

## Background Brief

### Genetically Manipulated Cotton in Northern Australia

To assist the community, media, Indigenous and other groups to understand conservation opposition to the release of genetically manipulated cotton into northern Australia.

In this brief :

- GM means genetically manipulated.
- Bt means *Bacillus thuringiensis*, soil bacterium used in some GM cottons.
- OGTR is the Office of the Gene Technology Regulator.
- APVMA is the Australian Pesticides and Veterinary Medicines Authority.
- RARMP is a Risk Assessment and Risk Management Plan prepared by the OGTR.

#### 1. What are the different types of GM cotton?

Different types of GM cotton do different things. Herbicide resistant cotton such as Liberty Link® and Roundup Ready® can be sprayed with particular herbicides without dying. This allows farmers to spray herbicides to kill weeds without harming the GM cotton plant.

The insecticide resistant GM cotton, Bollgard II®, contains two genes inside that kills particular insects. In this case the Cotton Bollworm and the Native Budworm will die when they eat Bollgard® GM cotton. Other insects however are not affected by the GM cotton.

The genes that are inside Bollgard II® have been taken from a soil bacterium called *Bacillus thuringiensis* or Bt for short. The Bt gene specifically kills lepidopteran insects such as Bollworms and Budworms. An earlier version of the GM cotton, Ingard®, only contained one Bt gene. As Bollgard II® contains two Bt genes it is often referred to as double Bt gene cotton.

#### 2. Where has GM cotton been grown?

On and off over the last ten years there have been various trials of GM cotton in northern Australia including the Kimberley (in the Ord and near Broome), the Northern Territory (at Katherine) and North Queensland (in the Burdekin and at Richmond). These trials have been undertaken with different types of GM cotton, on different sized sites.

In southern Australia GM cotton specifically Bollgard II®/Roundup Ready® has been grown commercially since 2003. The single Bt gene cotton, Ingard® was grown in southern Australia from 1996 – 2003.

#### 3. What's wrong with GM cotton?

##### Resistance in pests and plants

If you use the same chemicals over and over again the weeds that are being exposed may develop a resistance or immunity to that chemical. For example, if the herbicide Roundup Ready® is used on Roundup Ready® GM cotton to kill weeds some time down the track it is likely that the weeds will become immune to the herbicide and therefore new and different herbicides will be needed to kill the resistant weeds.

With Bollgard II® GM cotton the Bollworm and Budworm that die when they eat the GM cotton may develop a resistance to the insecticide inside the GM cotton over generations. As these insects can reproduce rapidly it is easier for them to develop a resistance to the Bt gene.

In southern Australia Bollgard II® GM cotton is grown. In an effort to slow down these insects developing resistance to Bollgard II® GM cotton, refuge crops of other plants such as chickpeas or lablab have to be grown. These 'refuge crops' support Bollworm and Budworm populations that are not eating the GM cotton. This way there will be some insects that are not resistant to the GM cotton that are breeding with those insects that are resistant, thereby slowing down resistance building in all Bollworm and Budworm populations. However, it is only a matter of time before resistance to Bollgard II® will occur and growers are not happy about having to grow and tend a refuge crop that doesn't provide any financial benefits.

### **Unknown long term effects – not enough research**

Not enough is known about GM cotton in northern Australia to be sure what its impacts are on the environment and human health. There has been no research in northern Australia on the impact of GM cotton on native species such as goannas and frogs that feed on insects that might in turn feed on GM Cotton. There has also been limited research in northern Australia on soil micro-organisms and how the GM cotton might affect soil fungus and other diseases.

### **Impact on 'good' insects**

In agriculture there are 'good' insects that are called 'beneficials' because they eat other insects that cause problems for crops. The main cotton crop pests, Cotton Bollworm and Native Budworm, can be controlled by using Bollgard II® GM Cotton, however there are a host of other insects including spider mites, thrips and aphids that are not affected by Bt gene and still need to be managed. One way of managing 'pest' insects is for beneficial insects to eat them. To keep healthy populations of beneficial insects you have to reduce your sprays of chemicals such as pesticides. If pest populations do increase beyond the capacity of beneficial insects to keep them in check, chemicals will be used to kill the pests. This will wipe out beneficial insect populations and increase the need to continue to spray to keep pest insect populations low.

