

# Prudence, prejudice or paranoia?

Hugh Bigsby

The Royal Commission on Genetic Modification, which recently concluded hearings around the country, provides an interesting opportunity to observe the windows, or paradigms, through which various interests view the nature of the debate. Reading through submissions provided to the Commission (<http://www.gmcommission.govt.nz/>) provides a striking contrast of perceptions about what is at issue and what is at stake.

Submissions from the forest industry to the Commission show that there are a number of ways that genetic modification directly involves the forest sector. Forest Research is using genetic engineering to "evaluate the expression of specific transgenes in the conifer background".<sup>1</sup> They have presently developed a number of transgenic *Pinus radiata* and *Picea abies* trees, in which they have inserted marker genes, antibiotic resistance genes and genes involved in herbicide resistance, reproductive development and wood quality. Most experiments are conducted in containment laboratories and containment greenhouses.

While the two major forest companies in New Zealand, Carter Holt Harvey and Fletcher Challenge Forests, are evaluating transgenic Radiata pine for use in forestry plantations, they do not have commercialized applications of biotechnology in use in forestry in New Zealand at the present time.<sup>2</sup> Carter Holt Harvey obtained approval from the Environmental Risk Management Authority (ERMA) in 1999 to field test a strain of genetically modified Radiata pine incorporating genetic markers and it subsequently produced 120 such seedlings.

In their combined submission to the Commission, Carter Holt Harvey and Fletcher Challenge Forests say that demonstrating that biotechnology can be applied to Radiata pine will provide a basis for investigating future applications. The examples of future applications that they provide include, increasing wood yields, improving wood quality, strengthened the ability to manage risks to forest health and reducing the amount and number of herbicides that must be used on newly established Radiata pine. A read through the submissions from environmental groups reveals that if agricultural crops are any indication, there is significant cynicism about some of these benefits.

A number of environmental groups raise the precautionary principle (when in doubt, don't) as one of the most important considerations in this issue.<sup>3</sup> Greenpeace claims that since the precautionary principle first emerged in the 1980s, it has become a characteristic element of contemporary international environmental agreements (e.g. Convention on Biological Diversity and the Framework Convention on Climate Change). The essence of how the precautionary approach works is that where there are threats of serious or irreversible damage, a "lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent

environmental degradation."

In the context of regulation of genetic modification, a key factor is whether regulation is interpreted as risk management or a simple application of the precautionary principle that would potentially result in an outright ban on the use of biotechnology. Forest industry submissions to the Commission identify differing interpretations of the precautionary principle as an important issue and they recommend that a workable definition for the precautionary principle be an outcome of the Royal Commission, along with an acknowledgement that regulation of biotechnology involves an assessment of a statistical probability of an outcome, and a measure of possible outcomes. Without this definition, a literal interpretation of the precautionary approach would potentially make any uncertainty about a proposed application as grounds for a decision against it, in effect resulting in a prohibition on the use of biotechnology in New Zealand.

No one disputes that there will always be an element of uncertainty with respect to the development of biotechnology applications in the forestry sector. However, the industry argues that it is essential to manage whatever the risk is within an appropriate risk management framework. As such, the forest sector takes an approach that is based on classic assessment of risk and consequences. NZFIC observes that in New Zealand, the management framework is provided by the Hazardous Substances and New Organisms Act 1996.

In this context, Forest Research's submission states that risk analysis should be focussed on the risk inherent in the product rather than associating risk with the process or technology used to make the product. This could mean defining a 'containment class' for laboratories and then approving GMO development work by containment class rather than by organism to prevent repetitive cycles of applications for GMO development work for essentially the same risk class of organism. It could also mean defining 'risk classes' based on scientific evidence and adopting a notification system for low risk contained field trials of transgenic organisms.

Looked at in this way, Forest Research points out that there is no scientific evidence that indicates that the

<sup>1</sup> Forest Research Ltd, Submission to the Royal Commission on Genetic Modification, [http://www.gmcommission.govt.nz/publications/PDF\\_submission.html](http://www.gmcommission.govt.nz/publications/PDF_submission.html)

<sup>2</sup> Fletcher Challenge Forests and Carter Holt Harvey, Submission to the Royal Commission on Genetic Modification, [http://www.gmcommission.govt.nz/publications/PDF\\_submission.html](http://www.gmcommission.govt.nz/publications/PDF_submission.html)

<sup>3</sup> Greenpeace, ECO and Friends of the Earth submissions to the Royal Commission on Genetic Modification, [http://www.gmcommission.govt.nz/publications/PDF\\_submission.html](http://www.gmcommission.govt.nz/publications/PDF_submission.html)

biotechnology research they are involved in will have an adverse effect on human health, as conifers are rarely part of the human diet. In terms of potential environmental impacts, Radiata pine is the main species targeted for genetic engineering. One concern raised about genetically engineered Radiata pine is transgene transfer through pollen, that would result in fertilisation of susceptible recipient plants, resulting in the formation of a novel plant that would have an adverse effect on the environment or biodiversity. Forest Research says that this is not a major concern for field trial experiments where the numbers involved are relatively low and successful transgene transfer through pollen appears highly unlikely. In general, Radiata pine when grown in New Zealand as an exotic plantation crop, does not hybridise with any native plant species and it can only cross naturally with one other species of pine (*Pinus attenuata*). Radiata pine pollen is usually distributed by wind and the majority of pollen does not travel further than about 500 meters. In the case of large scale plantations of genetically engineered trees there would need to be an assessment of the likelihood of pollen transfer, subsequent fertilization and formation of a novel organism posing a threat.

