



Colorado Science and Engineering Fair

**2024
Team Project
Abstract Form**

Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.

Title of Project: Plant Warfare: Investigating the Mechanisms of Plant Allelopathy on Agriculture Crops

Team Leader's Name: Joshua Wells

Team Member 1: Zander Braun

Team Member 2:

School and City: Weldon Valley School, Weldon Colorado

Sponsor's Name: Krista M. Dunn

Category: Plant Sciences (PLNT)

Division: Senior (9th - 12th grades)

Abstract (250 words or less):

The purpose of our investigation was to test allelopathic dilutions from Kentucky BlueGrass and Brohm seed on germination of common crops: wheat, barley, and oats. We hypothesized that oats would germinate the quickest, 60% -100% solution would have the most harmful effects on the seeds, and that Kentucky Blue Grass would have the most harmful effects on germination.

This experiment involved 198 petri dishes: 3 petri dishes for each dilution measured in increments of 10%, starting from 0% up to 100%. Five seeds of wheat, barley or oats were put in their perspective dishes with a total of 15 seeds for each percentage of solution giving 33 petri dishes for each type of seed. The seeds were examined for 7 days. The experiment was conducted twice to test the effect of a more potent dilution.

The data collected supported our hypothesis with the Kentucky BlueGrass seed in that the higher solution did have a negative impact on germination. The Brohm seed had the opposite effect. Wheat seed grew the quickest and had the healthiest germination growth. Kentucky grass seed had the most potent allelopathic effect overall on germination growth.

These findings led us to believe that more studies need to be conducted using Kentucky Bluegrass seed as a natural herbicide or fertilizer. This would be a cheap method to naturally kill out weeds in crops. Plant allelopathy is a friendly way to use herbicides without causing serious environmental problems or posing a threat to human health.

We hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. We also attest that the above properly reflects our own work.

Team Leader's Signature: Joshua Wells

Date: 2/29/24

Team Member 1's Signature: ZB

Date: 2/29/24

Team Member 2's Signature: _____

Date: _____

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with your Finalist Verification/Permission Form. A signed copy of this form must be included in your notebook.