

11 July 2016

## **Field test GMF100001 - Annual Report to the Environmental Protection Authority (EPA)**

This report relates to control 13 for the field test approval GMF100001 (ERMA200479), approved 14 December 2010. The report covers the period 1 June 2015 to 31 May 2016. This is the fifth annual report for the approval.

Note, currently no genetically modified trees or cuttings are planted on the field site under the field test approvals GMF99001 or GMF99005.

### **Purpose of field test**

To field test in containment *Pinus radiata* with genetic modifications to alter plant growth/biomass acquisition, reproductive development, herbicide tolerance, biomass utilisation, wood density and wood dimensional stability.

### **Field testing activities carried out**

On 29 July 2015, during a scheduled inspection for reproductive structures, an immature reproductive structure was observed on a control (non-modified) tree in the herbicide resistant trial. The immature reproductive structure was on an untransformed control (wild-type) tree planted at the same time as the genetically modified trees.

On 31 July 2015, the 185 trees still growing in the herbicide resistant trial were felled and composted. The trial was ended because all the required data had been collected.

On 14 August 2015, 684 trees with genetic modifications intended to alter biomass utilisation were transferred to the field test site. These trees were planted on 20 October 2015.

On 12 November 2015, the extended field test area was approved for use by the Ministry for Primary Industries. The field test area is now approximately 2.8 hectares.

On 18 December 2015, 219 trees carrying genetic modifications to alter biomass utilisation were transferred to the field test site. These trees were planted on 25 January 2016 and 19 February 2016.

On 31 May 2016, during a scheduled inspection for reproductive structures, a reproductive structure was observed on a tree in an experiment to modify plant growth/biomass acquisition. The immature reproductive structure was on an untransformed control (wild-type).

### **Unforeseen adverse effects and incidents that have occurred**

No unforeseen adverse effects have occurred.

## **Incidents**

No incidents have occurred.

## **Activities relevant to engagement with Maori**

A number of groups and individuals representing iwi and Māori business interests toured the site and discussed forest biotechnology. These interactions have given opportunities to exchange information about the future use of genetic modification technology for both commercial and environmental applications.

## **Results of the field test research which have been disseminated to third parties**

Results from the field trial, and field trial associated activities, form part of many of Scion's interactions with stakeholders. During the last year these have included:

- Scientific presentations at academic conferences in New Zealand and internationally
  - e.g. - EPSO/FESPB Congress 2016, June 2016
- Industry workshops and meetings
  - e.g. – Growing Confidence in Forestry's Future Workshop - Genetics 101, May 2016
- Outreach activities
  - MBIE-funded Unlocking Curious Minds project- Our Biotech future, April 2016.

## **Environmental impact research**

Glasshouse-based research investigating the impact of a genetic modification in biomass utilisation on pine-feeding insects was completed. No significant differences in survival were found between insects fed on genetically modified pines, transgenic controls or wild-type trees.

## **Five-year assessment of outcomes and benefits achieved to date**

The field trial approval (control number 13) requires that every fifth year the annual report contains an assessment of the outcomes and benefits achieved to date. These are described below for the period 1 June 2011 to 31 May 2016.

Because of the life cycle of *P. radiata* each field test experiment will require several years to complete. Experiments investigating improvements in a number of approval-specified traits are now growing in the trial and comprehensive evaluation is ongoing.

There was some initial delay in beginning field trial experiments as a result of criminal damage to trees growing in the site. The first trees planted under approval GMF100001 (in September 2011) were destroyed in April 2012 by unknown persons who illegally entered the site. Further plantings were delayed while security was evaluated and additional measures put in place.

The destroyed trial, investigating herbicide tolerance, was replanted and has recently been completed. Results are being prepared for publication.

Our ongoing engagement with mana whenua hapū concerning genetic modification and the field trial has continued to develop with a Kaumātua from Ngāti Tuteata involved in monitoring progress of the field test. A Ngāti Whakaue's Matakokiri Wananga, held at Scion in April

2015, provided an opportunity for Ngāti Whakaue ākonga (40 students and 20 whānau) to see and discuss our field trial and work with GMO trees.

One of the most significant ongoing benefits from the field trial has been its use to facilitate engagement with government, industry, Māori and public stakeholders concerning genetic modification technology, potential benefits and its regulation in New Zealand. Scion's operation of the field trial, in full compliance with the controls set out in our approval, has demonstrated the benefits of safely conducting field testing in New Zealand to collect New Zealand relevant data to inform future decision making on the use of genetic modification.

These interactions have included dialogue with groups that are opposed to genetic modification. The organisers of the Food Matters Aotearoa Conference, held at Te Papa Wellington, requested a meeting with Scion to discuss genetic modification of trees. We hosted a discussion between national and international participants from the conference and a number of Scion scientists.

A considerable number of stakeholders have visited the field trial site and observed the safe and compliant operation of the trial as well as discussed the ongoing research outcomes and New Zealand's current regulatory processes.

Visitors to the facility have included:

- Members of New Zealand's Parliament (Hon. Jo Goodhew, Hon. Guy Nathan, Hon. Todd McClay).
- Representatives of Government and regulatory agencies including:
  - EPA
  - MPI
  - MBIE
  - MfE
  - Treasury
  - Kahui Kaumatua (the EPA Māori National Network)
  - EPA HSNO Advisory committee.
- Industry - including representatives of:
  - NZ Forest Owners Association
  - NZ Farm Forestry Association
  - Arborgen LLC (USA) and Arborgen NZ
  - Wai NOTZ
  - Individual forest managers.
- CRI Board Chairs from AgResearch, GNS, Plant and Food Research and NIWA.
- Representatives of the Institute of Forest Biotechnology.
- Visiting national and international scientists.
- Representatives of iwi and other Māori organisations.
- Media representatives including press and television (TV3 and TVNZ).

In addition to site visits, the operation and results from the trial have been extensively used in presentations and discussions with third parties. These include public outreach activities (presentations to schools and community organisations e.g. Rotorua Rotary and Green Drinks clubs, Parliamentary talks), industry workshops and discussions, e.g. STIMBR, NZFOA and Wood Processors and Manufacturers Association, and national and international science events.

Further benefits have arisen from our continued development of New Zealand-based expertise in the genetic modification of conifers and our ability to test innovative solutions to current and future challenges to the forest industry. The field trial has also enabled us to further develop national and international collaborations through our ability to evaluate whether laboratory based outcomes are able to be translated into an operational setting.