GENE TECHNOLOGY TECHNICAL ADVISORY COMMITTEE

COMMUNIQUE

This is the second communique of the Gene Technology Technical Advisory Committee (GTTAC). It covers matters considered at the second and third meetings of GTTAC held on 17 December 2001 (teleconference) and 1 March 2002 respectively.

GTTAC is a statutory advisory committee to the Gene Technology Regulator and the Gene Technology Ministerial Council. All committee members and expert advisers hold office on a part-time basis.

The Regulator receives input from GTTAC on all applications for licences to conduct dealings with GMOs and comment on the Risk Assessment and Risk Management Plan (RARMP) that is prepared in respect of each application.

The purpose of this Communique is to provide a brief overview of the applications and RARMPs considered by GTTAC and the advice the Committee has provided to the Regulator on those applications and RARMPs.

The Communique also provides an overview of any other major issues discussed by GTTAC.

RARMPs for licence applications for Dealings involving the Intentional Release of genetically modified organisms (DIRs) are released for comment as part of the consultation process for these applications. Information on how to obtain copies of applications and RARMPs for DIRs is provided at the end of the document.

1. Dealings Not Involving the Intentional Release of Genetically Modified Organisms (DNIRs)

1.1 Input to the preparation of, and advice on, RAMPS for DNIRs (in numerical order of receipt)

Murray Valley Encephalitus Virus (DNIR 001/2001)

The TVW Telethon Institute for Child Health Research has applied for a licence for work to develop a more effective vaccine against Murray Valley encephalitis virus and to test potential vaccines in mice.

GTTAC considered and endorsed the RARMP for this application out of session.

Gene Therapy for Hypertension (DNIR 002/2001)

The University of Queensland has applied for a licence to develop a new model for gene therapy by treating rats with hypertension (high blood pressure) with a gene which produces atrial natriuretic peptide.

GTTAC noted there was a remote possibility of replication competent retroviruses being produced.

GTTAC resolved to advise the Regulator:

. The measures proposed in this application will be adequate to contain the GMOs.

. To assess the risks posed to human health and safety as part of the RARMP the applicant should be requested to test for the presence of replication competent retroviruses.

Construction of Immortalised Macrophage Cell lines (DNIR 003/2001)

The Institute of Medical and Veterinary Science has applied for a licence to generate cell lines from macrophages isolated from patients who suffer from iron overload (haemochromatosis) to study the proteins involved in iron transport.

GTTAC noted that there was a remote possibility of replication competent retroviruses being produced.

GTTAC resolved to advise the Regulator:

. The measures proposed in this application will be adequate to contain the GMOs.

. To assess the risks posed to human health and safety as part of the RARMP the applicant should be requested to test for the presence of replication competent retroviruses.

Pilot Scale Fermentation and Processing of ESO-1 Antigen Expressed in Recombinant E coli (DNIR 004/2001)

Commonwealth Serum Laboratories Ltd has applied for a licence to produce quantities of the protein coded for by the gene ESO-1, isolated from a human oesophageal carcinoma cell line, to be used to test the properties of the protein.

GTTAC noted that the applicant had not provided information on the antibiotic resistance genes being used as marker genes.

GTTAC resolved to advise the Regulator:

. The measures proposed in this application will be adequate to contain the genetically modified organisms (GMOs).

. To assess the risks posed to human health and safety as part of the RARMP information should be sought on the antibiotic resistance genes being used as marker genes.

Testing Protection of Cattle from Fluoroacetate (DNIR 005/2001)

Murdoch University has applied for a licence for a dealing that involves inoculating cattle with rumen bacteria (*Butyrivibrio fibrisolvens*) which have been genetically modified to

detoxify fluoroacetate (a compound poisonous to cattle which occurs in some native plants) and contain antibiotic resistance genes. The cattle will be monitored to see if the bacteria colonise the rumen in the cattle. The cattle will then be challenged with fluoroacetate.

GTTAC considered and endorsed the RARMP for this application out of session. GTTAC requested that some minor amendments be made to the RARMP.

Evaluation of Chimeric Influenza Virus, Incorporating the Fusion Glycoprotein of Respiratory Syncytial Virus (DNIR 006/2001)

The Royal Melbourne Institute of Technology (RMIT) has applied for a licence to generate a virus strain with potential as a live vaccine by replacing a gene from an influenza A virus strain with a gene from the respiratory syncitial virus.

GTTAC considered and endorsed the RARMP for this application out of session. GTTAC requested that some minor amendments be made to the RARMP.

Cloning and Inactivation of Phospholipase Gene from *Clostridium perfringens* to Produce a Non-toxic Vaccine Antigen (DNIR 007/2001)

RMIT is aiming to produce a vaccine against the chicken disease, necrotic enteritis, which is caused by the bacterium *Clostridium perfringens*.

