

# GENETIC TECHNOLOGIES AND OUR ENVIRONMENT

A public deliberation

An enabling process not only helps understand different perspectives, it encourages people to feel comfortable about forming and expressing opinions on new technologies, taking into account wider issues and implications.

## KEY POINTS

In the years since the 2001 Royal Commission into Genetic Modification, New Zealanders have become increasingly aware of, and concerned about, environmental problems and biodiversity declines. In the same period, genetic research has advanced in terms of fundamental scientific understanding and in the subtlety and power of potential technologies. So:

- Do New Zealanders feel current technologies will be able to address Aotearoa New Zealand's biodiversity decline?
- How do New Zealanders feel now about novel genetic technologies for environmental problems?
- Could we - and should we - use genetic technologies to reduce pest plant and mammal numbers?
- If so, what regulations and controls should there be? Who should make decisions? What mechanisms might need to be put in place to manage any technological change to ensure social and cultural concerns are addressed?

## WHAT DO YOU THINK?

Many New Zealanders pride themselves on New Zealand's clean, green environment. They take responsibility for keeping it healthy with a plethora of community-based environmental and predator control groups established across the country. As a country, we see the problems caused by predators, weeds, tree diseases and we currently use a range of tools to manage them. Many of these tools are resource intensive (like laying and checking traps) and others can have off-target effects (like aerial chemical controls). Are our current technologies enough? Should we consider new tools, including genetic technologies?

Answering this question requires that Aotearoa New Zealand grapple with both the opportunities and the challenges. While novel genetic technologies may offer advantages for managing some of our most pressing biodiversity and biosecurity problems, there are significant legislative, regulatory, social, and cultural concerns around



One of the purposeful games used by the team in the exploration phase

## AT A GLANCE

How do we engage New Zealanders on important and complex issues, and encourage conversation, particularly around new technology advances to address environmental problems and the decline in biodiversity?

the use of these technologies. In addition, for non-science audiences, these are unfamiliar and complicated technologies, with uncertain impacts.

This project has been running a national conversation to better understand public feelings around these issues, and in the process has developed a rigorous method for engaging the nation in important and complex conversations. This process could be used for a broad range of other topics where social license is essential and to inform the responsible development of novel technologies, including gene technologies.

*“Our aim is not to discover whether people agree or do not with the use of genetic technologies, but rather to capture the nuanced nature of their decision-making”*

## It's not just fun and games (though some of it is)

We knew we had to help people feel comfortable talking about the complicated and sometimes unfamiliar, sometimes contested topic of genes and genetic technologies. And because technologies do not exist in a vacuum, it was important to encourage everyone to connect genetic technologies with wider physical, social, legislative, and knowledge contexts.

So, we ran a three-step process that we call Explore, Refine, Deliberate, or the ERD process.

**Explore:** In 90-minute workshop sessions we asked people to play project-designed purposeful games. These were built to put genetic technologies into context – the context of ecology, of scientific processes, and of social and political decision making. These games helped people relax, chat, laugh, and think about the broader issues.

After playing the games, they were ready to join a facilitated discussion about their visions for New Zealand's environment, and about what role, if any, genetic technologies might play in New Zealand's environmental future.

**Refine:** In this phase, we met with specialists – scientists, bioethicists, industry groups and interest groups – to discuss a range of related topics to better understand what's feasible, important, of concern, and where the gaps in our social, cultural, and technical knowledge lie. We wanted to know what is currently happening, what is possible, and what is not (or should not be) possible. This helped us design our third phase – a set of scenarios where genetic technologies are being actively considered to manage environmental issues.

**Deliberate:** We are soon to take a set of scenarios to public groups for in-depth discussion and decision making. We have four problems to present: rats, varroa mite, wilding pines, and myrtle rust. All are problems that are being dealt with using current technologies, and all have active research programmes to design and assess genetic solutions. In addition, these technologies involve both genetic editing techniques and others that do not edit the gene (in particular RNAi).

We will present small groups with key information about the problems, current and potential solutions, as well as a range of perspectives about genetic technologies that we heard during our exploration stage. We will ask people to assess these scenarios and put forward the solutions they feel comfortable with as a group. What technologies? What limits? What rules? Who should decide? How should any development and application of these technologies be managed?



Above/below: Purposeful games used in the exploration phase



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## AND?

From this process we already know a lot about the complex ways people are thinking about the intertwined problems of technologies, ecologies, society and cultures, and trust. We have also gained a better understanding of where we might and could go from here. Those insights are built into our deliberations to show people the multiple and nuanced perspectives their fellow New Zealanders have on the use of genetic technologies for environmental purposes. Our aim is not to discover whether people agree or not with the use of genetic technologies, but rather to capture the nuanced nature of their decision making.

After the deliberation stage, we will have a set of clear if complex proposals for the development of policy around genetic technologies for the environment. These will include details about the governance, management, and implementation of these technologies to guide future considerations about the research and development of gene technologies.

### Key words:

genetic modification, gene technologies, perspectives, decision making, governance, management, conversation

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