Biotechnology Solutions for Forest Biosecurity Problems

Fifth Annual Forest Health Workshop

FOA/MAF Biosecurity Workshop

Rotorua – 28th Feb/1st Mar 2006

NEW ZEALAND
FOREST OWNERS' ASSOCIATION INC.
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Workshop Objectives

1. To review progress in forest biosecurity over the previous 12 months
2. To transfer knowledge from FBRC/FRST-funded research programmes to end-users
3. To provide an update on breeding and other technology solutions for forest health problems
4. To develop strategies for solving current and potential forest biosecurity problems including identifying possible funding opportunities

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Agenda:

Day 1 – Tuesday 28 February - 4.00pm

Chair: *Mark Ross*

4.00 – 4.10pm Welcome and Introduction (**David Rhodes and David Hayes**)

4.10 – 4.30pm "Technology Solutions for Biosecurity Problems - Stretching our Thinking" (**Dr Stephen Goldson – Chief Science Strategist, AgResearch**

4.30 – 6.30pm FBRC Science - What's been done and what's been learned?

ENSIS Presentations:

Lindsay Bulman and Tod Ramsfield

Lincoln Bio-protection CORE Presentations:

Robert Hill

630 pm Refreshments

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Agenda:

Day 2 – Wednesday 1 March - 0800

Chair: Bill Dyck

08.00 – 08.30am WHAT'S BEEN ACHIEVED IN A YEAR?

A review of 2005 Workshop & Outcomes and other forest health achievements of 2005. (**Bill Dyck**)

08.30 – 09.00am THE NEED FOR SOLUTIONS TO BIOSECURITY PROBLEMS – AN FOA PERSPECTIVE

Making the case for solving existing and potential problems (**Jeremy Fleming – Chairman FHC and FBRC**)

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Agenda:

09.00 – 10.00am WHAT DISEASES AND INSECTS PESTS ARE WE WORRIED ABOUT AND WHAT'S BEEN DONE TO PROVIDE SOLUTIONS IN NEW ZEALAND

Tod Ramsfield - Overseas pest threats (Ensis)

Gordon Hosking - Nectria from an industry perspective (Industry)

Margaret Dick - pests and diseases present in NZ (Ensis)

Luis Gea – Single gene for cypress canker resistance? (Ensis)

Roly Burdon - the genetic basis of biotic risk management (Ensis)

10.00 – 10.30 Break

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Agenda:

10.30-10.45am BREEDING FOR RESISTANCE – WHAT'S BEEN DONE INSIDE AND OUTSIDE OF NEW ZEALAND AND THE CHALLENGES OF GENETIC VARIABILITY. DOTHISTROMA AS A CASE STUDY

Sue Carson – Carson Associates Ltd (with input from Rosie Bradshaw, Massey University)

10.45-11.00 Discussion

11.30-12.00 THE RPBC BREEDING STRATEGY – BIOSECURITY RISK CONSIDERATIONS

Denis Albert – Radiata Pine Breeding Company

12.00 – 12.45 Lunch

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Agenda:

12.30 -1.15THE POTENTIAL FOR USING MOLECULAR BIOLOGY TECHNIQUES FOR ACHIEVING RESISTANCE

Mike Carson – Carson Associates Ltd

1.15-1.45 BIO-PROTECTION SOLUTIONS TO FOREST BIOSECURITY PROBLEMS - An international perspective followed by specific NZ examples

Robert Hill (Biodiscovery Ltd)

Danny Paderes (FORENZA Ltd)

Travis Glare (AgResearch)

1.45-2.15 Discussion

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Agenda:

2.15 – 2.35pm INTRODUCTION TO WORKSHOP SESSION:

Introduction – Luis Gea (Ensis), Brian Richardson (Ensis)

The big future biosecurity issues (Jeremy Fleming – Chair FHC)
Are we looking wide enough for solutions (Denis Hocking – FFA)

Pro-active non-high-tech measures (Ecke Brockerhoff- Ensis)

Potential biotechnology solutions (Wei-Young Wang – PF Olsen)

Linkages between biotic risk and genetic diversity (Elaine Birk – Rayonier)

2.35 – 4.00pm BREAK INTO GROUPS TO DISCUSS TOPICS

4.00 – 4.30pm REPORT BACK AND WRAP UP

3PM TEA

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Workshop session:

First name is facilitator – others are support.

Group to start with designated topic, then try to tackle others.

Group 1 (C Holden, Jeremy Fleming) What do we see as the big biosecurity issues facing the industry in the near to medium future?

Group 2 (D Hammond, Denis Hocking, Ecke Brockerhoff) Are we trapped in narrow thinking and not looking wide enough for solutions to current problems? Especially given the expected future. Pro-active non-high tech-measures for ensuring forest health – what are they? Are we missing something simple?

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Workshop session:

Group 3 (G Hosking, Wei-Young Wang) What are potential biotechnology solutions to focus effort? And what are the advantages and disadvantages of advanced biotechnology solutions?

