



**SUSTAINABLE BIOECONOMY**  
FOR ARID REGIONS

# Extension & Outreach Newsletter

June 2021; Volume 2, Issue 2

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## NOTEWORTHY & NEWSY



### Dr. Paul Gutierrez is Retiring

Happy trails to Dr. Paul Gutierrez, SBAR Sustainability Team and Extension Team Lead from New Mexico State University, Department of Agricultural Economics and Agricultural Business.

Read about Paul's many contributions on Page 2.

SBAR welcomes Dr. Maryfrances "Frannie" Miller to the Leadership Teams for the Economic Sustainability and the Extension - Youth Outreach initiatives, where she will take over for Dr. Gutierrez.

### Check out these website updates!

[Extension](#) pages offer updated info on Guar and Guayule for producers

[Education](#) pages offer new lessons, learning activities, and teacher resources

[Youth Outreach](#) pages offer SBAR-themed Future Farmers of America lessons

[New Videos](#) offer updates on guar and bilingual professional interviews

### Thank You & Best Wishes

**Ali Yaylali - SBAR Education Fellow** is a PhD candidate in Teaching, Learning and Sociocultural Studies at University of Arizona.

**Darien Pruitt - SBAR Education Fellow** earned an MS in Plant Sciences from New Mexico State University

**Jacob Usrey - SBAR Education Fellow** is earning an MS in Chemical Engineering at New Mexico State University

**Felicia Hinton-Causey - SBAR Educator** retired from teaching at the Santa Rosa Ranch School in Tohono O'odham Nation. Felicia piloted SBAR lessons in her classroom and helped adapt lessons for a Native American student base.

**Traci Klein - SBAR Educator** teaches at Valencia Middle School in Tucson, Arizona. Traci created and piloted SBAR lessons in her science classroom and participated with SBAR for three years.

**Margaret Strand - SBAR Educator** teaches at Camino Real Middle School in Las Cruces, New Mexico, where she taught SBAR content and piloted after school activities.

### Welcome to the Extension Team

Oluwatobi Omotayo will begin work with SBAR Youth Outreach programming in Fall 2021 and contribute to the SBAR System Performance and Sustainability team. Oluwatobi is earning a Master of Science in Agricultural Economics from NMSU and aspires to help shape economic policy to improve agricultural competition and productivity for local growers.



# Youth Outreach

## Youth Leadership in Underrepresented Populations in STEM

*SBAR Youth Development is helping put youth in leadership positions and helping create a platform for women in STEM, particularly Spanish speaking women in STEM.*

Three newly trained Arizona 4-H STEM ambassadors, Ayraza Hernandez, Laysha Gonzalez, and Pamela Salcido along with Santa Cruz County 4-H Program Coordinator Norma Elisa Ruiz from Nogales partnered with Dr. Laura Rodriguez-Urbe from New Mexico State University to record several video presentations. The videos feature Guar and Guayule, respectively, with content delivered in both English and Spanish. Youth STEM ambassadors were included on the recording so they could pose real world questions to Dr. Rodriguez-Urbe in both languages. Arizona 4-H's Dr. Nick Morris stated, "We recognized that SBAR research contains challenging vocabulary for any audience, and offering content in the native language of many youth from across Arizona and New Mexico makes this important work more accessible." He added, "this opportunity further supports equity by showing Youth and Adult Latino and Latina representation in STEM." After editing by grad student Oluwatobi Omotayo and Dr. Frannie Miller, both of NMSU, the videos will be available for viewing on the SBAR website.

~ Dr. Nicholas Morris reporting

## SBAR Kits for Classrooms

### *Unpacking the Science of Bioeconomies*

The combined Junior and Senior Future Farmers of America (FFA) members from Roy, New Mexico, unpacked their SBAR classroom kit filled with the equipment and supplies to support studying plant materials. These educational kits are provided by SBAR to support scientific exploration and opportunities in rural communities. The town of Roy



certainly qualifies as rural, with a population of 188 people in town and only 441 people in all of Harding County. Two of the FFA students were winners in last year's New Mexico State Fair; one project focused on plastics in the environment and the other on cattails in livestock ponds.

We can't wait to see the science projects students develop this year, and we are glad to support their scientific prowess with kits to study the development of sustainable bio-economies in arid regions!

~Dr. Frannie Miller reporting

Photo credit to Becky Smith, science teacher and New Mexico FFA Board of Trustees Member.

## Dr. Paul Gutierrez Retires

We wish Dr. Paul Gutierrez all the best in his retirement! Dr. Gutierrez is retiring from New Mexico State University, where he spent a lifetime developing unique extension programs that respond to the needs of diverse communities throughout the Western United States and into Mexico. He served in a variety of capacities, helping to shape and lead extension programs ranging from county-level experience up to Vice Provost.



Dr. Gutierrez is widely respected throughout the agricultural industry. He provided support to all styles of producer, from the smallest niche farmer of specialty crops to the largest historical ranches in the state. As a co-PI with SBAR, he worked on the Extension and Outreach team, the Research team and the Youth Development team. One of the SBAR principles is the dissemination of knowledge, which he conducted with charm and vigor. Dr. Gutierrez will be deeply missed as a mentor and teacher.

