



SUSTAINABLE BIOECONOMY
FOR ARID REGIONS

Extension & Outreach Newsletter

July 2020; Volume 2, Issue 1

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NOTEWORTHY & NEWSY

Welcome Nick Morris!

University of Arizona Associate in Extension, 4-H Youth Development
SBAR Lead for Youth Development, Extension & Outreach

"Greetings everyone, I am so happy to be part of a great coalition of researchers and educators focused on sustainability. Our youth development initiative will hopefully ensure that the impact of your work lasts well into the future." ~Nick



KUDOS!

> Matthew Katterman, PhD candidate, earned a UA/NASA Space Grant Fellowship to promote understanding of scientific research to the public through educational outreach.

> Dr. Idowu, Dr. Angadi and the NMSU Extension team hosted the 'Alternative Crops Conference' in March, increasing awareness of guar, hemp and other crops for the 50+ grower, agricultural consult, university researcher and student attendees.

> Dr. Rodriguez-Urbe presented SBAR outreach content to 32 Seniors and 3 adult leaders at the 4-H Senior Leadership Retreat: Opening the Door to Your Future.

Thank you Educators & Fellows

Wishing you the best in your next chapter!

Tracie Mikesell, NMSU

Cathy Bradley, NMSU

Meshack Audu, MS, NMSU

Mostafa Dehghanizadeh, MS, NMSU

Jaime Camero, UArizona

Priscilla Fischback, UArizona

Melissa Wilburn, UArizona

Seth Steichen, MS, UArizona

Matthew Katterman, PhD, UArizona

COVID-19 UPDATES

The SBAR Education, Extension & Outreach Team has worked tirelessly to adapt programming and materials to the virtual realities of national COVID-19 mitigation and safety plans. The Youth Development team is in the process of creating and adapting 4-H and Future Farmers of America materials that will be available virtually in the future. This part of the SBAR website will be revamped to launch in late summer. The Education Team has education resources for our partner schools and educators available online.

Learn more here: <https://sbar.arizona.edu/education/educational-resources>

Grower Trials: Guar and Guayule Research Updates

Guar in New Mexico

Guar demonstration trials continue in New Mexico.

In 2019, we evaluated the effects of different rates of nitrogen and phosphorus on growth and yields of guar at four different locations of NMSU research centers in New Mexico. Kinman variety of guar was tested at all the locations. These sites were Leyendecker Plant Science Center in Las Cruces, Agricultural Science Center at Los Lunas, Agricultural Science Center at Clovis, and Agricultural Science Center at Tucumcari.

Three rates of nitrogen (0, 22.3, and 44.6 lb N/ac) and phosphorus (0, 22.3, and 44.6 lb P₂O₅/ac) were applied at all possible combinations to the soil at guar planting, which took place in June 2019 for Las Cruces, Clovis and Tucumcari, and July 2019 for Los Lunas site. The nitrogen fertilizer applied was Urea (45-0-0), while Triple Super Phosphate (0-45-0) was used as phosphorus fertilizer. Trials were harvested in November 2019 across the different locations.

Average guar yields across all treatments vary with location, with the Los Lunas site yielding lowest (566 lb/ac) presumably due to late planting of guar. Guar yield at Clovis site was highest (893 lb/ac) but it was not statistically different from the yield at Tucumcari (789 lb/ac). The yield at Las Cruces (760 lb/ac) was lower than the yields at Tucumcari and Clovis.

Generally, across all locations, the lowest yield occurred when no nitrogen or phosphorus were added to the soil, while the highest yield was recorded in plots with nitrogen at a rate of 22.3 lb/ac and phosphorus at a rate of 44.6 lb/ac.

Maximum plot yields of guar recorded were 685 lb/ac in Los Lunas; 1166 lb/ac in Las Cruces; 953 lb/ac in Tucumcari; and 1053 lb/ac in Clovis. This is an on-going study and the trial will be repeated in 2020 using the same treatments at the same locations. Other on-going research on guar in New Mexico include germplasm, seeding density and irrigation trials being conducted by Dr. Kulbhushan Grover and Dr. Sangu Angadi. Reports of these trials will be shared in future newsletters editions.



Guar at midseason in Clovis (N&P trial, August 24, 2019)



✚ Denotes NMSU Science Center with guar trials

Guayule in Arizona



✚ Denotes SBAR or Bridgestone plot with guayule trials

Even the best laid plans have been foiled by this pandemic. As we described in our last newsletter, SBAR researchers had many trials planned: a new irrigation trial, continued salt tolerance screening work, root structure work, and a nitrogen fertilizer trial. We had also planned to have another guayule grower field day at the Bridgestone research farm. Unfortunately, these projects were postponed to some degree by the pandemic. As COVID-19 mitigation practices begin to ease, we are proceeding with some trials, but others will be pushed into the fall and into next year. We hope to have more and clearer information available to you by this winter's newsletter.

