

1 **Using sensory and instrumental analysis to assess the impact of grape smoke**  
2 **exposure on different red wine varieties in California**

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12 **Supplementary Files**

14 **Supplementary Table S1:** GC-MS/MS analysis parameters used for compound identification and  
15 quantification. RT- retention time, CE- collision energy

| Compound Name        | Precursor ion | MS1 res | Product ion | MS2 res | RT    | Left<br>Delta<br>RT | Right<br>Delta<br>RT | Dwell<br>(ms) | CE<br>(V) |
|----------------------|---------------|---------|-------------|---------|-------|---------------------|----------------------|---------------|-----------|
| d-guaiacol           | 127.1         | Wide    | 109         | Wide    | 8.84  | 0.20                | 0.14                 | 82.6          | 10        |
| d-guaiacol           | 127.1         | Wide    | 81          | Wide    | 8.84  | 0.20                | 0.14                 | 82.6          | 20        |
| guaiacol             | 123.9         | Wide    | 109         | Wide    | 8.86  | 0.12                | 0.14                 | 82.6          | 10        |
| guaiacol             | 123.9         | Wide    | 81          | Wide    | 8.86  | 0.12                | 0.14                 | 82.6          | 20        |
| creosol              | 138.1         | Wide    | 123         | Wide    | 9.61  | 0.12                | 0.14                 | 54.7          | 10        |
| creosol              | 138.1         | Wide    | 95          | Wide    | 9.61  | 0.12                | 0.14                 | 54.7          | 20        |
| d-creosol            | 141.1         | Wide    | 126         | Wide    | 9.61  | 0.12                | 0.14                 | 54.7          | 10        |
| d-creosol            | 141.1         | Wide    | 98          | Wide    | 9.61  | 0.12                | 0.14                 | 54.7          | 20        |
| d-o-cresol           | 115           | Wide    | 113         | Wide    | 9.87  | 0.12                | 0.14                 | 67.1          | 20        |
| d-o-cresol           | 115           | Wide    | 81          | Wide    | 9.87  | 0.12                | 0.14                 | 67.1          | 30        |
| o-cresol             | 108           | Wide    | 107         | Wide    | 9.91  | 0.12                | 0.14                 | 45.5          | 15        |
| o-cresol             | 107           | Wide    | 77          | Wide    | 9.91  | 0.12                | 0.14                 | 45.5          | 15        |
| phenol               | 94            | Wide    | 66          | Wide    | 9.94  | 0.12                | 0.14                 | 43.6          | 10        |
| phenol               | 94            | Wide    | 65          | Wide    | 9.94  | 0.12                | 0.14                 | 43.6          | 20        |
| d-4-ethylguaiacol    | 157           | Wide    | 139         | Wide    | 10.15 | 0.12                | 0.14                 | 42.4          | 10        |
| d-4-ethylguaiacol    | 157           | Wide    | 96          | Wide    | 10.15 | 0.12                | 0.14                 | 42.4          | 30        |
| 4-ethylguaiacol      | 151.8         | Wide    | 137         | Wide    | 10.19 | 0.12                | 0.14                 | 73.3          | 10        |
| 4-ethylguaiacol      | 151.8         | Wide    | 94          | Wide    | 10.19 | 0.12                | 0.14                 | 73.3          | 30        |
| d- <i>pm</i> -cresol | 115           | Wide    | 113         | Wide    | 10.54 | 0.12                | 0.14                 | 67.1          | 20        |
| d- <i>pm</i> -cresol | 115           | Wide    | 85          | Wide    | 10.54 | 0.12                | 0.14                 | 67.1          | 20        |
| <i>pm</i> -cresol    | 108           | Wide    | 107         | Wide    | 10.58 | 0.12                | 0.14                 | 48.5          | 15        |
| <i>pm</i> -cresol    | 107           | Wide    | 77          | Wide    | 10.58 | 0.12                | 0.14                 | 48.5          | 15        |
| 2,3-dimethoxyphenol  | 154           | Wide    | 139         | Wide    | 10.67 | 0.12                | 0.14                 | 67.1          | 5         |
| 2,3-dimethoxyphenol  | 154           | Wide    | 65          | Wide    | 10.67 | 0.12                | 0.14                 | 67.1          | 20        |
| d-4-ethylphenol      | 126.1         | Wide    | 111         | Wide    | 11.29 | 0.12                | 0.14                 | 54.7          | 10        |
| d-4-ethylphenol      | 126.1         | Wide    | 80          | Wide    | 11.29 | 0.12                | 0.14                 | 54.7          | 30        |
| 4-ethylphenol        | 121.9         | Wide    | 107         | Wide    | 11.30 | 0.12                | 0.14                 | 82.6          | 10        |
| 4-ethylphenol        | 121.9         | Wide    | 77          | Wide    | 11.30 | 0.12                | 0.14                 | 82.6          | 30        |
| d-syringol           | 160           | Wide    | 142         | Wide    | 11.99 | 0.12                | 0.14                 | 82.5          | 10        |
| d-syringol           | 160           | Wide    | 114         | Wide    | 11.99 | 0.12                | 0.14                 | 82.5          | 20        |
| syringol             | 153.9         | Wide    | 139         | Wide    | 12.02 | 0.12                | 0.14                 | 82.5          | 5         |
| syringol             | 153.9         | Wide    | 65          | Wide    | 12.02 | 0.12                | 0.14                 | 82.5          | 20        |
| 4-methylsyringol     | 168           | Wide    | 153         | Wide    | 12.71 | 0.12                | 0.14                 | 110.4         | 5         |
| 4-methylsyringol     | 168           | Wide    | 125         | Wide    | 12.71 | 0.12                | 0.14                 | 110.4         | 10        |

