



SBAR

SUSTAINABLE BIOECONOMY
FOR ARID REGIONS

GUAR AS A ROTATION CROP

GUAR FIELD IN NEW MEXICO, PHOTO: JOHN IDOWU



GUAR WITH PODS - PHOTO: JOHN IDOWU

PURPOSE OF CROP ROTATION

- > Improve soil health
- > Optimize nutrients in the soil
- > Combat pest and weed pressure

CROP ROTATION AS GOOD PRACTICE

- > Crop rotation is one important way to manage soil health and improve crop productivity. Farmers that produce various kinds of crops are very careful to develop sound crop rotation practices.
- > Practicing crop rotation is beneficial because:
 1. Soilborne pests that feed on one family of plants are slowed because their food crop changes.
 2. Alternating shallow-rooted and deep-rooted plants in a given area draws nutrients from the soil at varying depths.
 3. Plants that fix nitrogen, such as legumes, improve soil quality for future crops.
 4. Farmers who practice crop rotation may not need to let fields lie fallow as often.

BREAKING DISEASE & PEST CYCLES IN A CROPPING SYSTEM

- > Planting the same crop repeatedly can lead to a buildup of diseases and pests that are peculiar to that crop. After the pathogens and pests have built up over time, specific diseases can start showing up on that crop, leading to reduced crop yields.
- > Planting another crop family breaks the cycle of diseases. Sometimes growing the same crop can increase weed problems and reduce crop yields.
- > Therefore, a crop such as guar in a crop rotation can assist with disease and pest management on the farm and guarantee sustainable crop yields.

CHOOSING A ROTATION CROP

- > Carefully consider options
- > Identify crops that grow well in your region
- > Choose crops using these factors:
 - Cost of crop production
 - Water use
 - Equipment needed
 - Crop market
 - Seed availability
 - Profitability



MANAGING SOIL HEALTH

- > Apart from breaking disease cycles, introducing a diverse crop rotation into cropping systems can bring several soil health benefits.
- > Incorporation of crops with deep roots, like guar, into the rotation helps alleviate compaction and enhances soil structure. Guar is a leguminous crop and can fix atmospheric nitrogen, and nitrogen can be returned to the soil through the nitrogen-rich residue that is left after harvest.
- > Different crop families have different microbial communities that associate with their roots. Therefore, a rotation that contains a variety of crops will enhance the soil microbial diversity and community structure, thus improving the soil health.



IMPROVE NUTRIENT & WATER USE EFFICIENCY WHILE REDUCING POLLUTION

- > Sustainability of a crop rotation can be improved by including a deep-rooted crop like guar in a rotation.
- > A crop like guar with its deep roots will be able to utilize the nutrients and water from a deeper soil profile, improving nutrient and water use efficiency.
- > This can also reduce environmental pollution which could result when nutrients leach into the groundwater.

CHOOSING A ROTATION CROP

- > The decision to choose an appropriate rotation crop requires careful thinking.
- > The rotation crop is chosen after considering cost of producing the crop, water use, equipment needed, market for the crop, seed availability, and profitability.
- > Guar is one such option that can grow well in arid and semiarid regions. Farmers unfamiliar with guar should get in touch with a local agricultural or horticultural Extension Agent.

Any opinions, findings, conclusion or recommendation expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture. Grant #: 2017-68005-2686

GUAR AS ROTATION CROP

GUAR RESOURCES

- > 807 N 5th Street,
Brownfield, TX 79316
- > Phone: 806-637-4662
- > Email:
info@guarresources.com

REFERENCES

- > Hodges, R.J.; Kinman, M.L.; Brints, N.W.; Boring III, E.P.; Mulkey Jr., J.R. **1970**. *Keys to Profitable Guar Production*. Leaflet/Texas Agricultural Extension Service; no.907.
- > Singh, J. **2020**. *Guar Growth and Development Under Pre-Irrigation and in-Season Irrigation Management in the Southern High Plains*. Master's Thesis, New Mexico State University, Las Cruces, NM.

- > Guar is a leguminous crop (bean family) with seeds that can be processed to generate guar gum, which is in high demand by the food, cosmetics, and oil/gas industries.
- > Guar is a low water demanding and drought resistant crop that grows very well in semiarid and arid regions like New Mexico and Arizona.
- > Since guar is an annual legume crop, it can fit into the rotation of several cropping systems in the desert southwest.
- > Studies have shown that guar can be highly beneficial as a rotation crop because it can improve the yields of the next crop grown after it. A 15% yield increase of cotton planted after guar was observed in some research experiments (Hodges et al., 1970).
- > SBAR research in eastern New Mexico has also shown that guar can extract soil moisture and nutrients from a deeper soil profile under limited rainfall or irrigation (Singh, 2020). The same research also showed that if guar is stressed for moisture after flowering, it will extract more water from the deeper soil layers.

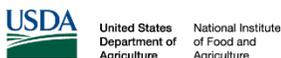
WANT TO GROW GUAR?

- > A contract with a seed processor before harvested guar beans can be processed is a requirement. Guar Resources is the major processor of guar beans in the New Mexico region, and is located in Brownfield, Texas. (see sidebar for contact details)
- > The processor can help you with seed procurement and information on other logistics involved with getting harvested beans to the processing plant.

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



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Guar as a Rotation Crop. SBAR Center of Excellence 3-page fact sheet. March 2021.