### **Chemicals**

A lot of chemicals will still need to be used with GM cotton – to spray for weeds and to kill insects. Other chemicals are likely to be used to control soil fungus problems and for fertiliser. These chemicals can get into the water and the soil and may poison animals and water sources. These chemicals can also harm humans. Chemicals are also used prior to harvest of GM cotton to strip the leaves off, these are called defoliant. Also if there are any wet season crops grown to reduce soil erosion and improve soil health, they will be sprayed with a herbicide before the GM cotton is planted. Chemicals are fundamental to growing GM cotton in northern Australia.

### **Water**

GM Cotton production also requires lots of water which should stay in the rivers and in underground reservoirs. Water will be taken from ground and river sources during the dry season. This can affect breeding of animals like the Pig Nosed Turtle, harm traditional activities, affect fishing and reduce natural flows.

## Landclearing

Lots of land that supports healthy native bush will need to be cleared to grow GM cotton crops. Land clearing destroys wildlife and habitats, stops traditional use, can lead to erosion, allows the spread of weeds and contributes to global warming.

## Ongoing problems

There are lots of issues with growing GM cotton that haven't been sorted yet, including a leaf disease called Alternaria and a soil fungus which kills the plants, called Fusarium wilt. There are also problems with new insects becoming pests such as Cluster Caterpillars and Aphids. The Silverleaf Whitefly, which is a pest and can also carry viruses, has been found in the Northern Territory and near the Burdekin River in Queensland.

## 4. What is happening right now with GM cotton in northern Australia?

There are two companies who want approval to grow GM cotton all over Australia, including northern Australia. Monsanto wants to grow BollgardII®/ Roundup Ready Flex®, the insecticide and herbicide resistant GM cotton and Bayer CropScience wants to grow Liberty Link®, a herbicide resistant GM cotton. Their applications for commercial release approval are currently with the Office of the Gene Technology Regulator (see Question 6).

## 5. What does 'commercial release' mean?

When a GM crop has approval to be 'commercially released' it can be grown anywhere. There are no other approvals it needs as a GM crop.

Currently in northern Australia GM cotton has only been grown in trials. Companies are now trying to obtain approval for 'commercial release' so this cotton can be grown in large quantities anywhere in northern Australia including the Kimberley, Cape York, the Gulf and the Top End.

## 6. Who approves the use of GM crops?

The Office of the Gene Technology Regulator (OGTR) is a Commonwealth Government agency within the Department of Health and Ageing. The OGTR is responsible for assessing and approving the use of GM cotton for trials and for commercial release. The *Gene Technology Act 2000* (Cth) directs the OGTR in how it assesses applications to grow GM cotton and other crops. The Regulator must consider the risk to human health and safety and to the environment if the GM crop were released. For more information go to [www.ogtr.gov.au](http://www.ogtr.gov.au)

If chemicals such as herbicides are to be used on the GM cotton crop they are assessed and approved by another Commonwealth Government agency, the Australian Pesticides and Veterinary Medicines Authority (APVMA) which is part of the Department for Agriculture, Forestry and Fisheries. For more information go to [www.apvma.gov.au](http://www.apvma.gov.au)

**Check out the OGTR website for further information on the specific applications by Monsanto and Bayer CropScience to grow GM cotton in northern Australia. Their licence applications are identified as DIR062/2005 for Bayer CropScience and DIR066/2006 for Monsanto.**

## **7. How can I get involved in this process?**

When a Company, Government Department or other organization or person wishes to grow GM cotton they must have an approval from the OGTR. A licence application is lodged and the Gene Technology Regulator puts a notice of the application on the website. There is a two step process where public comments may be made on the licence application and/or on the Risk Assessment and Risk Management Plan. The Risk Assessment and Risk Management Plan (RARMP) is a document prepared by the Gene Technology Regulator in response to the licence application which details the risks and the management of those risks. Both of these documents are usually long, rather technical and confusing! We recommend that you contact the OGTR with any questions or call your nearest conservation group for assistance.

