Statistical Summaries

Ian Morelan

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# Results

## Climate

### Growing degree days (GDD)

**Vintage GDD means and SDs**

|  |  |  |
| --- | --- | --- |
| Year | mean | sd |
| 2016 | 1518.462 | 107.0129 |
| 2017 | 1638.231 | 148.0091 |

**Paired t-test of GDD values between vintages**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| estimate | statistic | p.value | parameter | conf.low | conf.high | method | alternative |
| -119.7692 | -6.66121 | 2.32e-05 | 12 | -158.9445 | -80.59396 | Paired t-test | two.sided |

**2016 means, SDs, min, max (by AVA)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AVA | mean | sd | min | max |
| Santa Barbara | 1542.667 | 104.51954 | 1437 | 1646 |
| Monterey | 1567.000 | 159.80613 | 1454 | 1680 |
| Sonoma | 1502.000 | 84.39905 | 1400 | 1582 |
| Mendocino | 1631.000 | NA | 1631 | 1631 |
| Willamette Valley | 1335.000 | NA | 1335 | 1335 |

**One-way ANOVA of GDD values (2016 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 54418.56 | 13604.64 | 1.311249 | 0.3439095 |
| Residuals | 8 | 83002.67 | 10375.33 | NA | NA |

**2017 means, SDs, min, max (by AVA)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AVA | mean | sd | min | max |
| Santa Barbara | 1705.000 | 116.00000 | 1589 | 1821 |
| Monterey | 1765.000 | 114.55130 | 1684 | 1846 |
| Sonoma | 1607.333 | 99.86925 | 1472 | 1707 |
| Mendocino | 1566.500 | 204.35386 | 1422 | 1711 |
| Willamette Valley | 1271.000 | 36.76955 | 1245 | 1297 |

**One-way ANOVA of GDD values (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 306487.8 | 76621.94 | 5.760363 | 0.011393 |
| Residuals | 10 | 133015.8 | 13301.58 | NA | NA |

**Tukey’s HSD of GDD values (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | comparison | estimate | conf.low | conf.high | adj.p.value |
| AVA | Monterey-Santa Barbara | 60.00000 | -286.4972 | 406.49724 | 0.9766438 |
| AVA | Sonoma-Santa Barbara | -97.66667 | -366.0623 | 170.72894 | 0.7529971 |
| AVA | Mendocino-Santa Barbara | -138.50000 | -484.9972 | 207.99724 | 0.6886730 |
| AVA | Willamette Valley-Santa Barbara | -434.00000 | -780.4972 | -87.50276 | 0.0138705 |
| AVA | Sonoma-Monterey | -157.66667 | -467.5832 | 152.24988 | 0.4886464 |
| AVA | Mendocino-Monterey | -198.50000 | -578.0687 | 181.06871 | 0.4639904 |
| AVA | Willamette Valley-Monterey | -494.00000 | -873.5687 | -114.43129 | 0.0108715 |
| AVA | Mendocino-Sonoma | -40.83333 | -350.7499 | 269.08322 | 0.9914792 |
| AVA | Willamette Valley-Sonoma | -336.33333 | -646.2499 | -26.41678 | 0.0323450 |
| AVA | Willamette Valley-Mendocino | -295.50000 | -675.0687 | 84.06871 | 0.1519328 |

### Precipitation

**Vintage precipitation means and SDs**

|  |  |  |
| --- | --- | --- |
| Year | mean | sd |
| 2016 | 47.0430 | 43.34719 |
| 2017 | 106.9508 | 76.43345 |

**Paired t-test of log transformed growing season precipitation values between vintages**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| estimate | statistic | p.value | parameter | conf.low | conf.high | method | alternative |
| -0.8517664 | -16.62851 | 1.2x10-9 | 12 | -0.9633722 | -0.7401605 | Paired t-test | two.sided |

**2016 means, SDs, min, max (by AVA)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AVA | mean | sd | min | max |
| Santa Barbara | 19.2600 | 1.2905826 | 18.492 | 20.750 |
| Monterey | 11.5125 | 0.0021215 | 11.511 | 11.514 |
| Sonoma | 49.2000 | 13.5871116 | 28.493 | 62.830 |
| Mendocino | 59.6980 | NA | 59.698 | 59.698 |
| Willamette Valley | 175.8560 | NA | 175.856 | 175.856 |

**One-way ANOVA of log transformed growing season precipitation values (2016 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 6.9905473 | 1.7476368 | 28.19128 | 9.12e-05 |
| Residuals | 8 | 0.4959369 | 0.0619921 | NA | NA |

**Tukey’s HSD of log transformed growing precipitation values values (2016 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | comparison | estimate | conf.low | conf.high | adj.p.value |
| AVA | Monterey-Santa Barbara | -0.5131357 | -1.2983608 | 0.2720895 | 0.2509011 |
| AVA | Sonoma-Santa Barbara | 0.9019081 | 0.2936753 | 1.5101408 | 0.0058621 |
| AVA | Mendocino-Santa Barbara | 1.1327294 | 0.1394894 | 2.1259694 | 0.0260485 |
| AVA | Willamette Valley-Santa Barbara | 2.2130964 | 1.2198564 | 3.2063364 | 0.0003957 |
| AVA | Sonoma-Monterey | 1.4150437 | 0.7127170 | 2.1173704 | 0.0007969 |
| AVA | Mendocino-Monterey | 1.6458651 | 0.5923750 | 2.6993552 | 0.0042450 |
| AVA | Willamette Valley-Monterey | 2.7262321 | 1.6727420 | 3.7797222 | 0.0001355 |
| AVA | Mendocino-Sonoma | 0.2308214 | -0.6982696 | 1.1599123 | 0.9043198 |
| AVA | Willamette Valley-Sonoma | 1.3111884 | 0.3820974 | 2.2402793 | 0.0079007 |
| AVA | Willamette Valley-Mendocino | 1.0803670 | -0.1360986 | 2.2968326 | 0.0847889 |