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18 **Supplementary Table S2:** LC-MS/MS analysis parameters, multiple reaction monitoring was  
 19 used for compound identification and quantification

| <u>Compound Name</u>           | <u>Precursor Ion</u> | <u>Product Ion</u> | <u>Fragmentor (V)</u> | <u>Collision Energy (V)</u> | <u>Retention Time (min)</u> | <u>Retention Window</u> | <u>Polarity</u> |
|--------------------------------|----------------------|--------------------|-----------------------|-----------------------------|-----------------------------|-------------------------|-----------------|
| Salicin                        | 304                  | 269                | 70                    | 5                           | 2.41                        | 0.8                     | Positive        |
| Salicin                        | 304                  | 107                | 70                    | 10                          | 2.41                        | 0.8                     | Positive        |
| Guaiacol gentiobioside         | 466                  | 325                | 90                    | 5                           | 3.05                        | 0.8                     | Positive        |
| Guaiacol gentiobioside         | 466                  | 163                | 90                    | 10                          | 3.05                        | 0.8                     | Positive        |
| Guaiacol gentiobioside         | 466                  | 145                | 90                    | 20                          | 3.05                        | 0.8                     | Positive        |
| d3-Guaiacol gentiobioside      | 469                  | 325                | 90                    | 5                           | 3.05                        | 0.8                     | Positive        |
| d3-Guaiacol gentiobioside      | 469                  | 163                | 90                    | 10                          | 3.05                        | 0.8                     | Positive        |
| Phenol penthex                 | 406                  | 295                | 70                    | 5                           | 3.24                        | 1                       | Positive        |
| Phenol penthex                 | 406                  | 163                | 70                    | 10                          | 3.24                        | 1                       | Positive        |
| Phenol penthex                 | 406                  | 133                | 70                    | 15                          | 3.24                        | 1                       | Positive        |
| d3-Syringol gentiobioside      | 501                  | 163                | 90                    | 15                          | 3.45                        | 0.8                     | Positive        |
| d3-Syringol gentiobioside      | 501                  | 145                | 90                    | 20                          | 3.45                        | 0.8                     | Positive        |
| Syringol gentiobioside         | 496                  | 325                | 90                    | 5                           | 3.5                         | 0.8                     | Positive        |
| Syringol gentiobioside         | 496                  | 163                | 90                    | 15                          | 3.5                         | 0.8                     | Positive        |
| Syringol gentiobioside         | 496                  | 145                | 90                    | 20                          | 3.5                         | 0.8                     | Positive        |
| Guaiacol glucoside             | 304                  | 163                | 70                    | 5                           | 3.66                        | 0.8                     | Positive        |
| Guaiacol glucoside             | 304                  | 145                | 70                    | 5                           | 3.66                        | 0.8                     | Positive        |
| Guaiacol glucoside             | 304                  | 125                | 70                    | 5                           | 3.66                        | 0.8                     | Positive        |
| d5-Phenol rutinoside           | 425                  | 309                | 90                    | 5                           | 3.69                        | 0.8                     | Positive        |
| d5-Phenol rutinoside           | 425                  | 147                | 90                    | 10                          | 3.69                        | 0.8                     | Positive        |
| Phenol rutinoside              | 420                  | 309                | 90                    | 5                           | 3.76                        | 0.8                     | Positive        |
| Phenol rutinoside              | 420                  | 164                | 90                    | 5                           | 3.76                        | 0.8                     | Positive        |
| Phenol rutinoside              | 420                  | 147                | 90                    | 10                          | 3.76                        | 0.8                     | Positive        |
| Amygdalin                      | 475                  | 325                | 80                    | 5                           | 3.89                        | 0.8                     | Positive        |
| Amygdalin                      | 475                  | 163                | 80                    | 15                          | 3.89                        | 0.8                     | Positive        |
| Guaiacol penthex               | 436                  | 295                | 70                    | 5                           | 4.05                        | 1                       | Positive        |
