

10 July 2021

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 2020 to 31 May 2021. This is the tenth annual report for the approval.

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

376 trees for a new trial (ST_PR_002 and ST_PR_002 traits) were transferred to the Field Test site on 2/6/2020. These trees were planted in pots on 15, 16 and 17/6/2020.

The Field Test manual was reviewed and updated, and MPI approved the revised manual on 20/7/2020.

Refresher training of approved users was conducted in August 2020.

The Ministry of Primary Industries conducted an audit of Field Test activities on 20/11/2020 and the outcome was acceptable. No areas of non-compliance were identified.

The Ministry of Primary Industries conducted an audit of Field Test activities on 13/5/2021 and the outcome was acceptable. No areas of non-compliance were identified.

Details of inspections for reproductive structures and outcomes are given in Table 1.

Table 1: Identification of immature reproductive structures during scheduled inspections. For transgenic trees, the dates that the immature structures were removed and the trees carrying them were felled, are given. WT indicates wild type (non-transgenic) trees.

Date of identification	Number of trees identified - trait	Date of removal of structures from tree	Date of tree felling
30/6/2020	1 - Terpene - 1618	30/6/2020	9/7/2020
11/8/2020	3 – Terpene – 1071, 1072, 1074	11/8/2020	25/8/2020
8/9/2020	1 – Terpene - 1804	8/9/2020	22/9/2020

Unforeseen Incidents

No unforeseen incidents have occurred.

Activities relevant to engagement with Māori

Ongoing consultation has continued, including the continued involvement of a Kaumātua from mana whenua monitoring of the site. Mana whenua (Ngā Hapū e Toru) and their relationship with Scion has continued to evolve since the granting of the approval. Discussions between Scion and Ngā Hapū e Toru about field trial operation and management have also taken place. As a result of these discussions, a report updating mana whenua on the work we are doing and summarising our history of engagement has been prepared that will form the basis for continuing to develop relationships.

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

Results from the field test and field test associated activities form part of many of Scion's interactions with stakeholders. Covid-19 related reduction in travel has reduced the number of on-site interactions. This year these have included:

- Tour of site and discussions with the Radiata Pine Breeding Company.
- Site tour and discussions with the Wood Industry Transformation Team at MPI.
- Tour of site by the Wood Industry Transformation Plan Project leader.

The work undertaken in the trial and activities associated with it has continued to be showcased in presentations. Over the last year this has included virtual events:

- A virtual presentation to the Forest Growers Research Conference 2020.
- A webinar to the wilding conifer management group 2020.
- An in-person presentation to the Bluegreens forum 2021.

Environmental impact research

No environmental impact research was conducted.

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 2016 to 31 May 2021.

A key ongoing benefit of the trial has been to demonstrate to government, industry, Māori and public stakeholders that modified trees can be grown and prototyped in a safe and fully compliant way in an outdoor containment facility under New Zealand conditions. This has facilitated engagement on trait modifications, regulation and future applicability of biotech innovation in New Zealand's planted forests.

Visitors to the site have included:

- Representatives of NZ government and regulators.
- Industry groups and representatives.
- Māori groups and individuals.
- International delegations and working groups.
- National and international scientists.
- University and School groups and members of the public.

In addition to site visits, the operation and results from the trial have been extensively used in presentations and discussions with third parties. These have included industry conferences and workshops, national and international science conferences and discussions with stakeholders.

Additional benefits have accrued from the New Zealand-based capability that has continued to be developed in the genetic modification of conifers and in field testing expertise. This enables the potential economic and environmental risks and benefits to be tested in New Zealand rather than overseas where growth and environmental conditions will be different. Tertiary education students have been involved in projects associated with genetic modification and with field trial activities giving the next generation of New Zealand scientists experience of genetic innovation in forestry.

Another outcome of this capability building has been to maintain and increase New Zealand's connectivity to, and collaboration with, international organisations involved in producing and testing modified trees.

Trees modified with several different traits have been prototyped in the field test. These have included modifications targeting reproductive development, herbicide tolerance, plant growth/biomass acquisition and biomass utilisation.

Because of the growth cycle of *Pinus radiata* each field trial test takes several years to complete as many traits can only be evaluated in more mature trees. During the Covid-19 lockdown period in New Zealand it was decided to terminate three trials investigating biomass acquisition at an earlier age than anticipated. During scheduled monitoring, possible early stage reproductive structures were identified on a large number of trees. Our existing protocol would be to continue to monitor these trees to determine whether these were initiating reproductive structures or vegetative growth. Because of the unprecedented challenges and unpredictability associated with Covid-19 we acted with an abundance of caution. To prevent any compliance issues should staff members become infected with Covid-19, and the compliance group become unavailable, we terminated (killed) the trees before we were able to determine whether they would develop reproductive structures. This resulted in a loss of future data associated with these trials.