



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Aradhana Sinha	Project Number S1910
Project Title Triforine Sensitivity in Lettuce: Year Two	
Abstract Objectives/Goals The objective of this experiment is to more precisely define the location of the gene for triforine sensitivity (Tr) based on the segregation of alleles in the F4 filial of a cross between PI491224 and Iceberg. In addition I tested whether Tr is in the same or similar location in different accessions, and whether marker BAIS can be used to predict responses to triforine in different lettuces. Methods/Materials In the first phase, I developed a primer pair that amplifies an InDel on marker BAIS. PCR amplification and analysis of the BAIS marker segregation was used to find the location of Tr more precisely in the PI 491224 x Iceberg mapping population. Next, I grew different accessions of lettuce and determined whether they were sensitive to triforine by spraying them with a diluted triforine solution. Finally, I tested the primers developed in Phase 1 on these accessions to determine whether Tr is linked to BAIS in these cultivars, and if the BAIS marker can be used to predict reactions to triforine. Results Phase A: Primers were successfully designed with products around 1000bp. Phase B: The experimental recombination rate between the gene for triforine sensitivity (Tr) and BAIS was 2 in 41 plants. Phase C: There were sensitive and insensitive cultivars, all controlled by the same single dominant/recessive gene. The mutation is monophyletic for Lattuca sativa Phase D: Tr and BAIS were linked in non-romaine cultivars Conclusions/Discussion I found the location of the gene responsible for triforine sensitivity and developed a method to predict triforine sensitivity without killing plants; I also found that triforine can be used to distinguish self-crossed plants from hybrids.	
Summary Statement I found the location of the gene responsible for triforine sensitivity and developed a method to predict triforine sensitivity without killing plants; I also found that triforine can be used to distinguish self-crossed plants from hybrids.	
Help Received My mom drove me to and from the USDA. Dr. Ivan Simko, and Ms. Amy Atallah at the USDA guided me through my project.	