

SUDDEN OAK DEATH.

The Impact of Abiotic Factors on the Progression of *Phytophthora ramorum*



Introduction

Statement of Purpose:
 Sudden Oak Death (SOD) is a fatal disease of oaks that has been spreading rapidly in California and other parts of the world. Many trees have been killed, and the disease is spreading to new areas. The purpose of this project is to determine if various abiotic factors including relative humidity, percent soil moisture, and light intensity at different altitudes affect the concentration of *P. ramorum* and the progression of Sudden Oak Death.

Investigative Question:
 Do different abiotic factors including relative humidity, soil moisture, light intensity, and altitude affect the spread of *P. ramorum* and the rate of tree dieback caused by Sudden Oak Death in oak trees within a particular area?

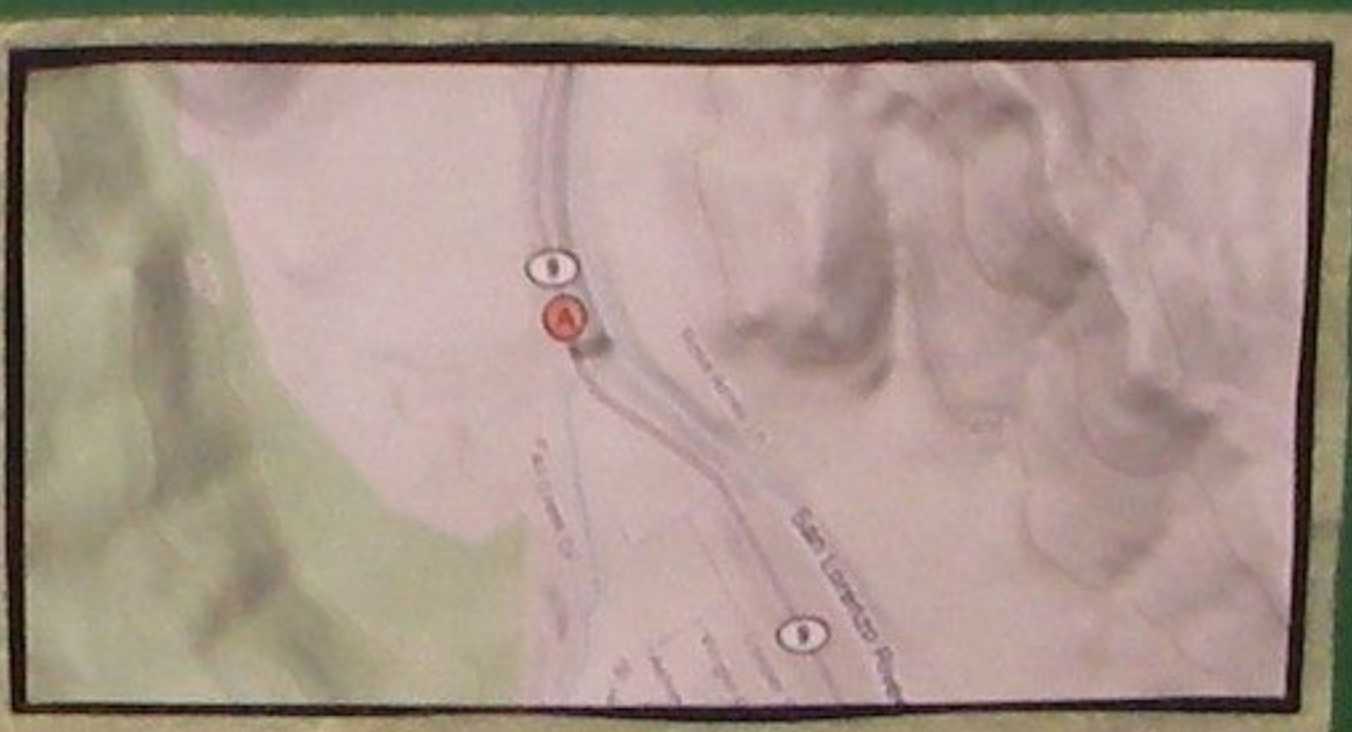
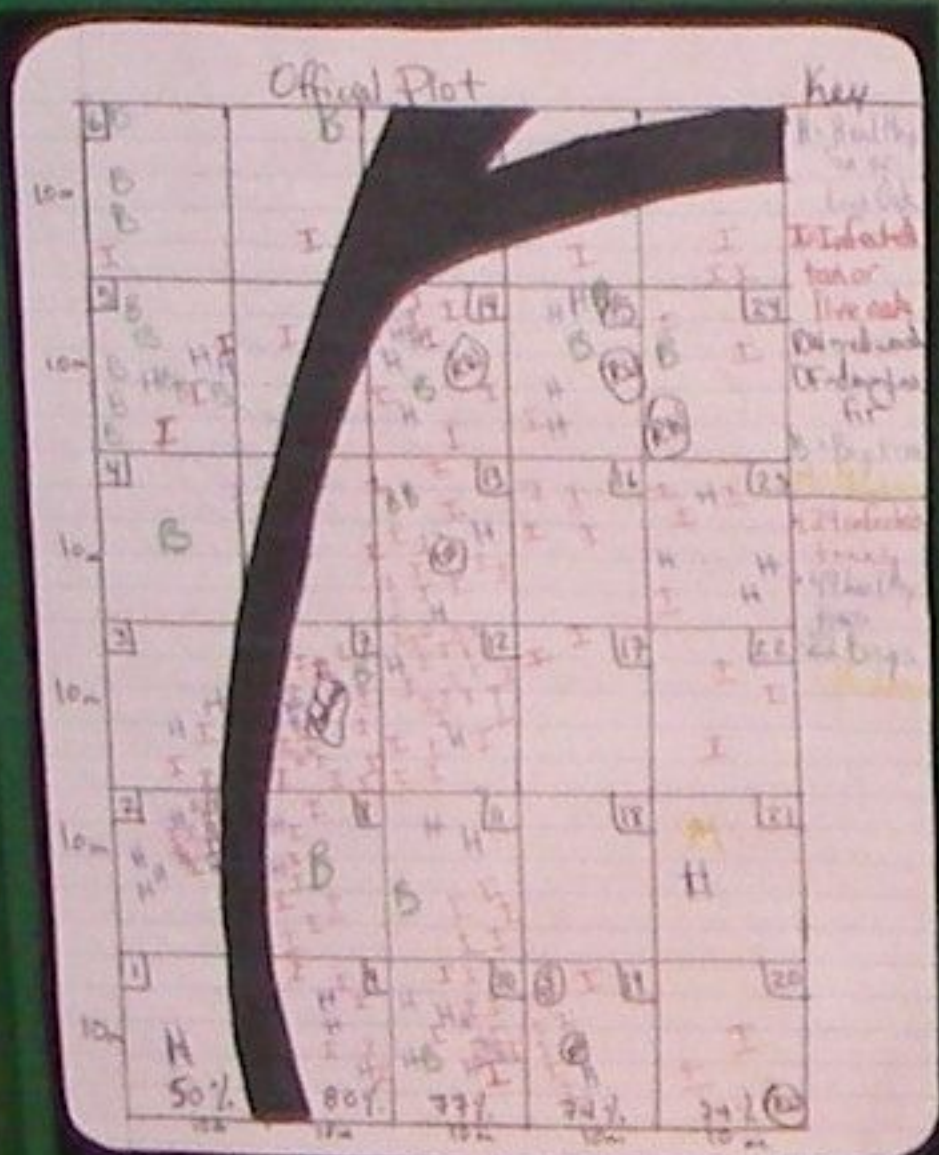
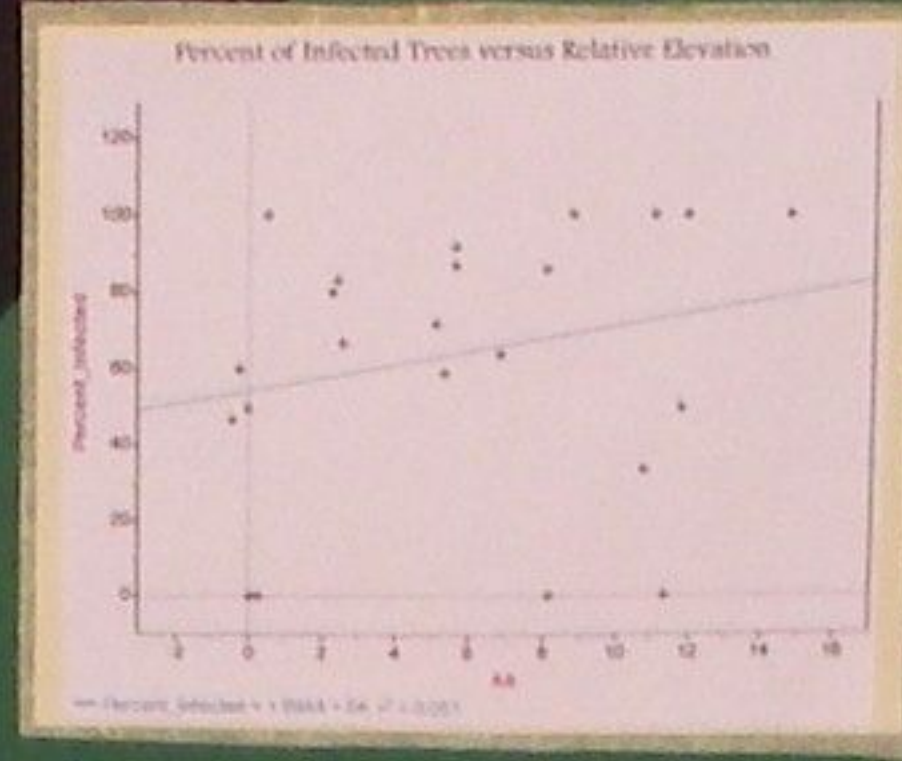
