SOY how far was our reach?

- 14 articles in newspapers, magazines and other publications (Distribution 148,789)
- 3 National RFD interviews (TV – 50 million households; Radio – 21 million households)
- 47 individual student research projects
- 14,541 + direct contacts with high school teachers through Constant Contact, the ARSTEM Science List Serve, Arkansas Educational Cooperatives and individual science teacher emails
- 10 original educational resources authored and designed for distribution at events, i.e. Virtual Field Trip Curriculum Guide, displays and fliers
- 700 + Grow Your Own Protein SSC Seed Packets distributed at educational conferences and others, i.e. Rice Expo, Arkansas Soybean Association, and Arkansas Curriculum Conference
- 55 seed orders from teachers/students from the Challenge seed store at the University of Arkansas Soybean Breeding & Genetics Lab
- Featured in Delta Farm Press Blog (Distribution 18,245), June, 2015

The University of Arkansas System Division of Agriculture is an equal opportunity/equal access/affirmative action institution.
**SOY what is the challenge?**

The Soybean Science Challenge is an educational partnership engaging high school science students in “real-world” scholarship to support Arkansas soybean production and sustainability and to reward their scientific inquiry and discovery. The Challenge is funded by the Arkansas Soybean Promotion Board through a partnership with the University of Arkansas Division of Agriculture, Cooperative Extension Service.

**SOY what did we do?**

The Soybean Science Challenge delivered three online courses.

- **9th – 12th grade student course**
- **Seven (7) hour Teacher In-Service course – ADE approved**
- **Online “Grab & Go: Teacher Curriculum Resources**

Students in grades 9-12 who successfully completed the Soybean Science Challenge online course and entered a project in one of the five regional and state science fairs were eligible for consideration of cash awards.

- **76 students in 9-12 grade science classes enrolled; 30 completed**
- **20 teachers enrolled in 7-hour professional development course; 4 completed**
- **33 teachers used the resources**

**Arkansas Regional and State Science Fairs**

Extension faculty and Arkansas Soybean Promotion Board members attended and judged 16 soybean-related science projects at six science fairs, five regional and the state fair.

Regional winners received $300 and $1,000 was awarded at the state level. The Challenge hosted a booth and spoke directly to over 30 teachers and 50 students about The Challenge.

**Student Impact**

**What was the value of your soybean research?**

“I learned that I do have an interest in agricultural science, which I didn’t think I had before.”

“I gained an interest. I saw that there could be a career in it.”

“A lot of people from our school are really interested in doing work on soybeans. Everybody doesn’t get the award...but everybody is doing work to increase the field. So even if it’s just one person winning, a lot of people are contributing.”

**Teacher/Educator Feedback:**

“We consider this program vital for our urban students to get a sense of what agriculture research involves. Most of our students have never been to a farm or talked to researchers. On occasion, students have also used the soybeans provided by the SSC to produce award winning high school research projects.”

– Melissa Donham, Chair, Science Department, Little Rock Central High School
Earth Day Education at Arkansas State University
Heber Springs

Four Extension staff members hosted a booth for over 1,200 students and teachers who attended this event.

- 525 students tasted strawberry soymilk smoothies made from soy milk and steamed edamame in the pod in educational sessions taught by Karen Ballard, Leigh Ann Bullington and Keith Cleek.

- 60 Soybean Science Challenge teacher packets were distributed with educational curriculum materials and edamame soybean seed packets supplied by the Arkansas Soybean Promotion Board, Arkansas Soybean Association, Greenwave Foods, Inc. and Extension.

Springfield High School Biology Field Day
Springfield, AR

Julie Robinson and Karen Ballard coordinated and planned the field day, and assisted graduate students Courtney Jackson and Juliet Fultz with curriculum development and student instruction.

- 147 10th grade biology students in six classes learned about soybean diseases.

- 200 soybean seed packets, Cruncha Ma-Me and other soybean educational resources distributed to teachers and students.

“Her mother and I believe Amerah’s participation in the Soybean Science Challenge has changed the course of her life.”

-Yaz Taleb (father) July 2015

Research Internship
U of A Poultry Science Lab

Dr. Karen Ballard with Dr. Rick Cartwright’s assistance arranged a summer 2015 internship for 16-year-old Amerah Taleb, 2014 Soybean Science Challenge winner at the Central Arkansas Regional Science and Engineering Fair. Amerah traveled from Dallas, Texas, where she now lives, to conduct research in the Poultry Science Lab under the supervision of Dr. Sami Dridi. Amerah spent four weeks learning lab protocols and initiating her research exploring “Molecular Mechanism of Soybean Isoflavones in Bone Cells.”
The Soybean Science Challenge seeks to introduce science back into the conversation through strong partnerships and a network of support for emerging student researchers.

Student Research Results: 2015 Winners

"By motivating students early to start exploration of soybeans, The Challenge represents a long-term investment in improving our agricultural output and usage of this versatile legume…I know how much a little motivation early in life can shape the trajectory of careers later on…"

– Patrick Foley, LRCHS Junior Academy of Sciences Director, Central Arkansas Regional Science & Engineering Fair Director

Taylor Hensley
Alpena High School

Light What? Phase III, Would Commodity Crop Yield be Affected by Light Minimum and Solar Maximum?

