Host Plant Resistance for Macrophomina Root Rot In California Strawberry

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Proposed Agenda

1. Welcome back and thank you!
2. Time available today, 20 minutes?
3. Review of data and variables
4. Goals for today
    a. Discuss results relating to your research question:

        "What are some ways that we can characterize environmental conditions that may be explanatory of disease incidence?"

    b. Correlations
    c. Degree-Days
    d. Graphs of Trends Over Time
5. Summary of Today's Discussion
6. Final Thoughts

Review of Data/Variables

Data:

- Hourly, daily, and monthly environmental (weather, soil) data
- Final mortality rate data of common strawberry cultivars
- Cultivar disease resistance numerical category

Scope of Inference:

- Cal Poly grown strawberries of these eight varieties: bg 6.3024, ps 9271, Big Sur, Fronteras, Monterey, pe 7.2059, Sweet Ann, and Ruby June
- Environmental conditions in San Luis Obispo, CA

Variables measured:

Mortality Rate (%)	Dew Point (°C)
Precipitation (mm)	Vapor Pressure (kPa)
Soil Temperature (°C)	Acc. Degree-Days for Soil Temp (°D)
Air Temperature (°C)	Acc. Degree-Days for Air Temp (°D)

Correlation Coefficients

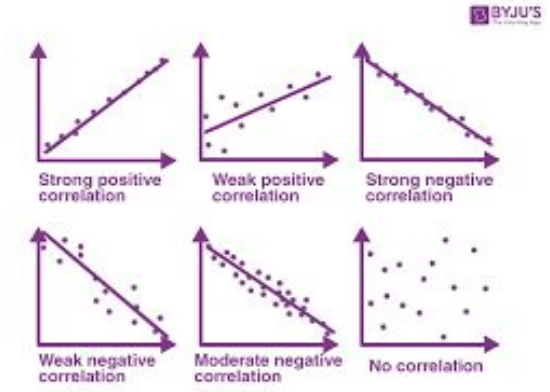
What is a correlation coefficient?

- Statistical measure that describes simple relationships between two variables

How to interpret correlation coefficients?

- With a large positive correlation coefficient, we can state that when variable A increases, variable B also increases

Size of Correlation	Interpretation
.90 to 1.00 (−.90 to −1.00)	Very high positive (negative) correlation
.70 to .90 (−.70 to −.90)	High positive (negative) correlation
.50 to .70 (−.50 to −.70)	Moderate positive (negative) correlation
.30 to .50 (−.30 to −.50)	Low positive (negative) correlation
.00 to .30 (.00 to −.30)	negligible correlation



Correlation Between Weather Conditions and Mortality Rate

Variables	Correlation
Dew Point	0.4402
Vapor Pressure	0.4217
Soil Temp	0.4145
Air Temp	0.4061

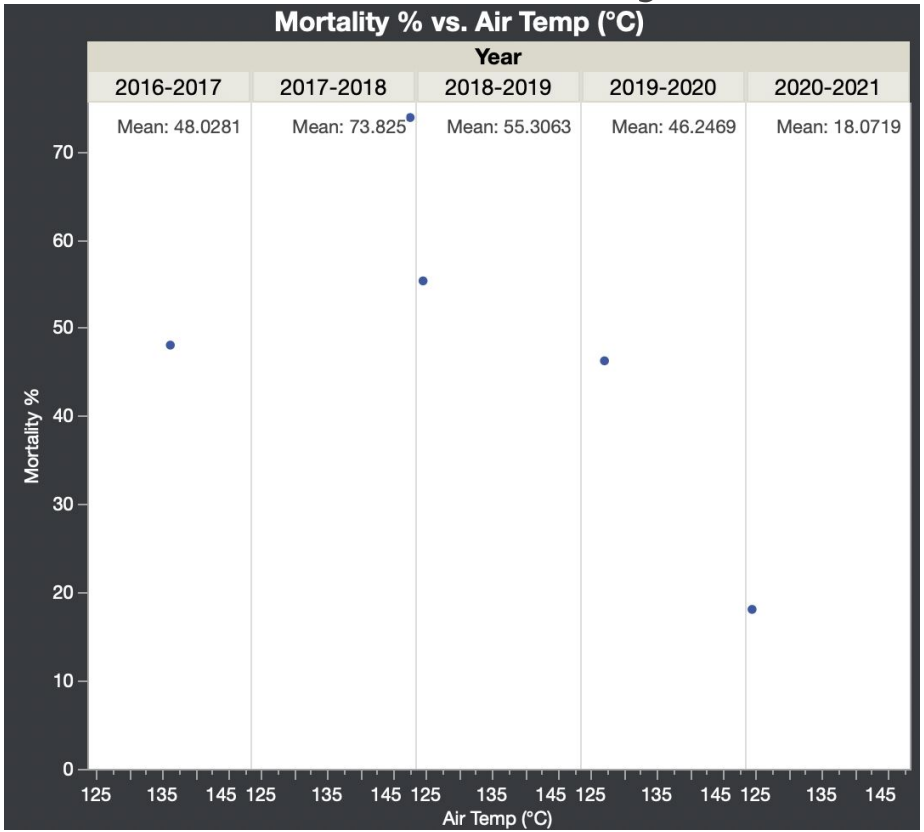
Correlation Between Degree-days and Mortality Rate

Degree-days for Air Temperature	Correlation
Lower Threshold of 0°C	0.4455
Lower Threshold of 10°C	0.4325
Lower Threshold of 20°C	0.4128
Lower Threshold of 25°C	0.4196
Lower Threshold of 30°C	0.4218

Degree-days for Soil Temperature	Correlation
Lower Threshold of 0°C	0.4463
Lower Threshold of 10°C	0.4451
Lower Threshold of 20°C	-0.3034
Lower Threshold of 25°C	0
Lower Threshold of 30°C	0

