conditional release, if such a category is created. (recommendation 6.8). The work to fulfil the intent of 7.1 should be done in the constraint period. There are clear benefits to the horticultural and agricultural sectors as well as national biosecurity in preserving the use of Bt as an organic insecticide in New Zealand.

Recommendation 13.4

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 in the New Zealand context (e.g. brassicas, ryegrass, ornamentals).

41. The Commission recommends that sterility technologies be used to prevent the movement of genes from GM plants into other compatible plants through cross-pollination (both between and within species), as a part of the strategy for preserving opportunities.

42. Although one form of sterility technology (known as "terminator technology") has become controversial, there are several GM and non-GM methods for making plants sterile and preventing gene flow. Officials recommend that sterility technologies could be allowed as one tool in the strategy to preserve opportunities.

Recommendation 7.2

that the appropriate agencies develop a labelling regime to identify genetically modified seed, nursery stock and propagative material at point of sale.

43. The Commission considers that some system of identification needs to be established for propagative plant material so that producers can exercise choice about whether or not to grow GM crops. The concept was raised by Vegfed, Fruitgrowers, Berryfed who thought that it was important for information to be passed down the production chain. Labelling would form an important part of the preserving opportunities strategy by ensuring that producers can exercise choice about what to grow.

44. It is not clear whether the Commission intends a voluntary or regulated labelling system. The report has minimal analysis and does not discuss the practicalities. The industry that proposed the idea assumes that it would work in conjunction with conditional release (recommendation 6.8).

45. Officials consider that the Government should accept the recommendation and direct officials to develop, in consultation with industry, options for the introduction of labelling of propagative plant material. Any regime should take into account the same major

considerations used in decisions on GM food labelling, i.e. enforceability; cost of compliance - imposing only a reasonable financial burden on businesses, regulatory authorities and consumers - and international obligations and trade.

Recommendation 7.7

that MAF develop an industry code of practice to ensure effective separation distances between genetically modified and unmodified crops (including those grown for seed production), such a code:

- *to be established on a crop-by-crop basis*
- *to take into account*
  - *– existing separation distances for seed certification in New Zealand*
  - *– developments in international certification standards for organic farming*
  - *– emerging strategies for coexistence between genetically modified and unmodified crops in other countries*
- *to identify how the costs of establishment and maintenance of buffer zones are to be borne.*

46. Cross-pollination of non-GM plants by GM plants is seen as having the potential to limit options for organic and other non-GM producers. Cross-pollination has always been an issue for plant breeders but until the development of sophisticated molecular biological techniques the extent was not appreciated. It is reasonable to try and minimise cross-pollination of seed stocks whether or not GM crops are involved. Guidelines for producers of certified seeds are already available but there is a recognised acceptable tolerance for out-crossing. An industry code of practice for GM crops has been produced in the UK, and the Commission recommends that a similar code of practice be developed in New Zealand.

47. Officials consider that this recommendation should be accepted in principle, while acknowledging that there could be practical difficulties with implementation. The potential for a code of practice should be investigated through consultation with affected groups, and alternative approaches should be considered. This recommendation would involve a cost to Government in developing the strategy, and could result in increased compliance costs for farmers if their practices were restricted. However, the benefits of such a strategy may outweigh the costs in the long term. As there is no indication that GM crops will be grown in New Zealand in the near future, and because the Government has decided on a two year constraint on release, it is not proposed that substantial work on a code of practice would start until the first application for release was received. But generic work should be started.

Recommendation 13.3

that MAF develop formalised local networks to encourage constructive dialogue and communication between farmers using different production methods, and to provide for mediation where necessary.

48. Coexistence will depend on agreement between neighbours about what activities can be carried out when, if all production options are to remain available. Farmers already have informal networks and understand the need for cooperation and understanding, but the Commission has rightly identified that there will be disputes and has suggested that MAF play a mediation role.

49. Officials consider that the intent of the recommendation should be accepted, to build upon existing networks and structures. However, mediation could involve significant costs. Success would depend on the goodwill of all parties and would be difficult where the differences involved fundamental values and philosophies.

Recommendation 7.3

that the Ministry of Agriculture and Forestry (MAF) develop a strategy to allow continued production of genetic modification-free honey and other bee products, and to avoid cross-pollination by bees between genetically modified and modification-free crops, that takes into account both geographical factors (in terms of crop separation strategies) and differences in crop flowering times.

