Bifenthrin Glueline Insecticide Treatments

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What is Glueline Treatment?

- Insecticide is added to glue mix
- Protection against insect attack including termites

Advantages of Glueline Treatment

- No solvent needed to deliver the chemical
- The carrier is the glue system
- Cost savings as no additional treatment process required

Incorporated into plywood or LVL manufacture

The active ingredient in Determite is Bifenthrin. Bifenthrin is used in over 50 countries throughout the world in a range of products and markets including pest control, timber protection, agriculture, horticulture, home and garden products, stored grain, and the turf industry.

Osmose® DeterMite™ Insecticide

Bifenthrin Development History

1989

- Commenced evaluation against termites in CSIRO trials

1995

- Commenced evaluation against wood boring insects in Asia, Australia and other parts of the world

1999

- Commercial evaluation against termites in Australia and Asia

2001

- As a result of excellent performance data, market development extended into key global markets

Why Use Bifenthrin?

Thermal and pH stability of different pyrethroids

Active	Degradation Temperature ^{o}C	pH
Permethrin	140	7.7
Cypermethrin	220	4
Deltamethrin	140	8
Bifenthrin	180	9.2

CSIRO - STUDIES

CSIRO Studies in Darwin

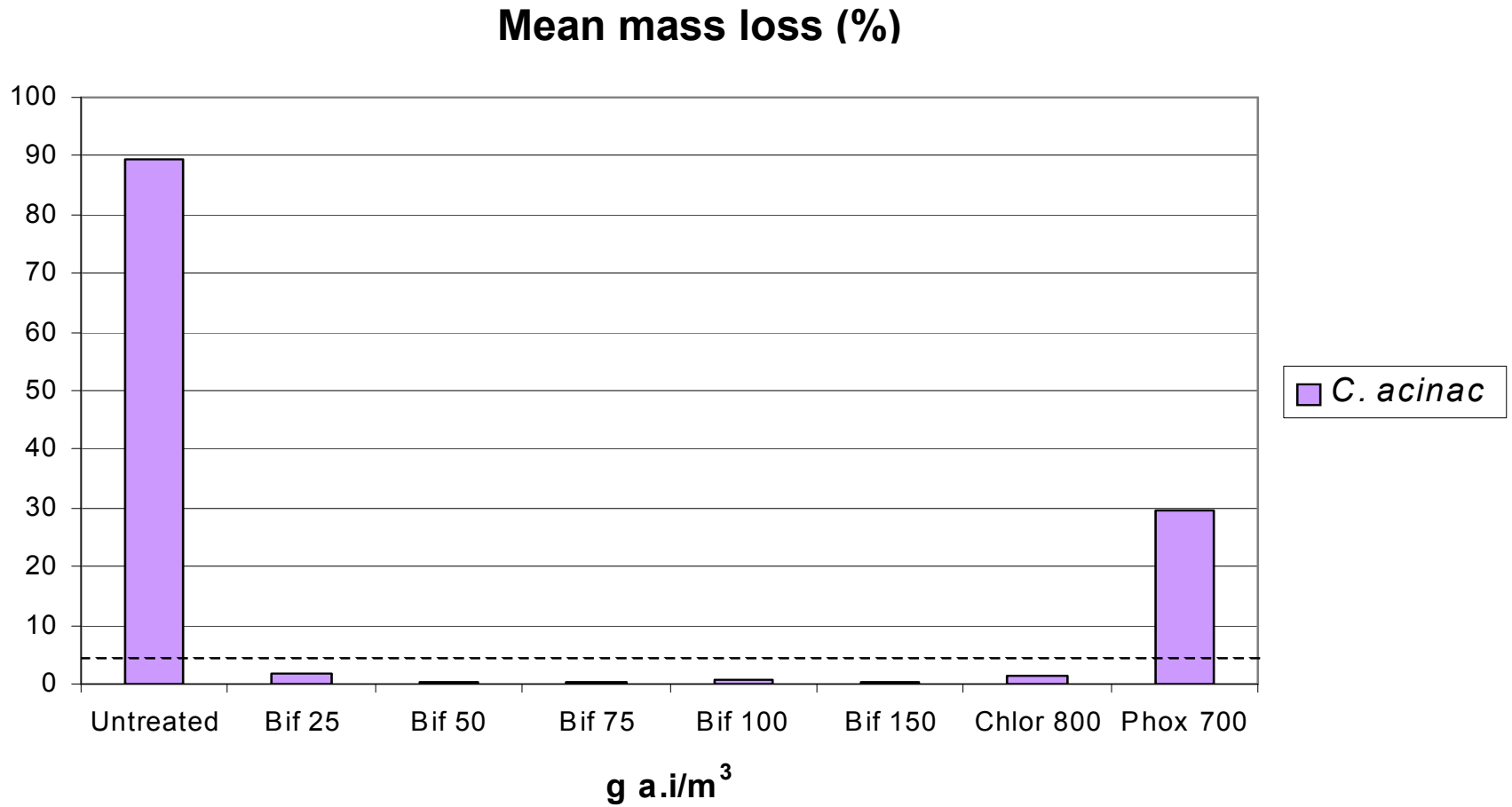
- Above-ground field trial
- PF-bonded plywood (*Pinus radiata* sapwood); 9 ply x 2.5 mm thick
- Retentions: 25, 50, 75, 100 and 150 g of active ingredient per m^3 of plywood (glueline treatment)
- Comparative treatments (chlordane at 800 g/m^3; phoxim at 700 g/m^3)
- Artificial weathering
- Six replicates per treatment

