Supplementary Table 1. List of taste and mouth-feel attributes and their corresponding standards for the sensory evaluation of 2014 and 2015 wines.

|  |  |
| --- | --- |
| Taste and mouth-feel |  |
| Sweetness | Different concentrations of sucrose (Sigma-Aldrich) |
| Acidity | Different concentrations of tartaric acid (Sigma-Aldrich) |
| Bitterness | Different concentrations of caffeine (caffeine tablet) |
| Astringency | Alum Crystals B.P. (Alpha Pharm)(0, 0.25, 0.5, 1 g/L) |
| Body | Carboxymethyl cellulose (CMC) solution (0.5/1/2 g/L) |
| Alcohol burn | 96% Ethanol(13%, 15%) |

**Supplementary Table 2.** Multivariate test of significance (Wilks test) for the impact of the different variables in the individual phenolic composition of all 2014 wines over time.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |

|  |
| --- |
| **F** |

 |

|  |
| --- |
| **p** |

 |
|

|  |
| --- |
| Training system |

 | 13.183 | 0.000 |
|

|  |
| --- |
| Vigour |

 | 5.962 | 0.000 |
|

|  |
| --- |
| Ripeness |

 | 53.010 | 0.000 |
|

|  |
| --- |
| Time |

 | 28.321 | 0.000 |
|

|  |
| --- |
| Training system\*Vigour |

 | 3.748 | 0.001 |
|

|  |
| --- |
| Training system\*Ripeness |

 | 13.053 | 0.000 |
|

|  |
| --- |
| Vigour\*Ripeness |

 | 2.204 | 0.031 |
|

|  |
| --- |
| Training system\*Time |

 | 4.114 | 0.000 |
|

|  |
| --- |
| Vigour\*Time |

 | 2.491 | 0.000 |
|

|  |
| --- |
| Ripeness\*Time |

 | 4.732 | 0.000 |
|

|  |
| --- |
| Training system\*Vigour\*Ripeness |

 | 5.032 | 0.000 |
|

|  |
| --- |
| Training system\*Vigour\*Time |

 | 1.242 | 0.169 |
|

|  |
| --- |
| Training system\*Ripeness\*Time |

 | 2.455 | 0.000 |
|

|  |
| --- |
| Vigour\*Ripeness\*Time |

 | 1.263 | 0.151 |
|

|  |
| --- |
| Training system\*Vigour\*Ripeness\*Time  |

 | 2.175 | 0.000 |



**Supplementary Figure 1.** Sample distribution of 2014 wines according to their phenolic content analysed by spectrophotometric methods. A) PCA scores scatter plot coloured according to the training system. B) PCA scores scatter coloured according to the vine vigour. C) PCA scores scatter plot coloured according to grape ripening. D) PCA scores scatter plot coloured according to the sampling stages. E) Loading plot with the colour and phenolic parameters: CD (colour density), MCD (modified colour density), TP (total phenolics), TRP (total red pigments), SO2 resist (SO2 resistant pigments).

**Supplementary Table 3**. Intensity values (0-100) for the taste and mouth-feel attributes of 2014 wines evaluated after 6 months of storage. The different letters indicate significant differences (ANOVA, p < 0.05) between the treatments.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Wine 6M** | **SD HV R** | **SD LV R** | **SD HV OR** | **SD LV OR** | **VSP HV R** | **VSP LV R** | **VSP HV OR** | **VSP LV OR** |
| Acidity | 55.33 ± 14.64 ab | 56.55 ± 14.11 a | 50.79 ± 15.10 bc | 48.29 ± 14.01 b | 53.77 ± 14.17 ab | 50.65 ± 15.82 bc | 47.14 ± 14.55 c | 46.59 ± 14.20 c |
| Sweetness | 28.27 ± 11.64 bc | 25.83 ± 11.44 c | 31.42 ± 14.03 ab | 33.61 ± 14.27 a | 29.17 ± 13.32 bc | 29.62 ± 13.87 b | 30.20 ± 13.23 ab | 28.79 ± 13.25 bc |
| Body | 38.02 ± 10.96 c | 37.38 ± 11.80 c | 42.91 ± 11.62 a | 43.70 ± 11.31 a | 39.41 ± 11.98 bc | 42.06 ± 11.91 ab | 43.58 ± 12.62 a | 43.20 ± 11.15 a |
| Alcohol burn | 44.95 ± 14.86 b | 45.64 ± 15.66 b | 47.82 ± 14.94 ab | 50.80 ± 14.25 a | 46.33 ± 13.96 ab | 45.98 ± 16.55 b | 50.59 ± 12.90 a | 48.20 ± 15.37 ab |
| Astringency | 42.77 ± 15.96 c | 46.47 ± 14.90 abc | 45.88 ± 14.64 bc | 44.17 ± 15.39 bc | 43.92 ± 15.73 bc | 45.32 ± 15.61 bc | 50.47 ± 15.41 a | 47.35 ± 14.84 ab |
| Bitterness | 44.06 ± 17.32 c | 43.26 ± 16.21 c | 49.38 ± 15.84 b | 51.95 ± 19.49 ab | 43.88 ± 16.73 c | 50.23 ± 16.96 ab | 54.82 ± 15.59 a | 54.17 ± 16.58 ab |

