

## Submission on Application to Field Test GM Pines

(Application Code: ERMA200479)

**To:** GM Pines Submissions  
ERMA New Zealand  
PO Box 131  
Wellington

**Email:** [gmpines@ermanız.govt.nz](mailto:gmpines@ermanız.govt.nz)  
**Fax:** (04) 914 0433

**This submission relates to an application made by Scion to field test genetically modified (GM) pine trees in containment.**

If you have any questions about making a submission please contact ERMA New Zealand on (04) 918 1489 or visit [www.ermanız.govt.nz](http://www.ermanız.govt.nz) for details.

**Closing date for submissions: Wednesday 6 October 2010**

Your name: **Glen Mackie**

Organisation name: **New Zealand Forest Owners Association**  
(if you are submitting  
on its behalf)

Email: [glen.mackie@nzfoa.org.nz](mailto:glen.mackie@nzfoa.org.nz)

Postal address: **P.O.Box 1208**  
**Wellington 6140**

Telephone number: **04 473 4769**

## Privacy

**Please keep my contact details confidential**

ERMA New Zealand will deal with any personal information you supply in your submission in accordance with the Privacy Act 1993. We will use your contact details for the purposes of processing the application that it relates to (or in exceptional situations for other reasons permitted under the Privacy Act 1993). Where your submission is made publicly available, your contact details will be removed only if you have indicated this as your preference in the tick box above. We may also use your contact details for the purpose of requesting your participation in customer surveys.

ERMA New Zealand is likely to post your submission on its website at [www.ermanız.govt.nz](http://www.ermanız.govt.nz). We also may make your submission available in response to a request under the Official Information Act 1982.

We recommend that you read the full application before completing your submission. The application can be downloaded from: [www.ermanz.govt.nz/find/webResults.aspx?search=erma200479](http://www.ermanz.govt.nz/find/webResults.aspx?search=erma200479)

## Decision sought

Please select one option

I support this application and would like it approved

OR

I oppose this application and would like it declined

OR

I neither support nor oppose this application

## Hearing

Please select one option

I wish to speak at the hearing in support of my submission

OR

I do not wish to speak at the hearing in support of my submission

## Host organism and modifications

Scion is proposing to field test genetically modified (GM) *Pinus radiata* (pine) trees.

The pine trees will have been altered for the following characteristics:

- plant growth/biomass acquisition
- herbicide tolerance
- wood density, and
- reproductive development
- biomass utilization
- wood dimensional stability

Do you have any comments about the use of *Pinus radiata* (pine tree) as a host organism?

---

Very suitable host organism:

92% of NZ's plantation estate is in radiata due to its superior economic performance over alternative species in a wide range of habitats. Therefore any genetic improvements have an economic basis for adoption.

NZ does not have any native pines. Contamination of the indigenous estate cannot occur from the inadvertant release of pine pollen.

Do you have any comments about the characteristics of the GM pine trees that Scion is proposing to field test?

---

All proposed traits / characteristics are desirable and appropriate for investigation. In assessing the risks and benefits of GM application there are the factors that forest owners would want further information on, both in terms of direct performance and also any other unrelated effects.

Plant growth / biomass acquisition: Direct impact on the profitability of a stand. Fast early growth, out competing weeds can result in a lowered need for chemical control of weeds. Biomass acquisition - additional wood volume can translate into greater stand value.

Reproductive development: Being able to produce sterile trees could reduce the problem of wildlings,

---

plus address concerns of unplanned spread of GE trees. In NZ, new plantings are via seedlings purchased from nurseries. Tree owners do not grow seedlings from their own seed, so sterile seed is not an issue. Seed orchards can control available pollen (standard tree breeding practice) and would not be affected by sterile trees.

Herbicide Tolerance: The ability to use glyphosate directly over pines to remove competing weeds would remove the need to use more toxic chemicals. There would be no issue with weed resistance to glyphosate as tree plantations typically only spray 2-3 years per crop rotation (30yrs).

Wood Density: Positively correlated with a number of desirable wood traits ie: stability

Wood Dimensional Stability: Highly desirable trait in nearly all sawn timber products. Current radiata estate has dimensional stability issues for a significant proportion of the resource.

