



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Raj M. Amin</b>	<b>Project Number</b> <b>S1601</b>
<b>Project Title</b> <b>Conserving Agricultural Irrigation Water by Controlling Transpiration Loss via Wind</b>	
<b>Objectives/Goals</b> The objective of this experiment is to determine whether the growth rate of the plants will be affected negatively by an increase in transpiration rate due to high winds. I believe that the plants with low or zero wind will have better growth rate than plants with high wind. The water consumption of the high wind plants will be larger compared to the low or zero wind plants.	
<b>Abstract</b> <b>Methods/Materials</b> Fifteen tomato plants of approximately same height, width, weight, and moisture content were transplanted into plastic containers. The plants were equally divided into three groups, the High Wind group, the Low Wind group, and the Zero Wind group. Water was added to equate the mass of each plant to 500-520grams, which was measured using a triple beam balance. The experiment table was set up to keep light, wind speed, temperature, and humidity constant for each group. Wind, temperature, and humidity were all measured with Kestrel 3000 instrument. To ensure all data calculated only the net transpiration, each container was covered with a lid to prevent evaporation from the soil. Temperature was regulated with a space heater. Each day's experiment started by turning on lights for plants and turning on fan that generated wind of 5.0+mph for high wind group, 1.0-1.5mph for the low wind group and the zero wind group were protected in a cardboard box. Data was collected by taking the measurements of the newest leaf for height and the longest opposing leaves for width. The weight of each plant was calculated (original weight # experimental weight) at the end of each experimental day to show the water consumption of each plant. The experiment lasted for twelve days with each day repeating the same procedure as specified.	
<b>Results</b> The experimental results suggest that wind inhibits growth rate and promotes water loss in the form of transpiration. Slowing down the ambient wind to the plants conserves the soil water and increases the growth rate.	
<b>Conclusions/Discussion</b> The results suggested that wind induced transpiration will decrease growth rates and increase water consumption. The wind-induced transpiration promoted soil water consumption in the high wind plants and conserved soil water in plants subjugated to little or zero wind. The results suggest that it would be beneficial for farmers to protect their crops with natural barriers such as trees and shrubs to conserve soil water and to achieve maximum plant growth.	
<b>Summary Statement</b> My project tests to determine whether, increased transpiration rates (via greater wind velocity) or decreased transpiration rates (via decreased wind velocity) will promote soil water conservation and plant growth	
<b>Help Received</b> My mother helped with transportation; Dr. Dave Gooraho provided me with literary resources and materials necessary for experimentation; My father helped with measurements	