**2017 means, SDs, min, max (by AVA)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AVA | mean | sd | min | max |
| Santa Barbara | 44.75267 | 9.0402384 | 34.658 | 52.102 |
| Monterey | 24.28450 | 4.8981287 | 20.821 | 27.748 |
| Sonoma | 129.70700 | 41.2712208 | 76.670 | 166.864 |
| Mendocino | 143.98450 | 0.8124648 | 143.410 | 144.559 |
| Willamette Valley | 273.58350 | 15.7663535 | 262.435 | 284.732 |

**One-way ANOVA of log transformed growing season precipitation values (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 8.5171749 | 2.1292937 | 27.52169 | 2.24e-05 |
| Residuals | 10 | 0.7736785 | 0.0773679 | NA | NA |

**Tukey’s HSD of log transformed growing precipitation values values (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | comparison | estimate | conf.low | conf.high | adj.p.value |
| AVA | Monterey-Santa Barbara | -0.6069102 | -1.4425678 | 0.2287474 | 0.1950240 |
| AVA | Sonoma-Santa Barbara | 1.0294571 | 0.3821595 | 1.6767547 | 0.0027261 |
| AVA | Mendocino-Santa Barbara | 1.1832245 | 0.3475669 | 2.0188821 | 0.0062104 |
| AVA | Willamette Valley-Santa Barbara | 1.8243027 | 0.9886451 | 2.6599603 | 0.0002237 |
| AVA | Sonoma-Monterey | 1.6363673 | 0.8889324 | 2.3838022 | 0.0002184 |
| AVA | Mendocino-Monterey | 1.7901347 | 0.8747177 | 2.7055518 | 0.0005537 |
| AVA | Willamette Valley-Monterey | 2.4312130 | 1.5157959 | 3.3466300 | 0.0000412 |
| AVA | Mendocino-Sonoma | 0.1537674 | -0.5936675 | 0.9012023 | 0.9570716 |
| AVA | Willamette Valley-Sonoma | 0.7948456 | 0.0474107 | 1.5422805 | 0.0361555 |
| AVA | Willamette Valley-Mendocino | 0.6410782 | -0.2743388 | 1.5564953 | 0.2201010 |

## Fruit maturity

### pH

**Vintage pH means and SDs**

|  |  |  |
| --- | --- | --- |
| Year | mean | sd |
| 2016 | 3.554808 | 0.0848372 |
| 2017 | 3.598077 | 0.0752576 |

**Paired t-test of pH between vintages**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| estimate | statistic | p.value | parameter | conf.low | conf.high | method | alternative |
| -0.0432692 | -1.984427 | 0.0705546 | 12 | -0.0907769 | 0.0042385 | Paired t-test | two.sided |

**2016 means, SDs, min, max (by AVA)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AVA | mean | sd | min | max |
| Santa Barbara | 3.5850 | 0.0812788 | 3.4925 | 3.6450 |
| Monterey | 3.5100 | 0.0424264 | 3.4800 | 3.5400 |
| Sonoma | 3.5150 | 0.0648460 | 3.4625 | 3.6250 |
| Mendocino | 3.7275 | NA | 3.7275 | 3.7275 |
| Willamette Valley | 3.6200 | NA | 3.6200 | 3.6200 |

**One-way ANOVA of pH (2016 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 0.0503308 | 0.0125827 | 2.793244 | 0.1009658 |
| Residuals | 8 | 0.0360375 | 0.0045047 | NA | NA |

**2017 means, SDs, min, max (by AVA)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AVA | mean | sd | min | max |
| Santa Barbara | 3.639167 | 0.0596518 | 3.5975 | 3.7075 |
| Monterey | 3.597500 | 0.0176777 | 3.5850 | 3.6100 |
| Sonoma | 3.575417 | 0.1022548 | 3.4275 | 3.7250 |
| Mendocino | 3.715000 | 0.1520280 | 3.6075 | 3.8225 |
| Willamette Valley | 3.527500 | 0.1060660 | 3.4525 | 3.6025 |

**One-way ANOVA of pH (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 0.0450365 | 0.0112591 | 1.196863 | 0.3703634 |
| Residuals | 10 | 0.0940719 | 0.0094072 | NA | NA |

### Titratable acidity (TA)

**Vintage TA means and SDs**

|  |  |  |
| --- | --- | --- |
| Year | mean | sd |
| 2016 | 4.846923 | 0.6731921 |
| 2017 | 4.855962 | 0.6148683 |

**Paired t-test of TA values between vintages**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| estimate | statistic | p.value | parameter | conf.low | conf.high | method | alternative |
| -0.0028951 | -0.1001521 | 0.9218773 | 12 | -0.0658789 | 0.0600887 | Paired t-test | two.sided |