| Guaiacol penthex               | 436                  | 163                | 70                    | 10                          | 4.05                        | 1                       | Positive        |
| Guaiacol penthex               | 436                  | 133                | 70                    | 15                          | 4.05                        | 1                       | Positive        |
| Syringol penthex               | 471                  | 295                | 90                    | 5                           | 4.4                         | 1                       | Positive        |
| Syringol penthex               | 471                  | 163                | 90                    | 15                          | 4.4                         | 1                       | Positive        |
| Syringol penthex               | 471                  | 155                | 90                    | 15                          | 4.4                         | 1                       | Positive        |
| Cresol penthex                 | 420.2                | 295                | 70                    | 5                           | 4.44                        | 1                       | Positive        |
| Cresol penthex                 | 420.2                | 163                | 70                    | 15                          | 4.44                        | 1                       | Positive        |
| Cresol penthex                 | 420.2                | 133                | 70                    | 15                          | 4.44                        | 1                       | Positive        |
| d3-Guaiacol rutinoside         | 453                  | 309                | 90                    | 5                           | 4.54                        | 0.8                     | Positive        |
| d3-Guaiacol rutinoside         | 453                  | 147                | 90                    | 10                          | 4.54                        | 0.8                     | Positive        |
| Guaiacol rutinoside            | 450                  | 309                | 90                    | 5                           | 4.58                        | 0.8                     | Positive        |
| Guaiacol rutinoside            | 450                  | 164                | 90                    | 10                          | 4.58                        | 0.8                     | Positive        |
| Guaiacol rutinoside            | 450                  | 147                | 90                    | 10                          | 4.58                        | 0.8                     | Positive        |
| 4-Methylsyringol gentiobioside | 510                  | 325                | 90                    | 10                          | 5.08                        | 0.8                     | Positive        |
| 4-Methylsyringol gentiobioside | 510                  | 163                | 90                    | 15                          | 5.08                        | 0.8                     | Positive        |
| 4-Methylsyringol gentiobioside | 510                  | 145                | 90                    | 20                          | 5.08                        | 0.8                     | Positive        |
| d5-Cresol rutinoside           | 439                  | 309                | 90                    | 5                           | 5.56                        | 0.8                     | Positive        |
| d5-Cresol rutinoside           | 439                  | 147                | 90                    | 10                          | 5.56                        | 0.8                     | Positive        |
| Cresol rutinoside              | 434                  | 309                | 90                    | 5                           | 5.67                        | 0.8                     | Positive        |
| Cresol rutinoside              | 434                  | 164                | 90                    | 5                           | 5.67                        | 0.8                     | Positive        |
| Cresol rutinoside              | 434                  | 147                | 90                    | 10                          | 5.67                        | 0.8                     | Positive        |
| 4-MS penthex                   | 480                  | 295                | 90                    | 10                          | 5.9                         | 1                       | Positive        |
| 4-MS penthex                   | 480                  | 169                | 90                    | 15                          | 5.9                         | 1                       | Positive        |
| d3-4-Methylguaiacol rutinoside | 467                  | 309                | 90                    | 5                           | 6.28                        | 0.8                     | Positive        |
| d3-4-Methylguaiacol rutinoside | 467                  | 147                | 90                    | 10                          | 6.28                        | 0.8                     | Positive        |
| 4-Methylguaiacol rutinoside    | 464                  | 309                | 90                    | 5                           | 6.31                        | 0.8                     | Positive        |
| 4-Methylguaiacol rutinoside    | 464                  | 309                | 90                    | 5                           | 6.31                        | 0.8                     | Positive        |
| 4-Methylguaiacol rutinoside    | 464                  | 164                | 90                    | 10                          | 6.31                        | 0.8                     | Positive        |
| 4-Methylguaiacol rutinoside    | 464                  | 147                | 90                    | 10                          | 6.31                        | 0.8                     | Positive        |