Alexandra Gibson
Nettleton Jr. High School

Glycine Growth Guaranteed with Chlorine?

Northeast Arkansas Regional Science & Engineering Fair

Cameron Thomas
Central High School

Effects of Overcrowding on the Glycine Max in a Hydroponic System

Central Arkansas Regional Science & Engineering Fair

Emilee Watson & Spenser Madden
Emerson High School

Aquaponics Farming Versus Conventional Farming

Southwest Arkansas Regional Science Fair

Evan Buckner
Pine Bluff High School

Fighting Pythium aphidnerdermatum in Soybeans

Southeast Arkansas Regional Science Fair

Teacher/Educator Feedback:

"The Soybean Science Challenge seeks to introduce science back into the conversation through strong partnerships and a network of support for emerging student researchers."

Patrick Foley, LRCHS Junior Academy of Sciences Director, Central Arkansas Regional Science & Engineering Fair Director
Virtual Field Trip - Gardens of the Galaxy: A Battle of Food for the Future

Over 2,000 participants journeyed thousands of miles from their classrooms to the Kennedy Space Center and to the plant pathology lab and greenhouse at the University of Arkansas at Fayetteville. The event was broadcast live from four locations: NASA-Kennedy Space Center and the Plant Pathology Lab, greenhouse and conference room at U of A Fayetteville.

GMOs and the science behind agriculture were hot topics. Students heard from and talked with Trent Smith, manager of the Veggie Project for NASA (pictured above), along with U of A Division of Agriculture System plant pathologists, Drs. Ken Korth and Burt Bluhm. A Discussion Guide was provided to all teachers before the broadcast to facilitate student participation and learning.

“Without even the barest knowledge of agriculture, our students are vulnerable to misinformation that sometimes vilifies farmers.”

–Karen Ballard

- 65 schools with 2 from other states/over 2,000 participants
- 41 Arkansas counties
- School participation > 333 percent from 2014 VFT
- Student participation > 387 percent from 2014 VFT (1,685 students)
- 304 questions submitted by students

The Soybean Science Challenge seeks to make our content relatable to the things young people care about. You can’t tell teenagers what to think.
This is the first generation that has unlimited access to digital information about agriculture, but few resources that help them filter accurate from inaccurate information about contemporary issues.

**EVALUATION: What is the impact of this program?**

**Process and outcome/impact evaluation** of the Soybean Science Challenge was an integral part of the program implementation plan.

**Evaluation methods** included needs assessment, participant data, pre/post-test knowledge testing, online surveys, interviews with teachers and student researchers, and use of digital analytics.

**Educational methods** included individual mentoring, face-to-face classroom/lab instruction, virtual class sessions, virtual field trip, on-campus research internship, evaluation of student-research projects and award presentations, teacher training/development of educational print and digital curriculum and products.

**The results are in: SOY what did we do?**

**Process Evaluation KEY Impact Indicators:**
- **Students**: Direct educational contacts = 4,310 (includes a diverse Arkansas student population of American Indian/Alaska Native, Asian, Black/African American, Hawaiian/Pacific Islander, White, Two or more races and Hispanic participants)
- **Teachers/Partners**: Direct educational contacts = 1,229
- **External organizational contacts** = 14,541

**Outcome/Impact Evaluation:** What evidence is there of real results?

**KEY Impact Indicators:**
- **Student Learning/Knowledge gained** (average online course pre-test score: 43%/post-test: 94%)
- **Utilization of SSC educational web resources**: www.uaex.soywhatsup
  - 1480 page views (Jan-Dec 2015)
  - Average time on page: 3:03 minutes
- **Student Research Projects**: 47
- **Student/Teacher Requests for seeds for research from online Soybean Seed Store**: 55
- **Teacher VFT Post-Survey**:
  - 100% of participating teachers surveyed (48) reported as a result of participating in the 2015 Virtual Field Trip they “understand more about the role of GMOs in support of agricultural sustainability”
  - 43.75% agree and 56.25% strongly agree they understand more about plant research
  - 41.67% agree and 56.25% strongly agree they understand more about the external stresses that impact crops
- **ACT The Condition of STEM: Arkansas 2014 & 2015 Student Reports**
  - 2014: Expressed Interest in Agronomy & Crop Science as a Major/Occupation (3/978/0%)
  - 2015: Expressed Interest in Agronomy & Crop Science as a Major/Occupation (20/1054/2%)

The 2015 U of A Extension Excellence Award for Innovation was presented to the 2014 SSC Virtual Field Trip production team. The Soybean Science Challenge likewise received an award in April 2015 from the Southwestern Energy Science and Engineering Fair Board of Directors for outstanding support of student scientific inquiry.

**Teacher/Educator Feedback:**

“I have personally witnessed tremendous student excitement by the recent addition of this program to our science fairs. Besides the cash awards, which are significant to students (which, in turn, stimulate creative thinking about the way in which soybeans can be used), this program has clearly raised the level of awareness of this major agricultural crop for Arkansas. More specifically, making this program a part of our science fair competitions illustrates the diversity of benefits, uses, and characteristics of soybeans.”

- Dr. Mark Bland, Director, Southwestern Energy Arkansas State Science & Engineering Fair