**2016 means, SDs, min, max (by AVA)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AVA | mean | sd | min | max |
| Santa Barbara | 4.978333 | 0.5062135 | 4.6375 | 5.5600 |
| Monterey | 5.803750 | 0.4118897 | 5.5125 | 6.0950 |
| Sonoma | 4.632500 | 0.6434341 | 3.8300 | 5.7725 |
| Mendocino | 4.282500 | NA | 4.2825 | 4.2825 |
| Willamette Valley | 4.390000 | NA | 4.3900 | 4.3900 |

**One-way ANOVA of TA values (2016 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 2.686057 | 0.6715143 | 1.951938 | 0.1951934 |
| Residuals | 8 | 2.752195 | 0.3440243 | NA | NA |

**2017 means, SDs, min, max (by AVA)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AVA | mean | sd | min | max |
| Santa Barbara | 5.07750 | 0.1186118 | 4.9425 | 5.1650 |
| Monterey | 5.64125 | 0.5391689 | 5.2600 | 6.0225 |
| Sonoma | 4.55000 | 0.6615701 | 3.7000 | 5.5175 |
| Mendocino | 4.41500 | 0.2545584 | 4.2350 | 4.5950 |
| Willamette Valley | 4.83500 | 0.1661701 | 4.7175 | 4.9525 |

**One-way ANOVA of TA values (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 2.313707 | 0.5784267 | 2.225036 | 0.1390927 |
| Residuals | 10 | 2.599628 | 0.2599628 | NA | NA |

### Total soluble solids (TSS)

**Vintage TSS means and SDs**

|  |  |  |
| --- | --- | --- |
| Year | mean | sd |
| 2016 | 24.02885 | 0.9887832 |
| 2017 | 23.97308 | 1.4537115 |

**Paired t-test of TSS values between vintages**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| estimate | statistic | p.value | parameter | conf.low | conf.high | method | alternative |
| 0.0557692 | 0.1378776 | 0.8926237 | 12 | -0.8255249 | 0.9370633 | Paired t-test | two.sided |

**2016 means, SDs, min, max (by AVA)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AVA | mean | sd | min | max |
| Santa Barbara | 24.35833 | 0.8401389 | 23.625 | 25.275 |
| Monterey | 22.62500 | 0.1414214 | 22.525 | 22.725 |
| Sonoma | 24.37500 | 0.7843787 | 23.475 | 25.475 |
| Mendocino | 22.85000 | NA | 22.850 | 22.850 |
| Willamette Valley | 24.95000 | NA | 24.950 | 24.950 |

**One-way ANOVA of TSS values (2016 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 7.224391 | 1.8060978 | 3.205202 | 0.07548 |
| Residuals | 8 | 4.507917 | 0.5634896 | NA | NA |

**2017 means, SDs, min, max (by AVA)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AVA | mean | sd | min | max |
| Santa Barbara | 23.16667 | 0.6125425 | 22.550 | 23.775 |
| Monterey | 23.06250 | 0.1237437 | 22.975 | 23.150 |
| Sonoma | 24.89167 | 1.7385818 | 22.300 | 26.800 |
| Mendocino | 23.46250 | 0.1590990 | 23.350 | 23.575 |
| Willamette Valley | 23.75000 | 0.6010408 | 23.325 | 24.175 |

**One-way ANOVA of log transformed TSS values (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 0.0151828 | 0.0037957 | 1.39093 | 0.3052337 |
| Residuals | 10 | 0.0272890 | 0.0027289 | NA | NA |

## Alpha Diversity

### Bacterial alpha diversity

#### Richness

**Vintage richness means and SDs**

|  |  |  |
| --- | --- | --- |
| Year | mean | sd |
| 2016 | 497.2308 | 253.3365 |
| 2017 | 398.4615 | 228.2672 |

**Paired t-test of richness values between vintages**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| estimate | statistic | p.value | parameter | conf.low | conf.high | method | alternative |
| 98.76923 | 1.16707 | 0.2658503 | 12 | -85.62381 | 283.1623 | Paired t-test | two.sided |

**2016 richness means and SDs (by AVA)**

|  |  |  |
| --- | --- | --- |
| AVA | mean | sd |
| Santa Barbara | 521.3333 | 306.89466 |
| Monterey | 908.0000 | 12.72792 |
| Sonoma | 401.8333 | 108.55306 |
| Mendocino | 140.0000 | NA |
| Willamette Valley | 533.0000 | NA |

**One-way ANOVA of richness values (2016 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 522702.8 | 130675.70 | 4.224723 | 0.0395891 |
| Residuals | 8 | 247449.5 | 30931.19 | NA | NA |

**Tukey’s HSD of richness values (2016 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | comparison | estimate | conf.low | conf.high | adj.p.value |
| AVA | Monterey-Santa Barbara | 386.66667 | -167.9901 | 941.3234 | 0.2064850 |
| AVA | Sonoma-Santa Barbara | -119.50000 | -549.1353 | 310.1353 | 0.8651279 |
| AVA | Mendocino-Santa Barbara | -381.33333 | -1082.9248 | 320.2581 | 0.3978849 |
| AVA | Willamette Valley-Santa Barbara | 11.66667 | -689.9248 | 713.2581 | 0.9999969 |
| AVA | Sonoma-Monterey | -506.16667 | -1002.2667 | -10.0666 | 0.0454588 |
| AVA | Mendocino-Monterey | -768.00000 | -1512.1501 | -23.8499 | 0.0430241 |
| AVA | Willamette Valley-Monterey | -375.00000 | -1119.1501 | 369.1501 | 0.4629781 |
| AVA | Mendocino-Sonoma | -261.83333 | -918.1120 | 394.4454 | 0.6561036 |
| AVA | Willamette Valley-Sonoma | 131.16667 | -525.1120 | 787.4454 | 0.9530493 |
| AVA | Willamette Valley-Mendocino | 393.00000 | -466.2705 | 1252.2705 | 0.5461338 |