21 **Supplemental Table S3: Descriptive analysis descriptors and preparation.**

| s/n | Category  | Descriptor        | Recipe                                                                                                                     | Brand                                                                                                                                                                    |
|-----|-----------|-------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Aroma     | Cigarette smoke   | Pinch of ash of Camel Brand Loose Leaf Tobacco + 20mL Base wine                                                            | No. 91 Danish Export Virginia Blend Cigarette Tobacco.                                                                                                                   |
| 2   | Aroma     | Musty             | 2cm square Wet Cardboard + 5mL Water to wet evenly                                                                         |                                                                                                                                                                          |
| 3   | Aroma     | Medicinal / Brett | 1 drop 40% Phenol Solution + 40mL Base Wine                                                                                |                                                                                                                                                                          |
| 4   | Aroma     | Liquid Smoke      | 1mL Wrights Liquid smoke hickory with 40mL Base wine.                                                                      | Wright's Liquid Smoke Concentrated Seasoning, Hickory                                                                                                                    |
| 5   | Aroma     | Sweet BBQ         | 1mL Stubbs Mesquite Liquid Smoke with 40mL Base wine.                                                                      | Stubbs Mesquite Liquid Smoke                                                                                                                                             |
| 6   | Aroma     | Menthol           | 1 ml solution (3 drops Eucalyptus oil in 100 ml water) + 40 ml Base wine                                                   | Nature's Truth Eucalyptus 100% pure essential oil                                                                                                                        |
| 7   | Aroma     | Tar               | 1 slice Bicycle inner tube touch with Asphalt cement                                                                       | Bell 12.5" Bicycle inner tube, Black Jack All weather Roof cement                                                                                                        |
| 8   | Aroma     | Solvent           | 0.125ml acetone, 1 drop ethyl acetate, 50ml Base wine                                                                      | Acetone- Day logic brand 100% Acetone                                                                                                                                    |
| 9   | Aroma     | Red Fruit         | 2 Frozen Dark Cherry, 2 Frozen Raspberry, 1 Frozen Strawberry cut into cubes and smashed                                   | <b>Strawberry:</b> Cascadian Farm (Sedro-Woolley, WA)<br><b>Dark Cherry &amp; Raspberry:</b> Woodstock Organic                                                           |
| 10  | Aroma     | Dark fruit        | 4 Frozen Blackberry, 2 Dark Frozen cherries, 5 Frozen Blueberry, all cut and smashed. + 1 drop Everclear                   | <b>Blueberry:</b> Cascadian Farm (Sedro-Woolley, WA). <b>Dark Cherry:</b> Woodstock Organic. <b>Blackberries:</b> Sthalbush Island Farms.<br><b>Everclear:</b> 120 proof |
| 11  | Aroma     | Cooked fruit      | 1 tsp of each Blueberry jam, Blackberry jam, 1/2 tsp Strawberry and 1/2 Raspberry Jam in 20 mL Base wine                   | <b>Wild Blueberry Jam-</b> St Dalfour brand. <b>Strawberry, Blackberry, Raspberry Preserve-</b> Smuckers                                                                 |
| 12  | Aroma     | Dried fruit       | 1/8 Pcs Prune + 4 Raisins + 1/4 Dried Figs +10mL Base wine                                                                 | <b>Prunes:</b> Sunsweet D'Noir Prunes preservative free. <b>Raisins:</b> Sunmaid raisins. <b>Figs:</b> Sun maid mission figs                                             |
| 13  | Aroma     | Bell pepper       | 0.5 cm square piece of Green bell pepper + 40ml Base wine, soak for 10 mins,                                               |                                                                                                                                                                          |
| 14  | Aroma     | Spice             | 1 chip Nutmeg + 1 chip Cinnamon + 4 pcs All spice + 4pcs Cloves, in 40mL Base Wine Soak 45 mins and filter                 | <b>Nutmeg:</b> Morton and Barret,<br><b>Cinnamon, All spice, Cloves:</b> Mc Cormick                                                                                      |
| 15  | Aroma     | Alcohol Hotness   | 16% Alcohol final content, 270mL/L 60% v/v Everclear                                                                       | Everclear, 120 proof                                                                                                                                                     |
| 16  | Mouthfeel | Sweet             | Low 5g/L Fructose, High 12.5g/L Fructose                                                                                   | Now Real Food                                                                                                                                                            |
| 17  | Mouthfeel | Sour              | Low 0.5g/L Tartaric Acid, High 2g/L Tartaric Acid                                                                          |                                                                                                                                                                          |
| 18  | Mouthfeel | Bitter            | Low- 500mg/L Caffeine, High 1000mg/L                                                                                       | Caffeine Anhydrous, VWR Life science                                                                                                                                     |
| 19  | Mouthfeel | Dry               | Low- 200mg/L Alum, High 620mg/L Alum                                                                                       | Mc Cormick                                                                                                                                                               |
| 20  | Mouthfeel | Hot               | Low- 85mL/L 60% v/v Everclear, High- 170mL/L 60% v/v Everclear                                                             | Everclear, 120 proof                                                                                                                                                     |
| 21  | Mouthfeel | Viscosity         | Low- plain Water, High 2g/L CMC in water                                                                                   | Sugarman candy.                                                                                                                                                          |
| 22  | Ashy      | Ashy Aftertaste   | Burnt Leeks ash in water, 100g leeks to 1000g water to make concentrate,<br>Concentrate : Water, 1 :5 for 100% solution. , |                                                                                                                                                                          |