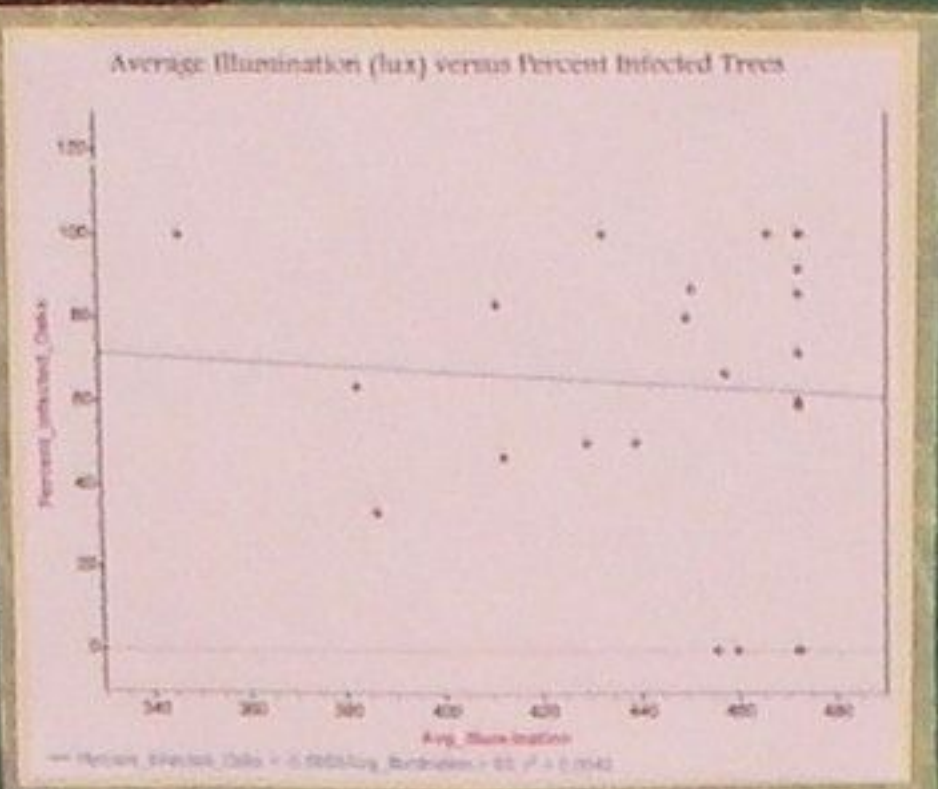
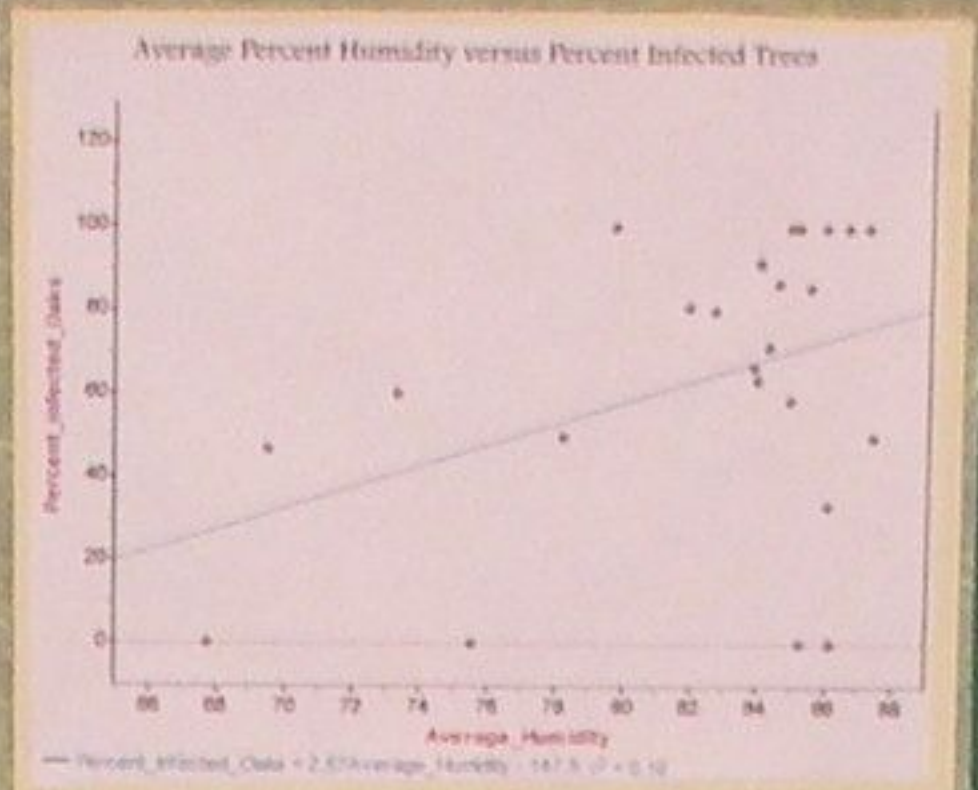
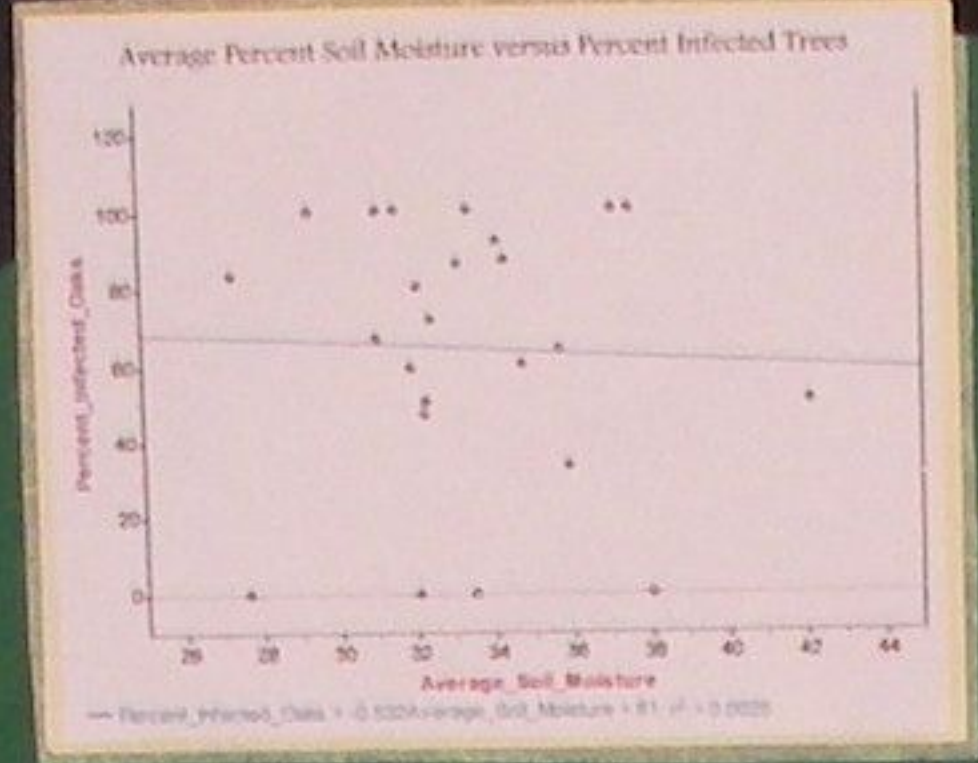
Hypothesis:
 As temperature, relative humidity, soil moisture, and light intensity increase, the concentration of *P. ramorum* will increase, and the rate of tree dieback will increase.

