



**CALIFORNIA STATE SCIENCE FAIR  
2014 PROJECT SUMMARY**

<b>Name(s)</b> <b>Anita Garg</b>	<b>Project Number</b> <b>J1107</b>
<b>Project Title</b> <b>The Effect of Competition on a Problematic Invasive Species, Brassica nigra</b>	
<b>Abstract</b> <b>Objectives/Goals</b> My project goal was to see how the invasive species Brassica nigra (black mustard) grows when in competition with native Southern California coastal sage scrub species. By exploring the factors that affect the growth of the Brassica nigra, I wanted to find out how to limit its growth in the Southern California coastal sage scrub ecosystem. <b>Methods/Materials</b> I tested four different plant groups: Brassica nigra grown alone, Brassica nigra grown with native shrubs, Brassica nigra grown with native forbs, and Brassica nigra grown with its own species. Materials: The materials used were: 2 metric rulers, 28 plant pots, 21 native shrub plants, 21 native forb plants, and 49 Brassica nigra plants. Procedure: 1. Identify plant pot number. Count number of leaves, excluding any leaf which has not yet grown a visible stem. 2. Measure height of plant from soil level to highest point of the plant. 3. Measure diameter of plant 90° from the widest point on the plant. 4. Record all measurements in measurement book. <b>Results</b> ANOVA (Analysis of Variance) test results: Out of 23 conducted ANOVA tests, 19 produced an F-value greater than 1. Therefore, the groups I measured in my project were statistically different from each other. The average number of leaves was highest when Brassica nigra was grown with shrubs; this category also had the second-highest average plant height. The plant diameter and the average number of leaves were significantly lower in the treatment in which the Brassica nigra plant was grown with its own species than in any other treatment. <b>Conclusions/Discussion</b> The invasive species Brassica nigra grows the least when it is grown with its own species, and grows well with native shrubs.  One key benefit of this project is the finding that scientists may identify native plants that exhibit similar characteristics to those of the Brassica nigra. These native plants, when grown in areas with a high population of black mustard, may be able to help limit the growth of the black mustard plant.	
<b>Summary Statement</b> The purpose of my project was to determine how the invasive species Brassica nigra grows when in competition with native Southern California plants.	
<b>Help Received</b> Teachers at my school guided me and reviewed my report.	