**2017 richness means and SDs (by AVA)**

|  |  |  |
| --- | --- | --- |
| AVA | mean | sd |
| Santa Barbara | 97.66667 | 32.59346 |
| Monterey | 612.00000 | 32.52691 |
| Sonoma | 498.33333 | 193.89344 |
| Mendocino | 240.00000 | 73.53911 |
| Willamette Valley | 445.50000 | 91.21677 |

**One-way ANOVA of richness values (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 476469.2 | 119117.31 | 5.813876 | 0.0110549 |
| Residuals | 10 | 204884.5 | 20488.45 | NA | NA |

**Tukey’s HSD of richness values (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | comparison | estimate | conf.low | conf.high | adj.p.value |
| AVA | Monterey-Santa Barbara | 514.33333 | 84.29947 | 944.3672 | 0.0184243 |
| AVA | Sonoma-Santa Barbara | 400.66667 | 67.56387 | 733.7695 | 0.0178029 |
| AVA | Mendocino-Santa Barbara | 142.33333 | -287.70053 | 572.3672 | 0.8082063 |
| AVA | Willamette Valley-Santa Barbara | 347.83333 | -82.20053 | 777.8672 | 0.1310190 |
| AVA | Sonoma-Monterey | -113.66667 | -498.30065 | 270.9673 | 0.8614736 |
| AVA | Mendocino-Monterey | -372.00000 | -843.07850 | 99.0785 | 0.1439092 |
| AVA | Willamette Valley-Monterey | -166.50000 | -637.57850 | 304.5785 | 0.7710172 |
| AVA | Mendocino-Sonoma | -258.33333 | -642.96732 | 126.3006 | 0.2508722 |
| AVA | Willamette Valley-Sonoma | -52.83333 | -437.46732 | 331.8006 | 0.9900369 |
| AVA | Willamette Valley-Mendocino | 205.50000 | -265.57850 | 676.5785 | 0.6209276 |

#### Exponential Shannon

**Vintage exponential Shannon means and SDs**

|  |  |  |
| --- | --- | --- |
| Year | mean | sd |
| 2016 | 49.56260 | 86.59518 |
| 2017 | 27.07156 | 22.84087 |

**Paired t-test of log transformed exponential Shannon values between vintages**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| estimate | statistic | p.value | parameter | conf.low | conf.high | method | alternative |
| -0.2079221 | -0.4411637 | 0.6669382 | 12 | -1.234805 | 0.8189605 | Paired t-test | two.sided |

**2016 exponential Shannon means and SDs (by AVA)**

|  |  |  |
| --- | --- | --- |
| AVA | mean | sd |
| Santa Barbara | 30.691444 | 32.916704 |
| Monterey | 238.440921 | 46.635328 |
| Sonoma | 9.821872 | 6.875203 |
| Mendocino | 1.409138 | NA |
| Willamette Valley | 15.017287 | NA |

**One-way ANOVA of log transformed exponential Shannon values (2016 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 23.326891 | 5.831723 | 5.402581 | 0.0208831 |
| Residuals | 8 | 8.635461 | 1.079433 | NA | NA |

**Tukey’s HSD of log transformed exponential Shannon values (2016 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | comparison | estimate | conf.low | conf.high | adj.p.value |
| AVA | Monterey-Santa Barbara | 2.7191408 | -0.5574618 | 5.9957435 | 0.1116312 |
| AVA | Sonoma-Santa Barbara | -0.6914194 | -3.2294648 | 1.8466261 | 0.8731888 |
| AVA | Mendocino-Santa Barbara | -2.4023466 | -6.5469575 | 1.7422643 | 0.3439627 |
| AVA | Willamette Valley-Santa Barbara | -0.0361228 | -4.1807337 | 4.1084881 | 0.9999998 |
| AVA | Sonoma-Monterey | -3.4105602 | -6.3412427 | -0.4798777 | 0.0234211 |
| AVA | Mendocino-Monterey | -5.1214874 | -9.5175111 | -0.7254637 | 0.0232846 |
| AVA | Willamette Valley-Monterey | -2.7552636 | -7.1512874 | 1.6407601 | 0.2819050 |
| AVA | Mendocino-Sonoma | -1.7109272 | -5.5878557 | 2.1660013 | 0.5760028 |
| AVA | Willamette Valley-Sonoma | 0.6552966 | -3.2216319 | 4.5322251 | 0.9738175 |
| AVA | Willamette Valley-Mendocino | 2.3662238 | -2.7098672 | 7.4423148 | 0.5300034 |

**2017 exponential Shannon means and SDs (by AVA)**

|  |  |  |
| --- | --- | --- |
| AVA | mean | sd |
| Santa Barbara | 4.438358 | 2.554993 |
| Monterey | 55.845426 | 6.086446 |
| Sonoma | 32.070557 | 23.049545 |
| Mendocino | 8.235201 | 8.453986 |
| Willamette Valley | 26.063407 | 8.167738 |

**One-way ANOVA of exponential Shannon values (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 4027.454 | 1006.863 | 3.539449 | 0.0477679 |
| Residuals | 10 | 2844.690 | 284.469 | NA | NA |