CSIRO - STUDIES

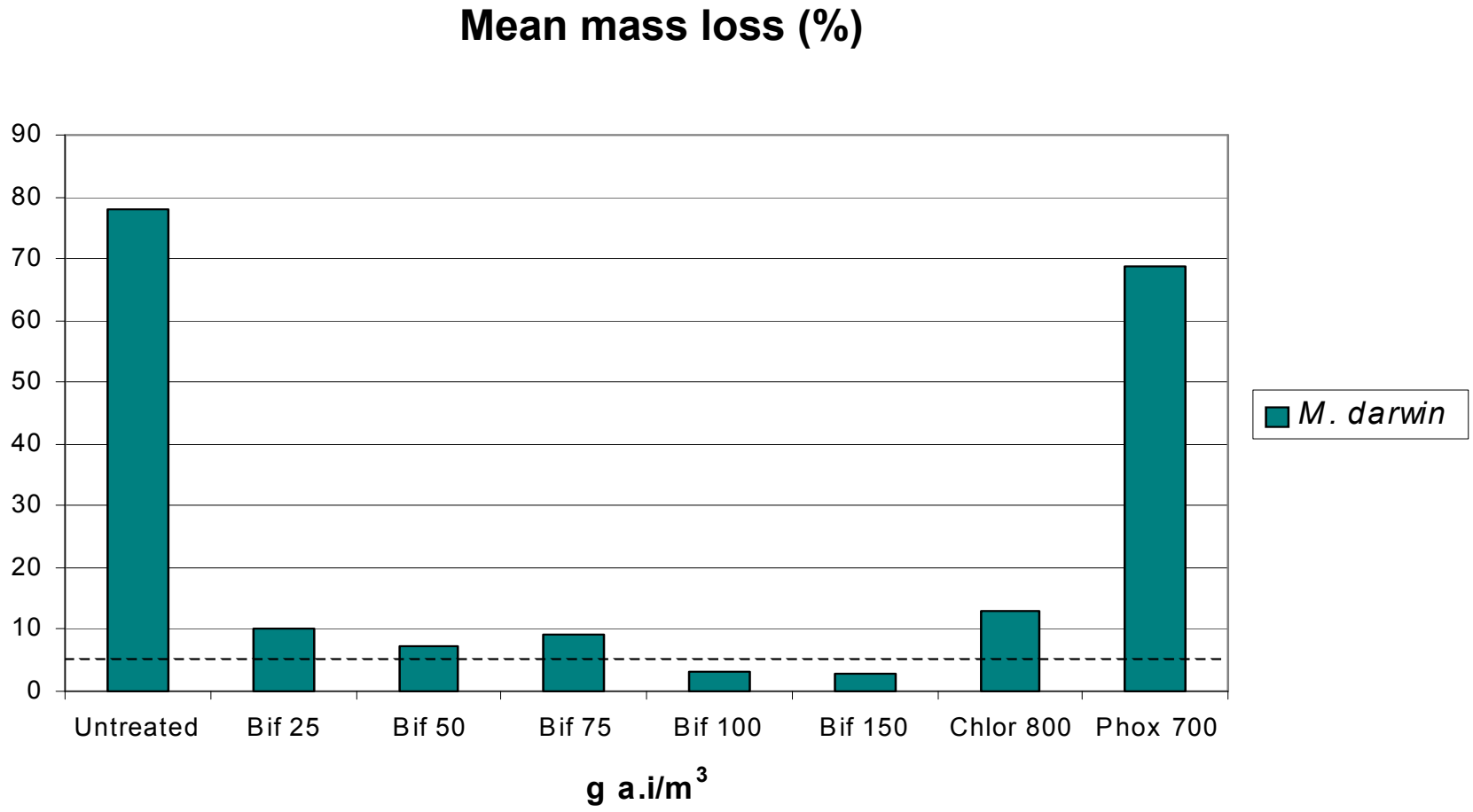
Glueline additives – Bifenthrin (Determite)

