Crop Load Optimisation
Chemical Thinning / Biennial Bearing and effects on Labour

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Agfirst
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Introduction

• Crop load optimization is one of the key drivers in overall orchard success.
• Each variety block within an orchard needs to be treated as an individual and assessed on its own merits.
Optimised Crop load

- Block performance factors need to be understood
  - Max yield potential
  - Fruit size and quality requirements
  - Variability
  - Biennial bearing risk and block status
Is this the right crop load for fruit size quality and return bloom?
Crop load influence on Labour

- Reduced tree crop load variability
  - Simplify work (quicker / cheaper)
  - Improve the pool of suitable workers
  - Improve fruit quality
- Reduce the fixed costs
- **Make it cheaper, make it easier, improve the fruit quality**
Over cropping reduced fruit quality
Under cropping also reduces fruit quality
Crop Load Optimisation – A Continuous System

- Initial crop load plan
- Pruning to the plan
- Chemical thinning
- Hand thinning
- General orchard management
- Collection of data along the way to make changes where and when needed.
### Winter Pruning Report

Season Ending 2016

<table>
<thead>
<tr>
<th>Blockname</th>
<th>Ssn</th>
<th>Type</th>
<th>Gross Kg/ha</th>
<th>Class1 Kg/ha</th>
<th>Fruit Harvested Weight (g)</th>
<th>TCA Harvested Fruit (cm²)</th>
<th>Target Buds/Fruit</th>
<th>Actual Buds/Fruit</th>
<th>Target Buds/Tree</th>
<th>Monitor Buds/Tree</th>
<th>Actual Buds/Tree</th>
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<tbody>
<tr>
<td>Sunpeach Thompson A</td>
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<tr>
<td>Envy Env M9</td>
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<td>84,000</td>
<td>266</td>
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<td></td>
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<td>2014</td>
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<td>57,434</td>
<td>286</td>
<td>102</td>
<td>11.3</td>
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<td>41,512</td>
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Phone: 846-872-7080

### Thinning Report

Season Ending 2016

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<th>Class1 Kg/ha</th>
<th>Fruit Harvested Weight (g)</th>
<th>TCA Harvested Fruit (cm²)</th>
<th>Tree Pickout %</th>
<th>Target Fruit/Tree post-thin</th>
<th>Actual Fruit/Tree post-thin</th>
</tr>
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<td>Sunpeach Thompson A</td>
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</table>
**Orchard Thinning Plan Recording Sheet**

**Assessment Date:** __________  
**Assessed by:** ___________

<table>
<thead>
<tr>
<th>Orchard:</th>
<th>Block:</th>
<th>Variety:</th>
</tr>
</thead>
</table>

**Theoretical Maximum / Optimum Gross Yield for this variety (T/ha)***  
___ T/ha

**Canopy Development (This canopy as % of theoretical optimum)***  
___ %

**Seasonal gross yield goal (T/ha) from pruning plan**  
___ T/ha

<table>
<thead>
<tr>
<th>Biennial Cropping Pattern -</th>
<th>Even</th>
<th>Biennial On</th>
<th>Biennial Off</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

**Initial Tree Assessment**

- **Required Vigour Status (Canopy):**  
  - More □  
  - Less □  
  - Same □

- **Pre thin Total Fruit # per tree**  
  ___

- **Visual average fruit # / cluster:**  
  - 1 □  
  - 2 □  
  - 3 □  
  - 4 □  
  - 5 □  
  - 6 □

- **Within tree areas of concern:**  
  - Top □  
  - Mid □  
  - Bottom □  
  - All □

- **Within block Tree to Tree Variability:**  
  - Low □  
  - Mod □  
  - High □

**Rules to Thinners**

- **Expected fruit number target per tree**  
  ___

- **Required fruit # per cluster – Top of tree**  
  ___

- **Required fruit # per cluster – Middle / Bottom of tree**  
  ___

- **Timing of thinning required:**  
  - Flower □  
  - November □  
  - December □  
  - Split Timing □

- **Specific focus needed on tree variability:**  
  - Yes □  
  - No □  
  - Split thinning □

- **Non standard trees - Fruit # tree**  
  ___

- **Fruit # per cluster**  
  ___

- **Comments (including focus on removal of poor fruit quality):** –

**Post Thinning Assessment**

- **Average fruit # per tree**  
  ___

- **Follow up tree grooming required:**  
  - Yes □  
  - No □

- **Comments – (possible impact on harvest etc.):** –
Biennial Bearing

- What is the variety risk?
- What is the block status?
- Is fruit set your issue?
  - Good flower # but poor final set.
- Create a biennial bearing plan.
- Don’t be scared to adjust along the way.
Biennial Bearing & Labour

• On years increase hand thinning $, later harvest date and potentially reduce colour, maturity and size.
• Off years increase cost per unit and can increase Pit and Blotch.
• Often blocks have on and off within the block - Difficult to manage.
• Overall biennial bearing leads to lower labour efficiency.
Management of poor fruit set.

- Flower strength / nutrition status
- Tree vigour
- Flower numbers
- Pollinator proximity / flower overlap
- Bee / insect activity
- Weather conditions
Management of Biennial Bearing.

• Management practices / tools
• Correct crop load
  • Pruning
  • Chemical thinning
  • Hand thinning
• Root ripping / cinturing
• Regalis™, mid season Ethephon, NAA
• *Create a plan – Adjust if needed*
Management of Biennial Bearing.

- Visit the APAL Library
- Solving Biennial Bearing
Chemical Thinning – Why?

• To provide a level of fruit removal that –
• Reduces Biennial bearing
• Produces even crop load
• Produces required tree vigour
• Reduces hand thinning – without over thinning
Chemical Thinning

- What options are available for each variety?
- What is the focus of your individual block?
  - What did your winter bud numbers show?
  - What has historically happened in the block?
  - What vigour response do you require?
  - What is the risk / reward?
  - Specific targeted areas - Tops / bottoms etc..
- Create a Chemical Thinning Plan
- Don’t be scared to adjust along the way.
Management of Chemical thinning.

- Management considerations
  - Seasonal expectations of block.
  - Product choices – For your conditions
  - Product rates – including surfactants
  - Personal experience / history
  - Sprayer calibration
    - Targeted where? Water rates?
  - Timing – spray target
- Make a plan before you start
Chemical Thinning.

• Visit the APAL Library
• http://apal.org.au/getting-chemical-thinning/
What does your flower look like?

Mark target branch &
monitor flower development
Is your water rate adjusted correctly for the tree row volume?

WRG 5x2.5, TRV 22,100m³, consistency 86%
What should hand thinning cost $/ha?

<table>
<thead>
<tr>
<th>Labour cost</th>
<th>Budget</th>
<th>Actual</th>
<th>Yield</th>
<th>$/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 12</td>
<td>$2500/ha</td>
<td>$2498</td>
<td>32 t/ha</td>
<td>$0.08</td>
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<tr>
<td>Block 36</td>
<td>$2500/ha</td>
<td>$5000</td>
<td>120 t/ha</td>
<td>$0.04</td>
</tr>
</tbody>
</table>
Summary
Crop Load plan

✓ History
✓ Target
✓ Pruning
✓ Dormancy breakers - flower compaction
✓ Bloom thinning
✓ Fruitlet thinning
✓ Hand thinning

“Failing to plan is a plan to failure”
Thank you