## Containment

The GM pine trees will be contained in accordance with the MAF/ERMA Plant Containment Standard (available at [www.ermanz.govt.nz/find/webResults.aspx?search=erma200479](http://www.ermanz.govt.nz/find/webResults.aspx?search=erma200479)). Scion has proposed that the trees would not be allowed to produce mature reproductive structures and would be cut down at 8 years of age (or earlier).

Do you have any comments about the proposed containment measures?

---

Very comprehensive. IF these restrictions are adhered to we consider that all reasonable and practical contained steps will have been taken and they will provide a high level of security.

## Location

Scion is proposing to carry out this field test at a MAF Biosecurity NZ approved plant containment facility in Rotorua, New Zealand.

Do you have any comments about how the location of the field test might affect you or your organisation?

---

Noting that no genetically modified material is to be released into the environment then unlikely the location will affect any forest owners nearby resources.

Even if pollen was allowed to be released (and noting that the trees will not be allowed to produce mature reproductive structures), this would not "contaminate" any neighbouring radiata resource with respect to markets. The product sold from a forest is the stem and the genetic make up is determined by the original parents that donated genetic material for the original seed. ie: The wood would not contain any inadvertently released GE material.

The seed however on a neighbouring stand could be "contaminated" by an inadvertent release of pollen. However, as there are no seed orchards in the vicinity this should not be an issue. In addition, technology is commonly used in the industry on seed orchards to exclude wild pollen. The NZ forest industry no longer utilises seed from non-seed orchard stands.

## Time limit

Scion has requested that the field test be approved for a period of 25 years.

Do you have any comments about this proposed duration?

---

It is noted that the period comprises a number of sub-trials rather than one continual assessment. This allows for adaptation depending on results while remaining within the overall constraints and is appropriate rather than requiring continual application. That said, on-going approval should be subject to adhering to the scope and containment requirements of the original application.

No issues with time period.

## Effects on the environment

What potential **adverse** effects might the GM pines have on the environment?

---

In most cases the potential undesirable effects and the probability of their occurring are uncertain and that is one of the prime objectives listed by Scion as wanting to undertake this work. A suitably managed field trial with appropriate controls is an essential step toward quantification of risk.

We note the protection measures such as removal of mature flowers and physical containment make release to the wider environment extremely unlikely.

NZ is in a different position to many other countries in that we have no native pines. Therefore there is no ability for pollen to fertilise a native or indigenous resource.

Wood is the main product produced from a forest - an existing stand/forest does not become contaminated from wild pollen. (Unlike wheat, corn, rice etc). So we consider this greatly reduces the potential adverse effects a trial could have.

While the development of herbicide tolerance in weeds has been raised as a potential adverse effect, we note that herbicide tolerance is extremely unlikely to develop in weeds under radiata GE trees with the herbicide gene as radiata forest crops are only sprayed with herbicide for 2-3yrs per 25-32 yr rotation. There would be insufficient opportunity for weeds to develop resistance, in fact no greater than under current regimes. As wilding pines are not controlled in NZ with roundup, tolerance in radiata to roundup would not affect wilding management.

A build up of resistance by insects to BtK may possibly occur if large scale plantings of trees with the BtK gene were to occur. The significance of the adverse effect requires research such as the proposed trials to determine if this is or is not a risk. We note again that investigation of potential risk under highly controlled conditions in no way implies adoption of GM techniques regardless of the outcomes.

There is the possibility of reduced genetic diversity in GMO stands compared to stands using trees from standard tree breeding. However, this is a forest management decision, weighing the risk associated with reduced genetic diversity. Forest managers are well aware of this risk which has been part of the management decision process since modern tree breeding techniques such as clonal forestry became a crop option. Again, this does not constitute a risk to indigenous genetic diversity.

FOA considers the field trial as proposed has very little potential to adversely affect the environment, but will supply important answers regarding the significance of these potential adverse effects.

What potential **beneficial** effects might the GM pines have on the environment?

---

The Forest Stewardship Council (FSC) notes that potential environmental and social benefits may include provision of traits that allow trees to be more easily established for firewood production, soil conservation, shade or windbreaks in marginal environments. They may reduce the use of pesticides, by introducing herbicide, virus or insect resistance. They may reduce the environmental impact of pulp mills, by using trees with modified lignin. (FSC-POL-30-602(2000) EN

Herbicide resistance may allow Forest Managers to use more benign chemicals to release trees than they currently use.