In a similar way, NZFIC states that the mix of costs, risks and benefits for each potential application of the technology means that there should be an individual assessment of each case (e.g. the product) rather than some blanket application of a policy. Greenpeace's reaction to the "responsive, case-by-case policy on genetic engineering" is that it in effect reflects an "absence of

proactive, systems-based approaches to societal needs and problems, whereby all the options are considered, before a particular course of action is chosen." What is implied in this is that the case-by-case approach lacks any underlying societal consideration of the vision that we have for agriculture, forestry or medicine, and whether genetic engineering has a place in that vision. In other words, the interpretation of the case-by-case approach to genetic engineering, is that it operates in a moral vacuum and on the "erroneous operating principle" that the ends justify the means. The key concern here seems to be that case-by-case is identified as being synonymous with secrecy and an erosion of the "democratic rights of the public to shape society, and the role and activities of our scientific institutions." Two fundamentally different paradigms looking at the same issue.

One other issue identified by NZFIC was the effect of any domestic regulatory regime related to genetically modified organisms on New Zealand's international trade. The industry has been involved lowering impediments to trade, including tariff and non-tariff barriers. The industry's concern is that domestic regulations do not present a non-tariff barrier. NZFIC's view is that a domestic regulatory regime for genetically modified organisms should be consistent with WTO obligations, and as well as be developed through an internationally binding multi-lateral environment agreement covering trade in biotechnology and associated products. Domestic regulation of the import and export of the

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## Anegre affair highlights native timber quandary **letters**

Sir,

The Hon Jonathan Hunt's embarrassment during March about anegre, a hardwood from Africa, being used to replace tawa panelling in the Beehive reminds me of an incident of thirty years ago which had not been made public.

During 1969/70 while the Beehive was being built I was working as Private Secretary to the Minister of Forests.

Whilst sorting papers in preparation for a forthcoming meeting of Cabinet opportunity was given for me to ask the Minister why the Government architects were prescribing Malaysian hardwoods to panel the Beehive.

Hon Duncan McIntyre somewhat indignantly asked Cabinet what message would be given to the people of New Zealand by using overseas substitutes for our own beautiful indigenous timbers.

As a consequence the panelling which survived the first 30 years of the Beehive was tawa.

This time the desire to eschew our beautiful indigenous timbers for refurbishing the Beehive is being driven by our Prime Minister.

Concurrently sustainably certified silver beech, eminently suitable for panelling, is being exported to China

to make tool handles for the UK market because no one in New Zealand is willing to buy it.

Peter Allan

### Professorial wisdom recalled

Sir,

When reading the N.Z. Journal of Forestry 45(4) I was reminded of a favourite saying of my late Professor of Forestry. "On his first five year tour in India the graduate was worth nothing. On his second five-year tour he was worth half what they paid him. But on his third five-year tour he was worth four times what they paid him." Now, graduates think they are "instant" experts!

The forest models all contain the effects of variability: but do they also allow for edge effects, and effects of 'Acts of God'? When I first ran Forestry in the Solomons I was at the equivalent of the end of my second five-year tour in India, but when I ran Forestry again I was in the equivalent of my third five-year tour in India. So I understand my late Professor's adage.

K.D. Marten



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products of biotechnology in a manner incompatible with international law will result in additional non-tariff barriers to trade. This is not as straightforward an analysis as might appear when first considered as the Greenpeace submission has a lengthy analysis of international agreements by which they substantiate use of the precautionary principle.

Taken as presented, all the views expressed about the biotechnology debate covered thus far appear to be ones which advocate prudence. The only difference between views is that different paradigms lead people to different conclusions about the need for genetically modified organisms or their regulation. Elements of prejudice or paranoia only creep in elsewhere in submissions when you encounter contentions or inferences in submissions that:

- Biotechnology will contribute to mining of soils, depletion of natural resources or a decline in the quality of products like food.
- Biotechnology creates monocultures and threatens biodiversity.
- Biotechnology deprives people of indigenous life forms by transforming public property into private property.
- Biotechnology development is done by big, private companies that already control vast amounts of wealth.

Issues like these are side ones that reflect a range other

concerns held by various people about big business, property rights or sustainability. These issues could be raised in any forum irrespective of the specific debate about genetic modification. As such they are not relevant to the specific discussion of how to deal with the technology of genetic modification.

Looking through the points raised, the key issues for the Royal Commission that could affect the forest sector are:

- Will issues related to property rights, big business and our economic system dominate our decisions on how we use biotechnology?
- Will regulation of genetically modified organisms be driven by process or by the nature of the organism? This will determine whether the technology used to develop a product or the nature of the product that is developed becomes a limiting factor.

- Will genetically modified trees compromise Forest Stewardship Council or similar types of certification?

Since New Zealand is but the first of many nations to address this topic, it is unlikely that what we decide will ultimately determine how we use biotechnology. Rather, New Zealand's Royal Commission will be but one step along a path that will shape rather than prevent our use of biotechnology. The important factors in the mean time will be to maintain a biotechnology capability that matches society's understanding of that technology, and to make a concerted effort to address society's concerns.



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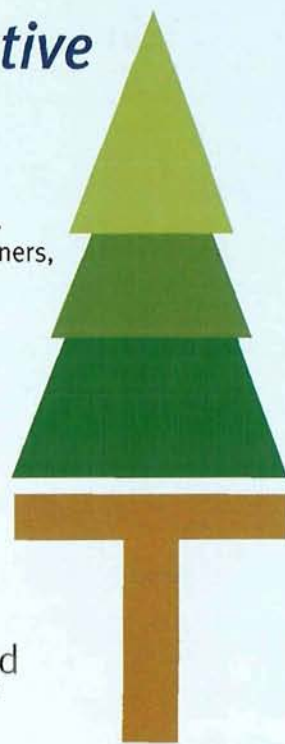
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