22 #Base wine- where applicable , all aroma, taste, and mouthfeel standards made with Franzia Pinot Noir / Carmenere blend

23 **Supplemental Table S4:** Basic chemical composition of grapes used for winemaking.

| Wine       | Brix (°)        | pH             | TA (g/L)        | Malic (mg/L)   | NOPA (mg/L)     | NH3 (mg/L)        | YAN (mg/L)        |
|------------|-----------------|----------------|-----------------|----------------|-----------------|-------------------|-------------------|
| DA 1       |                 |                |                 |                |                 |                   |                   |
| 20CS_A_ST  | 27.83 ± 0.45 C  | 3.68 ± 0.08 D  | 4.49 ± 0.29 D   | 2314 ± 262 D   | 80.67 ± 1.53 CD | 35.00 ± 2.00 B    | 109.67 ± 3.21 D   |
| 20CS_B_ST  | 24.60 ± 0.17 H  | 3.94 ± 0.01 C  | 3.36 ± 0.04 G   | 2390 ± 53 D    | 64.00 ± 2.65 F  | 17.33 ± 4.51 E    | 78.33 ± 1.15 G    |
| 20CS_C_ST  | 25.37 ± 0.15 F  | 3.63 ± 0.03 DE | 4.02 ± 0.09 E   | 1418 ± 67 G    | 66.67 ± 5.51 F  | 25.33 ± 0.58 D    | 88.00 ± 5.2 F     |
| 20CS_D_ST  | 26.03 ± 0.06 E  | 3.60 ± 0.02 DE | 5.64 ± 0.13 B   | 3131 ± 49 B    | 74.67 ± 2.08 E  | 34.67 ± 4.51 BC   | 100.00 ± 5.29 E   |
| 20CS_E_ST  | 23.95 ± 0.07 I  | 3.43 ± 0.01 FG | 5.98 ± 0.08 A   | 3778 ± 14 A    | 76.50 ± 3.54 DE | 38.00 ± 1.41 B    | 108.00 ± 4.24 D   |
| 20CS_F_ST  | 28.00 ± 0.00 C  | 3.55 ± 0.01 EF | 5.29 ± 0.36 C   | 2739 ± 124 C   | 90.33 ± 5.86 B  | 36.67 ± 2.08 B    | 120.67 ± 5.03 B   |
| 20CS_G_ST  | 26.90 ± 0.10 D  | 3.91 ± 0.01 C  | 3.62 ± 0.02 FG  | 1986 ± 130 E   | 101.00 ± 3.61 A | 34.67 ± 3.21 BC   | 130.00 ± 6.24 A   |
| 20CS_H_ST  | 25.83 ± 0.06 E  | 3.71 ± 0.02 D  | 4.60 ± 0.08 D   | 79 ± 3 H       | 45.67 ± 4.04 G  | 116.33 ± 1.15 A   | 116.00 ± 0.00 BC  |
| 21CS_I_NST | 24.97 ± 0.06 G  | 3.34 ± 0.03 G  | 5.76 ± 0.17 AB  | 2997 ± 62 B    | 36.00 ± 0.00 H  | 21.00 ± 1.00 DE   | 53.00 ± 1.00 H    |
| 21CS_J_NST | 31.70 ± 0.17 B  | 24.80 ± 0.17 B | 3.86 ± 0.01 EF  | 1490 ± 24 G    | 68.67 ± 0.58 F  | 19.67 ± 1.53 E    | 84.67 ± 1.15 F    |
