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**Brother & Sister Team win Regional and Statewide Arkansas Soybean Science Challenge Award at Arkansas Science Fairs**

The brother and sister team of Will and Katie Welch at Alpena High School won the Arkansas Soybean Science Challenge award at a regional round at the Northwest Arkansas Science & Engineering Fair. The team advanced to state competition in Conway on April 4th, where they also won that competition. Their project was titled: Stress Signals: Evaluating Cellular Signaling in Cotton, Soybeans and Corn by Colorimetric means as an Inexpensive Method of Crop Monitoring.”

Katie, 17, and Will, 18, won a $300 cash award at the regional level and $500 at the state level. Funds for the awards were provided by the Arkansas Soybean Promotion Board.

“The team has done competitive projects since they were in kindergarten,” said their dad, Mark Welch. “For Will and Katie to complete a large amount of work in their senior year that culminated with the project that your group selected as their award winner was very exciting.”

Overall, team Will and Katie won nine awards for their project at the Northwest Arkansas Science and Engineering fair, including the Arkansas Soybean Science Challenge Award. They also received the last special award at the regional fair which was the NWARSEF Overall Best Project, which qualified them to compete at the prestigious Intel International Science and Engineering Fair in May in Los Angeles.

At the Intel International Science and Engineering Fair in May, Will and Katie went on to earn an award recognition. Their project was recognized as one of the top 50 projects
representing North, Central, and South America. Will and Katie’s selection came from a total of 1,015 projects from those areas of the world and was based upon economic and social impact of the research. Will and Katie’s project is only the 2nd one from Alpena High School in 12 years to win an award.

Team Welch also won the Division IV (10-12th grade teams) Plant Systems category at the Arkansas FFA Agriscience Fair in April and has qualified as semifinalists for the National FFA Agriscience Fair.

The Arkansas Soybean Promotion Board and Extension are very proud and supportive of all the recognition that Soybean Science Challenge winners Will and Katie have received for their soybean science fair project.

“The Challenge is a great program. The course is not too long, and that allows a person to learn much about the topic and it helps us understand our project even better. I think this is one of the best special awards given at our fairs,” said Will Welch.

“I really enjoyed learning about all the different uses of a soybean plant,” said Katie Welch. “We grew up on soy milk so I knew it had some uses, but I had no idea it could be used as fuel or how much livestock relies on soybeans. I just really liked learning about something with real-world applications and the Soybean Science Challenge course really taught that.”

“The Arkansas Soybean Science Challenge Award program is a new partnership between the UofA Cooperative Extension Service and the Arkansas Soybean promotion Board,” said Dr. Karen Ballard, Extension developer and coordinator of the award.

“The goal of the Arkansas Soybean Science challenge is to engage students in “real-world” education to support soybean production and agricultural sustainability,” said Shannon Davis, president 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 opened in January 2014 to 9-12 grade science students. Students who successfully completed the online course were eligible to have their original soybean-related research projects judged at the 2014 ISEF affiliated Arkansas science and Engineering fairs.

Mark Welch said Will and Katie were excited and honored to be among the first Arkansas Soybean Science Challenge winners and all agreed that it is a very beneficial program for rewarding high school original soybean-related student research.

Katie Welch stated the Soybean Science Challenge course made the student researchers learn more as they did their projects. “So I think it will improve researchers’ understanding about the soybean crop as well as give them an incentive to do research on soybeans,” she said.
Information on the 2014-15 Arkansas Soybean Science Challenge will be available in summer 2014. For more information, contact Dr. Karen Ballard or Dr. Julie Robinson at 501.671.2086 or jrobinson@uaex.edu.

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

Will and Katie Welch – Arkansas Soybean Science Challenge Winners – Northwest Arkansas Science & Engineering Fair

Project Title: Stress Signals: Evaluating Cellular Signaling in Cotton, Soybeans, and Corn by Colorimetric Means as an Inexpensive Method of Crop Monitoring

Abstract:

The project's purpose was to find an affordable way for farmers to check their crops for heat stress at the cellular level before they are mature, allowing farmers to react to the stressors prior to yield reduction. Control and heat stressed plants grown under controlled conditions at the Altheimer Lab were tested for ATP, membrane leakage, and chlorophyll levels and then compared to calcium, phosphate, nitrate, and ammonia colorimetric tests to find if there was correlation between the tests. Cotton, corn, and soybeans were grown at the high school lab under similar conditions and tested for calcium, phosphate, nitrate, and ammonia to further verify the technique. The Altheimer lab average control results: calcium 19.5 ppm, phosphate 2.15 ppm, ATP 15604046.15 RLU, and boll mass 14.7 g. The average stressed results: calcium 23.2 ppm, phosphate 0.98 ppm, ATP 14306507.5 RLU, and boll mass 11.8 g. The average high school lab control results: cotton calcium 4.70 ppm, corn 5.20 ppm, soybeans 4.89 ppm, cotton phosphate 1.77 ppm, corn 1.03 ppm, soybeans 0.72 ppm, cotton leaf dry matter (%) 6.40, corn 11.2, and soybeans 13.0. The stressed results: cotton calcium 6.50 ppm, corn 9.70 ppm, soybeans 11.3 ppm, cotton phosphate 1.50 ppm, corn 1.08 ppm, soybeans 0.44 ppm, cotton leaf dry matter (%) 7.20, corn 9.40, and soybeans 11.4. In conclusion farmers could use the calcium to test if the plants were stressed and the phosphate to determine ATP levels, so the farmers could test their crops for stress and reduce yield loss.
From left, Soybean Science Challenge judge, Kimberly Cochran, NWARSEF Arkansas Soybean Science Challenge regional winners, Will and Katie Welch and judge David Moseley.

Will and Katie Welch hard at work on their soybean-related research science project, Stress Signals: Evaluating Cellular Signaling in Cotton, Soybeans, and Corn by Colorimetric Means as an Inexpensive Method of Crop Monitoring.
Arkansas State Science Fair Soybean Science Challenge winners Katie and Will Welch with Dr. Rick Cartwright, UofA Cooperative Extension Service. Team Welch was also the Soybean Science Fair Challenge regional winner at the Northwest Arkansas Science and Engineering Fair.