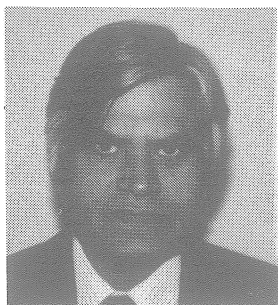


### Management of Genetically Modified Organisms

Dr Abdul Moeed, Secretary, ACNGT, and Chairperson, IAG



#### Introduction

Genetic technology has created opportunities to modify characteristics of organisms to suit specific needs. This has given rise to a desire to balance economic, social, and environmental concerns for the orderly development and management of the new technology.

The development and release of genetically modified organisms (GMOs) into the environment shares common features with the importation of new species. Each release of a "new" organism results in the introduction into the New Zealand environment of an organism which has not previously occurred here, and whose impacts can not be fully predicted.

Because genetic technology is new and prospects exciting, it is more than likely that short cuts may be taken to minimise the time needed for proper environmental evaluation under controlled conditions. This may result in a premature release of a GMO which could have serious environmental consequences later on and beyond where the organism was developed and released in the first place.

This is an important consideration for an island nation such as ours with a high number of native plants and animals many of which are unique in the world.

#### Benefits

Introduction of new species to New Zealand began when some species introduced themselves from Australia, for example birds and insects. The number of introduced fauna and flora increased considerably with the arrival of humans.

Many of these imported animals, plants, and micro-organisms have contributed significantly to the New Zealand way of life and will no doubt continue to do so in the future. Our primary industry is based on imported organisms including sheep, ryegrass, clover, pines, fruits, trout, and salmon. New organisms have contributed to increased agricultural activity and to other economic benefits for New Zealand. New organisms have been used to enhance pest and disease resistance, improve growth rates in crops and livestock, increase feed supply or pasture productivity, improve product quality, and open new markets. They also have had a significant effect on many other areas of agriculture.

In the same way, there are also potential benefits to be gained from recent developments in genetic technology to create GMOs. The use of GMOs could result in new vaccines, increased agricultural productivity, and improved organisms for the fermentation industries and for biological waste control.

#### Risks

However, there may be problems associated with the development and release of GMOs. The new organisms could influence aspects of the environment, including public health, native plants and animals, agriculture or other aspects of people's cultural and social values. Poorly conceived introductions carried out in the past have resulted, many years later, in serious environmental and economic implications for the country. Examples are the Australian brushtail possum, which is a pest in native forests, and the European rabbit, a serious pest in pasture. Release of modified genes in the environment could have similar impacts.

#### Current Situation

The New Zealand guidelines for GMO research were first developed in 1975 at the request of the Medical Research Council (MRC). In 1977 the public sector laboratories agreed to follow

the MRC guidelines for any research relating to GMOs.

In 1978, the Advisory Committee on Novel Genetic Techniques (ACNGT) was set up. The background for the establishment of the ACNGT was the concern among scientists and members of the public alike for the possible ecological and public health consequences of release of a GMO into the environment. The ACNGT is concerned with laboratory experiments involving novel genetic techniques and gives advice to researchers on contained laboratory and glasshouse experiments.

By 1986 it was clear that research in this field in New Zealand was advancing rapidly and many researchers would soon be at the stage of wanting to conduct field trials. Accordingly, the Minister of Science set up the Field Release Working Party (FRWP) to make recommendations on the regulation of field testing and release of GMOs.

In 1987, the FRWP recommended that the Ministry for the Environment (MfE) establish and administer a committee to assess all proposals to field test or release GMOs. The MfE accepted this responsibility as it was already engaged in coordinating the development of a new policy regarding the importation of new species into New Zealand.

It was recognised that until new legislation is in place to guide research into, and development of, GMOs, an interim system for assessing field trials with GMOs would be necessary. It was agreed that MfE should administer the interim system because of its role in the overall new organisms policy development exercise. Therefore, the Minister for the Environment established the GMO Interim Assessment Group (IAG) under Section 33 of the Environment Act 1986. Researchers funded by the Government are required to submit proposals to the IAG for assessment and applications are also invited from the private sector.