There is little doubt that Dr. Gutierrez will find plenty to do in retirement. He is an avid cyclist, he will have more time to work on his family's ranch near Gallup, and he is looking forward to more time with his grandkids.

~ Thanks to Dr. Frannie Miller for this farewell message

## Fact Sheets

### Read these Extension Publications

- ❑ [GUAR FACT SHEET](#)
- ❑ [GUAR AS A ROTATION CROP](#)
- ❑ [GUAYULE FACT SHEET](#)
- ❑ [HISTORY OF GUAYULE FACT SHEET](#)
- ❑ [USDA PLANT GUIDE: GUAYULE](#)

## Website Updates

### Updated content for Guar and Guayule

#### [Grower Resources](#)

Includes info from conferences, field days, and virtual events

#### [Guar Content](#)

Includes updated, research-based best practices for growers

#### [Guayule Content](#)

Includes updated, research-based best practices for growers

## Guayule in Arizona

### Expanding Guayule Production in Arizona

SBAR and Bridgestone Americas have been working with the Environmental Defense Fund (EDF) to generate new funding for the expansion of guayule production throughout Pinal County. Previous funding from EDF in 2018 led to a pilot project of a 40-acre guayule field in the Maricopa-Stanfield Irrigation and Drainage District. The project was instructive in terms of the commercial establishment and production of guayule and highlights the great potential of guayule for Arizona producers. While one field is a great start, it would be ideal to have several growers with small amounts of production spread throughout Pinal County, giving multiple growers some hands-on experience. This would establish local, trusted experience in every farming town where guayule could potentially be grown. SBAR hopes to develop such a network with the next step of expanding guayule production as early as spring of 2022. While we wait with high hopes for the next round of funding, Bridgestone and SBAR have been developing videos to explain the projects and the research on guayule in Arizona and New Mexico.



✚ Denotes SBAR or Bridgestone plot with guayule trials

~ Blase Evancho reporting

## Guar in New Mexico

### Irrigation Trials Indicate Savings for Growers

The declining water availability in the Southern High Plains (SHP) is a primary concern for agriculture production in the region. It is crucial to adopt low water use crops like guar to sustain available water resources. Therefore, a three-year field experiment was conducted during 2018, 2019, and 2020 at the New Mexico State University Agricultural Science Center in Clovis, NM. The experiment design was a split block design with a split arrangement, where pre-irrigation and in-season growth-based irrigation treatments were strip factors and cultivars were split factors. Results showed that pre-irrigating guar improved the averaged final seed yield by 32% compared to plots that did not receive pre-irrigation. Also, withholding water during the vegetative growth stage saved 37% of water and still had a similar yield compared to plots that received irrigation throughout the crop season. Overall, the 'Kinman' cultivar that produces more branches outperformed the 'Monument' cultivar in all three years. Conclusively, farmers can save irrigation water by growing guar and skipping irrigation during the early growth stage.

~Jagdeep Singh reporting



✚ Denotes NMSU Science Center with guar

## In The Community

### **SBAR at the New Mexico State Fair**

Two new contests will be open to youth participants of the Southern New Mexico State Fair: an Agricultural Science Fair and an Agricultural Public Speaking Contest.

Both contests feature a Sustainable Bioeconomy category that encourages students to research or advocate for the production and use of renewable biological resources. Entrants are directed to the SBAR website to find materials to help develop their research or their speeches on the topic.

Scholarships to New Mexico State University College of Agricultural, Consumer, and Environmental Sciences will be awarded to contest winners!

**Contest registration deadline:** Wednesday, September 1, 2021.

**Contest date:** Saturday, September 25, 2021.



~Contact Dr. Frannie Miller for info

### **Grower Field Days in New Mexico**

Join the SBAR Extension Team at these field events! Learn about guar trials and best practices

**August 3, 2021 - Clovis**

**August 18, 2021 - Los Lunas**

**August 25, 2021 - Las Cruces**

### **Grower Field Day in Arizona**

Join Bridgestone and SBAR Extension at the Bridgestone Guayule Research Farm to learn about guayule trials and best practices.

**November TBD, 2021 - Eloy**

## **Bilingual videos coming soon!**

SBAR Education and Youth Outreach teams have been interviewing STEM professionals, farmers and other bioeconomy professionals. Teachers use these videos to highlight careers and pathways.

Many interviews are now available in Spanish, English and soon Spanish!

