

New Zealand needs for introduced plant genetic resources: implications of the Convention on Biological Diversity

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Abstract

New Zealand agricultural food, fibre and forestry sectors are virtually entirely dependent on exotic species, i.e., the indigenous genetic resources of other countries. Although New Zealand has genebanks containing some of the genetic resources used or tested in the past, the holdings, with few exceptions, represent only a small proportion of the available and potentially useful genetic material. If New Zealand is to retain and improve its competitive position in these sectors, an active programme of genetic resource acquisition and maintenance must be carried out. Under the Convention on Biological Diversity, several relatively new concepts will come into law, including, (1) the sovereignty of genetic resources, (2) the authority of governments to determine access to genetic resources, (3) the power to grant access only on "mutually agreed terms", (4) the opportunity for a country of origin to be involved in research and have access to technology developed in another country using its genetic resources. This paper looks at some of the issues for New Zealand, including future access to exotic genetic resources in the new legal environment. It also warns of the need for care in formulating national policies to avoid inappropriate restrictions of access to New Zealand's plant genetic resources.

Additional key words: *Plant genetic resources, genebanks, biotechnology*

Introduction

New Zealand recently ratified the Convention on Biological Diversity. This Convention is commonly regarded as relating to conservation and sustainable use of the native flora and fauna. However, its implications for agriculture, horticulture and forestry are at least as great, if not greater, than they are for the native species.

New Zealand agricultural food, fibre and forestry sectors are virtually entirely dependent on biological diversity from other countries:

- all of the livestock
- all of the main pasture plants
- all of the crop plants
- all of the fruit crops
- virtually all vegetables
- most ornamental species
- many forest trees

Thus the major *in situ* sources of genetic diversity in our important economic plants all occur in other countries. Our only immediately accessible sources of genetic variation are held in the national genebanks, arboreta and botanical gardens. In a few cases (e.g., old

pastures) there are naturalised populations but these generally contain limited genetic variation and are not immediately accessible. New Zealand must therefore be active internationally in assisting with the preservation of biological diversity.

To remain competitive in the face of changing environmental and economic conditions, New Zealand has a continuing need to explore and introduce new sources of genetic variation in the economic species and to find new species. To date, with few exceptions, our genebanks hold only a tiny proportion of the potentially useful genetic diversity both among and within species. An active programme of genetic resource exploration and maintenance must be carried out.

The Convention on Biological Diversity is about the conservation and sustainable use of the world's genetic diversity. It introduces into law some new concepts for genetic resources work and has important implications for our access to genetic resources in other countries and vice versa. Some of these are covered in this paper.

Since 1983, the protocols for the exchange of agricultural plant genetic resources among many countries have been agreed under an FAO Undertaking, to which New Zealand is a signatory. It is likely that this Agreement will be amended to incorporate all

aspects of the Convention and will become either a protocol to the Convention or a stand-alone legal instrument.

The FAO International Undertaking on Plant Genetic Resources

This is a legally non-binding agreement relating to genetic resources of agricultural plants. When first formulated in 1983, its objective was to ensure that plant genetic resources for interest to agriculture would be explored, preserved, evaluated and made available for plant breeding and scientific purposes without restriction.

In the following 10 year period, the Undertaking was modified to take into account the concerns of countries on issues of plant variety rights, breeders' lines of seed, farmers' rights and sovereignty of genetic resources. Many of these changes have been included in the Convention on Biological Diversity.

Concepts coming into law under the Convention

In the relatively short period since 1983, there have been enormous changes in international thinking about plant genetic resources. Under the Convention on Biological Diversity, several relatively new concepts will come into law:

1. Sovereignty of Genetic Resources

Under the FAO Undertaking in 1983, plant genetic resources were recognised as **"a common heritage of mankind to be preserved, and to be freely available for use, for the benefit of present and future generations."**

In 1991, FAO altered this by endorsing the concept **"that nations have sovereign rights over their plant genetic resources"** and, at the same time, **"that breeders' lines and farmers' breeding material should only be available at the discretion of their developers during the period of development."**

It also recognised that **"the best way to guarantee the maintenance of plant genetic resources is to ensure their effective and beneficial utilization in all countries."**

In only slightly modified form, these concepts have appeared in the Convention where they will eventually pass into law.

2. Access to Plant Genetic Resources

The Convention states that **"The authority to determine access to genetic resources rests with the national governments and is subject to national legislation."**

It further states that each country **'shall endeavour to create conditions to facilitate access to genetic resources for environmentally sound uses'** by other countries.

