Colorado Science and Engineering Fair

2024 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: Sumac Shindig An Investigation of Scarification

Finalist's Name: Finnley Reitz

School and City: Alta Vista Charter School , Lamar

Sponsor's Name: Marah Brase

Category: Plant Sciences (PLNT)

Division: Junior (6th - 8th grades)

Abstract (250 words or less):

Skunkbush sumac is a large shrub that grows throughout Colorado. It provides a home and a food source for many species of wildlife. For several years, Colorado Parks and Wildlife (CPW) technicians and biologists have been planting skunkbush sumac seed in grassland habitat projects. They have had no success getting skunkbush sumac to establish from seed. It is possible that their lack of success is because the seeds they are planting are not scarified.

Scarification is the process in which the outer seed coat is broken down allowing for the seed to germinate. Some species of plants require scarification and others don't. Different types of plants often require different types of scarification. The primary types of scarification are freeze/thaw, heat, acid, and echanical. In nature, freeze/thaw scarification occurs when the soil freezes and thaws during winter. Heat scarification most often occurs when wildfire scorches seeds. Acid scarification occurs when animals eat seeds, don't completely digest them, and expel the seeds in their feces. Mechanical scarification occurs when moving sand and seeds cause abrasion/erosion on the seed coat.

For my project I tested between four different scarification methods and a control. I used a refrigerator and freezer to cause freeze/thaw scarification, sulfuric acid for acid scarification, sandpaper for mechanical scarification, and boiling water for heat scarification. After scarifying the seeds, I put them in the refrigerator for a 30 stratification period. I then used a germination incubator for 10 days to stimulate the seeds to germinate. My hypothesis was that the acid scarification method would have the highest germination rate. In the end the method with the highest scarification rate was the acid scarification, therefore my hypothesis was accepted. Acid scarification was the strong winner, with 54.6% of the seeds germinating. Mechanical was in second place with a 21% germination rate. The untreated (control) seeds, the heat treated seeds, and the freeze/thaw seeds all had germination rates under 2%.

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 o 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.