



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

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| Name(s) Darian M. Spencer | Project Number J1218 |
| Project Title Ember Traps: Can Vegetation Reduce Fire Risks to Homes? | |
| <p style="text-align: center;">Abstract</p> <p>Objectives/Goals My experiment was designed to test whether vegetation reduces the number of embers hitting or entering a house during wildfire. My experiment tested two hypotheses: Do trees and shrubs near a house affect the number of embers that land around and inside the house, and what arrangement of plants is best to keep houses safe?</p> <p>Methods/Materials I simulated blowing embers by pouring a measured amount of sawdust in front of a fan toward a cardboard house with holes for windows. I placed trees and shrubs made from sticks and Spanish moss between the fan and house in different numbers and arrangements. After each trial, I counted the simulated embers landing inside the house and within 1 cm of the front and back of the house. I also used a camcorder to record how the embers behaved in the wind. The materials used were a cardboard house, scale-model trees, a box fan, a 5-foot long foam board, bedding sawdust, and a 1/3 cup measure.</p> <p>Results More embers landed in or near the house if there was no vegetation. Trees seemed more effective than shrubs in reducing embers, and in general, the number of embers reaching the house declined as I added more vegetation. Some arrangements worked better than others. For example, evenly spaced trees simulating an orchard were very effective, as were random arrangements of trees or shrubs. Some embers were trapped in the vegetation, but many of them actually fell to the ground in dead air spaces between the trees and shrubs.</p> <p>Conclusions/Discussion I conclude that placing fire-resistant vegetation around your house, with a 15 to 30 foot fire-break, will reduce the number of embers entering your house. Good arrangements include random placements of trees and shrubs, random placement of trees only, or orderly arrangement as in an orchard. Based on my research of the literature, I think it is important that the trees and shrubs are types that do not catch fire easily, such as irrigated fruit trees or oak trees.</p> | |
| Summary Statement Trees and shrubs can reduce the number of embers hitting or entering a house during wildfire. | |
| Help Received My father gave me ideas and contacts with fire experts and literature; my neighbor Brian lent me the fan. | |