Access, where granted, shall be **"on mutually agreed terms"** and **"subject to prior informed consent"** of the country providing the genetic resources, unless that country waives this requirement.

These provisions legalise what were previously well-recognised courtesies among plant collectors from official genebanks internationally. However, the major change is from "free access" under which we have previously operated, to access on "mutually agreed terms".

3. Sharing in the benefits of the use of plant genetic resources

The Convention requires that countries using genetic resources **"agree to share in a fair and equitable way the results of research and development and the benefits arising from the results of commercial and other utilization of genetic resources"** with the country of origin.

Mechanisms for achieving this will be worked out over the initial months and years of implementation of the Convention, probably beginning formally in 1996. It appears that there are likely to be several different approaches for achieving this. The first would be through government contributions to the Financial Mechanism to be established under the Convention. This will be a Fund administered centrally to enable developing countries to draw on contributions from developed countries. The second would be by use of bilateral agreements between countries. A third likely outcome is the development of a multi-lateral arrangement using a fairly standard form of agreement by which most countries would abide. However, this is still some distance in the future.

4. Research on genetic resources

The Convention requires participating countries to develop and carry out research based on genetic resources provided by other countries with the full participation of, and where possible in, such countries.

5. Access to and transfer of technology

Each country is required to take legally binding steps to ensure that both the public and private sectors which use genetic resources from other countries or develop technology from them, make this technology and the benefits from it available to the country of origin.

This transfer of technology (which includes biotechnology) is to be on a fair and most favourable basis, and on terms which are mutually agreed and recognise the protection of intellectual property rights.

Implications for New Zealand agriculture

The changes can be seen as enormously valuable in so far that they should ultimately lead to a fair return to all countries providing genetic resources and thereby provide incentives for the conservation of those genetic resources. In the case of developing countries in particular this should help to arrest the genetic erosion that is occurring in the major regions of genetic diversity.

The immediate effect of the forthcoming implementation of the Convention has been for several countries to effectively close their borders, presumably until details of access are worked out. Others are continuing to allow access under very stringent terms requiring consultation on all aspects of research on and use of collected material. Still others have not yet begun to restrict access at all.

Assuming that the Government introduces the appropriate legal framework, New Zealand should continue to be able to access genetic resources (albeit on new terms) from most countries and, as the Convention takes effect, it is likely that some borders will open that have previously been effectively closed.

The terms of access will be the subject of international negotiations in the next few months and years. They will be binding on both the public and private sectors and will require the return of some of the benefits of use of genetic resources to the country providing access. Research and development and training in plant genetic resource management and biotechnology would be part of the terms and conditions

under the Convention. Sharing of germplasm and technology as well as financial compensation under intellectual property agreements are also involved.

Because of its huge dependence on genetic resources from other countries, New Zealand must be meticulous in ensuring that it provides the appropriate returns to those countries when it uses exotic germplasm for plant breeding, biotechnology or other research leading to financial or social benefits.

For the same reason, New Zealand should take care not to introduce legal instruments that would inappropriately restrict access to genetic resources and cause other countries to retaliate by restricting access to genetic resources of importance to this country. In this context, New Zealand should not be conspicuously fast to enact legislation altering its current position on access, although this position will need to be modified in line with the Convention.

On the other hand, New Zealand should be seen to be active in developing systems for research on plant genetic resources and training of scientists and technologists from other countries in the use of genetic diversity. Collaborations with countries in the main regions of origin of the important species would be of mutual benefit. This would involve, in particular, Europe, North and South America, and North and Central Asia.

New Zealand Genebanks

With few exceptions, New Zealand genebanks hold only a very small proportion of the potentially useful genetic diversity in the main plant genera and species. Yet these genebanks hold the country's main store of economically important bio-diversity in readily available form. They also act as insurance against loss of populations from the overseas ecosystems through overuse, overgrazing and other human-induced environmental changes.

A continuing active programme of collection of plant genetic resources for use and research in agriculture and horticulture is needed. With the Convention on Biological Diversity the protocols will change but the need and the opportunities will remain as an ongoing challenge to the national foresight and planning for the future.

These genebanks are well recognised in the scientific community for their central role in preserving biological diversity of naturalised and introduced species. A wider recognition of the genebanks as a crucial part of New Zealand's contribution to conservation and sustainable use of genetic diversity is needed.