**Supplementary Table 4.** Intensity values (0-100) for the taste and mouth-feel attributes of 2014 wines evaluated after 12 months of storage. The different letters indicate significant differences (ANOVA, p < 0.05) between the treatments.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Wine 12M** | **SD HV R** | **SD LV R** | **SD HV OR** | **SD LV OR** | **VSP HV R** | **VSP LV R** | **VSP HV OR** | **VSP LV OR** |
| Acidity | 47.79 ± 1.62c | 52.93 ± 1.32 ab | 47.83 ± 1.32 c | 49.31 ± 1.47 bc | 55.68 ± 1.35 a  | 49.71 ± 1.53 bc | 46.55 ± 1.44 c | 51.95 ± 1.19 ab |
| Sweetness | 45.99 ± 1.61 b | 39.54 ± 1.40 c | 51.13 ± 1.67 a | 47.65 ± 1.53 ab | 37.04 ± 1.31 c | 37.64 ± 1.61 c | 46.06 ± 1.59 b | 39.06 ± 1.53 c |
| Body | 47.50 ± 1.55 bc | 44.41 ± 1.63 cde | 56.84 ± 1.43 a | 56.14 ± 1.33 a | 40.89 ± 1.66 e | 42.45 ± 1.52 de | 51.73 ± 1.54 b | 46.20 ± 1.64 cd |
| Alcohol burn | 45.29 ± 1.88 cd | 45.13 ± 1.66 cd | 51.38 ± 1.34 ab | 55.54 ± 1.51 a | 40.10 ± 1.58 e | 41.26 ± 1.58 de | 51.24 ± 1.70 ab | 48.15 ± 1.72 bc |
| Astringency | 45.08 ± 2.02 ab | 47.84 ± 2.00 a | 46.48 ± 1.62 a | 46.88 ± 1.63 a | 43.64 ± 2.13 ab | 40.25 ± 1.92 b | 48.75 ± 2.09 a | 47.35 ± 1.74 a |
| Bitterness | 34.96 ± 1.89 d | 37.98 ± 1.86 d | 46.73 ± 1.87 ab | 51.74 ± 2.38 a | 35.14 ± 2.04 d | 39.40 ± 2.05 cd | 44.76 ± 2.50 bc | 43.93 ± 1.92 bc |

**Supplementary Table 5.**Test of significance (Test of SS Whole model vs SS residual) for the colour and phenolics (spectrophotometric results) of 2015 wines at AF.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |

|  |
| --- |
| **F** |

 |

|  |
| --- |
| **p** |

 |
|

|  |
| --- |
| Colour Density |

 | 8.976 | 0.006 |
|

|  |
| --- |
| Hue |

 | 3.712 | 0.061 |
|

|  |
| --- |
| MCD |

 | 8.761 | 0.007 |
|

|  |
| --- |
| TP |

 | 12.697 | 0.002 |
|

|  |
| --- |
| TRP |

 | 4.798 | 0.034 |
|

|  |
| --- |
| % TRP |

 | 5.075 | 0.029 |
|

|  |
| --- |
| Tannins |

 | 1.924 | 0.204 |
|

|  |
| --- |
| SO2 Resistant  |

 | 123.970 | 0.000 |
|

|  |
| --- |
| Copigments |

 | 4.207 | 0.046 |

**Supplementary Table 6.** Test of significance (Test of SS Whole model vs SS residual) for the individual phenolic compounds of 2015 wines at AF.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |

