CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)
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Project Number
34465

Project Title
Battleships in the Garden: Allelopathic Effects of Trees on Oat Grass

Abstract

Objectives/Goals
The purpose of this experiment was to test the allelopathic (seed growth suppressing) properties of four different types of trees on Oat Grass.

Methods/Materials
The trees used were Black Walnut (Juglans californica), Western Cottonwood (Populus fremontii), Olive (Olea europaea), and Silver Dollar Eucalyptus (Eucalyptus polyanthemos). The seed used was common Oat Grass (Avena sativa). Ten trials were performed in petri dishes. Each Petri dish contained fifteen ml of seed starting mix and ten Oat Grass seeds. Ten ml of finely ground leaf litter was added to the top, over the seeds. The control dishes had ten ml of additional seed starting mix added to the top of the seeds (no leaf litter). All dishes were watered daily for 14 days. The number of sprouts per dish was counted and each sprout was measured for length of growth.

Results
The control group showed an average sprout growth of 7.96 cm and an 84% germination rate. The Black Walnut group showed an average sprout growth of .792 cm and a 21% germination rate The Cottonwood group showed an average sprout growth of .691 cm and a 16% germination rate. The Olive group showed an average sprout growth of 1.757 cm and a 25% germination rate. The Eucalyptus group showed an average sprout growth of .463 cm and an 8% germination rate.

Conclusions/Discussion
All four of the different tree types showed substantial growth suppressing qualities compared to the control. The Eucalyptus treated group was the most suppressed. The hypothesis was not completely proven, as the prediction was that Black Walnut would be the most growth suppressing type of tree.

Summary Statement
This project tests the allelopathic effects of 4 types of trees on the germination and growth of Oat Grass.

Help Received
Teacher helped with format of binder; Mother helped locate some research sites.