



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Sullivan Braun-Slavin	Project Number J1903
Project Title Synthetic Insecticides in GMO Plants: Necessary or Avoidable?	
Objectives/Goals GMOs (Genetically Modified Organisms) are controversial. GMO plants are designed to increase yield and resilience against environmental threats. GMOs are attractive to scientists and food producers, but pest resistance by splicing poisons into plant DNA could have negative effects on human health, beneficial insects, soil and surrounding plants.	
Abstract In my research I learned people have been using natural pesticides for centuries. I decided to study and test non-synthetic substances for pest control, to see if there are effective and safe alternatives to GMOs.	
Methods/Materials I planted 80 radish seeds in 20 pots, divided into 5 groups. All groups got equal water, sunlight, and exposure to rose bushes infested with aphids. Once plants sprouted I treated 4 groups with different oil solutions (Citrus, Eucalyptus, Peppermint and Neem). A control set got no solution.	
I monitored each plant for 1 month and recorded observation data for pest infestation (visible pests/holes in leaves) and general health (plant size and color/droopiness of leaves). Results were based on observation data and precise measurement of plant yield (weight of radishes and leaves).	
Results I hypothesized Peppermint would be most effective against pests due to its anti-microbial properties, and that Neem would also be effective due to its use as an herbicide in India and for killing lice on humans.	
My data showed Neem is the best natural pesticide: plants were untouched by aphids and had the most yield of all plants treated (largest/healthiest leaves, most vegetables). Peppermint plants were healthy, but showed infestation. Eucalyptus and Citrus oils had low infestation, but also low yields and damaged plants. Control plants had the most infestation, but also highest yield.	
Conclusions/Discussion Natural substances can be effective pesticides and may be considered viable alternatives to GMOs. However more experiment and research is necessary to understand the relationship of healthy plants and yield of edible vegetables.	
Future experiments could test variable potency of oil solutions to achieve a balance of pest resistance, healthy plants and maximum yield. I'd like to test GMO seeds against natural pesticides to compare	
Summary Statement My project investigates the effectiveness of several natural substances as non-synthetic organic pesticides, as possible alternatives to controversial GMO pesticide resistant plants.	
Help Received My parents helped by printing my report and pictures for my project board. My science teacher gave me feedback on my report and project board.	