**Tukey’s HSD of exponential Shannon values (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | comparison | estimate | conf.low | conf.high | adj.p.value |
| AVA | Monterey-Santa Barbara | 51.407068 | 0.7353545 | 102.078782 | 0.0464265 |
| AVA | Sonoma-Santa Barbara | 27.632199 | -11.6179414 | 66.882340 | 0.2163785 |
| AVA | Mendocino-Santa Barbara | 3.796843 | -46.8748702 | 54.468557 | 0.9990335 |
| AVA | Willamette Valley-Santa Barbara | 21.625049 | -29.0466642 | 72.296763 | 0.6385651 |
| AVA | Sonoma-Monterey | -23.774869 | -69.0970274 | 21.547290 | 0.4612320 |
| AVA | Mendocino-Monterey | -47.610225 | -103.1183059 | 7.897856 | 0.1028274 |
| AVA | Willamette Valley-Monterey | -29.782019 | -85.2900998 | 25.726063 | 0.4410367 |
| AVA | Mendocino-Sonoma | -23.835356 | -69.1575143 | 21.486803 | 0.4589558 |
| AVA | Willamette Valley-Sonoma | -6.007150 | -51.3293082 | 39.315009 | 0.9912860 |
| AVA | Willamette Valley-Mendocino | 17.828206 | -37.6798752 | 73.336287 | 0.8236535 |

#### Inverse Simpson

**Vintage Inverse Simpson means and SDs**

|  |  |  |
| --- | --- | --- |
| Year | mean | sd |
| 2016 | 14.816562 | 27.765279 |
| 2017 | 7.156068 | 4.334332 |

**Paired t-test of log transformed inverse Simpson values between vintages**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| estimate | statistic | p.value | parameter | conf.low | conf.high | method | alternative |
| -0.2068914 | -0.5128014 | 0.6173984 | 12 | -1.085941 | 0.6721577 | Paired t-test | two.sided |

**2016 inverse Simpson means and SDs (by AVA)**

|  |  |  |
| --- | --- | --- |
| AVA | mean | sd |
| Santa Barbara | 6.047116 | 5.038091 |
| Monterey | 75.731558 | 19.703573 |
| Sonoma | 3.069332 | 1.765597 |
| Mendocino | 1.088876 | NA |
| Willamette Valley | 3.505970 | NA |

**Kruskal-Wallis of inverse Simpson values (2016 vintage)**

|  |  |  |  |
| --- | --- | --- | --- |
| statistic | p.value | parameter | method |
| 6.989011 | 0.1364701 | 4 | Kruskal-Wallis rank sum test |

**2017 inverse Simpson means and SDs (by AVA)**

|  |  |  |
| --- | --- | --- |
| AVA | mean | sd |
| Santa Barbara | 2.535661 | 1.2688549 |
| Monterey | 8.405086 | 1.5200368 |
| Sonoma | 9.190504 | 5.0013053 |
| Mendocino | 3.461754 | 3.0509481 |
| Willamette Valley | 7.994586 | 0.2050275 |

**One-way ANOVA of inverse Simpson values (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 119.1204 | 29.78009 | 2.127969 | 0.1517519 |
| Residuals | 10 | 139.9461 | 13.99461 | NA | NA |

### Fungal alpha diversity

#### Richness

**Vintage richness means and SDs**

|  |  |  |
| --- | --- | --- |
| Year | mean | sd |
| 2016 | 81.38462 | 32.69439 |
| 2017 | 74.69231 | 19.62730 |

**Paired t-test of log transformed richness values between vintages**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| estimate | statistic | p.value | parameter | conf.low | conf.high | method | alternative |
| 0.056273 | 0.9229734 | 0.3742068 | 12 | -0.0765677 | 0.1891137 | Paired t-test | two.sided |

**2016 richness means and SDs (by AVA)**

|  |  |  |
| --- | --- | --- |
| AVA | mean | sd |
| Santa Barbara | 63.00000 | 7.2111026 |
| Monterey | 53.50000 | 0.7071068 |
| Sonoma | 89.83333 | 17.4747437 |
| Mendocino | 55.00000 | NA |
| Willamette Valley | 168.00000 | NA |

**One-way ANOVA of log tranformed richness values (2016 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 1.2267742 | 0.3066935 | 10.96995 | 0.0024783 |
| Residuals | 8 | 0.2236609 | 0.0279576 | NA | NA |

**Tukey’s HSD of log transformed richness values (2016 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | comparison | estimate | conf.low | conf.high | adj.p.value |
| AVA | Monterey-Santa Barbara | -9.50000 | -54.535227 | 35.53523 | 0.9436763 |
| AVA | Sonoma-Santa Barbara | 26.83333 | -8.050804 | 61.71747 | 0.1482988 |
| AVA | Mendocino-Santa Barbara | -8.00000 | -64.965557 | 48.96556 | 0.9866309 |
| AVA | Willamette Valley-Santa Barbara | 105.00000 | 48.034443 | 161.96556 | 0.0014557 |
| AVA | Sonoma-Monterey | 36.33333 | -3.947398 | 76.61407 | 0.0794002 |
| AVA | Mendocino-Monterey | 1.50000 | -58.921098 | 61.92110 | 0.9999848 |
| AVA | Willamette Valley-Monterey | 114.50000 | 54.078902 | 174.92110 | 0.0012088 |
| AVA | Mendocino-Sonoma | -34.83333 | -88.119733 | 18.45307 | 0.2506673 |
| AVA | Willamette Valley-Sonoma | 78.16667 | 24.880267 | 131.45307 | 0.0062604 |
| AVA | Willamette Valley-Mendocino | 113.00000 | 43.231726 | 182.76827 | 0.0033817 |

