



Colorado Science and Engineering Fair

2025 Individual 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: heater Cheater Rangeland Eater: A Study on Mitigating the Spread of Downy Brome Using Pseudomonas Fluorescens D7 and ACK55

Finalist's Name: Kaycee Clark

School and City: Wray High School, Wray Colorado

Sponsor's Name: Danae Knust

Category: Plant Sciences

Division: Senior (grades 9 - 12)

Abstract (250 words or less):

Downy brome is an invasive annual grass that infests disturbed land that has been affected by overgrazing, fire, drought and road construction. Using weed suppressive bacteria such as pseudomonas fluorescens D7 and ACK55 has been found to suppress downy brome. These two bacterias are cold loving organisms that's life cycle matches downy bromes. There have been mixed findings in the literature on the success of both bacterias. This study was conducted by planting one downy brome seed in each plant cell. 144 seeds were planted for each bacteria and a control. Both bacterias were applied at 1.7×10^8 CFU. The downy brome grew for 8 weeks in a cooler that stayed between 50-55 degrees fahrenheit. After growing germination and dry biomass was compared between the control and bacterias. Average below ground biomass was lowest in areas affected by Pseudomonas fluorescens D7. It had a 16.3% reduction compared to the control. The average above ground biomass was also lower in downy brome that was affected by D7 with a 25.3% reduction. Germination rate was lowest in the control. Even though the germination may increase with application of the bacterias decreasing biomass may give native the edge to compete with downy brome. Pseudomonas fluorescens D7 is a suitable way to decrease the growth of downy brome.

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

Finalist'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 you Finalist Verification/Permission Form. **A signed copy of this form must be included in your notebook.**