Group 4 (N Heron, Elaine Birk) Are we missing some of the linkages between biotic risk and genetic diversity? How do we deal with these?

All groups also to discuss: “Identifying possible funding opportunities”

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Report back:

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Group 1 report back

Topic: What do we see as the big biosecurity issues facing the industry in the near to medium future?

General – not just industry but indigenous and urban forests too

Four themes:

1. Issues: - Role of industry in funding for research and more general needs, pre-border to response stage; need for partner-ships with researchers and govt; what interest does industry have in biosecurity? – new owners – are they committed?

Strategies – more interaction with industry at a senior level – e.g., CEO w/shop; more of this needed; encourage to participate in planning exercises, e.g., PPC exercise;

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Group 1 report back (2)

2. Issues: - Fragmentation of institutions – research – a whole bunch of committees; fragmentation around funding; need for a “one forest” approach.

Strategies - Aggregating consultative committees; engender whole of forest focus; find ways to do this; other owners, DOC, councils, etc; promote “ecosystem services”

3. Issues: - Capability – need for succession planning; maintaining skills;

Strategies – Encourage new investment into capability; Govt; and industry; build commitment to provide ongoing training etc

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Group 1 report back (3)

4. Issues: - Future threats – containers; uncertainties around new organisms and problems – surprises!; climate change – new organism establishment; alienated communities – increasingly urban;

Strategies – More scenario planning; risk analysis, simulations, raising awareness of the need for biosecurity. And the benefits.

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Group 2 report back

Topic: Are we trapped in narrow thinking and not looking wide enough for solutions to current problems? Especially given the expected future. Pro-active non-high tech-measures for ensuring forest health – what are they? Are we missing something simple?

Yes – we are trapped in our thinking. We should be looking further a field – outside of forestry – outside of NZ. Other crops – grapes, olives, Spain. Understanding role of soil micro-organisms. Learning from other countries. Encourage collaboration amongst researchers; In-kind as well as $ contribution to funding

The future is "unexpected" – we don't know what we are going to have to deal with; therefore we shouldn't get too focused on one or two issues; be somewhat conservative;

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Group 2 report back (2)

Alternative species as a way to mitigate risk; need to extract existing information; ecosystem approach to biosecurity risk management.

Risk perception varies. e.g., timeframe of rotations.

Leadership as a key issue. FBRC seen as a good start – leadership and direction; more needed in other areas for industry.

Spend on forest health – especially in non-commercial estate; One-forest theme – more cohesive approach;

Funding a key issue - levy? Or similar? Capture more of the beneficiaries. Ecosystem services etc

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Group 3 report back

Topic: What are potential biotechnology solutions to focus effort? And what are the advantages and disadvantages of advanced biotechnology solutions?

Technology solutions covered. Don't invent a complex solution when you can use a simple one.

Pre-border – application of technology – risk goods and people; people ok but not perfect; use technology to raise awareness – videos etc – but difficult; technology to collect data – understanding and evaluating risk at the most critical point can only pay dividends; id pathways and how to close pathways; we've lost data in the past (dead organisms);

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Group 3 report back (2)

Border – technology – (1) existing – refine and apply; (2) new tech – risky – future; Don't overlook – fumigants – have we put enough effort into looking at alternatives to MeBr? Etc heat treatment; gamma rays;

Border tech – enabling technologies – we need trade; import of genetic material (applies to other sectors too); swap info with colleagues in Oz; sharing knowledge – this is in technology areas; Oz $ -

Post-border – early detection technology – resource monitoring, remote sensing; CSI – forensic technology; nanotech;

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Group 3 report back (3)

Funding – Whole-forest approach and ecosystem services – others should pay (as well) – increasing risk from newer pathways – e.g., containers; National Issue!

Make better use of data – identifying risk at the border for e.g.,

Need to access best information when we do have problems – expertise, real time, video conf etc

Heaps of advantages; but risky and expensive for new tech – but can be strongly offset with old tech; public acceptance can be a disadvantage to new tech (or even old tech); piggyback on others

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Group 4 report back

Biotic solutions – are we missing something; genetic diversity – what are the risks?

Can we utilise existing databases to id potential useful genetic crosses; FH D/base? Dothi surveys to re-evaluate crosses;

Genetic diversity narrower today – risk that new introduction would result in selection from a narrower range (I.e., for resistant trees); consider protecting some remnant stands or preserving germplasm;

Needle retention data – need to re-examine this in full context of disease risk;

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Group 4 report back

Consider more than genetics – like endophytic fungi – could play an important role; structure of needles etc;

Propagation methods – consider development work on some of the older methods – in case of an incursion we need to rapidly propagate selected material

Put genetic trials close in incursion points – consider “sentinel forests” – e.g., port of Auckland;

More work needed on the application of new breeds/clones by companies – to locate where they will be of most use – site-specific forestry;

Consider new and novel approaches to propagation.

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Thank you

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