

**Sydney Wolf and Anna Leslie win 2024 Arkansas Soybean Science Challenge Senior Division at Northeast Arkansas Regional Science Fair**

Sydney Wolf and Anna Leslie, 17, seniors at The Academies at Jonesboro High School won the 2024 Senior Division award at Northeast Arkansas Regional Science Fair at Arkansas State University, Jonesboro, Arkansas, March 8.

 Wolf and Leslie split a $300 cash award for their regional win. Awards were provided by the Arkansas Soybean Promotion Board. The science project titled “How effective is Green Filtering” placed first in plant sciences, won the Best Aquatic Science Award, and was awarded ISEF Finalist Alternate.

 Allyson Goodin, Sydney’s teacher, won the $200 regional award. Goodin stated that the Soybean Science Challenge is a great way to learn about the science behind soybeans in the classroom. “The SSC is a great program that allows the students to learn at their own pace. It is full of amazing information about our state agriculture and the wonderful impact of soybeans,” she explained.

Sydney said she was happy to win the Senior Division Soybean Science Challenge. “I am extremely grateful for the opportunity to challenge myself and learn more about soybeans for three years. This year was special for me because I got to share the experiences with Anna Leslie, my partner in the science fair,” she replied. Anna stated she was amazed she won. “I'm both shocked and excited to be the 2024 winner of the Soybean Science Challenge. I went into the science fair not expecting to win much since it was my first science fair, but my teacher and partner made me feel so comfortable and confident in the project. I feel like their support and encouragement is what really helped us win,” she explained.

Mr. and Mrs. Wolf, Sydney’s parents, were very proud to see her receive the award. "We are very excited to see her recognized for the work and time she has put into this project,” they stated. Mr. and Mrs. Leslie felt proud to see Anna win. “We love watching our daughter excel and seeing her reap the benefits of the hard work that she puts into everything she does,” they replied.

 Goodin expounded on why the Soybean Science Challenge is so important. “The students developed their communication and research skills. They increased their knowledge of plants and water in Arkansas. They improved their ability to interpret data and overcome challenges,” she stated.

Sydney explained what she had learned about participating in The Challenge. “Growing up with farmers in my family has made me more accustomed to agriculture, however, this online course has made me see soybean farming in another light. To understand why farmers grow soybeans like they do, was truly memorable,” she stated. Anna also talked about what she learned from the Soybean Science Challenge. “I gained a lot of skills from participating in the Soybean Science Challenge. I was able to work on my public speaking and networking skills while also learning a lot about other fields of science, by looking at other's projects. The Soybean Science Challenge is a great way to get out of your comfort zone and to try new things. You'll learn a lot about your capabilities and strengths,” she explained.

“The Soybean Science Challenge provides an opportunity for Arkansas junior high and high school students to participate in scientific research that can impact the State of Arkansas as well as the world. Soybean Science Challenge student researchers learn about this important commodity crop and its many uses including feeding the world, development of biofuels and sustainable products. The Soybean Science Challenge helps students develop an understanding of the challenges and complexities of modern farming,” said Professor Julie Robinson, director of the program.

 “The goal of the Arkansas Soybean Science Challenge is to engage students in “real- world” education to support soybean production and agricultural sustainability,” said Gary Sitzer, a former member of the Arkansas Soybean Promotion Board. “The program also rewards scientific inquiry and discovery that supports the Arkansas Soybean Industry.”

The Arkansas Soybean Science Challenge was launched in January 2014 to 9-12th grade science students. Students who successfully completed the online course were eligible to have their original soybean-related research projects judged at the 2024 ISEF-affiliated Arkansas Science and Engineering Fairs.

Information on the 2024-2025 Arkansas Soybean Science Challenge will be available in summer 2024. For more information, contact Dr. Julie Robinson at jrobinson@uada.edu, Diedre Young at dyoung@uada.edu, or Keith Harris at kharris@uada.edu.

The Cooperative Extension Service is part of the University of Arkansas System Division of Agriculture.

**Sydney Wolf and Anna Leslie, The Academies at Jonesboro High School, Jonesboro, Arkansas; Teacher: Allyson Goodin**

**Category: Plant Sciences**

**Title: How effective is Green Filtering**

**Abstract:** The purpose of this experiment is to examine whether taproots or fibrous roots filter chemically infused water more efficiently. The initial idea was to prove that a green filter is beneficial to the agriculture community by preventing chemicals in the runoff caused by human pollution from affecting the fields. Similarly, the hypothesis would be that if the roots of plants could filter water to a degree, then the deeper the root system, such as in taproot plants, would be able to naturally filter runoff better compared to fibrous roots. The students predict that the taproot will be able to naturally filter more water, due to the length of the root. The null hypothesis would therefore be that the fibrous roots due to their amount of root spurts would be able to naturally filter water better compared to taproot plants.

To investigate this idea, the students gathered 18 plants of both *Medicago sativa,* alfalfa, and *Heuchera sanguinea*, coral bells. The alfalfa simulated the taproot root system, while coral bells simulated the fibrous root system. The students created a zinc solution and a lead solution to imitate chemical runoff caused by human pollution. Two samples of each plant species were labeled as controls and given only the control water. Then starting the trials, eight plants of each type were given water mixed with lead nitrate solution. The last eight plants of alfalfa and coral bells were given water mixed with zinc nitrate solution. The excess runoff from each plant was collected and sent to be analyzed to determine the amount of lead and zinc in the water of each sample by the USDA Extension Office. After the experiment, each plant was measured for the root length as well as replanted in new soil. The soil samples from every plant used in the experiment were also sent to the USDA Extension Office to examine the amount of lead and zinc in each sample. The independent variable was the type of root system and the type of soil used. The dependent variable was the lead or zinc amount in the runoff water sample and soil sample. The controlled variables were the dilution of the solutions given, the sunlight exposure, and the type of water used.

After data analysis, it was found that the alfalfa with the taproot root system could naturally filter the chemically infused water. The alfalfa plant trials had similar lead and zinc amounts in both the soil and water samples as the alfalfa control that were only given water. On the other hand, the coral bells had higher amounts of lead and zinc in both the soil and water samples compared to the coral bell control. In comparison, the coral bell plants left an exponentially greater amount of the chemicals introduced through the water in the soil than the alfalfa plants. The alfalfa plants also seemed to thrive after being given the lead solution, despite the prediction that the chemicals would harm the plant.

In conclusion, the students were able to accept the alternative hypothesis and reject the null hypothesis. The alternative hypothesis concluded that the taproot root system would best naturally filter the chemically infused water. This allows farmers to implement the use of alfalfa in the technique of green filtering to not only protect their crops from outside chemicals, but also keep the desired chemicals within the alfalfa barrier of the field.