CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)

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Project Number

38334

Project Title

Trails, Soil, and SOD

Abstract

Objectives/Goals

We are studying Phytophthora ramorum, a water mold which is killing tanoaks and causing a foliar infection on Bay laurels in Santa Cruz County. Sudden Oak Death threatens the survival of oaks, an important keystone species, and creates a significant fire danger because of the large amounts of dead trees. The pathogen produces infective spores in wet weather, which are then spread through wind-driven rain, runoff, plant material, and soil causing the disease Sudden Oak Death (SOD). In last years project, we noticed that most of the infected trees behind San Lorenzo Valley High School were close to a small trail, and this year we wanted to test the hypothesis that infections are indeed closer to the trail than deeper into the forest.

Methods/Materials

To test whether infections were more common closer to the trail, we laid out a 100 meter tape along the trail and laid a perpendicular transect at 5 randomly selected distances. We then collected tanoak leaf samples at 0, 5, 10, 50, and 100 meters from the trail. After testing with Agdia Immunostrips, culturing the leaf samples on VARP media given to us from UC Berkeley and microscopically identifying sporangia or chlamydospores, we observed a greater tanoak infection rate closer to the trail. Additionally, we re-evaluated our plot from last year, by measuring each of the 25 marked tanoaks# distance from the nearest trail, finding a more significant infection rate closer to the trail. Lastly, to test soil for P. ramorum we used aqueous leaf baiting. We put soil samples and distilled water in a bag and floated uninfected Bay laurel and Camellia leaves, which we then tested with Immunostrips.

Results

Therefore, our tests have supported our hypothesis that Sudden Oak Death infections are more common closer to the trail. We have also detected P. ramorum in the soil along and near our trail using aqueous leaf baiting.

Conclusions/Discussion

Our results show that Sudden Oak Death infections are more common closer to the trail. To prevent the further spread of the disease, we plan to construct a boot washing sanitation station at the trailhead behind our school and implement a public education program for its use. The boot wash station should help prevent pedestrians from taking the pathogen from the forest and infecting other trees

Summary Statement

In our project, we found that Sudden Oak Death infections are more common closer to trail than deeper in the forest and that the pathogen is present along the trail behind SLVHS; to limit the spread we built a boot washing station

Help Received

Dr. Michael Loik helped us to find the direction of our project and answered many logistical questions. Douglas Schmidt, Tina Popenuck, and Laura Sims at UC Berkeley donated culturing materials, showed us procedures and their labs.

Preliminary