Cheater Cheater Rangeland Eater: A Study on Mitigating the Spread of Downy Brome (Bromus tectorum) Using Pseudomonas fluorescens D7 and ACK55

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Downy brome (Bromus tectorum) is an invasive annual, cool-season grass that invades disturbed land impacted by overgrazing, fire, drought, and road construction. The application of weed suppressive bacteria, such as Pseudomonas fluorescens D7 and ACK55, has been shown to suppress the growth of downy brome. These two bacteria are cold-loving organisms whose life cycle aligns closely with that of downy brome. There have been mixed findings in the literature on the effectiveness of both bacteria. In this study, one downy brome seed was planted per cell, with 144 seeds assigned to each test group including the bacterial treatments and the control. Both bacteria were applied at 1.7x108 CFU, and the seeds were grown for eight weeks in a cooler maintained between 50-55°F. Germination and dry biomass measured to compare the control and bacterial test groups. Results showed that plants treated with P. fluorescens D7 had the lowest mean below ground biomass with a 16% reduction compared to the control. D7 also reduced the mean above ground biomass by 23%. Germination rate was lowest in the control. Even though the germination may increase with application of the bacteria, decreasing biomass may give native plants the edge to compete with downy brome. This study demonstrates that P. fluorescens D7 is an effective agent for reducing the growth of downy brome.

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