GTTAC noted that ampicillin would not be effective treatment in the case of accidental ingestion of the pathogen.

GTTAC resolved to advise the Regulator that:

. The measures proposed in this application will be adequate to contain the GMOs.

. To assess the risks posed to human health and safety, the RARMP should include advice regarding the choice of an appropriate antibiotic treatment should accidental ingestion of the bacterium occur.

The Role of Osteoclast Inhibitory Lectin in Breast Cancer Metastases to Bone (DNIR 008/2001)

St Vincent's Hospital Melbourne has applied for a licence to study the role of osteoclast inhibitory lectin in breast cancer metastasis to bone. This research is to see if, in mice, an inhibitor of osteoclast formation can slow the spread of human breast cancer cells to bone.

GTTAC considered and endorsed the RARMP for this application out of session. GTTAC requested that some minor amendments be made to the RARMP.

Production of humanised monoclonal antibodies from NSO cells (DNIR 009/2001)

Biotech Australia Pty Ltd has applied for a licence to produce antibodies to be used in clinical trials.

This dealing is a DNIR and not an exempt dealing only because it involves greater than 10 litres of GMO culture.

GTTAC considered and endorsed the RARMP for this application out of session.

2. Dealings Involving the Intentional Release of Genetically Modified Organisms

2.1 Advice on Applications (in numerical order of receipt)

Agronomic Assessment and Seed Increase in Northern Australia of Transgenic Cotton Expressing *Cry1 Ac* or *Cry 1 Ac* and *Cry 2 Ab* Gene from *Bacillus thuringiensis* (DIR 006/2001)

CSIRO has applied for a licence for the limited and controlled release of genetically modified insect resistant types of cotton registered under the trade names INGARD® cotton, Bollgard II® cotton and Bollgard II ®/Roundup Ready® cotton.

INGARD® and Bollgard II® cotton are resistant to the major caterpillar pests that attack cotton. They contain one or two insecticidal genes, respectively, that produce proteins that are toxic to specific insects. Bollgard II®/Roundup Ready® cotton was produced by conventional breeding of Bollgard II® cotton with genetically modified Roundup Ready® cotton which contains a gene for tolerance to the herbicide glyphosate (Roundup®). Bollgard-II®/Roundup Ready® cotton therefore contains the two insecticidal genes from Bollgard II® as well as the glyphosate tolerance gene from Roundup Ready® cotton.

CSIRO is proposing to carry out a limited and controlled release on a total of ten sites in northern Western Australia and the Northern Territory (above latitude 22° South), over a total area of 210 hectares. The purpose of these trials is to continue large-scale evaluation of the agronomic performance of a number of different genetically modified cotton varieties and to produce seed for possible future releases, which would be subject to a separate application and assessment process.

GTTAC resolved to advise the Regulator:

. That the following potential hazards should be addressed in the risk assessment and risk management plan.

(a) The potential for the genetically modified cotton to be harmful to other organisms because it is toxic or allergenic.
(b) The potential for the genetically modified cotton to be harmful to agricultural or natural environments because of inherent weediness or increased potential for weediness.
(c) The potential for the new genes introduced into the cotton to cross into other organisms with adverse consequences.
(d) The potential for resistance to the insecticidal proteins produced by the genes to develop in target insects in the long term.

Improved Alkaloid Production in Oilseed Poppy (*Papaver somniferum*) (DIR 007/2001)

Agriculture Western Australia has applied for a licence for the limited release of an oilseed poppy which has been genetically modified by the introduction of a modified gene involved in the alkaloid production pathway, and a gene conferring resistance to the antibiotic hygromycin.

The purpose of the release is identify whether the alkaloid production of oilseed poppy is altered by the introduction of the genetic modifications. The proposed trial will be carried out on one site in Western Australia covering a total area of 0.2 hectares.

GTTAC noted that without containment poppy may be capable of establishing itself in the region selected for the trial as the seed is capable of long periods of dormancy. GTTAC also questioned the need for a field trial to test for improved alkaloid production when contained cultivation in a glass house may be able to achieve the same result.

GTTAC resolved to advise the Regulator:

. The following risks or potential risks should be assessed in relation to the application

- toxicity or allergenicity of the genetically modified poppy and its products
- weediness or increased potential for weediness
- potential for the introduced genes to cross into other organisms.

. The RARMP should also include measures to prevent the spread or persistence of the GMO or its genetic material in the environment.

. In addition, the following information should be requested from the applicant

- the purpose or justification for the release
- information concerning the effect of the genetic modification on the production of other alkaloids, and the distribution of alkaloids within the plant
- data from previous trials on the emergence and management of volunteers, and the longevity of poppy seed in and around release sites.