Hardwood Plywood Tests

CSIRO STUDIES - *Coptotermes*



CSIRO STUDIES – *Mastotermes*



H2 - Engineered Wood Products

Conclusions

- Effective Rate - *Mastotermes spp*.

  75 g ac/m^3

- Effective Rate - *Coptotermes spp*.

  25 g ac/m^3

- Bifenthrin is extremely repellent to termites
- Capable of withstanding high pH & temp.
- Provides long term residual protection

Testing of Bifenthrin Treated Plywood

- Analytical method developed
- Quantified actual bifenthrin loading after manufacture
- Glue bond strength tested in accordance with AS/NZS 2098.2 and .4-1996
- No weakening of bond strength found

Approval Status

- Approval has been granted in Australia in AS1604 for H2 for plywood and LVL
- Registered in Japan for glue line and surface treatments (JIS K1570)
- AQIS approved for both hardwood, softwood and combined species plywood (up to 2.5mm veneer thickness)

Commercial Operations

- 2 LVL and 1 Plywood mill in Australia
- 1 LVL and 1 Plywood mill in New Zealand
- Results:
  - No bond problems
  - Ease of handling
  - No OH&S problems

Current H2 Approvals
(AS/NZS1604.3 Amend 2 March 2008)

- South of Tropic of Capricorn only
  - Softwood up to 3.2mm
    - 0.0021% m/m bifenthrin in glueline
  - Softwood up to 4.3mm
    - 0.0027% m/m bifenthrin in glueline
  - Hardwood (durability 1,2,3) up to 2.5mm
    - 0.0028% m/m bifenthrin in glueline

Current H2 Approvals
(AS/NZS1604.3 Amend 2 March 2008)

- All regions
  - Max veneer thickness 2.5mm
  - Glueline only
    - Bifenthrin at 0.0083% m/m
  - Glueline plus face veneer treatment
    - Bifenthrin at 0.0042% m/m

Approval Updates

- Hardwood approval
- Extension for glueline and face north of TOC
- H1 Approval

Recent CSIRO Trials

- Glueline plus face veneer spray
- Range of radiata veneer thicknesses to 5.15mm
- One hardwood (keruing) thickness 2.5mm
- Weathered before exposure
- Tested against *Mastotermes darwiniensis*

Figure 2: Aboveground H2 field container targeting *M. darwiniensis*.

