PRACTICAL MANAGEMENT OF GRAPEVINE TRUNK DISEASES
NZ WINE PROJECT OUTCOMES

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Grapevine trunk diseases

**Eutypa dieback**

_Eutypa lata_ and Diatrypaceous spp.

**Botryosphaeria dieback**

Botryosphaeriaceous spp.

M. Jaspers
Disease cycle

- Trunk cross section
- Infected xylem vessels
- Open wound
- Canker
- Infected wood
- Fruiting bodies
- Fungal spores
- Toxins Eutypa
- Botryosphaeria dieback
- Eutypa dieback
Project objectives

Trunk disease surveys
Pruning wound protection
  • Evaluation
  • Spray application

Economic analysis
Trunk disease surveys

- December 2013 (HB, M) & 2015 (CO)
- 736 vineyard blocks
- 22 varieties
- 200 vines per block
- Foliar and dieback symptoms
Trunk disease surveys
Trunk disease surveys

GTD incidence

![Graph showing GTD incidence across vine ages for Hawkes Bay, Marlborough, and Central Otago regions. The graph includes scatter plots and trend lines for each region.](image)
Trunk disease surveys

Rainfall (long term average)

Source: www.niwa.co.nz
Trunk disease surveys

Variety

Source: Wine Australia
Trunk disease surveys

Pruning method

Proportion of vineyards assessed

HAWKE'S BAY
- Cane: 60%
- Cordon: 40%

MARLBOROUGH
- Cane: 85%
- Cordon: 15%
Trunk disease surveys

Pruning method

<table>
<thead>
<tr>
<th>Pruning Method</th>
<th>Average Age (y)</th>
<th>GTD Incidence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cane-pruned</td>
<td>11.8</td>
<td>6</td>
</tr>
<tr>
<td>Cordon-pruned</td>
<td>13.9</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: Wine Australia
Trunk disease surveys

**Rootstocks**

![Graph for Sauvignon Blanc (15+)](image1)

- SO4 (25)
- Schwarzman [9]
- Riparia Gloire [4]
- Millardet 101-14 [4]

**Clones**

![Graph for Pinot Noir (15+ yo)](image2)

- B 115 [3]
- UCD 5 [13]
- UCD 6 [9]
- AM 10/5 [4]

![Graph for Pinot Noir (15+)](image3)

- Schwarzman [8]
- SO4 [8]
- Teleki SC [4]
- Couderc 3309 [7]

![Graph for Chardonnay (15+ yo)](image4)

- UCD 6 [10]
- UCD 15 [10]
- B 95 [4]
Pruning wound protection

Detached Cane Assays

Vineyard evaluations

Pruning → Wound treatment → Inoculation → Isolation

Eutypa lata

Neofusicoccum luteum
Pruning wound protection

Disease control
Sauvignon Blanc - Marlborough

Eutypa dieback

Botryosphaeria dieback

Fungicides (application rate/100 L)
Pruning wound protection

Natural alternatives

Detached cane assay

![Graph showing disease control percentages for different treatments]

- **TriD25™ (100 g/L)**
- **Biorepel® (100 ml/L)**
- **HML 32™ (undiluted)**

- **Trichoderma spp.**
- **Garlic extract**
- **Potassium bicarbonate**

- Eutypa dieback
- Botryosphaeria dieback
Pruning wound protection

Timing of application
Eutypa and Botryosphaeria dieback

Curative (Inoculated with pathogen on day of pruning)

<table>
<thead>
<tr>
<th>Fungicide (Day 1)</th>
<th>Fungicide (Day 3)</th>
<th>Fungicide (Day 6)</th>
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</thead>
<tbody>
<tr>
<td>Chief®</td>
<td>Chief</td>
<td>Chief</td>
</tr>
<tr>
<td>Folicur®</td>
<td>Folicur</td>
<td>Folicur</td>
</tr>
</tbody>
</table>

Disease control (%)

Preventative (Fungicide applied on day of pruning)

<table>
<thead>
<tr>
<th>Pathogen (Day 1)</th>
<th>Pathogen (Day 7)</th>
<th>Pathogen (Day 14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief®</td>
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<td>Chief</td>
</tr>
<tr>
<td>Folicur®</td>
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</table>

Disease control (%)
Pruning wound protection

Spray application

**Hawke’s Bay (cordon-pruned Cab Sauv)**
- Paintbrush
- Air-shear
- Weed
- Recycle

**Marlborough (cane-pruned Sauv Blanc)**
- Paintbrush
- Tangential
- Air-shear
- Recycle

**Sprayer (water volume)**
- 300 L/ha
- 600 L/ha
- 100 L/ha
- 200 L/ha
- 900 L/ha
- 300 L/ha
- 600 L/ha
- 300 L/ha
- 600 L/ha
- 850 L/ha

**Disease control (%)**
- Eutypa dieback
- Botryosphaeria dieback

**Sprayer types**
- Modified weed sprayer
- Recycle sprayer
- Tangential sprayer
- Air-shear sprayer
Pruning wound protection

Spray application
## Economic analysis

**Greg McCarthy – Sutton McCarthy Ltd**

### Cost of wound treatment

*Based on 2,220 vines/ha*

<table>
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<tr>
<th></th>
<th>Cane-pruned</th>
<th>Cordon-pruned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spray application</strong></td>
<td>$120/ha</td>
<td>$120/ha</td>
</tr>
<tr>
<td><strong>Hand application</strong></td>
<td>$240/ha</td>
<td>$460/ha</td>
</tr>
</tbody>
</table>
Economic analysis
Greg McCarthy – Sutton McCarthy Ltd

Annual wound treatment programme

NPV = net present value

Based on:
Sauvignon Blanc
Cane-pruned
2220 vines per ha
Economic analysis
Greg McCarthy – Sutton McCarthy Ltd

Annual wound treatment programme

Based on:
Sauvignon Blanc
Cane-pruned
2220 vines per ha

A Do Nothing
B Spray Annually
C Hand Paint Annually

Cost
2,000
4,000
6,000
8,000
10,000
12,000

Cumulative NPV annual cost/ha

Age of vineyard (years)

Cost recovered

Relative NPV benefit of reducing GTD

NPV = net present value
Economic analysis
Greg McCarthy – Sutton McCarthy Ltd

Remedial and preventative response

NPV = net present value

Based on:
Sauvignon Blanc
Cane-pruned
2220 vines per ha
Economic analysis
Greg McCarthy – Sutton McCarthy Ltd

Remedial and preventative response

Based on:
Sauvignon Blanc
Cane-pruned
2220 vines per ha

Relative annualized NPV future cost/ha

Incidence of Trunk Disease (%)

NPV = net present value
Economic analysis

Greg McCarthy – Sutton McCarthy Ltd

Remedial and preventative response

Based on:
Sauvignon Blanc
Cane-pruned
2220 vines per ha

Relative annualized NPV future cost/ha

Incidence of Trunk Disease (%)

NPV = net present value
Economic analysis
Greg McCarthy – Sutton McCarthy Ltd

Take-home messages

• Early adoption of wound protection will minimize future cost
• Spray application will further reduce cost
• Once GTD evident, remediation + preventative sprays can provide up to $3,000/ha benefit
• Potential national value of implementing remedial and spray treatments is $40m per annum
Acknowledgements
More information

NZ Winegrowers website
• Final report
• Fact sheet

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