

Genetically-modified trees: starting points for dialogue

Peter Kanowski The Fenner School of Environment & Society

fennerschool.anu.edu.au peter.kanowski@anu.edu.au





Context 1: TFD Scoping Dialogue



About

History Steering Committee Staff Latest News TFD Home

Upcoming Events

Full Calendar

Priority Issues

The Forests Dialogue







Latest News

10 – 11 November 2011 – TFD's Genetically Modified (GM) Trees Scoping Dialogue, New Haven, CT, USA

"TFD stimulates ... collaborative solutions to difficult issues facing forests & people" TFD Strategic Plan 2011-2015

www.theforestsdialogue.org



Context 1a: genetically-modified trees



- One biotechnology, amongst others
- "GM trees are those that have been modified using recombinant DNA & asexual gene transfer" Brunner et al 2007
- syn. 'transgenic' or 'GE' see IUFRO/FAO 2010











Context 2: a(nother) wicked problem





Context 3: the changing world (... of forests)



Figure 5.22 Novel biotically scaled environments under the 2070 medium-impact scenario, based on vascular plant generalised dissimilarity modelling

Changing climate & changing ecosystems ... Map: Dunlop et al 2011. CSIRO Photo: Stora Enso/ Veracel



Changing production systems & changing products ...



Context 4: a window of opportunity

- Rapid scientific advances "what is appropriate?" cf "what is possible?"
- Little GMt deployment
 - 450 ha poplar in China
 - 700 field trials globally
- Strong debate;
 but also reflection & learning?





GM trees: framing the issues



www.globaljusticeecology.org; www.greenpeace.org/international



GM trees - the agbiotech legacy







"Crudely put, the agricultural GM experience represents a warning, a cautionary tale of how not to assess an emerging technology and allay public concern." Kearnes et al 2006: 291

UCSB



Not the agbiotech legacy? – trees are different ...

Compared to agricultural crops, forest trees are:

- part of diverse & extensive ecosystems
- Iong-lived & 'natural'
- of strong cultural significance
- little domesticated
- not a food source
- more strongly regulated



GM trees narratives

Category	Core position
'Strong' proponents	 GM technologies offer important benefits (eg productivity, adaptation, lesser impacts) that are impossible, or harder, to realise conventionally. Risks vary, & can be assessed & managed. Risk assessment should focus on product not process.
'Conditional' proponents or opponents	 GM technologies may offer benefits, but principally in 'public-good' applications. Levels of precaution & complementary action should be higher than for crops.
'Strong' opponents	 Industrial IMPF is (generally) unacceptable. Use of GM technologies will further disadvantage those already disadvantaged. The risks and costs of GM trees are unacceptable, & demand a very strong precautionary approach.



Key elements of GMt discourses #1

Ethical considerations & moral imperatives



How can ethics help us resolve these dilemmas?



Key elements of GMt discourses #2

Land & resource ownership & use



How to achieve more equitable benefit-sharing?



Key elements of GMt discourses #3a

Environmental benefits & risks

Risks

- Adaptation: to new or altered environments
 Intensification of production: necessary to meet demands
 Increased returns along value chain
 Boduced environmental impacts
- Reduced environmental impacts associated with reduced inputs
 Recovery of doomed species

- Spread of transgenes: vertically, horizontally
- Potential ecosystem disruption: impacts on species & processes
- Unstable gene expression
- Other unexpected effects

General agreement that genetic confinement a prerequisite?



Key elements of GMt discourses #3b

Strategic benefits & risks



Hard decisions, at many levels – 'no regrets'?



In the larger context





www.panda.org/livingforests www.theforestsdialogue.org www.unep.org





IN OUR GLOBAL EN



Intensively Managed Planted Forests Toward best practice



Summary and Recommendations from TFD's IMPF Initiative June 2005 – June 2008

The Forests Dialogue



Governance & regulation: where world views collide ... Internationally



Nationally

Significant variation (approach, process, capacity)

Non-state

Significant consequence – eg FSC ban on GMt



Dialogue about GM trees ...

Opportunities & challenges

- learning from the genetic technologies/ GM crop/ plant breeding debates
- learning from other forest(ry) experiences, including IMPF, LCF, 4Fs ...
- finding ways for the sciences (social & life) to inform, but not overwhelm
 "in the absence of knowledge, precautionary approaches ... prevail" Boyd 2010
- generating knowledge at low risk



In summary ...



- A 'super-wicked' ('diabolical') problem, but a window of opportunity
- Some instructive key learnings
 "if modern biotechnology is to stand a chance, three main conditions ... utility, low risk, and an assurance that the biotechnology is used in a decent way" Gamborg & Sandoe 2010: 168-9
- Society needs scientific advance, but science needs legitimacy



Dialogue about GM trees ...

3 interdependent but separable levels ...

- Informing (real) dialogue
 - building shared understanding & trust
- Should we use GM technologies in trees? eg what goals, which technologies?
 what levels of public good/ public funding?
- For any GM technologies & products we may use, what are appropriate standards & governance?



Key sources/ more information

Kanowski. 2011. *GM trees*. TFD background paper, + sources. <u>www.theforestdialogue.org</u>

El-Kassaby (ed). 2010. *Forests & GM trees*. IUFRO/FAO. <u>www.fao.org/docrep</u> > ...

Global Justice Ecology Program. *Stop GM trees*. www.globaljusticeecology.org

Institute of Forest Biotechnology. 2010. *Forest biotechnology ...* <u>www.forestbiotech.org</u>

Murphy. 2007. Plant breeding & biotechnology. CUP.

Williams. 2010. Of forests and time ... International Forestry Review 12: 407 UNEP. 2007. The potential ... impacts of GM trees www.cbd.int > SBSTA > SBSTA13