

# THE EFFECT OF THE ORGANIC, BIODYNAMIC AND CONVENTIONAL

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## PRODUCTION PROCESSES ON THE QUALITY OF A TYPICAL WINE

### AIM

The aim of this study was to evaluate the impact of the organic, biodynamic and conventional management on the quality of a typical wine, such as Chianti DOCG. The chemical and descriptive profiles of the wines were defined by an analytical approach; the Napping test to highlight the perceived differences and the typicality by a global quality evaluation of a panel of experts judges

### METHODS

Fourteen commercial Chianti DOCG wines from Tuscany (coded by a capital letter from A to P), 2016 harvest were selected based on their production management including 4 biodynamic (\_BD), 4 organic (\_OR), and 5 conventional (\_CV) samples. Standard chemical and color parameters, free volatile compounds, polyphenol profile were determined. Quantitative Descriptive Analysis method (QDA) was performed by a panel of trained judges. Napping and Typicality was performed by 45 experts judges.

### RESULTS

#### Chemical analysis

Wines were separated, in a two dimensions map, according to the estate management (46.97% of total explained variance) as follows: conventional wines were grouped on the left side of the graph and organic and biodynamic on the right side. It is possible to evidence three subgroups such as the wines B<sub>BD</sub>, C<sub>BD</sub> and D<sub>BD</sub> that were characterized by caffeic acid, isoamyl acetate, total tannins, polymeric pigments. A second group was represented by the wines A<sub>BD</sub>, E<sub>OR</sub> and H<sub>OR</sub> characterized by CI, TPI, alcohol, total acidity, quercetin and gelatin index. Another subgroup could be evidenced on the left side of the graph constituted by the wines M<sub>CV</sub> and N<sub>CV</sub> related to the variables pH, octanoic acid and L\*. O<sub>CV</sub> wine was defined by the variables petunidin- and peonidin-3-O-glucoside, acetaldehyde, procyanidin B1 and total SO<sub>2</sub>.

Figure 1. PCA Significant Chemical Variables

#### Sensory Analysis

##### QDA

Figure 2 shows the result of the QDA shows the relationship between the wine samples and the significant descriptive attributes (PC1 44,47%; PC2 34,98%), with Type of management, Judges and Replica as factors. It is possible to see that the samples are separated in two main groups along the first dimension: N<sub>CV</sub>, P<sub>CV</sub>, C<sub>BD</sub>, M<sub>CV</sub>, E<sub>OR</sub>, H<sub>OR</sub> and even if to a lesser extent D<sub>BD</sub>, on the left side and I<sub>OR</sub>, L<sub>CV</sub>, B<sub>BD</sub>, O<sub>CV</sub>, F<sub>OR</sub> and A<sub>BD</sub> on the right side. The two groups were related to the attributes Vanilla Flavor, Wood Odor, Astringency and Bitterness on the left side, and Vegetal Odor and Flavor on the right side.

Figure 2 Significant Sensory Attributes according to Type of Management

#### Napping and Typicality

Figure 3 shows the results of the Napping test. It is possible to see that samples were separated along the first dimension in three main groups (figure 4a): the samples F<sub>OR</sub>, B<sub>BD</sub>, A<sub>BD</sub> and D<sub>BD</sub> on the left side; the samples I<sub>OR</sub>, L<sub>CV</sub>, H<sub>OR</sub>, E<sub>OR</sub>, M<sub>CV</sub> and O<sub>CV</sub> in the middle area; the samples C<sub>BD</sub>, N<sub>CV</sub> and P<sub>CV</sub> on the right side of the plot. The result of Napping test can be translated in terms of level of quality as with the N<sub>CV</sub>, P<sub>CV</sub> and C<sub>BD</sub> grouped and related to the descriptor Vanilla, in opposition to several of the organic and biodynamic samples such as I<sub>OR</sub> and B<sub>BD</sub> related to the descriptor Vegetal. The distribution of the scores of Typicality evidenced a clear trend to reward the samples on the right side of the Napping map (C<sub>BD</sub>, N<sub>CV</sub>, P<sub>CV</sub>, M<sub>CV</sub>), with a few of the experts more related to the samples of the left side (H<sub>OR</sub>, F<sub>OR</sub>, D<sub>BD</sub>, A<sub>BD</sub>).

Figure 3 Consensus Napping and distribution of the Typicality Scores

### CONCLUSION

The results showed that the wines did not present systematic differences of the eligibility and identity profiles according to the kind of production process. Experts rewarded two conventional and one biodynamic wine as the more typical of the set. The evidences support that in order to produce a typical wine, the process control represents the critical point for every kind of management.

### REFERENCES

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