Check out the ***SBAR Interviews with Bioeconomy Professionals videos*** [HERE](#)

### **SBAR Publications in the Pipeline**

*Science informs practice:* Extension Specialists and Researchers are collaborating on the following publications for 2021/2022

- > *Guar Seed Rate Study*
- > *Guar Nitrogen & Phosphorus Study*
- > *Guar Germination Temperature Study* - [published](#)
- > *Guayule Impacts on Central Arizona Agriculture*
- > *Guayule Weed Control Study*
- > *Guayule Yield by Variety Study*
- > *Guayule Stand Density Study*

### **SBAR at the Arid Lands International Conference**

SBAR Research Fellow Oluwatobi "Tobi" Omotayo was lauded for his "lightning talk" at the International Arid Land Consortium Conference in May 2021. Tobi was one of only six graduate student presenters from the United States, Israel, and Jordan who made it to the final round of competition. His presentation featured a tool developed by the SBAR Sustainability and System Performance team, the BENCO model, and guar yield data collected by Dr. Sangamesh Angadi from the SBAR experimental plot in Clovis, New Mexico. Tobi's research talk, "Harnessing the environmental and economic potentials of gaur in the arid regions," was featured in the Water & Agriculture theme of the conference and was applauded for a job well done.

## **The Future of Water Sustainability in the Arid Southwest**

Growers in the Southwest are feeling the burn from drought-related water restrictions, but there is hope. Guar and guayule can be part of the solution. Check out [SBAR publications](#) featuring innovative practices guided by research that can contribute to a healthy bioeconomy in the arid Southwest.

## Educator Resources

### DOWNLOAD AND USE SBAR-THEMED LESSONS, VIDEOS, AND RESOURCES IN YOUR CLASSROOM

#### Story Maps

Learn more about participating with SBAR through Story Maps!

*SBAR - A Guayule & Guar Story*

*Orientation to the SBAR Educator Partnership*

*SBAR Classroom Connections: A Teacher's Story*

*Become an SBAR Education Partner*  
[Use this [sign up form](#)]

#### Lesson Plans

Lesson Plans map to specific NGSS, New Mexico and Arizona state standards for science learning in grades 6 to 8.

Each lesson provides teacher presentations, student activities, worksheets, companion videos and other support materials.

#### Videos

A range of videos accompany and support Lesson Plans and can be used independently of SBAR lessons.

*Interviews with Bioeconomy Professionals*

*SBAR After School and Summer Camps*

*Guar and Guayule Basics*  
*And more*

#### What Teachers Say...

Ten Science Teachers from Arizona and New Mexico have partnered with SBAR since 2018. Hear about their experience, what it's like to have an SBAR Graduate Student Fellow in the classroom, how seamless it is to incorporate SBAR-themed lessons into the curriculum, and how students love the learning activities. [Watch Jaime Camero](#) and [Watch Melissa Wilburn](#)

#### What Fellows Say...

Twelve Graduate Student Fellows from University of Arizona and New Mexico State University participated since 2018. Here are some of their favorite things!

**Arisbeth:** "I hadn't realized that cultural relevance was an important part of education. I can see now how important it can be... for students to feel included in the lessons in [order] to be interested and engaged in learning."

**Darien:** "The SBAR Fellowship experience has not only improved my ability to communicate difficult science topics but has also given me confidence when public speaking."

**Jacob:** "... science storytelling. I like relating with the [students] and hearing what they have to say, and if I can craft a story that draws the kids in and teaches them science, then that's an even bigger bonus."

**Paramveer:** "Communicating complex results in a simple language is an important skill for a scientist especially when you are engaged in Agricultural extension."

**Karina:** "Students must be given space to think, to write, and above all to ask questions. Thinking of a story or local problem to address a topic... helps students to become more interested. It helps them connect the issue with a larger situation."

**Ali:** "I will use this experience to develop literacy materials suitable for young learners so that they can develop their science writing abilities ..."

**Tenzin:** "The SBAR Education fellowship helped me understand the importance of environmental outreach programs and their impact in educating the next generation. Also the SBAR community is the best!"

#### ***Guardians of the Biosphere*** **After School Clubs**

Coming soon! Create a "GOB" club at your school with content by SBAR 4-H. GOB was initiated by New Mexico science educators Cathy Bradley and Tracie Mikesell.

Watch a GOB student-created video [HERE](#)

Educators Join SBAR today! Fill out an Interest Form [HERE](#)

# COMING SOON!

## Recruiting: Growers

SBAR is seeking growers for trial plots

Available Fall 2021

Contact: John Idowu for guar in New Mexico

Contact: Blase Evancho for guayule in Arizona

## Recruiting: Educators

SBAR is seeking educators for virtual partnership

Available Fall 2021

Contact: Catie Brewer (NM)

Contact: Corey Knox (AZ)

## Recruiting: 4-H Volunteers

SBAR is seeking community members as 4-H volunteers

Available Fall 2021

Contact: Frannie Miller (NM)

Contact: Nick Morris (AZ)

## SBAR Plant Guide on Guar

Available Fall 2021

Contact: John Idowu

## SBAR Agronomics on Guayule

Available Summer 2022

Contact: Blase Evancho

## SBAR Whole Farm Analysis Tool

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

Available Fall 2021

Contact: Trent Teegerstrom

# Contact Our Team

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We would love to hear from you! Contact our team directly at the email provided.

Check out the SBAR website for more information about the program, research and resources: <https://sbar.arizona.edu>

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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