Integrated Pest Management Systems for INGARD® Cotton in the Kimberley, WA (DIR 008/2001)

Agriculture Western Australia has applied for a licence for the limited and controlled release of a genetically modified insecticidal type of cotton registered under the trade name INGARD® cotton.

The proposed trial will be carried out on 30 sites in northern Western Australia (above latitude 22° South) over a total area of 500 hectares. The purpose of the trial is to conduct experiments/research on integrated pest management strategies for INGARD® cotton; evaluate the agronomic performance of new varieties of INGARD® cotton; assess the effects of releasing INGARD® cotton on key pests and beneficial insects and to assess the potential development of pests resistant to the insecticidal activity of the cotton.

GTTAC resolved to advise the Regulator:

. That the following potential hazards should be addressed in the risk assessment and risk management plan.

(a) The potential for the genetically modified cotton to be harmful to other organisms because it is toxic or allergenic.
(b) The potential for the genetically modified cotton to be harmful to agricultural or natural environments because of inherent weediness or increased potential for weediness.
(c) The potential for the new genes introduced into the cotton to cross into other organisms with adverse consequences.
(d) The potential for resistance to the insecticidal proteins produced by the genes to develop in target insects in the long term.

Preliminary Field Evaluation of Bollgard II® Cotton in the Kimberley Region of WA (DIR 009/2001)

Agriculture Western Australia has applied for a licence for the limited and controlled release of a genetically modified insecticidal type of cotton registered under the trade name Bollgard II® cotton.

The proposed trial will be carried out over a total of 80 hectares. The purpose of the trial is to conduct experiments/research on integrated pest management strategies for Bollgard II® cotton; evaluate the agronomic performance of new varieties of Bollgard II® cotton; assess the effects of releasing Bollgard II® cotton on key pests and beneficial insects and to assess the potential development of pests resistant to the insecticidal activity of the cotton.

GTTAC resolved to advise the Regulator:

. That the following potential hazards should be addressed in the risk assessment and risk management plan.

(a) The potential for the genetically modified cotton to be harmful to other organisms because it is toxic or allergenic.
(b) The potential for the genetically modified cotton to be harmful to agricultural or natural environments because of inherent weediness or increased potential for weediness.
(c) The potential for the new genes introduced into the cotton to cross into other organisms with adverse consequences.
(d) The potential for resistance to the insecticidal proteins produced by the genes to develop in target insects in the long term.

Small and Large Scale Trialing of InVigor canola for the Australian cropping system (DIR 010/2001)

Aventis CropScience Pty Ltd has applied for a licence for the intentional release of genetically modified canola into the environment. The male sterility line of the modified canola contains the *barnase* gene conferring male sterility and the fertility restorer line contains the *barstar* gene, which inhibits the enzyme produced in the male sterile line. Crossing of the male sterile line with the fertility restorer line results in hybrids which are fertile. Both the male sterile and fertility restorer lines of the modified canola contain the *bar* gene involved in conferring tolerance to the herbicide glufosinate ammonium.

The purpose of the release is to evaluate the agronomic performance of the modified canola and to produce seed for future releases both here (subject to further licence applications) in Australian conditions and overseas. The proposed release would be carried out over three years covering a total of 318 hectares of GM canola on 90 different sites, comprising 106 hectares at 30 sites in each year.

GTTAC noted that glufosinate ammonium herbicide is not widely used in weed control in Australia and therefore the impact of the release on current agricultural and weed control practices would be limited. One exception is the use of glufosinate ammonium in the control of weeds in vineyards, and this might represent one instance where there was potential for an impact on current agricultural practices.

GTTAC resolved to advise the Regulator:

. The following risks or potential risks should be assessed in relation to the application

  - toxicity or allergenicity of the genetically modified canola
  - weediness or increased potential for weediness; and
  - potential for the introduced genes to cross into other organisms.

. The following measures should be addressed in the RARMP to prevent the spread of the GMO or its genetic material in the environment

  - the trials not be conducted within 5 kilometres of vineyards and other horticultural pursuits where the introduction of glufosinate ammonium tolerant plants had the potential to interfere with current agricultural practices.

. In addition, the following information should be requested from the applicant. It was noted that the licence could be issued for a period of one year with the second and third years contingent upon receipt of the information

  - information on the potential impact of glufosinate resistance on the viticulture and horticultural industries
  - information on seed longevity, including data from overseas studies
  - identification of measures to manage a persistent seedbank
  - confirmation that the resources available to the company are sufficient to adequately manage the large size and number of trial sites involved
  - the provision of information on measures for detecting and managing volunteers

- the provision of data on gene flow and on the persistence and population dynamics of GM canola within and around release sites.

