

**Supplemental Table 1** Changes in free anthocyanin concentration and profile of Nebbiolo grape skins during berry ripening under different sunlight exposure in 2006.

| Dpv/<br>treatment <sup>a</sup> |    | Individual anthocyanin concn (mg/kg) <sup>b</sup> |          |         |        |        | Total A <sup>b</sup><br>mg/kg | Individual anthocyanin proportion (%) <sup>b</sup> |         |        |         |         | 3'/3',5'-<br>hA <sup>b</sup> |
|--------------------------------|----|---|----------|---------|--------|--------|-------------------------------|--|---------|--------|---------|---------|------------------------------|
|                                |    | Dp  | Cy       | Pt      | Pn     | Mv     |                               | Dp   | Cy      | Pt     | Pn      | Mv      |                              |
| 14                             | C  | 26.7 a <sup>c</sup>                               | 99.0 a   | 20.5 a  | 215 a  | 73.2 a | 459 a                         | 5.7 a  | 21.4 ab | 4.4 a  | 46.9 a  | 16.1 ab | 2.6 a                        |
| 14                             | LR | 28.0 a  | 96.4 a   | 19.5 a  | 185 a  | 62.9 a | 411 a                         | 6.8 a  | 23.5 a  | 4.7 a  | 44.9 a  | 15.3 b  | 2.6 a                        |
| 14                             | FV | 23.0 a  | 67.8 a   | 18.1 a  | 177 a  | 76.4 a | 378 a                         | 6.2 a  | 18.1 a  | 4.8 a  | 46.7 a  | 20.0 ab | 2.2 a                        |
| 14                             | FH | 23.8 a  | 65.5 a   | 19.8 a  | 182 a  | 87.2 a | 397 a                         | 6.0 a  | 16.4 b  | 5.0 a  | 45.9 a  | 22.0 a  | 1.9 a                        |
| 14                             | VH | 21.5 a  | 84.6 a   | 16.6 a  | 170 a  | 59.1 a | 371 a                         | 5.8 a  | 22.8 a  | 4.5 a  | 46.1 a  | 16.1 ab | 2.7 a                        |
| 28                             | C  | 41.2 a  | 115.1 a  | 33.4 a  | 358 a  | 156 a  | 749 a                         | 5.5 b  | 15.3 a  | 4.5 b  | 47.7 a  | 20.9 b  | 2.0 a                        |
| 28                             | LR | 47.3 a  | 98.2 ab  | 36.5 a  | 269 ab | 158 a  | 647 ab                        | 7.3 a  | 15.0 a  | 5.7 a  | 41.4 b  | 24.6 ab | 1.6 ab                       |
| 28                             | FV | 47.5 a  | 107.6 ab | 37.8 a  | 358 a  | 168 a  | 763 a                         | 6.2 b  | 14.1 a  | 5.0 ab | 46.9 a  | 22.0 b  | 1.8 ab                       |
| 28                             | FH | 44.9 a  | 91.6 ab  | 36.6 a  | 332 ab | 173 a  | 715 ab                        | 6.3 ab   | 12.8 a  | 5.1 ab | 46.4 a  | 24.1 ab | 1.7 ab                       |
| 28                             | VH | 35.1 a  | 65.2 b   | 29.3 a  | 230 b  | 163 a  | 556 b                         | 6.3 ab   | 11.6 a  | 5.2 ab | 41.2 b  | 29.7 a  | 1.3 b                        |
| 42                             | C  | 35.2 b  | 82.3 a   | 27.1 b  | 290 a  | 143 a  | 629 a                         | 5.5 b  | 12.8 ab | 4.3 c  | 46.2 a  | 22.9 a  | 1.8 a                        |
| 42                             | LR | 57.8 a  | 100.7 a  | 43.5 a  | 313 a  | 191 a  | 767 a                         | 7.5 a  | 13.2 ab | 5.7 a  | 40.8 b  | 24.8 a  | 1.4 a                        |
| 42                             | FV | 39.6 b  | 73.7 a   | 33.2 ab | 342 a  | 179 a  | 728 a                         | 5.4 b  | 10.1 b  | 4.6 bc | 46.9 a  | 24.7 a  | 1.7 a                        |
| 42                             | FH | 40.7 b  | 70.9 a   | 33.3 ab | 301 a  | 178 a  | 684 a                         | 6.0 b  | 10.4 b  | 4.9 b  | 44.0 ab | 26.0 a  | 1.5 a                        |
| 42                             | VH | 46.6 ab   | 104.9 a  | 35.5 ab | 330 a  | 160 a  | 742 a                         | 6.3 b  | 14.1 a  | 4.8 bc | 44.5 ab | 21.6 a  | 1.8 a                        |
| 54                             | C  | 43.4 b  | 109.1 a  | 35.4 b  | 408 a  | 176 a  | 829 a                         | 5.3 b  | 13.2 a  | 4.3 b  | 49.2 a  | 21.2 b  | 2.0 a                        |
| 54                             | LR | 53.2 a  | 96.4 a   | 42.9 a  | 341 a  | 205 a  | 796 a                         | 6.7 a  | 12.1 ab | 5.4 a  | 42.8 a  | 25.7 ab | 1.5 b                        |
| 54                             | FV | 43.7 b  | 93.6 a   | 37.6 ab | 402 a  | 200 a  | 838 a                         | 5.2 b  | 11.2 ab | 4.5 b  | 48.0 a  | 23.8 ab | 1.8 ab                       |
| 54                             | FH | 42.8 b  | 80.2 a   | 38.2 ab | 370 a  | 212 a  | 805 a                         | 5.3 b  | 9.9 b   | 4.8 ab | 45.9 a  | 26.4 a  | 1.6 b                        |
| 54                             | VH | 44.6 ab   | 88.3 a   | 37.4 ab | 341 a  | 203 a  | 775 a                         | 5.8 ab   | 11.4 ab | 4.8 ab | 43.9 a  | 26.1 ab | 1.5 b                        |