| 21CS_K_ST  | 33.70 ± 0.26 A  | 26.07 ± 0.15 A | 3.89 ± 0.01 EF  | 1699 ± 20 F    | 86.00 ± 0.00 BC | 30.33 ± 2.08 C    | 110.67 ± 1.53 CD  |
| DA 2       |                 |                |                 |                |                 |                   |                   |
| 20CF_A_ST  | 25.63 ± 0.06 E  | 3.76 ± 0.02 D  | 3.93 ± 0.13 EF  | 1679 ± 24.66 G | 74.33 ± 1.53 E  | 22.33 ± 5.13 DEF  | 92.67 ± 2.89 FG   |
| 20CF_B_ST  | 26.27 ± 0.21 D  | 3.96 ± 0.01 B  | 3.25 ± 0.09 H   | 1463 ± 26.41 H | 48.33 ± 2.52 G  | 14.33 ± 1.53 EF   | 60.33 ± 3.51 H    |
| 20CF_C_ST  | 27.40 ± 0.10 C  | 3.65 ± 0.07 F  | 3.68 ± 0.63 FG  | 1851 ± 58.43 F | 78.67 ± 2.31 E  | 41.00 ± 18.25 ABC | 112.67 ± 15.89 DE |
| 20MA_D_ST  | 24.93 ± 0.06 H  | 3.87 ± 0.02 C  | 4.25 ± 0.03 CDE | 3276 ± 74.06 A | 95.67 ± 5.69 D  | 34.67 ± 2.52 BCD  | 124.67 ± 6.51 CD  |
| 20ME_E_ST  | 27.77 ± 0.31 B  | 3.44 ± 0.03 H  | 4.80 ± 0.34 B   | 1843 ± 47.79 F | 93.33 ± 3.21 D  | 43.00 ± 6.24 ABC  | 129.00 ± 8.00 C   |
| 20ME_F_ST  | 25.27 ± 0.12 FG | 4.04 ± 0.00 A  | 2.70 ± 0.00 I   | 1682 ± 21.46 G | 76.00 ± 4.36 E  | 8.67 ± 2.08 F     | 83.33 ± 2.89 G    |
| 20PV_G_ST  | 25.67 ± 0.25 E  | 3.91 ± 0.01 BC | 4.03 ± 0.08 DEF | 2674 ± 24.01 C | 130.33 ± 4.93 B | 32.00 ± 2.00 CD   | 157.00 ± 3.61 B   |
| 20PV_H_ST  | 25.43 ± 0.12 EF | 3.94 ± 0.01 B  | 3.46 ± 0.06 GH  | 2129 ± 41.40 D | 74.33 ± 6.66 E  | 12.33 ± 4.62 EF   | 81.00 ± 2.65 G    |
| 20SY_I_ST  | 28.63 ± 0.29 A  | 3.70 ± 0.02 E  | 5.71 ± 0.15 A   | 3059 ± 55.56 B | 137.67 ± 1.15 A | 50.67 ± 8.02 A    | 180.00 ± 5.57 A   |
| 20ZN_J_ST  | 22.70 ± 0.10 J  | 3.48 ± 0.02 G  | 4.57 ± 0.07 BC  | 2158 ± 68.08 D | 66.00 ± 3.00 F  | 25.67 ± 2.31 DE   | 87.00 ± 4.58 FG   |
| 21MA_K_NST | 25.03 ± 0.12 GH | 3.67 ± 0.01 EF | 4.31 ± 0.03 CD  | 2008 ± 12.12 E | 62.67 ± 1.53 F  | 47.00 ± 13.00 AB  | 101.33 ± 11.02 EF |
| 21SY_L_NST | 23.50 ± 0.10 I  | 3.49 ± 0.02 G  | 5.70 ± 0.04 A   | 3023 ± 12.50 B | 115.00 ± 2.08 C | 47.67 ± 13.28 AB  | 137.67 ± 18.82 C  |

24 Fisher's LSD was used to determine differences between each column for each DA across wines