Berry sensory profiles to assess grape ripening and quality

Vineyard and winery routine analysis
The Descriptive and Quantified Sensory Analysis (D.Q.S.A.) of grape berries, the DIWC methodology, is a tasting method for grape berries, established according to ISO 11035 norm.

In the vineyard and in the winery, it allows a description and a differentiation of lots of grape berries using a predefined profile composed of descriptors quantified on a fixed scale.
When the grapes arrive at the winery...

The D.Q.S.A. of berries allows the chief winemaker to characterize and differentiate the lots, to evaluate the conformity of berries with the wine profile objectives, to allow reorientations and adjustments on winemaking processes.
When the grapes arrive at the winery...

Paired with the D.Q.S.A. of the Wine (D.I.W.C. methodology), the D.Q.S.A. of Berries allows to correlate the improvement of grapes quality with the improvement of the final product.
The D.Q.S.A is a precise tool to monitor the ripening of the same vineyard lot at 2 moments, close to picking.
Main viticulture criteria for a 12 € market goal

- High grape concentration
- Mid to low yield: < 1.5 kg/plant
- Preferentially short pruning
- Complete ripening
Sugar and phenolic model curves

Alcohol potential

Not completely ripe

Fully ripe

Anthocyanins

Time

1 week
Aspect of the berry and tasting the pulp

- **Color**
- **Fragility**
- **Destemming**
- **Drop of juice**
- **Separation**
- **Sweetness**
- **Acidity**
- **Herbaceous**
- **Fruity**

**Not completely ripe**

**Fully ripe**

- High
- Medium
- Low

- Aspect
- Tasting
Aspect of the berry and tasting the pulp

To assess maturity homogeneity

- Color
- Fragility
- Destemming
- Drop of juice
- Separation
- Sweetness
- Acidity
- Herbaceous
- Fruity

- Not completely ripe
- Fully ripe

- High
- Medium
- Low

Aspect Tasting
Aspect of the berry and tasting the pulp

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Color</th>
<th>Fragility</th>
<th>Destemming</th>
<th>Drop of juice</th>
<th>Separation</th>
<th>Sweetness</th>
<th>Acidity</th>
<th>Herbaceous</th>
<th>Fruity</th>
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</thead>
<tbody>
<tr>
<td>Easiness</td>
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<td>3.0</td>
<td>3.0</td>
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<tr>
<td>Not completely ripe</td>
<td>3.0</td>
<td>3.0</td>
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<td>3.0</td>
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<td>3.0</td>
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<td>3.0</td>
</tr>
</tbody>
</table>

Easiness of ripe pigments and tannins diffusion during maceration
Aspect of the berry and tasting the pulp

More linked to aromatic profile of the pulp than to sugar and pH
Aspect of the berry and tasting the pulp

Absolute key point: herbaceous aromas in the pulp always completely diffuse into the wine.
Tasting the skin

Easiness of ripe pigments and tannins diffusion during maceration

5th bite 10th bite After chewing
What you feel at the 5th bite, you get it in the wine even with short maceration.
Tasting the skin

What you feel at the 10th bite, gives you the potential for long maceration.
Tasting the seeds

- **Color**: Not completely ripe - High, Medium, Low
- **Resistance**: Fully ripe - High, Medium, Low
- **Ripe flavors**: Not completely ripe - High, Medium, Low
- **Tannic intensity**: Fully ripe - High, Medium, Low
- **Astringency**: Fully ripe - High, Medium, Low

Bar chart showing the comparison of Not completely ripe and Fully ripe for each attribute.
The sensory profile of the seeds is only an indicator of maturity dynamics. Seeds do not generally participate to the wine profile. Wine is made with pulp and skins...
Obvious conclusion:

If possible, don't pick at the first date (orange bars): the grapes have not a conforming maturity for the 12 Euro segment.
Effect of ripening. Red grapes

The D.Q.S.A is a precise tool to monitor the ripening of the same vineyard lot at 2 moments, close to picking.
Main viticulture criteria for a 7 € market goal

- Sound grapes, every year, every lot
- Mid concentration
  - Mid yield: 2-2.5 kg/plant
- Preferentially short pruning
- Complete pulp ripening
Sugar and phenolic model curves

- Alcohol potential
- Anthocyanins

Not completely ripe | Fully ripe

Time

1 week
Aspect of the berry and tasting the pulp

- Not completely ripe
- Segment goals

<table>
<thead>
<tr>
<th>Aspect</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td></td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Fragility</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Destemming</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Drop of juice</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Separation</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Sweetness</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Acidity</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Herbaceous</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Fruity</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
Aspect of the berry and tasting the pulp

To assess mechanical resistance of the grapes and its ability to release good pigments, tannins and aromas without aggressive mechanical extraction.
Aspect of the berry and tasting the pulp

Absolute key point: herbaceous aromas in the pulp always completely diffuse into the wine.
Tasting the skin

Crushing
Acidity
Herbaceous
Fruity
Acidity
Herbaceous
Fruity
Tannic Intensity
Astringency
Dryness
Aspect of mixture