|  |
| --- |
| **F** |

 |

|  |
| --- |
| **p** |

 |
|

|  |
| --- |
| Gallic acid |

 | 1.373 | 0.319 |
|

|  |
| --- |
| Catechin |

 | 1.979 | 0.196 |
|

|  |
| --- |
| B1 |

 | 0.735 | 0.560 |
|

|  |
| --- |
| Polymeric phenols |

 | 6.768 | 0.014 |
|

|  |
| --- |
| Total hydroxycinnamic acids |

 | 29.804 | 0.000 |
|

|  |
| --- |
| Total flavonols |

 | 6.237 | 0.017 |
|

|  |
| --- |
| Total glucosylated anthocyanins |

 | 12.925 | 0.002 |
|

|  |
| --- |
| Total acetylated |

 | 12.183 | 0.002 |
|

|  |
| --- |
| Total coumaroylated |

 | 29.854 | 0.000 |
|

|  |
| --- |
| Polymeric pigments |

 | 4.506 | 0.039 |

**Supplementary Table 7**. Multivariate test of Significance (Wilks test) for colour and phenolics (measured by spectrophotometric methods) in all 2015 wines made from different grape ripeness levels (21ºBrix. 23ºBrix. 24ºBrix and 25ºBrix) during 18 months of bottle ageing.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |

|  |
| --- |
| **F** |

 |

|  |
| --- |
| **p** |

 |
|

|  |
| --- |
| Ripeness |

 | 17.710 | 0.000 |
|

|  |
| --- |
| Time |

 | 30.940 | 0.000 |
|

|  |
| --- |
| Ripeness\*Time |

 | 3.510 | 0.000 |

**Supplementary Table 8.** Univariate test of Significance for colour and phenolics (measured by spectrophotometric methods) in all 2015 wines made from different grape ripeness (21ºBrix. 23ºBrix. 24ºBrix and 25ºBrix) during 18 months of bottle ageing.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |

|  |
| --- |
| **CDF** |

 |

|  |
| --- |
| **CDp** |

 |

|  |
| --- |
| **HueF** |

 |

|  |
| --- |
| **Huep** |

 |

|  |
| --- |
| **MCDF** |

 |

|  |
| --- |
| **MCDp** |

 |

|  |
| --- |
| **TPF** |

 |

|  |
| --- |
| **TPp** |

 |
|

|  |
| --- |
| Ripeness |

 | 66.522 | 0.000 | 18.89 | 0.000 | 53.909 | 0.000 | 20.682 | 0.000 |
|

|  |
| --- |
| Time |

 | 39.558 | 0.000 | 69.19 | 0.000 | 38.296 | 0.000 | 11.401 | 0.000 |
|

|  |
| --- |
| Ripeness\*Time |

 | 0.630 | 0.804 | 3.63 | 0.001 | 3.380 | 0.002 | 1.016 | 0.453 |
|  |

|  |
| --- |
| **TRP****F** |

 |

|  |
| --- |
| **TRP****p** |

 |

|  |
| --- |
| **Tannins****F** |

 |

|  |
| --- |
| **Tannins****p** |

 |

|  |
| --- |
| **SO2** **resistantF** |

 |

|  |
| --- |
| **SO2** **resistantp** |

 |

|  |
| --- |
| **Copigments****F** |

 |

|  |
| --- |
| **Copigments****p** |

 |
|

|  |
| --- |
| Ripeness |

 | 21.661 | 0.000 | 44.623 | 0.000 | 92.068 | 0.000 | 1.305 | 0.285 |
|

|  |
| --- |
| Time |

 | 70.650 | 0.000 | 3.434 | 0.016 | 130.053 | 0.000 | 19.528 | 0.000 |
|

|  |
| --- |
| Ripeness\*Time |

 | 1.829 | 0.076 | 3.429 | 0.002 | 11.921 | 0.000 | 4.151 | 0.000 |

**Supplementary Table 9.** Multivariate test of Significance (Wilks test) for individual phenolic compounds in all 2015 wines made from different grape ripeness (21ºBrix. 23ºBrix. 24ºBrix and 25ºBrix) during 18 months of bottle ageing.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |

|  |
| --- |
| **F** |

 |

|  |
| --- |
| **p** |

 |
|

|  |
| --- |
| Ripeness |

 | 29.544 | 0.000 |
|

|  |
| --- |
| Time |

 | 15.418 | 0.000 |
|

|  |
| --- |
| Ripeness\*Time |

 | 2.592 | 0.000 |

**Supplementary Table 10.** Univariate test of significance for the individual and group of phenolic compounds in 2015 wines made from grapes at different ripeness levels (21ºBrix. 23ºBrix. 24ºBrix and 25ºBrix) during 18 months of bottle ageing.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Gallic acid****F** | **Gallic acid****p** | **Catechin****F** | **Catechin****p** | **B1****F** | **B1****p** | **Pol. phenols****F** | **Pol. phenols****p** | **Hydroxy. Ac.****F** | **Hydroxy. Ac.****p** |
| Ripeness | 40.640 | 0.000 | 1.071 | 0.374 | 1.345 | 0.275 | 167.903 | 0.000 | 41.740 | 0.000 |
| Time  | 112.610 | 0.000 | 2.061 | 0.106 | 1.689 | 0.174 | 1.665 | 0.180 | 51.730 | 0.000 |
| Ripeness \* Time | 3.540 | 0.002 | 4.383 | 0.000 | 3.655 | 0.001 | 4.648 | 0.000 | 1.430 | 0.198 |
|  | **Flavonols****F** | **Flavonols****p** | **Gluc. anth.****F** | **Gluc. anth.****p** | **Acyl. anth.****F** | **Acyl. anth.****p** | **Coum. anth.****F** | **Coum. anth.****p** | **Pol.****pigment****F** | **Pol.****Pigment****p** |
| Ripeness | 7.693 | 0.000 | 58.245 | 0.000 | 64.849 | 0.000 | 54.959 | 0.000 | 64.590 | 0.000 |
| Time  | 66.120 | 0.000 | 106.509 | 0.000 | 148.839 | 0.000 | 151.668 | 0.000 | 0.945 | 0.449 |
| Ripeness \* Time | 1.596 | 0.137 | 8.461 | 0.000 | 11.426 | 0.000 | 13.101 | 0.000 | 2.568 | 0.014 |

**Supplementary Table 11.** Test of significance (Test of SS Whole model vs SS residual) for the taste and mouth-feel attributes in 2015 wines after 6 months of storage.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Acidity | Sweetness | Body | Alcohol burn | Astringency | Bitterness |
|  |

|  |  |
| --- | --- |
| **F** |  |

 |

|  |
| --- |
| **p** |

 |

|  |
| --- |
| **F** |

 |

|  |
| --- |
| **p** |

 |

|  |
| --- |
| **F** |

 |

|  |
| --- |
| **p** |

 |

|  |
| --- |
| **F** |

 |

|  |
| --- |
| **p** |

 |

|  |
| --- |
| **F** |

 |

|  |
| --- |
| **p** |

 |

|  |
| --- |
| **F** |

 |

|  |
| --- |
| **p** |

 |
|

|  |
| --- |
| Ripeness |

 | 2.976 | 0.059 | 3.726 | 0.030 | 20.379 | 0.000 | 47.244 | 0.000 | 14.592 | 0.000 | 29.788 | 0.000 |
|

|  |
| --- |
| Time |

 | 1.424 | 0.278 | 9.352 | 0.022 | 2.644 | 0.155 | 0.011 | 0.918 | 0.000 | 0.988 | 0.000 | 0.987 |
|

|  |
| --- |
| Ripeness\*Time |

 | 14.400 | 0.000 | 9.919 | 0.000 | 2.212 | 0.122 | 2.599 | 0.084 | 3.664 | 0.032 | 2.671 | 0.078 |

**Supplementary Table 12.** Wine alcohol % for the wines after 12M.

|  |  |  |  |
| --- | --- | --- | --- |
| 21⁰Brix | 23⁰Brix | 24⁰Brix | 25⁰Brix |
| 11.82 ± 0.39 d | 12.72 ± 0.09 c | 14.12 ± 0.04 b | 15.83 ± 0.05 a |