50. Submitters to the Commission claimed that honeybees would be especially vulnerable to any effects of genetic modification of crops, as they rely almost exclusively on pollen as a food source. Submitters also claimed that there is an increasing market in Europe for honey sourced from areas where GM crops are not grown.

51. A strategy to limit the exposure of bees to GM plants would only be required once flowering GM crops were released from containment. While some GM pollen could have a detrimental effect on bees, impacts on pollinators would be considered as part of an ERMA risk assessment.

52. The success of such a strategy for maintaining coexistence would depend on the extent and scale of plantings of flowering GM crops. Officials consider that this recommendation is unlikely to be achievable in the long term if GM flowering crops were released and grown throughout New Zealand. It is, however, likely to be many years before large-scale planting of GM flowering crops occur. Until then, if flowering GM crops were released only in certain locations and on a small scale, some work to preserve opportunities for the bee industry could be possible. Any strategy would rely on the voluntary compliance and support of apiarists.

C: Providing underpinning research to assist in preserving opportunities and protecting the environment

53. The Commission noted several areas where it considered that additional research effort was required. This additional research would provide additional information on the possible environmental impacts of GM organisms, and also ensure that the socio-economic and other impacts of GM technology are investigated.

Recommendation 6.13

that public research funding be allocated to ensure organic and other sustainable agricultural systems are adequately supported

54. The Commission received several submissions that were concerned about the distribution of research funding across research areas, in particular between organics and research involving genetic modification. Submissions also called for more research into organics and sustainable agricultural systems. The Commission identifies particular areas of research in need of greater investment, including organics and integrated pest management methods of sustainable agriculture.

55. Officials consider that the Government should accept this recommendation. FRST are already working towards these outcomes, but could be assisted by developing a research strategy by the organic and sustainable farming sector in consultation with research providers. FRST and MAF could also investigate ways in which the industries can co-fund research to increase the overall research investment.

Recommendation 6.14

that public research funding portfolios be resourced to include research on the socio-economic and ethical impacts of the release of genetically modified organisms.

56. The Commission identifies particular areas of research in need of greater investment, including the social, cultural and ethical aspects of genetic modification[4]. FRST is currently funding research in this area, which includes a new programme that is related to Maori values and GM.

57. Officials consider that the Government should accept the intent of the recommendation, and after an initial analysis it is thought that up to $1.5m per annum of new funding for Vote RS&T may be needed to fully implement this recommendation. Officials believe that further analysis of the need, and the best way to fund and allocate research will be required. In addition to current research FRST will be conducting a tender process to fund further research in the areas that this recommendation has identified.

Recommendation 6.12

that the Environmental Risk Management Authority (ERMA) require research on environmental impacts on soil and ecosystems before release of genetically modified crops is approved.

58. The intention is to ensure that necessary research is undertaken so that ERMA has sufficient information on environmental impacts on soil and ecosystems before making decisions on release of GM crops. The report states that "there are some significant gaps in knowledge on which to base risk assessments for field tests or release of GM organisms"[5]. The report identifies "a particular need for further research to be carried out on horizontal gene transfer"[6].

59. Crown Research Institutes and other interested persons suggested the need for environmental impact research, especially relating to horizontal gene transfer. The discussion in the report leading to this recommendation suggested that further underpinning research was needed to answer the more generic questions related to environmental impacts on soil and ecosystems. ERMA may decline an application if there is insufficient information to assess the adverse effects of the organism. However, ERMA could require research on horizontal gene transfer, on a case by case basis, by applicants seeking to release new organisms. Generic research is not ERMA responsibility, but could be undertaken as part of government-funded public good research.

60. Officials consider that Government should accept the intent of this recommendation. Initial analysis suggests that the HSNO legislation is already sufficiently clear, and gives ERMA the authority and mandate to require that this information is provided before any release is approved. Further work is required to assess the significance of the information gaps identified by the Commission and the areas where additional underpinning research may be required. However, after an initial analysis it is thought that up to $1m per annum of additional funding in Vote RS&T would be required to establish and progressively implement a programme of underpinning research related to this recommendation. MfE, ERMA and FRST have already started work to identify further research needed in this area.

Recommendation 7.4

that in connection with any proposal to develop genetically modified forest trees, an ecological assessment be required to determine the effects of the modification on the soil and environmental ecology, including effects on soil microorganisms, weediness, insect and animal life, and biodiversity.