**2017 richness means and SDs (by AVA)**

|  |  |  |
| --- | --- | --- |
| AVA | mean | sd |
| Santa Barbara | 64.33333 | 23.629078 |
| Monterey | 70.50000 | 10.606602 |
| Sonoma | 77.66667 | 11.290114 |
| Mendocino | 60.00000 | 9.899495 |
| Willamette Valley | 116.50000 | 2.121320 |

**One-way ANOVA of richness values (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 4266.733 | 1066.683 | 5.417386 | 0.0138781 |
| Residuals | 10 | 1969.000 | 196.900 | NA | NA |

**Tukey’s HSD of richness values (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | comparison | estimate | conf.low | conf.high | adj.p.value |
| AVA | Monterey-Santa Barbara | 6.166667 | -35.9904562 | 48.32379 | 0.9874038 |
| AVA | Sonoma-Santa Barbara | 13.333333 | -19.3214337 | 45.98810 | 0.6728328 |
| AVA | Mendocino-Santa Barbara | -4.333333 | -46.4904562 | 37.82379 | 0.9966930 |
| AVA | Willamette Valley-Santa Barbara | 52.166667 | 10.0095438 | 94.32379 | 0.0149600 |
| AVA | Sonoma-Monterey | 7.166667 | -30.5398104 | 44.87314 | 0.9674417 |
| AVA | Mendocino-Monterey | -10.500000 | -56.6808144 | 35.68081 | 0.9396748 |
| AVA | Willamette Valley-Monterey | 46.000000 | -0.1808144 | 92.18081 | 0.0510100 |
| AVA | Mendocino-Sonoma | -17.666667 | -55.3731437 | 20.03981 | 0.5610309 |
| AVA | Willamette Valley-Sonoma | 38.833333 | 1.1268563 | 76.53981 | 0.0429180 |
| AVA | Willamette Valley-Mendocino | 56.500000 | 10.3191856 | 102.68081 | 0.0160477 |

#### Exponential Shannon

**Vintage Exp. Shannon means and SDs**

|  |  |  |
| --- | --- | --- |
| Year | mean | sd |
| 2016 | 3.235194 | 1.087735 |
| 2017 | 3.072183 | 1.057347 |

**Wilcoxon signed rank of exponential Shannon values between vintages**

|  |  |  |  |
| --- | --- | --- | --- |
| statistic | p.value | method | alternative |
| 52 | 0.6848145 | Wilcoxon signed rank test | two.sided |

**2016 exponential Shannon means and SDs (by AVA)**

|  |  |  |
| --- | --- | --- |
| AVA | mean | sd |
| Santa Barbara | 3.227378 | 0.2831956 |
| Monterey | 1.541755 | 0.0371007 |
| Sonoma | 3.898455 | 0.6163921 |
| Mendocino | 1.609050 | NA |
| Willamette Valley | 4.292097 | NA |

**One-way ANOVA of exponential Shannon values (2016 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 12.136538 | 3.034135 | 11.77463 | 0.001964 |
| Residuals | 8 | 2.061472 | 0.257684 | NA | NA |

**Tukey’s HSD of exponential Shannon values (2016 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | comparison | estimate | conf.low | conf.high | adj.p.value |
| AVA | Monterey-Santa Barbara | -1.6856224 | -3.2865428 | -0.0847019 | 0.0390315 |
| AVA | Sonoma-Santa Barbara | 0.6710778 | -0.5689898 | 1.9111455 | 0.4016025 |
| AVA | Mendocino-Santa Barbara | -1.6183282 | -3.6433502 | 0.4066938 | 0.1289472 |
| AVA | Willamette Valley-Santa Barbara | 1.0647198 | -0.9603022 | 3.0897418 | 0.4263275 |
| AVA | Sonoma-Monterey | 2.3567002 | 0.9247934 | 3.7886070 | 0.0030528 |
| AVA | Mendocino-Monterey | 0.0672942 | -2.0805660 | 2.2151544 | 0.9999614 |
| AVA | Willamette Valley-Monterey | 2.7503422 | 0.6024820 | 4.8982024 | 0.0138853 |
| AVA | Mendocino-Sonoma | -2.2894060 | -4.1836406 | -0.3951714 | 0.0191190 |
| AVA | Willamette Valley-Sonoma | 0.3936420 | -1.5005926 | 2.2878766 | 0.9464331 |
| AVA | Willamette Valley-Mendocino | 2.6830480 | 0.2029127 | 5.1631833 | 0.0341239 |

**2017 exponential Shannon means and SDs (by AVA)**

|  |  |  |
| --- | --- | --- |
| AVA | mean | sd |
| Santa Barbara | 2.774919 | 0.7616120 |
| Monterey | 4.732467 | 0.3744467 |
| Sonoma | 2.654316 | 0.9276679 |
| Mendocino | 2.485664 | 0.1069003 |
| Willamette Valley | 3.787077 | 0.0362509 |

**One-way ANOVA of exponential Shannon values (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 8.533895 | 2.1334737 | 3.79899 | 0.0395449 |
| Residuals | 10 | 5.615897 | 0.5615897 | NA | NA |