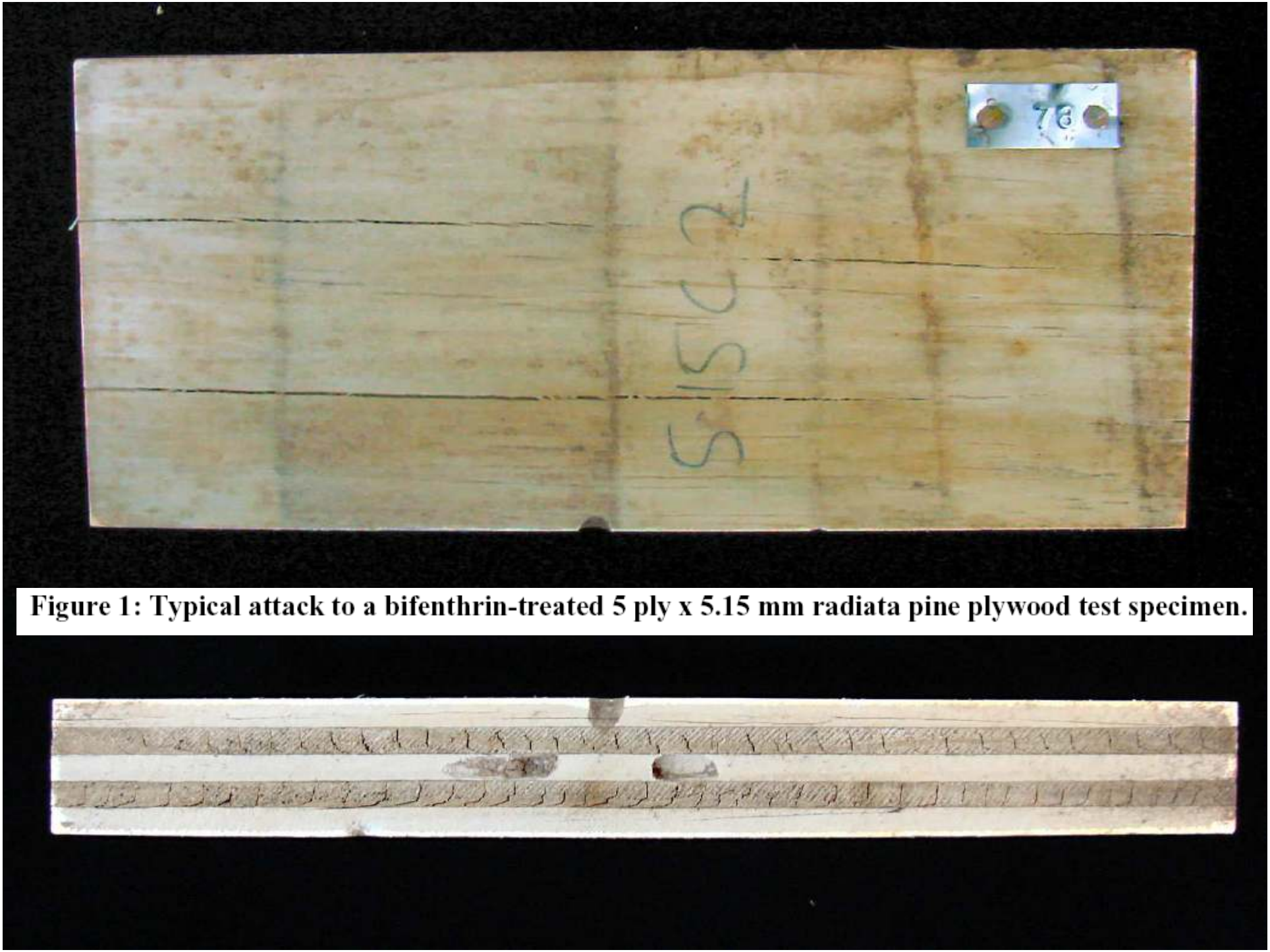