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[4] para 141, pg 132

[5] para 144, pg 133

[6] para 144, pg 133

61. The intention is to ensure that necessary research is undertaken so that the ERMA has sufficient information on environmental impacts on soil and environmental ecology before making decisions on release of GM forest trees. The potential impacts of GM in the area of forestry were highlighted in submissions. The Commission wants the Government to address the risks associated with GM forestry such as cross pollination, unintended side effects, weediness and possible nutrient depletion and loss of soil fertility.

62. Officials consider that the Government should accept this recommendation. Initial analysis suggests that the HSNO legislation is already sufficiently clear, and gives the ERMA the authority and mandate to require that such information is provided before any release is approved. Further work is required to identify the significance of the information gaps identified by the Commission and the extent to which private and publicly funded research is contributing to providing this information and the areas where additional research may be required. This work will be will be carried out in association with the work in relation to Royal Commission recommendation 6.12. The ERMA and FRST are already taking a more proactive role in identifying appropriate research in this area.

CONSULTATION

63. Two meetings have been held with MAF stakeholders and comments invited from others. Generally, organics groups did not support the Royal Commission's recommendations, or believe that coexistence would be possible if GM organisms were released in New Zealand. Environmental non-governmental organisations similarly did not accept many of the recommendations dealt with in this paper, retaining the belief that no releases should be permitted out of the laboratory. Maori groups did not generally support the report, and some expressed frustration with the consultation process. Representatives of CRIs and industry groups tended to endorse the report's findings, but were keen that any additional measures to manage GM organisms were "light-handed" in terms of regulation, and with minimal compliance costs. Some members of CRIs were keen to wait for more research to be done on GM organisms.

64. The following agencies were consulted in the preparation of this paper: Ministry of Agriculture and Forestry, Ministry of Fisheries, Ministry of Consumer Affairs, Department of Conservation, Customs, Ministry of Economic Development, Ministry for the Environment, Ministry of Foreign Affairs and Trade, Ministry of Health, Ministry of Justice, Department of Prime Minister and Cabinet, Ministry of Research, Science and Technology, State Services Commission, Te Puni Kokiri, and the Treasury. Amendments were made to this paper at the direction of the office of the Minister for the Environment, by the Ministry for the Environment in consultation with some other agencies. These amendments were required as some matters previously referred to in this paper were considered in Paper 1 at Cabinet on 29 October 2001.

FINANCIAL IMPLICATIONS

65. The potential costs of establishing and maintaining agricultural co-existence networks **[*Deleted under section S9(2)(f)(iv) of the Official Information Act*]** be considered when establishment of each of the networks is being considered. **[*Deleted under section S9(2)(f)(iv) of the Official Information Act*].**

66. The Ministry of Research, Science and Technology advises that**[*Deleted under section S9(2)(f)(iv) of the Official Information Act*]** new funding would be required to implement the Commission's recommendations related to the need for new research in socio-economic and environmental areas.

HUMAN RIGHTS

67. There are no human rights implications arising from the recommendations of this paper.

TREATY OF WAITANGI IMPLICATIONS

68. Treaty of Waitangi implications relating to genetic modification are discussed in Paper 6.

LEGISLATIVE IMPLICATIONS

69. It is proposed that the HSNO Act be amended to provide for a new category of release for new organisms, including GM organisms, to be known as conditional release. The precise nature of the amendment is yet to be determined. Other issues do not appear to require legislative changes at this stage.

REGULATORY IMPACT AND COMPLIANCE COST STATEMENT

70. Several of the proposed actions identified in this paper would impact on compliance costs. However the exact nature of the actions required will only be known once further policy work has been completed. Officials will be reporting back to Cabinet during 2002, and the necessary regulatory impact statements will be prepared at that time.

PUBLICITY

71. A communications strategy is being developed for the whole package of Government decisions on the Royal Commission's report. This is outlined in Paper 1.

RECOMMENDATIONS

72. I recommend that Cabinet:

1 **note** that the Commission's discussion tended to focus on aspects of GM related to primary production, but that its recommendations apply to all uses of GM organisms, and to the effects of those organisms on the environment;

2 **note** that Cabinet has [CAB Min (01) 33/22 refers]

2.1 **agreed** that the Commission's proposed use of the Ministerial call-in provision is not the appropriate mechanism to implement a 'proceed with caution' approach;

2.2 **agreed** that, in accordance with the precautionary approach, there is a need to constrain the release of GMOs (with limited exceptions) for a period while the work, analysis and research identified as necessary by the Commission is underway;

