Crop Estimation at Hogue Cellars - 2004
Hogue Crop Estimate - 04

<table>
<thead>
<tr>
<th></th>
<th>SB</th>
<th>WR</th>
<th>CH</th>
<th>CS</th>
<th>MR</th>
<th>SY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimate</td>
<td>508</td>
<td>1999</td>
<td>1453</td>
<td>1311</td>
<td>1606</td>
<td>234</td>
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<tr>
<td>Actual</td>
<td>474</td>
<td>1824</td>
<td>1454</td>
<td>1383</td>
<td>1587</td>
<td>233</td>
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</tbody>
</table>
Why make crop estimates?

- To predict incoming volume for winery management – How much to crush or sell?
- To enhance quality – vine balance
- To make accurate cluster thinning recommendations
Crop Estimating Techniques

- “Eyeball” Method
- Historical Yields
- “Seat of Pants” Method
- Individual Yield Parameters
Crop Estimation Yield Parameters

- Block Size
- Vine Density
- Vine Stand (% full canopy)
- Average Clusters/Vine
- Average Cluster Weight

→ Final Harvest Cluster Weight
Procedures: Crop estimating

- Sample blocks between early July (Pea Size) and July 23
- Sample ‘typical’ vines on grid (6-20 vines/block)
- Harvest vines, record clusters/vine and total cluster weight
- Calculate yield using cluster ‘growth factor’ (2 at Lag Phase)
- Communicate thinning recommendations based on each block’s ‘target’ yield
Data Base Interface

Data collected on Palm Pilots.

Data analyzed and reported statistically.

Used to generate crop adjustment recommendations.

Flexible enough to allow for predictions based on experience.
# Crop Estimates And Recommendations

**To:** Joe Cervantes  
**Fax:** 837-2913  
**From:** Rick Hamman, Viticulturist  
**Mobile Phone:** 509-781-1401  
**Date:** Friday, July 16, 2004

## ARROWSMITH

<table>
<thead>
<tr>
<th>Block</th>
<th>Date</th>
<th>Targ T/A</th>
<th>Est T/A</th>
<th>Est lb/cl</th>
<th>Est cl/vn</th>
<th>Req cl/vn</th>
<th>Recommendation</th>
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</thead>
<tbody>
<tr>
<td>ARCB</td>
<td>7/12</td>
<td>6.00</td>
<td>5.37</td>
<td>0.264</td>
<td>83</td>
<td>83</td>
<td>No Thinning.</td>
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<td>ARCF</td>
<td>7/12</td>
<td>4.00</td>
<td>5.57</td>
<td>0.203</td>
<td>84</td>
<td>60</td>
<td>We recommend removing 24 clusters/vine to reach target yield.</td>
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<td>ARCH</td>
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<td>6.00</td>
<td>6.00</td>
<td>0.150</td>
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<td>ARGTN</td>
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<td>7.30</td>
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<td>0.184</td>
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<td>No Thinning.</td>
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</tbody>
</table>
2000 Crop Estimates-Hogue Cellars

Projection vs. Actual Tons

- CS
- CH
- MR
- SB
- WR
Reference Block Cluster and Berry Growth

- Clusters & berries show double sigmoid growth
- Lag Phase occurs third week of July through first week of August (about 50 days after bloom)
- Overlap between varieties, Chardonnay earliest, Cabernet latest
- Lag Phase dates identical for clusters and berries
Cluster Weight Growth Factors (Ratios)

- Calculate cluster ‘growth factors’ (ratios) using final cluster weight
- Helps clarify Lag Phase dates
- Lag Phase occurs at a growth ratio of 2, i.e. when weight is half of final weight
- Final weight (ratio of 1) occurs 4th week of August, shortly after veraison complete
99 CLUSTER WEIGHT RATIOS
Calculating a Ratio

• Current Cluster Weight = 0.11(lbs)
• Last Years Final Cluster Weight = 0.26(lbs)
• Ratio = 0.26/0.11 = 2.36
• Expect clusters to grow slightly more than double (2.36X) their current weight.
• Ratio = 0.29/0.18 = 1.61
Potential Errors

1. Block Size – GPS or not
2. Vine Density – mechanically planted
3. Vine Stand – highly variable blocks
4. Clusters / vine – counted or harvested
5. Inaccurate cluster weight – true harvest weight
6. Sample Size – Too Small
7. Sampling too early – before pea size
8. Mental fatigue – data entry
Typical Example

- 726 vines/acre @ 95% stand = 690 vines/acre
- July 22 – Sampled 20 vines from 12 acre WR block
- Clusters/Vine = 94 and Cluster weight = 0.14 lbs
- 94 X 0.14 = 13.16 lb/vine on July 22
- 13.16 lb X 690 = 9,080 lb/acre or 4.54 TA
- Predict 1.75 growth factor
- 1.75 X 0.14 = 0.245 lb/cluster final weight
- 94 X 0.245 = 23.03 lb/vine = 15,891 lbs/acre
- Target = 6TA or 12,000 lbs
- Need to remove 3,891 lbs/acre or 23 clusters/vine