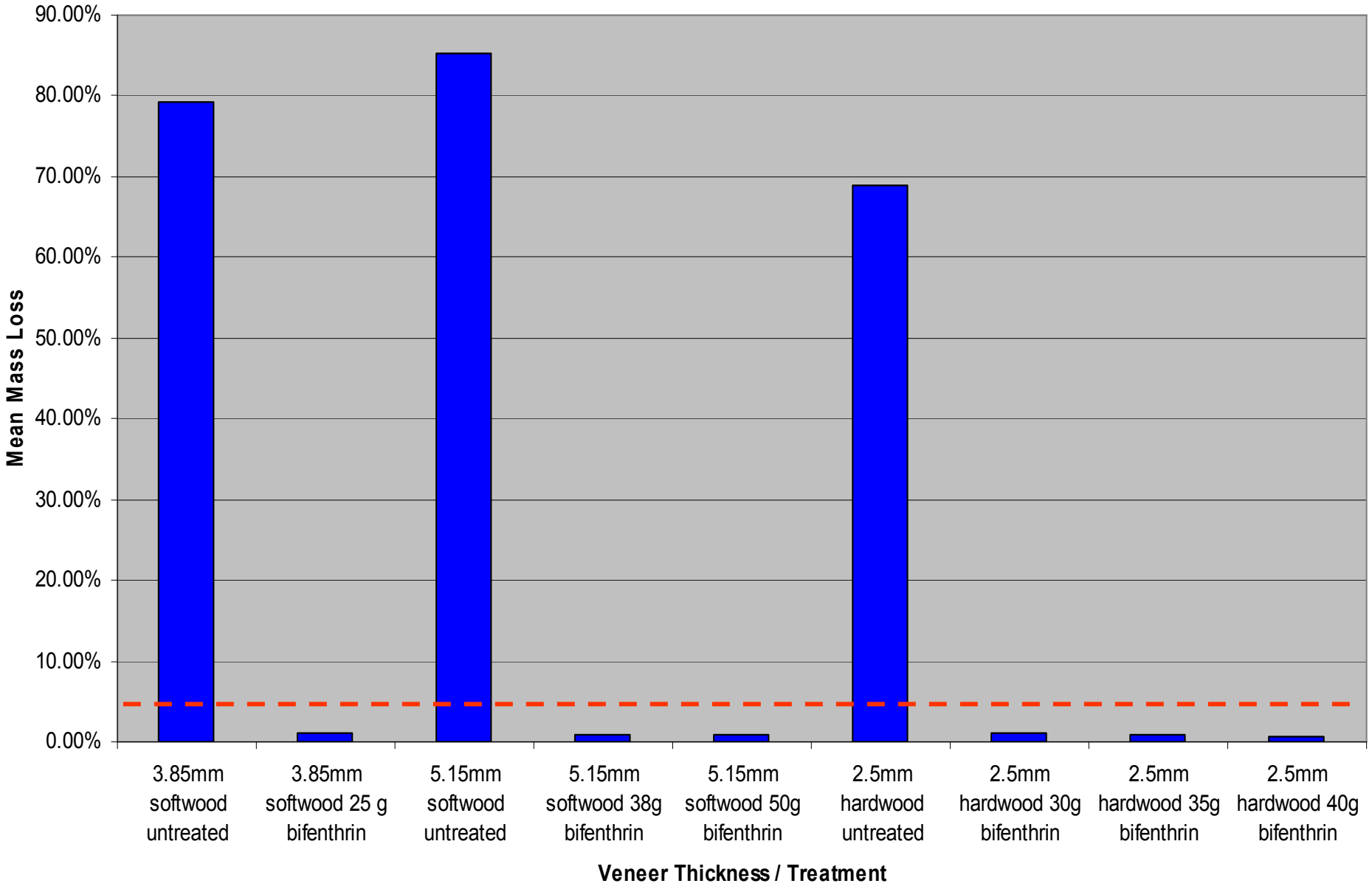


