EXECUTIVE SUMMARY

- SBAR research has generated an integrated model that enables concurrent assessment techno-economics and life cycle impact assessment. The model includes all aspects of the guayule to rubber process with detailed agricultural and biorefining model. The biorefinery produces three products: natural rubber, bagasse, and resin.

- The current results show that the system can meet economic parity with reduced environmental impact than traditional natural rubber systems when the co-products (bagasse and resin) can be moderately valorized.

- The modeling work is being used to identify critical areas for further research and development to support commercialization of this drought-tolerant desert crop.

SBAR HIGH-IMPACT ACCOMPLISHMENTS

- Demonstrated guayule as a sustainable commercial crop for the American Southwest.

- Developed a unique integrated model that includes guayule agriculture from planting to processor, an integrated TEA/LCA model, and advanced water LCA methods for application in arid regions.

- Designed sustainable biomass supply chain optimization, including the location of processing facilities, transportation, and harvesting logistics.

- Increasing farm profitability with optimal crop rotations and machinery scheduling.

- Completion of the BENCO model: a dynamic tool that supports evaluation of the economic, financial, and resource implications of crop adoption.
FUTURE WORK AND NEEDS

- Drive the technology towards commercialization through results-based, focused research and development.
- Evaluate co-product systems for trade-offs that can be used to enhance and direct future research.
- Investigate water use intensity of the optimal cropping systems for guayule.
- Optimize guayule harvest under extreme weather and disruptive events.
- Update enterprise budgets to reflect current circumstances.
- Estimate regional economic impact for crop adoption under different scenarios.
- Partner with regional growers to establish break-even prices for guayule and existing crops using the BENCO model. (BENCO – break-even for new crop options)

For more information: https://sbar.arizona.edu