



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

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<b>Project Title</b> <b>Commercial vs. Organic Farming: Effects on Night Time Pollinator Presence and Diversity</b>	
<b>Objectives/Goals</b> Major pollinators such as bees and butterflies which contribute to the yield and quality of leading crops globally are declining in dismaying quantities. Scientists believe many factors may be implicated in this population decline, including habitat loss, pesticide use and climate change. These threats may also apply to night pollinators such as moths and beetles, who have recently been identified as equally important as the bees and butterflies. Pesticides used in commercial farms are suspected to pose a threat not only to pests, but also to beneficial insects. I wondered if night pollinators might exhibit less diversity and fewer numbers near commercial farms versus in the vicinity of organic farms. I hypothesized that night pollinator diversity and numbers of night pollinators would be lower near commercial farms compared to in the vicinity of organic farms. <b>Abstract</b> Major pollinators such as bees and butterflies which contribute to the yield and quality of leading crops globally are declining in dismaying quantities. Scientists believe many factors may be implicated in this population decline, including habitat loss, pesticide use and climate change. These threats may also apply to night pollinators such as moths and beetles, who have recently been identified as equally important as the bees and butterflies. Pesticides used in commercial farms are suspected to pose a threat not only to pests, but also to beneficial insects. I wondered if night pollinators might exhibit less diversity and fewer numbers near commercial farms versus in the vicinity of organic farms. I hypothesized that night pollinator diversity and numbers of night pollinators would be lower near commercial farms compared to in the vicinity of organic farms. <b>Methods/Materials</b> Two farms with similar microclimates and crops but 45 miles apart were chosen for field research, a certified organic farm and a commercial farm. Both were vineyards. Using a light trap to attract insects, night pollinator diversity and numbers were documented and compared over a total of 18 field hours distributed over 8 night visits and 2 day visits during the winter of 2017-2018. <b>Results</b> More moths were documented near the organic farm than in the vicinity of the commercial farm. At the organic farm five different orders were represented and at the commercial farm three different orders were present. At each farm, the orders Lepidoptera, Coleoptera and Diptera were seen; the orders Araneae and Hymenoptera were seen exclusively at the organic farm. I saw more moths and overall night pollinators at the organic farm. The numbers of beetles at each farm were too small to analyze. <b>Conclusions/Discussion</b> Using a model comparing organic versus commercial farms as a surrogate measure of pesticide presence, I found that pesticides may have a negative correlation to the number of moths and overall nighttime pollinator diversity in an area. I saw more moths and more variety of pollinators at the organic farm compared to the commercial farm. Further research is needed to evaluate the effects of pesticides on nighttime pollinators, and appropriate measures need to be taken to protect these important contributors to pollination.	
<b>Summary Statement</b> I studied and documented night pollinator numbers and diversity near local vineyards.	
<b>Help Received</b> I'd like to thank my parents for driving me to the vineyards where I performed my field studies. Thanks goes out to my science teacher who gave me guidance. I conducted all of my field research myself.	