In contrast to these setbacks, Dr. Bill McCloskey's weed control trials were, fortunately, not affected by the COVID-19 pandemic. He installed field trials focusing on preemergent weed control in guayule. He is also working on how to control weeds in established guayule stands. This set of trials includes the effects of sequential applications of Aim herbicide and a comparison of how different spray adjuvants affect the efficacy of Aim in this production system. These trials will be key as we move toward commercial production of guayule to decrease the costs of stand establishment and to clean up any problems that may arise during its production.

Results from last year's guayule variety yield trial have been collected and are currently under analysis by the researchers at Bridgestone. These results will be available in the next few months and will be distributed in our next newsletter.

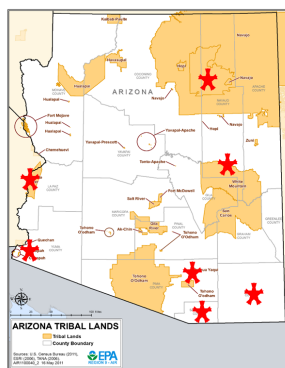
Initiatives and Recruiting



Above: Dr. Rodriguez-Urbe and 4-H Youth at NMSU Project Day



Above Left: 4-H Youth at UArizona; Above Right: 4-H Youth at NMSU



Above: locations of SBAR youth outreach initiatives in Arizona and New Mexico.

SBAR Collaborations with 4-H and FFA

We are expanding our outreach to youth by developing, revising and double-branding curriculum for both Future Farmers of American (FFA) and Regional 4-H that will be provided, initially, in New Mexico and Arizona. FFA and 4-H are traditional spaces for youth who have agricultural literacy and may serve in the future bioeconomy. Curriculum can be used by local branches for professionals and volunteers to support science literacy in youth.

SBAR at NMSU hosted workshops to share the science of SBAR.

The 4-H Project Day invited 6th – 8th graders to be scientists in the lab, testing antioxidant activity in guar seeds and guayule leaf extracts.

At the 4-H Leadership Retreat: Opening the Door to Your Future, Dr. Laura Rodriguez-Urbe led a workshop on designing methods to separate the components of complex mixtures. This workshop trained senior students and adult volunteers on SBAR curriculum.

SBAR at UArizona was active during the second annual AZ 4-H Summit. Dr. Kimberly Ogden and Dr. Dennis Ray presented to 4-H youth on the academic day. Four UArizona SBAR Fellows will be leading educational sessions on sustainability and plant science during the Science in Agriculture week at the end of July.

AZ 4-H staff, volunteers and STEM youth ambassadors will participate in the STEM Youniversity Greenhouse Camp in Fall 2020.

Volunteer Recruitment & Training: We are recruiting 4-H staff and volunteers in Arizona (see map to left) and FFA school staff and volunteers in New Mexico (see map on left). To learn more and get involved, contact Laura Rodriguez-Urbe (NMSU) or Nick Morris (UArizona).

SBAR Education Partnership

We are expanding our Education initiative by going statewide and virtual. SBAR curricula align with NGSS and focus on 5 main areas that connect to SBAR Research:

- > Arid Lands, Agriculture & Sustainability
- > Land Use, Farming & Culture in Arid Regions
- > Building Bioeconomy in Arid Regions
- > Sustainable Crops: Guar & Guayule
- > Chemistry & Engineering

Educator Recruitment & Training

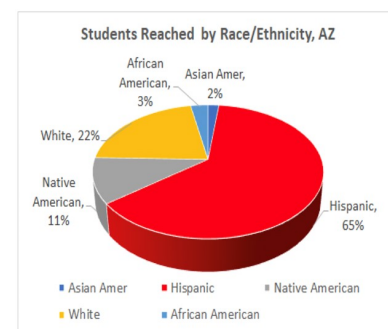
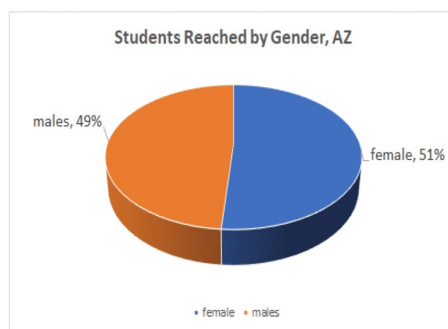
We are recruiting educators from across Arizona and New Mexico. SBAR curriculum, lesson supplies and graduate student Fellows will be available to all participating educators.

