



SUSTAINABLE BIOECONOMY
FOR ARID REGIONS

HISTORY OF GUAYULE

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USES THROUGHOUT TIME

- > Chewed up guayule rubber was used to make ball games possible
- > Used to fire smelters for raw ores in northern Mexico
- > Currently used as an alternative, natural rubber source

PRE-COLUMBIAN ERA

- > Guayule is native to the Chihuahuan Desert of New Mexico and Texas, and it has long been a source of natural rubber for the people of North America.
- > In pre-Columbian times, the people of the area played a game somewhat similar to racquetball or soccer, with a heavy rubber ball. The ball was made of natural rubber, and in the northern semidesert highlands, guayule stems were chewed to release the rubber from cells just beneath the bark.

THE FIRST EXTRACTIONS

- > The Spanish used guayule as a fuel to power smelters to extract silver. Near the beginning of the 20th century, guayule began to attract attention as a potential source of natural rubber for automobile tires. In 1910, roughly half of the imported natural rubber to the United States was extracted from guayule plants in Mexico.

- > Industrial leaders John D. Rockefeller, Bernard Baruch, Thomas Fortune Ryan, Nelson W. Aldrich, and Daniel Guggenheim invested a large amount into a guayule company, called the Continental-Mexican Rubber Company, which became a large exporter of guayule rubber.

- > After the Mexican Revolution in 1910, the Continental-Mexican Rubber Company moved across the border to the United States (mainly into Arizona and California) and became the Intercontinental Rubber Company.



FUTURE POTENTIAL

- > Strengthen regional biofuel and high-value product markets
- > Source of renewable natural rubber and co-products
- > A reliable and valuable crop to farmers in semiarid regions

~ 100,000

LBS OF GUAYULE PROCESSED
IN 1888

~24,000,000

LBS OF GUAYULE GROWN IN
3.5 YRS OF THE EMERGENCY
RUBBER PROJECT

19.6%

OF DEMAND FOR NATURAL
RUBBER IN THE AMERICAS
FULFILLED IN 2015-16

WAR EFFORTS

> The price of guayule rose substantially in the 1920s, and sold profitability for several years, until the Great Depression when prices dropped and development stopped.



> In 1942, during the Second World War, when the United States was cut off from natural rubber supplies from Southeast Asia, the government purchased experimental records, seed stocks, and holdings of the Intercontinental Rubber Company.

> Significant research and development of guayule as a crop took place during the war, with over 3 million pounds of rubber produced. However, the program ended with the war, and ~21 million pounds of guayule rubber was destroyed in the field.

ONGOING RESEARCH

> Around 1975, guayule was re-examined as a source of renewable natural rubber. Since then research has been steady, resulting in higher yielding guayule lines and improved cultural practices.

> SBAR's research on guayule focuses on several topics: genetic experiments to find the best strain of guayule; irrigation and soil experiments to determine the most efficient growing conditions; herbicide and pesticide experiments to best protect the guayule seedlings; and chemical and molecular studies to develop value-added co-products that will use the entire plant.

THE SBAR PROJECT

> The Sustainable Bioeconomy for Arid Regions (SBAR) project is evaluating raw material development, production, and delivery in the southwestern United States to generate a self-sustaining regional economy. Our approach is to optimize guayule and guar production to support the economies of the southwestern United States. As water becomes less available for agriculture, it is important to identify and test drought and heat tolerant crops that grow well in arid regions, and provide positive economic returns.

For more information: energy.arizona.edu/SBAR



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