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An innovative soil management impacts white grapes and wines sensory qualities

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INTRODUCTION

Sustainable grape production entails the implementation of management practices that permit low pesticides inputs, maintain grapevine performance, and conserve soil quality. The nutrition of the vine is one of the major parameters influencing the nature and the content of the secondary metabolites produced by the vine. These metabolites have a direct impact on the organoleptic quality of the wine. The present work investigates the quality of production of two varieties of grape (Riesling and Pinot Gris), in different combinations of locations (in Alsace, France), vintages and vineyards managements.

MATERIALS & METHODS

1. Six innovative cultures

<table>
<thead>
<tr>
<th>No.</th>
<th>Site-system</th>
<th>Vintage</th>
<th>System</th>
<th>Location</th>
<th>Harvest dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>ChâtenAB</td>
<td>Riesling</td>
<td>organic</td>
<td>Châtenois</td>
<td>10/09, 18/09, 08/09, 17/09</td>
</tr>
<tr>
<td>2.</td>
<td>IngerAB</td>
<td>Riesling</td>
<td>organic</td>
<td>Ingersheim</td>
<td>18/09, 01/09, 01/09, 01/09</td>
</tr>
<tr>
<td>3.</td>
<td>RibeauAB</td>
<td>Riesling</td>
<td>organic</td>
<td>Ribeauvillé</td>
<td>06/10, 09/10, 09/10, 09/10</td>
</tr>
<tr>
<td>4.</td>
<td>RibeauPI</td>
<td>Riesling</td>
<td>integrated</td>
<td>Ribeauvillé</td>
<td>06/10, 09/10, 09/10, 09/10</td>
</tr>
<tr>
<td>5.</td>
<td>RouffPI</td>
<td>Pinot Gris</td>
<td>integrated</td>
<td>Rouffach</td>
<td>17/09, 22/10</td>
</tr>
<tr>
<td>6.</td>
<td>RouffPlopt</td>
<td>Pinot Gris</td>
<td>Integrated optimum</td>
<td>Rouffach</td>
<td>17/09, 22/10</td>
</tr>
</tbody>
</table>

2. Analyzed products

| White berrie 2014 and 2015 | White wines 2014 from microvinification |

3. Chromametrics measurements

- L* (lightness) a* (green/red) b* (blue/yellow) color system on 4 berries of 12 grapes of each place per site (144 repetitions)

Fig. 1: Espace de couleur CIE L* a* b

4. Sensorial analysis methods

Sensory profiles estimated by quantitative descriptive analysis

- berries: 16 attributes
- wines: 15 attributes

Characterization of the hedonic quality of wines

- typicality assessment: 8 notes
- hedonic ratings: 5 notes

Fig. 2: Sensory laboratory room of 13 independent boxes

5. Sensory Panels

- 12 trained assessors
- 9 oenology wine experts
- 61 consumers of white wines

Descriptive analysis

- Wines Preferences
- Hedonic ratings

RESULTS

△ Sensory profiles of berries not dependant from the system type

A: IngerAB
B: RibeauPI

Rieslings: 5/15 sensory attributes differentiated berries for both studied years (Fig. 3).

Pinot gris: No attribute differentiated berries for both studied years (data not showed).

△ berries chromametric measurements correlated with expert color ratings

Berries from ChâtenAB harvested at lower ripeness, are greener than berries from both RibeauAB and RibeauPI (p<0.05). ChâtenAB are opposed to RibeauAB on the 3 parameters L*, a* and b* (fig. 4). The color is well characterized in absolute for both studied year.

△ Wines with variable sensory qualities

The oenologists (Fig. 5) and the consumers (data not showed) made no significant differences (at 5%) between the 2 Pinot Gris 2014 wines for quality sensory attributes. The 3 Riesling wines differed qualitatively on all criteria except for the typicality: the RibeauPI and RibeauAB wines were significantly more appreciated (at 5%) than the wine IngerAB with a strong aromatic potential and a stronger Terroir influence.

CONCLUSION & PERSPECTIVES

- The sensory visual and aromatic attributes of harvest berries enabled to distinguish the six sites-systems and the two studied year, but not the organic systems from the integrated ones.
- The chromametric measurements were correlated to the expert color ratings in relation to the grape variety.
- The sensory profile of the wine was linked to berry quality at harvest.
- There is no significant impact on consumer preferences of the wines.
- It would be interesting to continue describing the sites-systems with the production practices and others studied years.