The processes for assessing and approving chemicals to be used on a GM crop are managed by the APVMA and there are limited opportunities for you to have your say. There may be a Public Release Summary where the APVMA has assessed the environmental impacts and risks of a particular chemical and is calling for public submissions. There is no explicit requirement for the APVMA to consider regional variations when assessing the potential impact and risks of a chemical, such as the use of the chemical in northern Australian conditions. The APVMA also has to assess whether the use of a particular chemical might affect Australia's trade with another country. In these cases public submissions are called in response to a Trade Release Notice. Comments must only be on the possible impact on Australia's trade of using this chemical.

In relation to GM Cotton, the APVMA has already assessed the environmental impact of Bollgard II® insecticide, Roundup Ready Flex® herbicide resistance and Liberty Link® herbicide resistance within GM Cotton and issued approvals. There are Trade Release Notices for Roundup Ready Flex® herbicide for use on Roundup Ready Flex® GM Cotton and on the Liberty® 150 Herbicide, to be used on Liberty Link® GM Cotton. Please check out the public notices section at [www.ogtr.gov.au](http://www.ogtr.gov.au) and [www.apvma.gov.au](http://www.apvma.gov.au) for further information.

## **8. What's wrong with broadscale irrigated agriculture?**

Broad scale irrigated agriculture means extensive land clearing, high consumption of water and massive chemical use. It is not a sustainable economic activity for northern Australia.

## **9. What do conservation groups want?**

We want sustainable economic development in northern Australia based on keeping country healthy. This means no broadscale irrigated agriculture and therefore no GM cotton.

## **10. What else can I do to oppose GM cotton?**

If you have concerns about GM cotton you can:

1. Get involved in the government processes for assessing and approving GM Cotton (the OGTR or APVMA);
2. Make your concerns known by writing to:
  - the Environment Minister and Agriculture Minister in your own State or Territory
  - the Federal Minister for Health and Ageing, Minister for Agriculture, Fisheries and Forestry and Minister for Environment and Heritage
  - your local government body
  - your local paper;

- the companies seeking to grow GM Cotton in northern Australia, such as Monsanto and Bayer CropScience;
- 3. share information with others in your community
- 4. contact one of the conservation groups below to join in actions and keep informed.

If you want to know more about GM cotton:

- contact the OGTR or your State or Territory Department of Agriculture
- contact the nearest conservation group listed below
- check out [www.geneethics.org](http://www.geneethics.org), [www.i-sis.org.uk](http://www.i-sis.org.uk),

### Contacts as at July 2006

#### Conservation Groups

Environs Kimberley - Broome  
08 9192 1922

[envrkimb@broome.wt.com.au](mailto:envrkimb@broome.wt.com.au)  
[www.environskimberley.org.au](http://www.environskimberley.org.au)

Environment Centre of the Northern Territory – Darwin  
08 8941 1984

[ecntdaly@inet.net.au](mailto:ecntdaly@inet.net.au)

Cairns and Far North Environment Centre – Cairns  
07 4032 1746

[campaign@cafnc.org.au](mailto:campaign@cafnc.org.au)  
[www.cafnc.org.au](http://www.cafnc.org.au)

North Queensland Conservation Centre – Townsville  
07 4771 6226

[coord@nqcc.org.au](mailto:coord@nqcc.org.au)  
[www.nqcc.org.au](http://www.nqcc.org.au)

Australian Conservation Foundation – Cairns  
07 4031 5760

[j.crase@acfonline.org.au](mailto:j.crase@acfonline.org.au)  
[www.acfonline.org.au](http://www.acfonline.org.au)

The Wilderness Society – Cairns  
07 4041 6666

[cairns@wilderness.org.au](mailto:cairns@wilderness.org.au)  
[www.wilderness.org.au](http://www.wilderness.org.au)

#### Government Departments and Agencies

Office of the Gene Technology Regulator (OGTR)  
All information about assessing and approving releases  
of GM crops including cotton

Dr Sue Meek - Gene Technology Regulator  
1800 181 030

[www.ogtr.gov.au](http://www.ogtr.gov.au)  
[ogtr@health.gov.au](mailto:ogtr@health.gov.au)

Australian Pesticides and Veterinary Medicines  
Authority (APVMA)  
(02) 6272 5852

