Linking Pinot Noir canopy condition with wine quality

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Pinot noir in Tasmania

– Cane pruned, around 20 nodes
– VSP/Scott Henry
– Little to no shoot thinning
– Bunch thinning
– Target yield 5-15 t/ha (depends on who and for which wine style)
– Fruiting zone leaf removal
Trial location

– Tamar Valley
  – Mean GDD – 1273
  – Mean rainfall – 648 mm
  – Mean Jan temperature – 17.2 °C
  – Mean Feb temperature – 17.8 °C
## Trial seasonal climate

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td><strong>MJT (°C)</strong></td>
<td>17.2</td>
<td>17.5</td>
<td>18.1</td>
<td>17.2</td>
</tr>
<tr>
<td><strong>MFT (°C)</strong></td>
<td>17.7</td>
<td>19.3</td>
<td>17.4</td>
<td>17.8</td>
</tr>
<tr>
<td><strong>Rain (mm) (Sep-May)</strong></td>
<td>532</td>
<td>317</td>
<td>378</td>
<td>430</td>
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<tr>
<td><strong>Degree Days (Sep-May, base 10°C)</strong></td>
<td>1247</td>
<td>1364</td>
<td>1358</td>
<td>1273</td>
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</tbody>
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Trial objectives

– Research question: How should we manage Pinot noir vineyards to produce the best wines that will age well?

– Can we write a ‘method’ or a ‘growing guide’?
  – How many nodes should we prune to?
  – Do we need to bunch thin?
  – Do we need to remove leaves?
Trial setup

Tamar Ridge Estates experimental block

– Clone 114, moderate vigour

– Planted 2000 (5 years old for trials) on own roots

– 2963 vines/ha

– Scott Henry trellis, drip irrigated

– Small scale winemaking
  – 10 kg ferments
  – Standard protocol
Trial winemaking
Trial measurements

– Vineyard
  – Yield and yield components, pruning weight

– Fruit
  – Sugar, pH and TA, anthocyanins and phenolics

– Wine
  – Somers colour and phenolics measures

– Seasonal climate
  – GDD, rainfall, mean Jan and mean Feb T°
Trial analyses

- Principal component analysis (PCA)
- Data reduction method
  - Takes multiple variables and recalculates new values and plots them against each other
  - Shows relationships between samples and variables
Pruning trial

– Commercial standard for this vineyard and block
  – 30 nodes per vine (higher than Tas av.)

– Trial
  – 10, 20, 30 or 40 nodes per vine
Pruning level

– Increasing node number
  – Increased yield
    – 4 t/ha (10 nodes 2008) to 25.5 t/ha (40 nodes 2006)
  – Increased Y:P
– Only increased bunch weight in 2008
Pruning level

- Increasing node number
  - TSS
    - Highest for 30 nodes per vine in 2007
    - No effect any other season
  - TA
    - Decreased (significant 2007 and 2008)
  - pH, total grape anthocyanins and phenolics
    - No effect
Pruning level

– Young wine composition (2007 and 2008)
  – Only significant effects in 2008
  – Increasing node number
    – Reduced colour
    – Reduced stable pigment
Prune anal+weat... X-expl: 48%, 18%

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Bunch thinning

– Why do we reduce yield for Pinot noir?
– When is the best time to bunch thin?

– Trial
  – Removed 25 % of bunches
  – At fruit set, pea sized berries, 10 % veraison or 90 % veraison
Bunch thinning

– Bunch thinning
  – Reduced yield
  – No effect Y:P
  – Reduced bunch weight in 2006
Bunch thinning

- TSS
  - No effect
- TA
  - Only in 2008
  - End of veraison thinning lowest
- pH
  - Inconsistent response
- Grape total phenolics and anthocyanins
  - No response
Bunch thinning

– Young wines
  – No significant effects
  – Nothing
  – Zip

– Why do we bunch thin then?

– It costs money to drop money on the ground
  – Reducing 13 to 7.5 t/ha in 2006
  – Reducing 15.5 to 10 t/ha in 2007
  – Reducing 11 to 8 t/ha in 2008
Leaf removal 2007 and 2008

At 10 % veraison

Basal | Middle | Apical
Leaf removal

- No yield effects
- TSS
  - Apical LR reduced
- TA
  - Reduced with middle or basal LR
- pH, grape total anthocyanins and phenolics
  - No effect
Leaf removal

– No young wine effects in 2007
– 2008
  – No differences between basal LR and control
  – Apical LR
    – Reduced colour
    – Increased anthocyanins
    – Increased phenolics
    – Decreased stable pigment
  – Key contribution of the apical leaves
Summary

- Pruning level
  - Some effect on young wines
  - But no effect 12 month old wines
- Bunch thinning (25 %)
  - No effect on young wines
  - No effect 12 month old wines
- Basal leaf removal
  - No effect young wines
  - No effect 12 month old wines
Summary

– Seasonal climate differences more important than the management practices
– Warmer seasons = can sustain higher crop loads (winter pruning)
– Cooler seasons = bunch thinning and basal leaf removal can improve fruit and wine composition

– Yield and quality relationship needs to be managed within each season, cannot be prescriptive year to year
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