# Variety Data

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variety** | **Number**  **Plants** | **Number**  **Flowered** | **Percent**  **Flowered** | **In**  **Experiment?** | **Mean Budburst Date** |
| Alicante Bouschet | 7 | 0 | 0 | N | 13.90577701 |
| Aligote | 6 | 0 | 0 | N | 13.32480202 |
| Auxerrois | 5 | 1 | 20 | N | 13.9534995 |
| Barbera | 9 | 1 | 11.11111111 | N | 12.42439584 |
| Cabernet franc | 7 | 0 | 0 | N | 13.84282667 |
| Cabernet Sauvignon | 9 | 1 | 11.11111111 | Y | 14.70570969 |
| Calzin | 5 | 3 | 60 | N | 14.66366038 |
| Carmenere | 8 | 0 | 0 | Y | 15.55223647 |
| Carnelian | 9 | 3 | 33.33333333 | N | 11.59739021 |
| Chardonnay | 7 | 0 | 0 | Y | 13.27202255 |
| Chasselas doree | 7 | 0 | 0 | Y | 11.70141943 |
| Cinsault | 7 | 0 | 0 | Y | 16.36545183 |
| Coda di Volpe | 5 | 0 | 0 | N | 15.02306213 |
| Counoise | 9 | 0 | 0 | N | 17.88661987 |
| Dolcetto | 7 | 1 | 14.28571429 | Y | 14.67593836 |
| Durif | 15 | 6 | 40 | Y | 13.47568268 |
| Early Muscat | 6 | 0 | 0 | N | 11.74416829 |
| Furmint | 8 | 0 | 0 | Y | 14.97641002 |
| Gamay Noir | 8 | 4 | 50 | N | 12.87555823 |
| Gewurztraminer | 9 | 1 | 11.11111111 | Y | 12.45307628 |
| Gruner Veltiner | 7 | 0 | 0 | N | 14.86512484 |
| July Muscat | 5 | 0 | 0 | N | 11.20999857 |
| Macabeo | 6 | 0 | 0 | Y | 15.65572537 |
| Marsanne | 9 | 2 | 22.22222222 | N | 14.2368048 |
| Melon | 5 | 0 | 0 | N | 14.32830313 |
| Merlot | 6 | 0 | 0 | Y | 13.94825499 |
| Morrastel | 6 | 0 | 0 | N | 15.71067531 |
| Nebbiolo | 6 | 0 | 0 | Y | 13.6417069 |
| Palomino | 4 | 0 | 0 | Y | 14.87955351 |
| Pinot gris | 8 | 1 | 12.5 | N | 13.89299853 |
| Pinot Meunier | 6 | 3 | 50 | N | 13.73747328 |
| Pinotage | 5 | 3 | 60 | N | 10.7102415 |
| Refosco | 6 | 0 | 0 | N | 14.52280194 |
| Rkatsiteli | 5 | 0 | 0 | Y | 16.30820068 |

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| --- | --- | --- | --- | --- | --- |
| **Variety** | **Number**  **Plants** | **Number**  **Flowered** | **Percent**  **Flowered** | **In**  **Experiment?** | **Mean Budburst Date** |
| Rotgipfler | 7 | 1 | 14.28571429 | N | 14.4536252 |
| Roussanne | 6 | 0 | 0 | N | 16.77879992 |
| Ruby Cabernet | 8 | 4 | 50 | N | 15.75792645 |
| Ruby Seedless | 6 | 0 | 0 | N | 16.00731428 |
| Sangiovese | 7 | 0 | 0 | Y | 13.06463094 |
| Sauvignon blanc | 7 | 3 | 42.85714286 | Y | 15.75054996 |
| Schiopettino | 8 | 0 | 0 | N | 14.68581677 |
| Syrah | 8 | 1 | 12.5 | Y | 13.78461575 |
| Szagos feher | 7 | 1 | 14.28571429 | N | 13.51749972 |
| Tempranillo | 12 | 5 | 41.66666667 | Y | 14.63416892 |
| Tocai Friulano | 5 | 1 | 20 | N | 16.64069008 |
| Ugni blanc/Trebbiano | 5 | 0 | 0 | Y | 18.40547719 |
| Verdelho | 6 | 5 | 83.33333333 | N | 11.08427436 |
| Viognier | 8 | 0 | 0 | Y | 14.42165669 |
| Zinfandel/Primitivo | 6 | 0 | 0 | Y | 15.01516845 |

Table 1

Basic phenological data collected for all plants grown in the greenhouse. Mean Budburst Date is days after 15 August, when the plants were moved out of dormancy.

# Wang and Engel Curve



Figure 1

These theoretical curves show the expected response of phenological rate to temperature. In this example, the blue line represents a variety adapted better to cooler temperatures, while the variety represented by the red line has a higher optimal temperature.

# RMI and Greenhouse Budburst and Leafout



ghrmi\_vars\_noarrows

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| RMI/GH | F | DF | Estimate | Std Error | P |
| budburst | 14.55 | 1,47 | 0.8678 | 0.2275 | 0.0003977 |
| leafout | 18.91 | 1,47 | 0.9588 | 0.2205 | 0.00007307 |

Figure 2

The day of budburst and leafout in the Robert Mondavi Institute Vineyard 2015 growing season compared to the day of budburst and leafout in the greenhouse during the experiment. Each data point represents a different variety that was grown both in the vineyard and in the greenhouse.

# Days until 10% Flowering

chamber\_10percfin

|  |  |  |
| --- | --- | --- |
| Days to 10% flowering | continuous | |
|  | **F** | 0.4324 |
|  | **P** | 0.5183 |
|  | **DF** | 1,20 |

Figure 3

The black points and bars show the average number of days it took for plants to reach 10% flowering (once out of dormancy) and error in each chamber. The number above each chamber’s data is the sample size. The colored points represent individual plants. The legend in the top left corner gives the night/day temperature for each chamber.

# Number of Flower Buds Aborted

chamber\_bagbudsfin

|  |  |  |
| --- | --- | --- |
| Sum of fallen buds | continuous | |
|  | **F** | 7.4285 |
|  | **P** | 0.01179 |
|  | **DF** | 1,24 |

Figure 4

The black points and bars show the mean and error for the number of flower buds aborted in each chamber, and the number above each chamber’s data is the sample size. The colored points show the number of buds each individual plant lost during its time in the growth chambers. The legend in the top left corner gives the night/day temperature for each chamber.