CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
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Project Number
J1732

Project Title
Plants on Fire

Abstract

Objectives/Goals
The objective was to determine if fire affects the germination of certain species of plants.

Methods/Materials
We tested fire and four components of fire; heat, smoke, ethylene (plant hormone), and charate. We tested three different plants; lettuce, a common vegetable; Ericameria, a native plant; and ice plant, an invasive plant. Seeds were germinated in Petri dishes with wet paper towels. We tested fire by putting seeds in jars with soil and burning Artemesia californica around the bottles. For heat we put the seeds in foil in an oven at 150 ºF for 15 minutes. We collected smoke by holding a sieve with wet paper towels over the fire. For ethylene we put a ninth of an apple in the Petri dish. We put the ground up, burnt remainders of the fire in the Petri dish for the charate. Our control was seed of each species without fire, just water.

Results
Ericameria seeds did not germinate well in any treatment in the first trial. Lettuce seeds germinated in response to charate and ethylene but were heat sensitive. Fire and heat resulted in no germination. The lettuce seeds in the charrate also sprouted early secondary roots. Ethylene had the fastest germination; however the plant's stems quickly turned back on themselves and rapidly died. The ice plant seeds germinated in response to fire and smoke. They are not as heat sensitive as lettuce.

Conclusions/Discussion
Plants respond to fire, it affects seed germination. Two out of three species germinated. We think the third species of plant (Ericameria) did not germinate because of some sort of unidentified dormancy. Lettuce seeds did not do well in fire and heat; from this we concluded that there is major heat sensitivity in the lettuce species. The ice plant was not as heat sensitive lettuce. The ice plant responded to smoke positively; more seeds germinated than the control. Lettuce germinated in smoke but less than the control. The lettuce seeds in charrate germinated more than they did in the control. It seems that some aspects of fire affect the germination of lettuce and ice plant positively. Which plants come back after a fire may depend on the species.

Summary Statement
The project demonstrated that fire and its components, heat, ethylene, smoke and charrate, affect the germination of lettuce, Ericameria, and ice plant seeds differently.

Help Received
Philippa Drennan of LMU helped with putting our hypothesis together. Pam Williams helped with transport during the project.