Not completely ripe
Segment goals

High 3
Medium 2
Low 1

Crushing  Acidity  Herbaceous  Fruity  Acidity  Herbaceous  Fruity  Tannic Intensity  Astringency  Dryness  Aspect of mixture

5th bite  10th bite  After chewing
Tasting the skin

- Crushing
- Acidity
- Herbaceous
- Fruity
- Acidity
- Herbaceous
- Fruity
- Tannic Intensity
- Astringency
- Dryness
- Aspect of mixture

Not completely ripe
Segment goals

Easiness of ripe pigments and tannins diffusion during maceration

High
Medium
Low

Crushing Acidity Herbaceous Fruity Acidity Herbaceous Fruity Tannic Intensity Astringency Dryness Aspect of mixture

5th bite
10th bite
After chewing
Tasting the skin

What you feel at the 5th bite, you get it in the wine even with short maceration.
Tasting the skin

<table>
<thead>
<tr>
<th>5th bite</th>
<th>10th bite</th>
<th>After chewing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crushing</td>
<td>Acidity</td>
<td>Herbaceous</td>
</tr>
<tr>
<td>Fruity</td>
<td>Acidity</td>
<td>Herbaceous</td>
</tr>
<tr>
<td>Fruity</td>
<td>Tannic Intensity</td>
<td>Astringency</td>
</tr>
<tr>
<td>Dryness</td>
<td>Aspect of mixture</td>
<td></td>
</tr>
</tbody>
</table>

Not completely ripe

Not a surprise: never conforming for long maceration. Viticulture was not planned for it.
# Tasting the seeds

<table>
<thead>
<tr>
<th></th>
<th>Color</th>
<th>Resistance</th>
<th>Ripe flavors</th>
<th>Tannic intensity</th>
<th>Astringency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High</strong></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Medium</strong></td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Not completely ripe**
- **Fully ripe**
Tasting the seeds

Don’t taste the seeds if they are not « high » in color, that is dark brown. This not a viticulture that allows complete seed ripening.

- Color
- Resistance
- Ripe flavors
- Tannic intensity
- Astringency

- High
- Medium
- Low

Not completely ripe
Fully ripe
High
Medium
Low
Obviously conclusion:

If possible, don't pick at the first date: the grapes are not conforming for the 7 Euro segment.
Difference in skin ripening

Red grapes arriving at the winery

The D.Q.S.A is a precise tool to differentiate different lots arriving at the winery at the same moment with roughly the same sugar and phenolic analytical maturity.
Sugar curves

Alcohol potential
Late skin ripening

Anthocyanins
Late skin ripening

Fully ripe

Picking

Time

Sugar curves

Alcohol potential
Late skin ripening

Anthocyanins
Late skin ripening

Fully ripe

Picking

Time
Aspect of the berry and tasting the pulp

- Color
- Fragility
- Destemming
- Drop of juice
- Separation
- Sweetness
- Acidity
- Herbaceous
- Fruity

Late skin ripening vs. Fully ripe
Aspect of the berry and tasting the pulp

The DQSA immediately shows differences in the cellular and colloidal maturity, on several parameters.
Aspect of the berry and tasting the pulp

Not a surprise: with similar sugar and phenolic analytical profiles, the pulps have quite similar sensory profiles.
# Tasting the skin

<table>
<thead>
<tr>
<th>Aspect of mixture</th>
<th>5th bite</th>
<th>10th bite</th>
<th>After chewing</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Medium</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Low</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

- **Crushing**
  - Late skin ripening
  - Fully ripe

- **Acidity**
  - Late skin ripening
  - Fully ripe

- **Herbaceous**
  - Late skin ripening
  - Fully ripe

- **Fruity**
  - Late skin ripening
  - Fully ripe

- **Tannic Intensity**
  - Late skin ripening
  - Fully ripe

- **Astringency**
  - Late skin ripening
  - Fully ripe

- **Dryness**
  - Late skin ripening
  - Fully ripe

- **Aspect of mixture**
  - Late skin ripening
  - Fully ripe
Tasting the skin

The DQSA immediately shows important differences in the cellular, aromatic and colloidal maturity, on several parameters at the beginning of chewing of the skins.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>5th bite</th>
<th>10th bite</th>
<th>After chewing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crushing</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Acidity</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Herbaceous</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Fruity</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
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<tr>
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<td>Low</td>
<td>Low</td>
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</table>

Late skin ripening

The diagram illustrates the differences in the taste profile across different parameters at various stages of chewing.
Tasting the skin

Obviously differences in the long maceration potential ... although phenolic analytical profiles were similar.
Tasting the seeds

- Color
- Resistance
- Ripe flavors
- Tannic intensity
- Astringency

- Late skin ripening
- Fully ripe

High: 3
Medium: 2
Low: 1
Obvious conclusion:

Vinify the 2 lots in 2 separate tanks with 2 different procedures

... as Dominique Delteil will present you soon!
Thank you for your attention