



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: Persistent Plastics: Addressing the Effects of Amorphous Polypropylene on Radish Growth

Finalist's Name: Suhani Dureja

School and City: Stargate Charter School, Thornton

Sponsor's Name: Dr. Barbara Siles

Category: Plant Sciences (PLNT)

Division: Senior (9th - 12th grades)

Abstract (250 words or less):

The term 'microplastics' was coined within this vicennial; however, the incorporation of microplastics in our environment has subsisted since the mass production of plastics in the 1940s. Microplastics, small fragments of broken-down plastic, are found ubiquitously in water tables, soil, and crops.

This investigation included two parts: an experimental model and a computational complement. In the experimental portion, radishes were planted in soil mixed with variable levels of amorphous polypropylene to determine the effect of microplastic levels on plant growth. Computationally, Python was used to model experimental data. Analysis of the data generated an equation that represents the line of best.

Contrary to the hypothesis that plastic has a negative effect on plant growth, the findings suggest that the null hypothesis cannot be rejected. The null hypothesis states that the polypropylene plastic would not affect radish plant growth. This finding is representative of all trials conducted. It is worth noting that compared to the polypropylene-absent controls, the 50% plastic level plantings on average had the greatest sprout height and percent germination during data collection. Importantly, although higher microplastic levels may negatively affect human health, this study implies that plastic may have a positive impact on plant growth. Further work on a larger scale with greater statistical power, including field studies, will be required to find the long-term effect of microplastics on plant growth. This could be done with spectroscopy tools that detect plastic in water and agent-based modeling, which would reveal water flow and ion flow across a radish root.

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