Field trials of Roundup Ready® canola (*Brassica napus*) in Australia in 2002 (DIR 011/2001)

Monsanto Australia Ltd has applied for a licence for the intentional release of genetically modified canola into the environment. Roundup Ready® canola is tolerant to glyphosate, the active constituent of the proprietary herbicide Roundup®. Roundup Ready® canola has been genetically modified by the introduction of two genes, the CP4 EPSPS and *gox* genes that confer tolerance to the herbicide glyphosate.

The purpose of the release is to continue development and evaluation of potential commercial lines of genetically modified Roundup Ready® canola, including seed production in preparation for possible commercial release (subject to future licence application). The proposed release would be carried out on a total area of 34 hectares over 26 sites in winter 2002.

GTTAC noted that glyphosate is widely used in weed control in Australia and that the introduction of glyphosate tolerant plants into the environment has the potential to impact on weed control practices.

GTTAC resolved to advise the Regulator:

. The following risks or potential risks should be assessed in relation to the application

- toxicity or allergenicity of the genetically modified canola
- weediness or increased potential for weediness
- potential for the introduced genes to cross into other organisms.

. In addition, the following information should be requested from the applicant

- information on seed longevity, including data from overseas studies
- identification of measures to manage a persistent seedbank
- data on gene flow and on the persistence and population dynamics of GM canola within and around release sites
- the measures that would be taken to exclude large animals from the release site.

2.2 Advice on Risk Assessment and Risk Management Plans (in numerical order of receipt)

Agronomic Assessment and Seed Increase in Eastern Australia of Transgenic Cotton Expressing *Cry1Ac* and *Cry 2Ab* Genes from *Bacillus thuringiensis* (DIR 005/2001)

Cotton Seed Distributors have applied for a licence for large-scale field trial of genetically modified insect resistant cotton (Bollgard II®) and insect resistant/herbicide tolerant cotton (Bollgard II®/Roundup Ready®). The cotton is derived from INGARD® (Bt) cotton.

INGARD® cotton contains the *Cry1Ac* insect resistance gene and two antibiotic resistance genes. An extra insect resistance gene (*cry2Ab*) and a marker gene (*GUS*) were inserted into INGARD® cotton to produce Bollgard II®. The Bollgard II® modification has been backcrossed into a number of commercial cotton varieties developed for Australian farming systems and these are the varieties proposed for the trial.

The purpose of the trial is for seed increase and for large-scale evaluation of agronomic performance, in preparation for a licence application for commercial release of Bollgard II® cotton in 2003. The proposed trials will be carried out over a total of 480 hectares at six sites in the Shires of Balonne and Emerald in Queensland (below latitude 22° South).

GTTAC resolved to advise the Regulator:

. GTTAC agrees with the conclusions of the risk assessment management plan.

. The following additional measures should be taken to manage the risks associated with the release

- monitoring of the plants to determine if gene expression is stable over a period of time
- the applicant be requested to conduct a study to provide information on the effectiveness of the 50 metre isolation zone.

Agronomic Assessment and Seed Increase in Northern Australia of Transgenic cotton Expressing *Cry1Ac or Cry 1Ac* and *cry2Ab* Genes from *Bacillus thuringiensis* (DIR 006/2001)

The details of this application are provided in Section 2.1.

GTTAC resolved to advise the Regulator:

. GTTAC agrees with the conclusions of the risk assessment management plan.

Integrated Pest Management Systems for INGARD® Cotton in the Kimberley, WA (DIR 008/2001)

The details of this application are provided in Section 2.1.

GTTAC resolved to advise the Regulator:

. GTTAC agrees with the conclusions of the risk assessment management plan.

Preliminary Field Evaluation of Bollgard II® Cotton in the Kimberley Region of WA (DIR 009/2001)

The details of this application are provided in Section 2.1.

GTTAC resolved to advise the Regulator:

. GTTAC agrees with the conclusions of the risk assessment management plan.

3. Other Matters

Introduction of Antibiotic Resistance into *S. pyogenes*

GTTAC was requested to provide advice on the risk and appropriate category for dealings with GMOs in which an antibiotic resistance gene is inserted into a human pathogen.

GTTAC resolved to advise the Regulator:

. The introduction of kanamycin or spectomycin resistance genes into *S. pyogenes* as part of NLRD 037/2001 does not increase its virulence.

. The introduction of antibiotic resistance genes into potential pathogens does not increase their virulence.

. The appropriate category for the dealing was Schedule 3, Part 1.1(d), of the Gene Technology Regulations 2001. Consideration should be given to amending that regulation to give effect the principle that if a proposed dealing impairs in any way the treatment of a disease it should not be classified as an NLRD.

Enquiries and Risk Assessment and Risk Management Plans

For all enquiries and to obtain copies of applications and Risk Assessment and Risk Management Plans for dealings involving the intentional release of GMOs into the environment please phone the OGTR on 1800 181 030. The documents are also available electronically from our website at http://www.ogtr.gov.au/publications/riskassessments.htm

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