Reproductive development may prevent radiata wildling spread.

## Effects on the market economy

What potential **adverse** effects might the GM pines have on the market economy?

---

There is a potential market risk if it is perceived that the NZ industry is utilising GM material. The NZ industry is exclusively and heavily committed to FSC certification in the international market and such certification precludes the use of GM material. In this case no FSC certified forest is involved but, nonetheless, the perception could still pose an element of risk. This places a communication responsibility on Scion.

What potential **beneficial** effects might the GM pines have on the market economy?

---

Any potential benefits lie well in to the future. These particular trees will have negligible impact on the market economy. Plantation forestry is currently New Zealand's third largest export earner, at \$3.6 billion (Jun 2010 yr). Radiata pine making up about 92% of the plantation forestry estate with around 1.7 million hectares. If commercialised and adopted by the forestry industry these trait modifications have the potential to add hundreds of millions of dollars in annual export revenue, or save substantial amounts in forest management operations but any decision on the use of GM needs to weigh up other important factors as well. We do not see this trial work automatically leading to GM adoption by forest managers.

NZ forest exports compete on the international market. To stay competitive we must continually improve the product and our competitive position. NZ is a minor international wood products supplier. We do not dominate or control any international market. We must continually improve to match our competitors if we wish to protect or grow our market share. These trials do not imply adoption and use of GM material but rather will allow a more informed discussion on the risks and benefits, particularly at a time when there are overseas competitors assessing GM potential in the field.

## Effects on Māori culture and values

What potential **adverse** effects might the GM pines have on Māori culture and values?

---

Unsure, however SCION appears to have liaised extensively with Maori. No issues have been raised by Maori forest owners from within FOA.

What potential **beneficial** effects might the GM pines have on Māori culture and values?

---

Unsure, however SCION appears to have liaised extensively with Maori

## Effects on human health and safety

What potential **adverse** effects might the GM pines have on human health and safety?

---

Radiata pine does not make up part of the human food chain so unlikely to have human health related effects.

What potential **beneficial** effects might the GM pines have on human health and safety?

---

Plantations are in direct competition with other land uses, most of which have greater detrimental environmental effects through sedimentation, water use, carbon release, nitrification, chemical use etc. Accordingly a potential beneficial impact could be an improvement in those issues which are related to human welfare if it resulted in an improved economic competitiveness with other primary production land uses.

Plantations have an important role to play in New Zealand's carbon sequestration plans - which impacts on Climate Change - increased sequestration is a potential outcome.

## Effects on society and communities

What potential **adverse** effects might the GM pines have on society and communities?

---

This topic is undeniably controversial. A potential adverse effect is active and acrimonious opposition to the trials. At present the debate on GM application could benefit from more informed knowledge and this is not possible without trial information.

There is the risk that direct protest action against the trial may result in the spread of genetic material into the environment. While we consider actual environmental risk from a release is low, damage to the trial and to the ability to run trials in the future is a risk.

What potential **beneficial** effects might the GM pines have on society and communities?

---

Any release of GE material into the wider environment can only occur after the modifications are proven to be beneficial and safe and even then is not a guaranteed consequence. Field trials are an essential part of this process. The trials could also prove there are issues which cannot be satisfactorily addressed and be used as justification to not release.

Improved productivity via biomass / plant growth, biomass utilization and wood density improvements will have economic and social benefits. Greater plant growth could also reduce the need for herbicides, with the radiata tree growing above competing vegetation faster.

Reproductive development may reduce the issue of wildling pines in communities, plus reduce community concerns regarding the potential spread of GMO's.

Biomass utilization could help radiata provide a greater proportion of NZ's energy needs, with benefits from a low carbon energy source through to greater security of energy supply.

Dimensional stability could help radiata substitute for scarce (tropical hardwoods) or high carbon options (steel, mdf, etc)

## Additional Information

Is there any additional information you would like to provide to help us assess the risks, costs and benefits?

---

SCION has an excellent reputation as a GE researcher, with experience over a long period of time.

The Royal Commission on GMO's specifically allowed for trial work as specified by the SCION application.

The application meets NZ law.

## Other matters

Please indicate if you would like to receive the following:

- Notifications of genetically modified organism applications open for submission**
- Notifications of non-genetically modified new organism applications open for submission**
- The Bulletin, our monthly electronic publication of decisions**