



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Srinivas B. Balagopal	Project Number 36485
Project Title Effectiveness of Different Insect Shield Mesh Designs on the Amount of Water Collected through Fog Harvesting	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this experiment is to design an insect mesh that increases the amount of water that can be harvested from fog to inexpensively and effectively water home gardens, orchards and farms and therefore reduce our dependence on groundwater, surface water and snow-melt.</p> <p>Methods/Materials Three different mesh designs were constructed using steel meshes. The control was a square mesh, the 1st independent variable was a pyramid-shaped mesh and the 2nd independent variable was shaped like a flower bud. A humidifier was filled with 300 ml of water. Each mesh design was placed in front of the humidifier for sixty minutes. The constants for this experiment were the humidifier run time, the volume of water used, the material of the mesh, the temperature of the room, and the distance between the humidifier and the mesh. The water captured by the different meshes were channeled to the reservoir and measured.</p> <p>Results Three trials were run for each mesh design. The results demonstrated that the bud and leaf mesh design captured an average of 51 ml, while the pyramid mesh capture an average of 30 ml, and the standard square mesh about 14.5 ml. The 2nd independent variable - the bud and leaf mesh captured almost 2½ times the amount of water than the control square mesh.</p> <p>Conclusions/Discussion My unique bud and leaf mesh design harvested 2½ times more water than the standard square mesh. This was the result of the following factors. The larger surface area resulted in more water being condensed from the vapor. The obtuse contact angle caused an increased beading of the vapor into water droplets. The surface striations channeled the water efficiently to prevent clogging and the re-entrainment of the water droplets into the atmosphere. Finally, the apex indentation allowed for additional, un-trapped vapor to condense on the secondary mesh. Thus, a cylindrical insect shield measuring 6 inches by 30 inches would harvest about 1000ml of water from fog bank in 1 hour which is enough to water a rose plant for 3 days</p>	
Summary Statement My bud and leaf mesh design condensed and captured 2.5 times more water than the standard mesh. This design can inexpensively, sustainably, and efficiently harvest more water from fog to irrigate crops and plants.	
Help Received Thanks to my parents for purchasing the materials for me.	