Procedure

Materials:
 1. Sudden Oak Death Survey Form
 2. Soil Moisture Meter
 3. Relative Humidity Meter
 4. Light Intensity Meter
 5. Data Book and Pencil

Method:
 Step 1: The first step of our project was determining the location of SOD in our area. We used a map of the area and a list of oak trees to determine the locations of SOD. We then visited these locations and collected data on the abiotic factors listed above. We also collected data on the concentration of *P. ramorum* and the progression of SOD. We then analyzed our data to determine if there was a correlation between the abiotic factors and the concentration of *P. ramorum* and the progression of SOD.

Data



Results

The data we have obtained regarding the correlations between average relative humidity, average soil moisture, average illumination, relative elevation, and percent of infected trees is inconclusive and does not prove our hypothesis. To prove our hypothesis that as altitude decreases, soil moisture will increase, and pathogens fungi, like *P. ramorum* will infect trees at a higher rate, or to prove possibly a correlation among these factors, we will need to collect data over a longer span of time. We have not yet accomplished our objective of determining if various abiotic factors including relative humidity, percent soil moisture, and light intensity at different altitudes affect the concentration of *P. ramorum* and the progression of Sudden Oak Death. However, we will continue to collect data to obtain information regarding the impact of abiotic factors on the progression of the symptoms of sudden oak death.

Conclusion

Our results are inconclusive and do not support our hypothesis that due to the geographical movement of water to lower altitudes, soil moisture will increase, and pathogens fungi, like *P. ramorum* will infect trees at a higher rate. We were unable to support the conclusion because we have only been working on our project of 6 months and collecting our data on the weekend. Our results will support our hypothesis if we collect our data over a longer span of time. Although our data is inconclusive, we did find that more data collection could help us determine the relationship.



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