[www.apvma.gov.au](http://www.apvma.gov.au)

#### Ministers - Commonwealth

Ian Campbell  
Minister for Environment and Heritage  
[senator.ian.campbell@aph.gov.au](mailto:senator.ian.campbell@aph.gov.au)

Tony Abbott  
Minister for Health and Aging  
[Tony.Abbott.MP@aph.gov.au](mailto:Tony.Abbott.MP@aph.gov.au)

Peter McGauran  
Minister for Agriculture  
[Peter.McGauran.MP@aph.gov.au](mailto:Peter.McGauran.MP@aph.gov.au)

Anthony Albanese  
Shadow Minister for Environment and Heritage  
[A.Albanese.MP@aph.gov.au](mailto:A.Albanese.MP@aph.gov.au)

Julia Gillard  
Shadow Minister for Health  
[Julia.Gillard.MP@aph.gov.au](mailto:Julia.Gillard.MP@aph.gov.au)

Gavan O'Connor  
Shadow Minister for Agriculture and Fisheries  
[Gavan.Oconnor.MP@aph.gov.au](mailto:Gavan.Oconnor.MP@aph.gov.au)

**Ministers – Queensland**

Tim Mulherin  
Minister for Primary Industries and Fisheries  
[DPI@ministerial.qld.gov.au](mailto:DPI@ministerial.qld.gov.au)

Henry Palaszczuk  
Minister for Natural Resources, Mines and Water  
[NRM@ministerial.qld.gov.au](mailto:NRM@ministerial.qld.gov.au)

Desley Boyle  
Minister for Environment, Local Government, Planning  
and Women  
[ELGPW@ministerial.qld.gov.au](mailto:ELGPW@ministerial.qld.gov.au)

Stephen Robertson  
Minister for Health  
[Health@ministerial.qld.gov.au](mailto:Health@ministerial.qld.gov.au)

Anna Bligh  
Deputy Premier, Treasurer, Minister for State  
Development, Trade and Innovation  
[DeputyPremier@ministerial.qld.gov.au](mailto:DeputyPremier@ministerial.qld.gov.au)

**Ministers – Northern Territory**

Kon Vatskalis  
Minister for Primary Industries and Fisheries  
[minister.vatskalis@nt.gov.au](mailto:minister.vatskalis@nt.gov.au)

Marion Scrymgour  
Minister for Natural Resources, the Environment and  
Heritage  
[marion.scrymgour@nt.gov.au](mailto:marion.scrymgour@nt.gov.au)

Dr Peter Toyne  
Minister for Health  
[minister.toyne@nt.gov.au](mailto:minister.toyne@nt.gov.au)  
Clare Martin  
Chief Minister  
Minister for Indigenous Affairs  
[chiefminister.nt@nt.gov.au](mailto:chiefminister.nt@nt.gov.au)

Paul Henderson  
Minister for Business and Economic Development  
[minister.henderson@nt.gov.au](mailto:minister.henderson@nt.gov.au)

**Ministers – Western Australia**

Kim Chance  
Minister for Agriculture and Food  
[kim-chance@dpc.wa.gov.au](mailto:kim-chance@dpc.wa.gov.au)

Jim McGinty  
Minister for Health  
[jim-mcginty@dpc.wa.gov.au](mailto:jim-mcginty@dpc.wa.gov.au)

Mark McGowan  
Minister for the Environment  
[mark-mcgowan@dpc.wa.gov.au](mailto:mark-mcgowan@dpc.wa.gov.au)

Alan Carpenter  
Premier  
Minister for State Development  
[wa-government@dpc.wa.gov.au](mailto:wa-government@dpc.wa.gov.au)

Jon Ford  
Minister for the Kimberley  
[jon-ford@dpc.wa.gov.au](mailto:jon-ford@dpc.wa.gov.au)

**Companies**

Bayer CropScience  
1800 636 001  
1800 223 002  
[www.bayercropscience.com.au/](http://www.bayercropscience.com.au/)

Monsanto Australia Ltd  
03 9522 7122  
[www.monsanto.com.au/layout/default.asp](http://www.monsanto.com.au/layout/default.asp)