



California Science Center  
**CALIFORNIA STATE SCIENCE FAIR**  
**2001 PROJECT SUMMARY**

<b>Your Name</b> (List all student names if multiple authors.) <b>Laurel R. Phelps</b>	<b>Science Fair Use Only</b>
<b>Project Title</b> (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) <b>A "Corny" Way to Kill Weeds</b>	<b>J1322</b>
<b>Preferred Category</b> (See page 5 for descriptions.) <b>13 - Pharmacology / Toxicology</b>	<b>Division</b> <b>J Junior (6-8) J Senior (9-12)</b>
<b>Abstract</b> (Include Objective, Methods, Results, Conclusion. See samples on page 14.) Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.	
<b>Objective:</b> The goal of my project was to find out if corn gluten meal, a widely used animal feed, can be used effectively to inhibit the sprouting of grass seeds.	
<b>Materials and Methods:</b> Grass seeds were grown in flats with a central divider. One half of each flat was treated with corn gluten meal and the other was untreated. 15 flats were used, divided into 5 groups of 3 flats. 35 grams of grass seed was mixed with 6 cups of soil. Then, 2 cups of the mixture was spread over each of the three flats in each group to act as the control. Soil was mixed with corn gluten at the rate of 40 lb./sq. foot of soil surface area, then diluted serially with soil to create 5 different concentrations: 40lb./sq. ft., 20 lb./sq. ft., 10 lb./sq. ft., 5 lb./sq. ft. and 2.5 lb./sq. ft.. 35 grams of grass seed was then mixed with 6 cups of each concentration of treated soil and again, 2 cups were spread on top of each of the 3 flats per group. The flats were watered and allowed to grow for about 10 days. Then, 3 samples were cut from each side of each flat and the number of sprouts was counted and compared.	
<b>Results:</b> The corn gluten meal did inhibit the sprouting of the seeds. 40 lb./sq. ft. stopped 94% of the seeds from sprouting and 2.5 lb./sq. ft. stopped 9% of the seeds from sprouting. The number of sprouts in the control groups was fairly consistent.	
<b>Discussion:</b> In California, chemical herbicides are widely used in farming, the timber industry and in roadside weed control. Most of these chemicals have been shown to be toxic to some degree to insects, birds and mammals, including human beings. Some have been shown to cause cancer, neurological problems and reproductive damage. My experiment shows that corn gluten, which is non-toxic to animals, can be used as an effective pre-emergent herbicide and potentially reduce the amount of poisons in our environment. Although the cost of buying corn gluten is higher than the cost of most chemical herbicides, we need to also consider the long term cost to our health and the health of the environment from using toxic chemicals.	
<b>Summary Statement</b> (In one sentence, state what your project is about.) Can corn gluten be used as a non-toxic alternative to chemical herbicides?	
<b>Help Received in Doing Project</b> (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4. My mother helped me design my experiment and cut the mats for mounting my backboard. She also taught me how to use a spread sheet to make graphs. The corn gluten meal used in the experiment was donated by Ralph Zingaro of Bioscape, Inc. in Petaluma, California.	