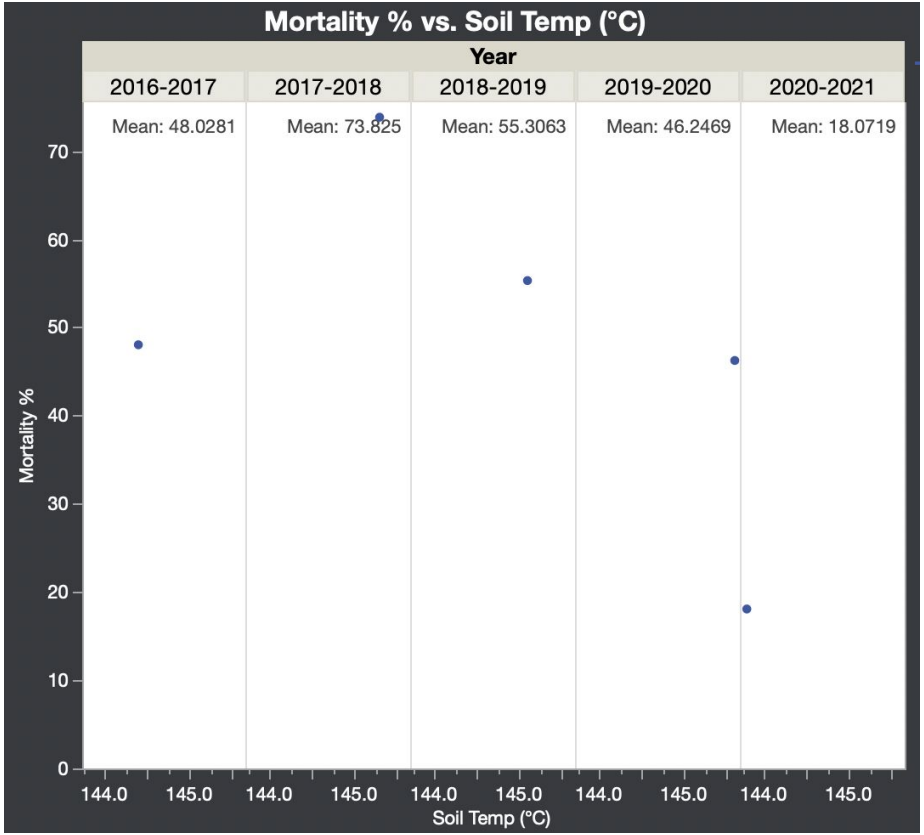
As the lower threshold of Degree-days for Air and Soil Temperature increases, the correlation between Degree-days and Mortality Rate will become more negative.

Key Findings



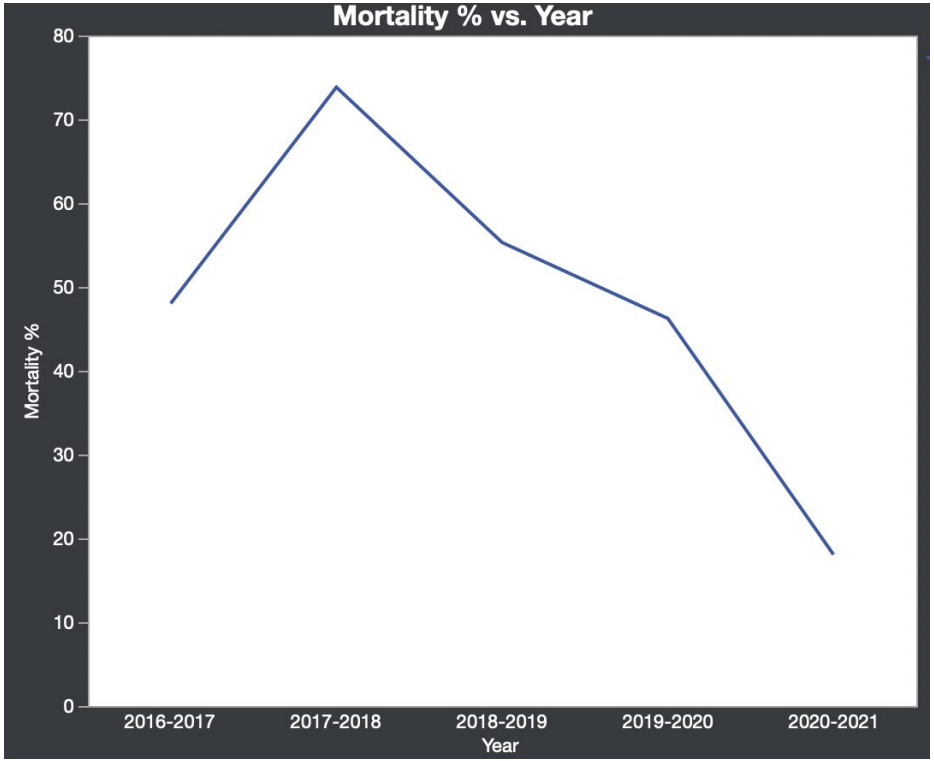
In general, when accumulated air temperature for each year is higher, mortality rate increases.

Key Findings



The sharp decrease in mortality rate during 2020-2021 may be attributed to the COVID-19 pandemic.

Mortality Rate by Year



Main Takeaways from Today's Meeting

- The Dew Point and Vapor Pressure these strawberries were grown in were the most correlated with Mortality Rates of strawberry plants

- Generally, as the soil/air temperature lower threshold increases, the correlation of our Degree-Days variables with Mortality Rate becomes more negative

- Hotter weather conditions (higher air temperatures, soil temperatures, vapor pressure etc.) are generally associated with higher Mortality Rates of strawberry plants


Thank You!