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Claire Green wins 2021 Arkansas Soybean Science Challenge Second Place Award at Virtual Southwestern Energy State Science and Engineering Fair, and Regional Award at Virtual ASMSA-West Central Arkansas Science Fair

Claire Green, 17, a junior at Arkansas School for Mathematics, Sciences, and the Arts (ASMSA) in Hot Springs won the Soybean Science Challenge (SSC) Second Place Award at the 2021 Virtual Southwestern Energy State Science and Engineering Fair April 1. Green also won the SSC Regional Award at the Virtual West Central Science Fair held at ASMSA, February 25.

Green received a \$500 cash award for her second-place finish at state and a \$300 cash award for her regional win. The awards were provided by the Arkansas Soybean Promotion Board at the virtual awards ceremonies. Her science fair project titled “Mushroom meds for bees” also received second place in animal sciences at the West Central Arkansas Science Fair and Honorable Mention in animal sciences at the Arkansas State Science Fair.

Dr. Lindsey Waddell, Green’s teacher, won the \$200 Soybean Science Challenge Teacher Mentor Award for both the second-place state SSC win and the regional SSC win for a total of \$400. She believes Claire has learned a lot about the importance of Arkansas soybeans, and agriculture in general, by completing the Soybean Science Challenge Online Course. “Claire has a deep interest in honeybees and the factors leading to hive collapse, especially viruses transmitted by non-native Varroa mites. The health of hives is obviously a large concern for the agriculture,” she replied.

Green was thrilled to receive the Soybean Science Challenge Award. “It’s exciting and humbling, and it makes me want to keep doing research and do a bigger and better project for next year,” she stated.

Jason and Jennifer Green, Claire’s parents, were thrilled she won the Soybean Science Challenge Award. “Her mom is a little afraid of bees, so she tried to talk Claire out of this topic a couple of times. We’re both glad she didn’t listen to us,” her dad quipped. “At one point when Claire was just starting to work on this project, she cajoled and nagged us to take her to meet a bee expert at 7 a.m. on a Saturday. Claire is not usually a morning person, so we knew she was serious.” Waddell also talked about Claire’s dedication. “Claire is a very self-driven student who shadowed my capstone research course a year early and became interested in bees by assisting in collecting data on pollinator visits to a local community garden. She did some research on her own and found that there is some existing evidence that mushroom extract, especially reishi,

might help reduce viral loads in honeybees in caged bee studies. Wanting to transfer these findings to the field, she made contact with beekeepers and researchers and was able to set up an experiment feeding bees mushroom extract at a few hives in Little Rock. Although the scale of her study was small, she did see a reduction in Varroa mites and a decline in loads of Varroa Destructor virus.”

The part of the Soybean Science Challenge course that appealed most to Green was their importance. “I was a little surprised to discover how important soybeans are to Arkansas. I was interested in learning more about the process of making soybeans and how important they are in Arkansas. While I knew about what a good source of protein soy could be, I didn’t really think that much about some of the other uses it has,” she acknowledged.

Green noted before she decided to participate in the Soybean Science, she felt she knew the basics about soybeans. “I knew some of the basics of soy from being a vegetarian and relying on it as a protein source in my diet. Participating in the Soybean Science Challenge allowed me to learn a lot about how and where soybeans are grown and the many other uses for soy. Preparing to participate in this challenge, I discovered a connection between bees and soy I had not fully appreciated before as well, since bees are essential for pollination of soybeans and healthy bee populations translate into good crop production,” she replied.

Both Waddell and Claire’s parents agree that Claire is a hard worker and has a strong interest in both science and the research behind it. Even Claire’s grandmother was mentioned. “This award especially pleased Claire’s Grandma, who is in her 80s. Grandma remembers spending her early years living on her family’s soybean farm. Even after her family moved to the city, her dad kept the farm while working at another job. Grandma remembers how important the soybean farm income was to her,” her dad 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 Dr. Julie Robinson, Associate Professor and 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 virtual 2021 ISEF-affiliated Arkansas Science and engineering fairs.

Information on the 2021-2022 Arkansas Soybean Science Challenge will be available in summer 2021. For more information, contact Dr. Julie Robinson at jrobinson@uada.edu or Diedre Young at dyoung@uada.edu.

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

Claire Green: Arkansas School for Mathematics, Science and the Arts, Hot Springs, AR.
Teacher-Dr. Lindsey Waddell

Category: Animal Sciences

Project Title: Mushroom Meds for Bees

Abstract: Bee populations are being negatively affected worldwide by the spread of the Varroa destructor mite, which is not only parasitic but can also transmit viruses. Close observers of nature have noticed mushrooms seem to attract wild bees, and laboratory experiments have found declines in viral loads of caged bees consuming extract. The purpose of this experiment was to discover if offering a homemade syrup made from mushroom extract could improve the health of bees in a community garden apiary in measurable ways. The procedure involved offering the syrup in two hives at a community garden site for two weeks during which hive monitoring equipment did not show significant swings in conditions within the hive. Findings showed a decrease in the number of Varroa mites in both hives. The genetic analysis further showed a drop in Deformed Wing Virus, Black Queen Cell Virus, and Varroa Destructor Virus 1. Other viruses increased but not to dangerous levels, probably due to outside factors like pesticide use that could not be controlled in an urban field study. A second experiment undertaken immediately following the first experiment occurred in a lab over a 72-hour period and featured applying undiluted and diluted extract on a sample of bees and mites, in Petri dishes. Results suggested undiluted extract may be toxic to bees and mites as all died more quickly after application compared to the control. Therefore, while bees in apiaries do seem to benefit from being offered mushroom extract, undiluted extract may be toxic to them.