Figure 1: Typical attack to a bifenthrin-treated 5 ply x 5.15 mm radiata pine plywood test specimen.

Mastotermes Glueline+Face Spray Test



Recent CSIRO Trials

- Glueline only treatment
- Range of radiata veneer thicknesses to 5.15mm
- Range of bifenthrin loadings
- Weathered before exposure
- Tested against *Coptotermes acinaciformis*

Installation of an above-ground H2 field container targeting *C. acinaciformis*

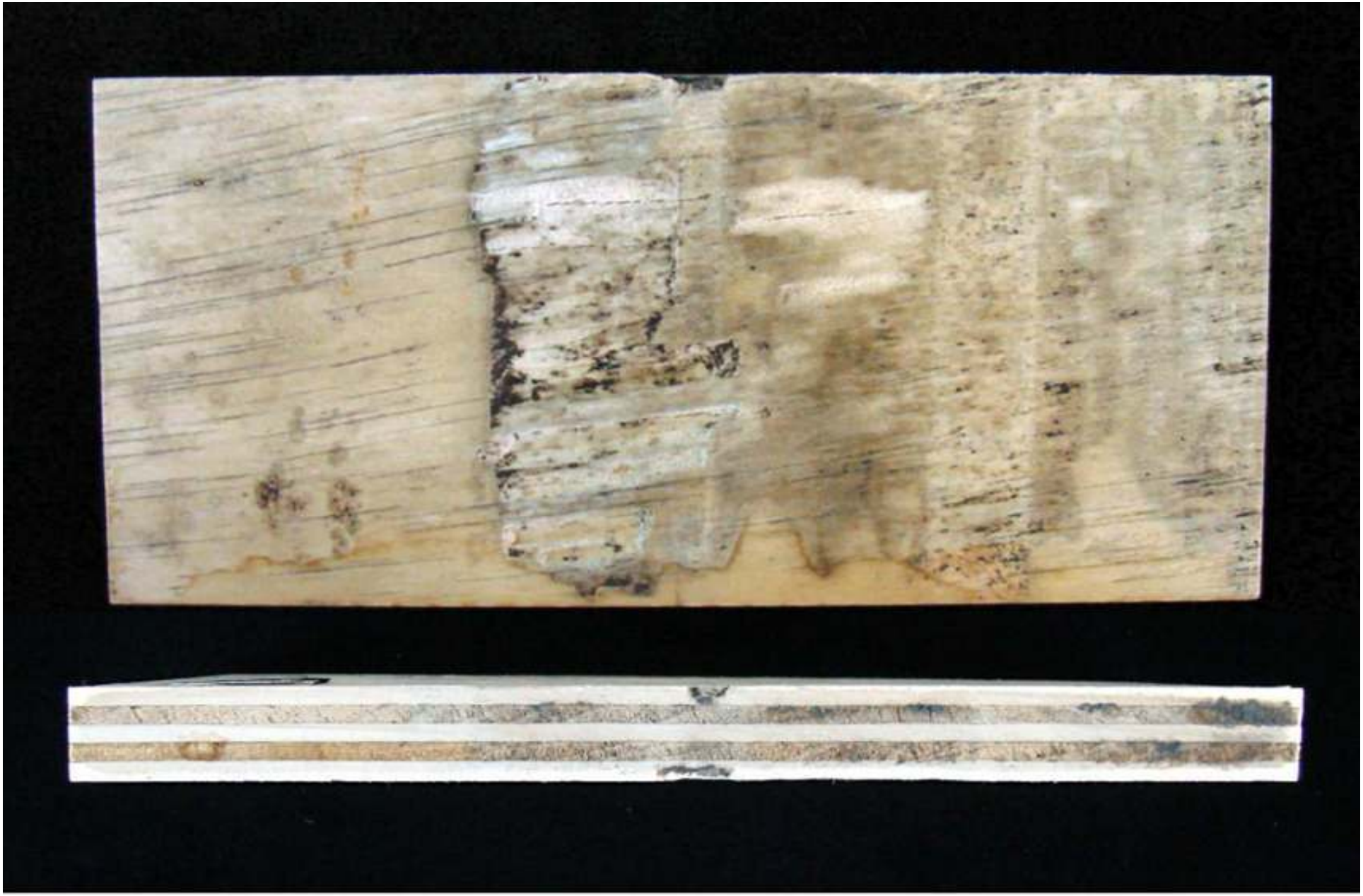
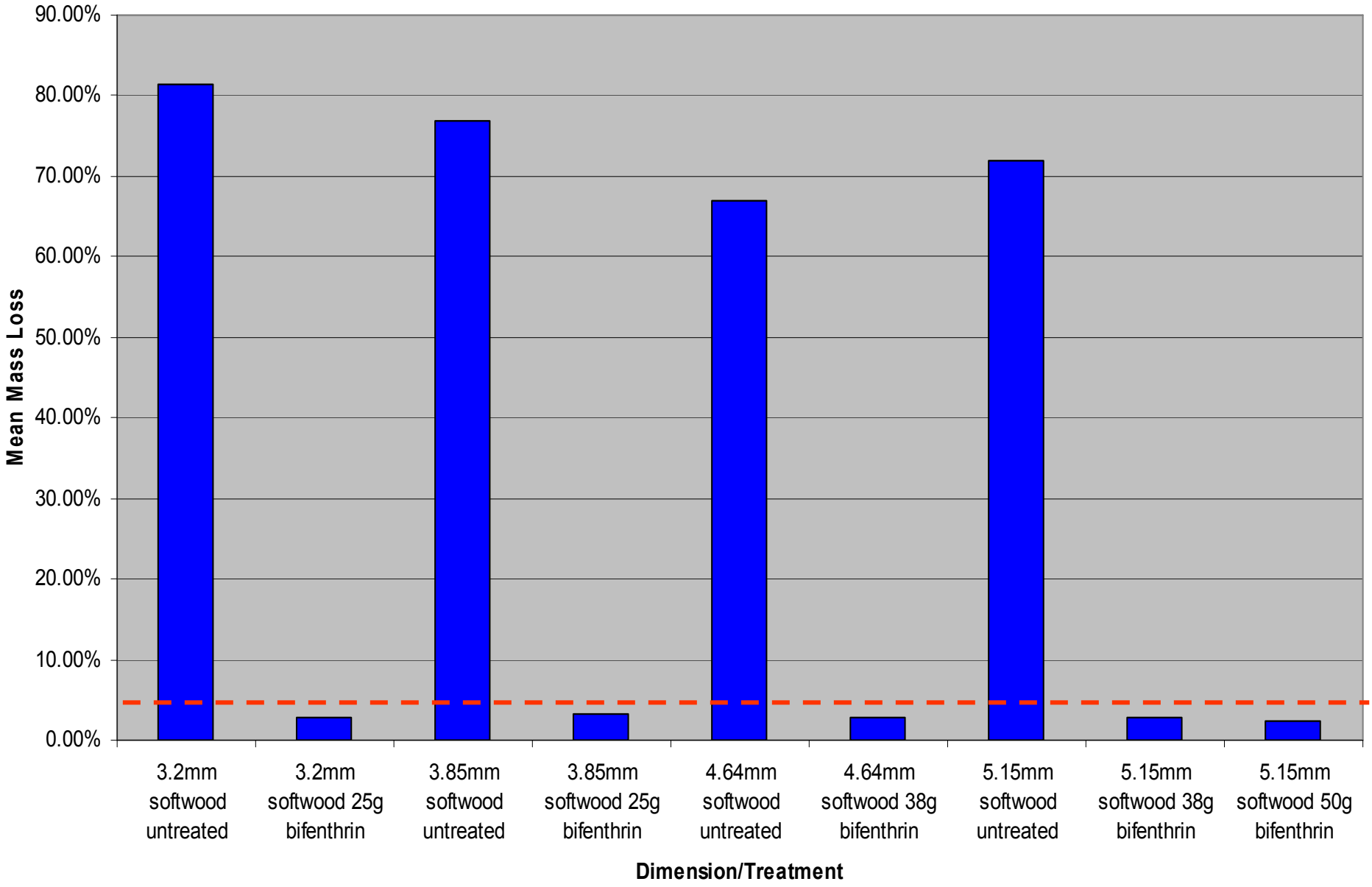


Figure 1: Example of the most severe attack to a bifenthrin-treated 5 ply x 3.2 mm radiata pine plywood test specimen.

Coptotermes Glueline Test



H1 Approval

- <2.2mm lyctus susceptible hardwood veneer
- Bifenthrin at 0.0012% m/m in glueline
- Approved by TUMA
- Approved in latest AS1604 DRAFT

Extension of Glue and Face Approvals for North of TOC

- CSIRO data supports combination of glueline plus face treatment against Mastotermes
  - Up to 4.3mm softwood veneers at 0.0027% m/m bif
  - Up to 2.5mm hardwood veneers at 0.0028% m/m bif
- Possibility of “upgrading” H2S glueline treatment by adding a surface spray
  - Reduced stockholding
  - Reduced costs
- Approvals pending for this


Thank You