<sup>a</sup>Dpv: days postveraison. C: control vines; LR: leaf-removed vines; FV: vines shaded from fruit set to veraison; FH: vines shaded from fruit set to harvest; VH: vines shaded from veraison to harvest.

<sup>b</sup>Abbreviations: Dp, delphinidin-3-glucoside; Cy, cyanidin-3-glucoside; Pt, petunidin-3-glucoside; Pn, peonidin-3-glucoside; Mv, malvidin-3-glucoside; Total A, total anthocyanins; hA, hydroxylated anthocyanins.

<sup>c</sup>Means followed by different letters in columns, within the same number of dpv, indicate significant differences at  $p \leq 0.05$ .

**Supplemental Table 2** Changes in free anthocyanin concentration and profile of Nebbiolo grape skins during berry ripening under different sunlight exposure in 2007.

| Dpv/<br>treatment <sup>a</sup> |    | Individual anthocyanin concn (mg/kg) <sup>b</sup> |         |         |         |          | Total A <sup>b</sup><br>mg/kg | Individual anthocyanin proportion (%) <sup>b</sup> |          |        |         |          | 3'/3',5'-<br>hA <sup>b</sup> |
|--------------------------------|----|---|---------|---------|---------|----------|-------------------------------|--|----------|--------|---------|----------|------------------------------|
|                                |    | Dp  | Cy      | Pt      | Pn      | Mv       |                               | Dp   | Cy       | Pt     | Pn      | Mv       |                              |
| 5                              | C  | 10.7 a <sup>c</sup>                               | 33.5 b  | 8.6 a   | 72 b    | 33.2 a   | 171 b                         | 6.2 a  | 19.6 ab  | 5.0 b  | 41.9 ab | 19.3 ab  | 2.0 ab                       |
| 5                              | LR | 17.1 a  | 69.8 a  | 12.4 a  | 124 a   | 43.3 a   | 286 a                         | 5.9 a  | 24.1 a   | 4.3 c  | 43.5 a  | 15.4 b   | 2.7 a                        |
| 5                              | FV | -   | -       | -       | -       | -        | -                             | -  | -        | -      | -       | -        | -                            |
| 5                              | FH | 9.4 a   | 17.0 b  | 7.5 a   | 45 b    | 39.3 a   | 130 b                         | 7.1 a  | 12.5 b   | 5.8 a  | 33.9 b  | 31.2 a   | 1.1 b                        |
| 5                              | VH | -   | -       | -       | -       | -        | -                             | -  | -        | -      | -       | -        | -                            |
| 20                             | C  | 24.1 a  | 88.3 a  | 19.5 a  | 202 a   | 82.3 a   | 455 a                         | 5.3 b  | 19.4 a   | 4.3 c  | 44.5 a  | 18.1 c   | 2.3 a                        |
| 20                             | LR | 26.8 a  | 89.0 a  | 20.9 a  | 204 a   | 85.8 a   | 466 a                         | 5.7 ab   | 19.1 a   | 4.5 bc | 44.0 a  | 18.4 c   | 2.2 a                        |