**Tukey’s HSD of exponential Shannon values (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | comparison | estimate | conf.low | conf.high | adj.p.value |
| AVA | Monterey-Santa Barbara | 1.9575477 | -0.2938783 | 4.2089737 | 0.0969520 |
| AVA | Sonoma-Santa Barbara | -0.1206029 | -1.8645500 | 1.6233441 | 0.9992947 |
| AVA | Mendocino-Santa Barbara | -0.2892552 | -2.5406812 | 1.9621708 | 0.9922514 |
| AVA | Willamette Valley-Santa Barbara | 1.0121581 | -1.2392679 | 3.2635841 | 0.5961123 |
| AVA | Sonoma-Monterey | -2.0781506 | -4.0918872 | -0.0644140 | 0.0424592 |
| AVA | Mendocino-Monterey | -2.2468029 | -4.7131165 | 0.2195107 | 0.0786489 |
| AVA | Willamette Valley-Monterey | -0.9453896 | -3.4117032 | 1.5209240 | 0.7185129 |
| AVA | Mendocino-Sonoma | -0.1686523 | -2.1823889 | 1.8450843 | 0.9985062 |
| AVA | Willamette Valley-Sonoma | 1.1327610 | -0.8809756 | 3.1464976 | 0.3988520 |
| AVA | Willamette Valley-Mendocino | 1.3014133 | -1.1649003 | 3.7677269 | 0.4559524 |

#### Inverse Simpson

**Vintage inverse Simpson means and SDs**

|  |  |  |
| --- | --- | --- |
| Year | mean | sd |
| 2016 | 2.435128 | 0.8496365 |
| 2017 | 2.366297 | 0.9871839 |

**Wilcoxon signed rank of inverse Simpson values between vintages**

|  |  |  |  |
| --- | --- | --- | --- |
| statistic | p.value | method | alternative |
| 48 | 0.8925781 | Wilcoxon signed rank test | two.sided |

**2016 inverse Simpson means and SDs (by AVA)**

|  |  |  |
| --- | --- | --- |
| AVA | mean | sd |
| Santa Barbara | 2.658189 | 0.1497796 |
| Monterey | 1.210958 | 0.0193134 |
| Sonoma | 2.876122 | 0.7194571 |
| Mendocino | 1.183107 | NA |
| Willamette Valley | 2.820341 | NA |

**Kruskal-Wallis of inverse Simpson values (2016 vintage)**

|  |  |  |  |
| --- | --- | --- | --- |
| statistic | p.value | parameter | method |
| 7 | 0.1358882 | 4 | Kruskal-Wallis rank sum test |

**2017 inverse Simpson means and SDs (by AVA)**

|  |  |  |
| --- | --- | --- |
| AVA | mean | sd |
| Santa Barbara | 2.360908 | 0.9424732 |
| Monterey | 3.917613 | 0.3985201 |
| Sonoma | 1.823046 | 0.6531294 |
| Mendocino | 1.627525 | 0.1536243 |
| Willamette Valley | 3.005432 | 0.2319988 |

**One-way ANOVA of inverse Simpson values (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | df | sumsq | meansq | statistic | p.value |
| AVA | 4 | 8.483297 | 2.1208242 | 5.11579 | 0.0166142 |
| Residuals | 10 | 4.145644 | 0.4145644 | NA | NA |

**Tukey’s HSD of inverse Simpson values (2017 vintage)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| term | comparison | estimate | conf.low | conf.high | adj.p.value |
| AVA | Monterey-Santa Barbara | 1.5567054 | -0.3776849 | 3.4910956 | 0.1336823 |
| AVA | Sonoma-Santa Barbara | -0.5378619 | -2.0362342 | 0.9605103 | 0.7615464 |
| AVA | Mendocino-Santa Barbara | -0.7333830 | -2.6677733 | 1.2010073 | 0.7260453 |
| AVA | Willamette Valley-Santa Barbara | 0.6445245 | -1.2898658 | 2.5789148 | 0.8046517 |
| AVA | Sonoma-Monterey | -2.0945673 | -3.8247385 | -0.3643960 | 0.0171184 |
| AVA | Mendocino-Monterey | -2.2900884 | -4.4091068 | -0.1710700 | 0.0330979 |
| AVA | Willamette Valley-Monterey | -0.9121809 | -3.0311992 | 1.2068375 | 0.6316614 |
| AVA | Mendocino-Sonoma | -0.1955211 | -1.9256923 | 1.5346502 | 0.9952417 |
| AVA | Willamette Valley-Sonoma | 1.1823864 | -0.5477848 | 2.9125577 | 0.2378573 |
| AVA | Willamette Valley-Mendocino | 1.3779075 | -0.7411109 | 3.4969259 | 0.2759823 |

# Assumption testing

## Climate

### GDD

**Shapiro Wilk of GDD values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9780322 | 0.8009357 | Shapiro-Wilk normality test |

**Levene’s test on GDD values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.5266017 | 0.7172573 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of GDD values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9623996 | 0.7902383 | Shapiro-Wilk normality test |

**Levene’s test on GDD values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 1.484545 | 0.2934717 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of GDD values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9271391 | 0.2471903 | Shapiro-Wilk normality test |

**Levene’s test on GDD values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 1.199631 | 0.3693366 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

### Precipitation

**Shapiro Wilk of log transformed growing season precipitation values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9582913 | 0.3173854 | Shapiro-Wilk normality test |

**Levene’s test on log transformed growing season precipitation values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.8021498 | 0.5362946 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of log transformed growing season precipitation values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9367318 | 0.4159984 | Shapiro-Wilk normality test |

**Levene’s test on log transformed growing season precipitation values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9387107 | 0.488644 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of log transformed growing season precipitation values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9338014 | 0.3107577 | Shapiro-Wilk normality test |