2.3 **directed** officials, led by the Ministry for the Environment (MfE), to report to POL and cabinet by 30 April 2002 with advice on implementation of a new category of release, including the purpose and scope of the new category, the criteria for conditions and any compliance and enforcement issues [Royal Commission on Genetic Modification (RDGM) recommendation 6.8 refers];

2.4 **directed** officials to explore the work involved in developing co-existence frameworks as far as is practicable in the absence of releases, and use that to complement the development of conditional release policy;

3 **note** that a decision to call in the first application for release of a GM crop would have been open to legal challenge;

Establishing a framework for managing releases of GM organisms, and for coexistence

4 **note** that there is provision in the HSNO Methodology for ERMA to take account of economic and related costs and benefits when considering an application to release a new

organism, including "the distributional effects of the costs and benefits over time, space, and groups in the community";

5 **direct** officials to report back on the best ways to make more specific reference to the economic impacts of a GM crop release on the proposed strategy of "preserving opportunities", by 1 February 2003;

6 **direct** officials to investigate the options for imposing location controls as part of considering the Commission's recommendation 6.8 on the establishment of a conditional release category [RCGM 13.1, paragraphs 35-37];

Techniques for managing the effects of GM organisms and encouraging coexistence in primary production

7 **agree** that work on coexistence be progressed as far as practicable in the absence of any actual applications for release;

8 **note** that using sterility technologies could be one tool in the strategy in preserving opportunities, particularly for GM crops most likely to cross-pollinate with non-GM crops in New Zealand [RCGM 13.4, paragraphs 41-42];

9 **direct** officials, led by MAF, to investigate the following issues and report back on the practicalities of the following by 30 March 2003:

9.1 strategies to help preserve the long-term effectiveness of Bt insecticide [RCGM 7.1, paragraphs 39-40];

9.2 options for a cost-effective labelling regime to identify GM propagative material (seeds, cuttings etc.) at point of sale [RCGM 7.2, paragraphs 43-45];

9.3 a strategy to mitigate the impacts on bee products arising from any releases of flowering GM crops [RCGM 7.3, paragraphs 50-52];

9.4 industry code of practice to ensure effective separation distances between GM and unmodified crops (on a case-by-case basis) [RCGM 7.7, paragraphs 46-47]; and

9.5 a nation-wide network to facilitate co-operation and requirements for a mediation service [RCGM 13.3, paragraphs 48-49].

10 **note** that developing these strategies further and implementing them would involve extra estimated costs

10.1 **[*Deleted under section S9(2)(f)(iv) of the Official Information Act*].**

10.2 **[*Deleted under section S9(2)(f)(iv) of the Official Information Act*].**

10.3 **[*Deleted under section S9(2)(f)(iv) of the Official Information Act*].**

Providing research to assist in preserving opportunities and protecting the environment

11 **agree** that adequate public research funding should be made available to support organic and other sustainable agricultural systems;

12 **note** development of a research strategy by the organic and sustainable farming sectors in consultation with research providers would usefully inform the prioritisation of public research in this area. [RCGM 6.13, paragraphs 54-55];

13 **agree** that public research portfolios should be resourced to include research on the environmental, socio-economic and ethical aspects of the release of GM organisms;

14 **note** that FRST is planning to fund more research in the area of the socio-economic and ethical impacts of GM organisms but that**[*Deleted under section S9(2)(f)(iv) of the Official Information Act*]** new funding may be required to implement the recommendation in this area [RCGM 6.14, paragraphs 56-57];

15 **note** that applicants seeking approval to test or release GM organisms, including crops and forest trees, are already required to provide the ERMA with appropriate data on their likely impacts on soil and ecosystems;

16 **note** that publicly funded research will continue to inform and underpin the management of environmental risks associated with GM organisms but that **[*Deleted under section S9(2)(f)(iv) of the Official Information Act*]** new funding may be required to support research related to understanding environmental impacts of GM organisms [RCGM 6.12 and 7.4, paragraphs 58-62];

17 **direct** MoRST to report back as part of the 2002 Budget process on the implications for Vote RS&T in implementing the recommendations of the Royal Commission that relate to research priorities [RCGM 6.12, 6.13, 6.14, and 7.4, paragraphs 54-62];

Gaps in the Royal Commission's Report

18 note that the Commission did not make any specific recommendations relating to the use of GM organisms in aquaculture and the marine environment but that any changes to the regulatory framework will affect all new organisms. These issues will be taken into account when any legislative changes are considered.

Hon Marian L Hobbs
MINISTER FOR THE ENVIRONMENT