| 20                             | FV | 22.2 ab   | 50.3 b  | 18.9 a  | 138 b   | 95.2 a   | 358 b                         | 6.2 a  | 14.1 b   | 5.3 ab | 38.4 b  | 26.7 b   | 1.4 b                        |
| 20                             | FH | 16.6 b  | 23.1 c  | 15.2 a  | 85 c    | 90.7 a   | 254 c                         | 6.5 a  | 9.1 c    | 6.0 a  | 33.4 c  | 35.7 a   | 0.9 b                        |
| 20                             | VH | 22.4 ab   | 66.6 b  | 17.5 a  | 155 b   | 76.0 a   | 366 b                         | 6.1 ab   | 18.2 a   | 4.7 bc | 42.4 ab | 20.6 c   | 2.0 a                        |
| 32                             | C  | 30.5 a  | 63.1 ab | 26.4 a  | 206 ab  | 135.2 a  | 516 a                         | 5.9 a  | 12.1 abc | 5.1 a  | 39.8 ab | 26.3 abc | 1.4 bc                       |
| 32                             | LR | 26.3 ab   | 84.3 a  | 21.3 b  | 221 a   | 93.1 b   | 494 a                         | 5.3 a  | 17.1 a   | 4.3 a  | 44.7 a  | 18.8 c   | 2.1 a                        |
| 32                             | FV | 24.8 ab   | 39.8 bc | 22.1 ab | 146 bc  | 119.8 ab | 396 b                         | 6.3 a  | 9.8 bc   | 5.6 a  | 36.7 bc | 30.7 ab  | 1.2 bc                       |
| 32                             | FH | 23.4 b  | 31.6 bc | 21.5 b  | 127 c   | 128.5 a  | 378 b                         | 6.2 a  | 8.4 c    | 5.7 a  | 33.5 c  | 33.8 a   | 0.9 c                        |
| 32                             | VH | 27.6 ab   | 63.6 ab | 22.9 ab | 180 abc | 107.3 ab | 446 ab                        | 6.2 a  | 14.2 ab  | 5.2 a  | 40.2 ab | 24.2 bc  | 1.6 ab                       |
| 47                             | C  | 33.2 a  | 83.4 ab | 28.4 a  | 257 a   | 141.8 a  | 615 a                         | 5.4 a  | 13.5 ab  | 4.6 ab | 41.8 a  | 23.1 c   | 1.6 ab                       |
| 47                             | LR | 30.6 a  | 102.5 a | 26.1 a  | 266 a   | 116.6 a  | 606 a                         | 5.0 a  | 16.9 a   | 4.3 b  | 44.0 a  | 19.3 c   | 2.1 a                        |
| 47                             | FV | 29.0 a  | 43.7 c  | 28.1 a  | 191 b   | 155.4 a  | 506 b                         | 5.7 a  | 8.6 cd   | 5.5 a  | 37.7 a  | 30.7 ab  | 1.1 b                        |
| 47                             | FH | 25.6 a  | 36.0 c  | 25.0 a  | 177 b   | 158.5 a  | 482 b                         | 5.3 a  | 7.5 d    | 5.2 ab | 36.9 a  | 32.8 a   | 1.1 b                        |
| 47                             | VH | 26.0 a  | 58.9 bc | 23.0 a  | 198 b   | 115.2 a  | 477 b                         | 5.5 a  | 12.4 bc  | 4.8 ab | 41.7 a  | 24.1 bc  | 1.6 ab                       |

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