**Levene’s test on log transformed growing season precipitation values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 1.086374 | 0.4138935 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

## Fruit maturity metrics

### pH

**Shapiro Wilk of pH (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9578161 | 0.3091186 | Shapiro-Wilk normality test |

**Levene’s test on pH (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.3196987 | 0.8618424 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of pH (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9047321 | 0.1552978 | Shapiro-Wilk normality test |

**Levene’s test on pH (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.5480862 | 0.7061017 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of pH (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9449523 | 0.4487228 | Shapiro-Wilk normality test |

**Levene’s test on pH (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 1.37581 | 0.3098346 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

### Titratable acidity (TA)

**Shapiro Wilk of titratable acidity values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9757538 | 0.7394971 | Shapiro-Wilk normality test |

**Levene’s test on titratable acidity values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 1.554825 | 0.2198898 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of titratable acidity values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9127584 | 0.2000173 | Shapiro-Wilk normality test |

**Levene’s test on titratable acidity values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.3668417 | 0.8259422 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of titratable acidity values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9793655 | 0.9649888 | Shapiro-Wilk normality test |

**Levene’s test on titratable acidity values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 3.349066 | 0.0551038 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

### Total soluble solids (TSS)

**Shapiro Wilk of TSS values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9397591 | 0.1089848 | Shapiro-Wilk normality test |

**Levene’s test on TSS values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 2.082617 | 0.1160206 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of TSS values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9438604 | 0.5087915 | Shapiro-Wilk normality test |

**Levene’s test on TSS values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.8798456 | 0.5168941 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of log transformed TSS values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.8865131 | 0.0594061 | Shapiro-Wilk normality test |

**Levene’s test on log transformed TSS values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 1.333661 | 0.3230639 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

## Alpha diversity

### Bacterial alpha diversity

#### Richness

**Shapiro Wilk of richness values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9617399 | 0.3831037 | Shapiro-Wilk normality test |

**Levene of richness values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9717887 | 0.4419859 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of richness values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9387734 | 0.4412172 | Shapiro-Wilk normality test |

**Shapiro Wilk of richness values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9295535 | 0.4929338 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of richness values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9647501 | 0.7741776 | Shapiro-Wilk normality test |

**Shapiro Wilk of richness values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.5604623 | 0.6967564 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

#### Exponential Shannon

**Shapiro Wilk of log transformed exponential Shannon values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9769372 | 0.7718099 | Shapiro-Wilk normality test |

**Levene of log transformed exponential Shannon values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.7740127 | 0.5533181 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of log transformed exponential Shannon values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9446275 | 0.5195364 | Shapiro-Wilk normality test |

**Levene of log transformed exponential Shannon values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 1.307449 | 0.3451214 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of exponential Shannon values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9037613 | 0.1086514 | Shapiro-Wilk normality test |

**Levene of exponential Shannon values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9147146 | 0.4920704 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

#### Inverse Simpson

**Shapiro Wilk of log transformed inverse Simpson values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9305592 | 0.0636852 | Shapiro-Wilk normality test |

**Levene of log transformed inverse Simpson values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 1.548232 | 0.2216578 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of log transformed inverse Simpson values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.8576744 | 0.0359023 | Shapiro-Wilk normality test |

**Levene of log inverse Simpson values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 1.185639 | 0.3866443 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of inverse Simpson values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9242571 | 0.2236026 | Shapiro-Wilk normality test |

**Levene of inverse Simpson values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.937729 | 0.4808028 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

### Fungal alpha diversity

#### Richness

**Shapiro Wilk of log transformed richness values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.960263 | 0.3537108 | Shapiro-Wilk normality test |

**Levene of log transformed richness values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.2462071 | 0.9090013 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of log transformed richness values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9044365 | 0.1538542 | Shapiro-Wilk normality test |

**Levene of log transformed richness values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 3.16253 | 0.0777205 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of richness values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9472433 | 0.4821283 | Shapiro-Wilk normality test |

**Levene of richness values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.6624046 | 0.6321161 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

#### Exponential Shannon

**Shapiro Wilk of log transformed exponential Shannon values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9002502 | 0.0115962 | Shapiro-Wilk normality test |

**Levene of log transformed exponential Shannon values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 3.223724 | 0.0307057 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of exponential Shannon values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9014444 | 0.1399741 | Shapiro-Wilk normality test |

**Levene of exponential Shannon values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.4361344 | 0.7795785 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of exponential Shannon values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.965404 | 0.7851518 | Shapiro-Wilk normality test |

**Levene of exponential Shannon values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 2.464553 | 0.1127578 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

#### Inverse Simpson

**Shapiro Wilk of log transformed inverse Simpson values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.8922589 | 0.007572 | Shapiro-Wilk normality test |

**Levene of log transformed inverse Simpson values (both vintages)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 2.819068 | 0.0486599 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of log transformed inverse Simpson values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.8256347 | 0.0139711 | Shapiro-Wilk normality test |

**Levene of log transformed inverse Simpson values (2016 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.5470103 | 0.7067913 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |

**Shapiro Wilk of inverse Simpson values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.9343617 | 0.3167188 | Shapiro-Wilk normality test |

**Levene of inverse Simpson values (2017 vintage)**

|  |  |  |
| --- | --- | --- |
| statistic | p.value | method |
| 0.7778862 | 0.5642784 | Modified robust Brown-Forsythe Levene-type test based on the absolute deviations from the median |