Following IAG's establishment, the voluntary moratorium on field releases, which had been in place since 1978, was lifted.

The IAG advises the Minister for the Environment on all applications for work with GMOs outside strictly contained conditions. This includes field trials, some glasshouse trials, work involving volumes greater than 10 litres as in large scale fermentation work and transportation of GMOs.

The IAG has 12 members who bring technical expertise in science, environmental, legal, conservation, industry, agricultural, and Maori perspectives. All proposals before the IAG are publicly notified and submissions called for.

Proposals to field test GMOs are submitted to the IAG secretariat at the MfE. If the IAG is satisfied that all is in order, the applicant then places the public notice in the New Zealand Herald (Auckland), The Dominion (Wellington), The Press (Christchurch), and the Otago Daily Times (Dunedin). This provides the public with an opportunity to make submissions on each proposal. Thirty working days are allowed for public submissions.

In order to ensure that GMO proposals are dealt with in a consistent and effective manner, the IAG has prepared guidelines for certain aspects of GMO work. These include, a checklist for researchers submitting proposals to the IAG, guidelines for the transportation of GMOs, checklist for researchers wishing to export a GMO, guidelines to handle confidential information, and guidelines for the isolation of transgenic animals.

The IAG is kept informed of monitoring work done on the trials. Researchers send their monitoring data to the MfE where it is entered on a datafile and distributed to IAG members.

The IAG believe it is important that information about genetic engineering is more readily available and that a forum is provided in which the related issues can be discussed more fully. It is therefore important that guidelines, based on ethical considerations, are developed for GMOs for human consumption and also those derived from human tissues. Internationally

acceptably guidelines are also needed for the development of biotechnology products and their use.

These considerations are important for example in:

- 1 developing crops with antibiotic or herbicide resistance as protection against pests and diseases. The reason for caution is the possible transfer, through pollen dispersal, of undesirable genes from modified crops to associated weeds and other plants; and
- 2 a hypothetical situation where a genetically modified vegetable is given a gene from an allergenic plant, say from peanuts to potatoes. In such a case it may be required that this fact be made known by way of appropriate identification of the modified potato to protect those who may be allergic to peanuts.

#### *Future Arrangements*

Neither of the two advisory committees (ie the ACNGT and the IAG) has any legislative authority. In part to address this, the Government intends to establish an independent agency, the Environmental Risk Management Authority (ERMA). The

ERMA will be responsible for assessing and approving the development of GMOs in containment and any release of GMOs into the environment.

The Hazardous Substances and New Organisms Bill will specify the new agency's objectives and functions, and the decision criteria which will govern its work. The new Bill is being drafted and is expected to be introduced in 1994.

Until the ERMA is established, MfE will continue its responsibilities for administration of the two advisory committees.

In summary, New Zealand has responded to the advent of genetic technology by establishing mechanisms, compatible with similar developments overseas, to safeguard the environment and public health against possible consequences of an undesirable GMO release into the environment. This has been possible with the consultation and cooperation of the organisations and the people involved in genetic technology.

## *Calendar*

### **Ethics and the Professions: Moral Theories and Contemporary Problems An Interdisciplinary Seminar**

June 4-11, 1994  
University of Nebraska, Lincoln, USA

This seminar will bring together a group of professional school faculty to explore some major ethical theories and apply them to important moral problems arising in the professions. The aim is to clarify ethical theories, define moral concepts, formulate problems encountered in teaching and research, and stimulate both discussions and papers that illuminate these problems.

Stipend and housing: Participants will receive \$1000 plus accommodations, including breakfast, at the University of Nebraska, Lincoln.

#### **Information:**

Write or call Stephen Kalish at the College of Law, University of Nebraska, Lincoln, NE 68583-0902; 402-472-1248.