Professional Development (PD) is offered via UArizona and is fully online.

Students Receiving SBAR Curriculum (Schools)

Total Students: 550 AZ, 281+ NM

12 Schools AZ & NM



PD will provide asynchronous modules digitally for educators to train at their own pace, emphasize NGSS connections, and promote educator connections via list serves.

Check out the Digital Corner (page 4) for a link to the SBAR Story Map and more information. To sign up, contact Catie Brewer (NMSU) or Corey Knox (UArizona).

COMING SOON!

Guayule Field Day at Bridgestone Farm

Grower Event with Extension Agents and Operations Updates

Fall 2020

Contact: Blase Evancho

Recruiting: Growers

SBAR is seeking growers for trial plots of guar (NM) or guayule (AZ)

Available Spring 2021

Contact: John Idowu (Guar, NM)

Contact: Blase Evancho (Guayule, AZ)

Recruiting: Educators

SBAR is seeking educators for virtual partnership

Available Fall 2020

Contact: Catie Brewer (NM)

Contact: Corey Knox (AZ)

Recruiting: 4-H Volunteers

SBAR is seeking community members as 4-H volunteers

Available Fall 2020

Contact: Laura Rodriguez-Urbe (NM)

Contact: Nick Morris (AZ)

USDA Plant Guide on Guayule

Available Spring 2021

Contact: Blase Evancho

SBAR Plant Guide on Guar

Available Spring 2021

Contact: John Idowu

SBAR Whole Farm Analysis Tool

for Evaluating the Adoption of Guayule and Guar into Your Current Operation

Available Spring 2021

Contact: Trent Teegerstrom

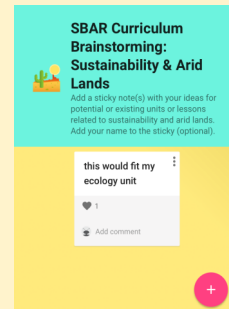
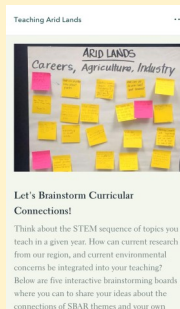
EDUCATION DIGITAL CORNER

The SBAR Education Partnership offers a digital treasure trove of lessons, activities, videos and graduate students to support educators in creating and teaching arid regions themed lessons. Learn more from the interactive Story Map.

SBAR [Story Map](#) Orientation— created by Education Researcher Corey Knox, PhD

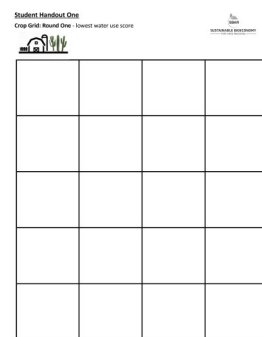
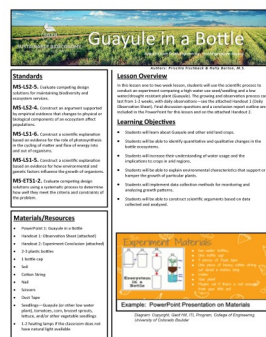


Images from SBAR Story Map

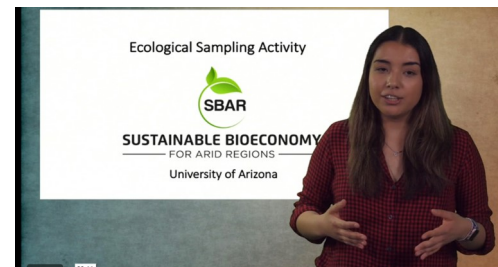
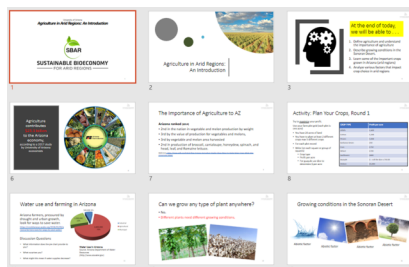


Educator Resources

- Lesson Plans
- Power Point Presentations
- “Explainer” Videos
- Activities
- Career Interview Videos
- Real time support from humans



Above: SBAR Lesson Plan (left) and companion classroom activity (right)



Above: SBAR lesson slides in Power Point (left) and lesson “explainer video” (right)



Above: SBAR “career interview” (left) and SBAR Educators, Fellows and UArizona Education Team in Sells, AZ (right)

Contact Our Team

Education

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Any opinions, findings, conclusions or recommendations expressed in this publication/work are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

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FOR ARID REGIONS



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Department of
Agriculture



National Institute
of Food and
Agriculture



USDA
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