

## What is SARE?

Since 1988, the Sustainable Agriculture Research & Education (SARE) program has been the go-to USDA grants and outreach program for farmers, ranchers, researchers and educators who want to develop innovations that improve farm profitability, protect water and land, and revitalize communities. To date, SARE has awarded over \$406 million to more than 8,802 initiatives.

### SARE is grassroots with far-reaching impact

Four regional councils of expert practitioners set priorities and make grants in every state and island protectorate.

### SARE communicates results

SARE shares project results by requiring grantees to conduct outreach and grower engagement; and by maintaining an online library of practical publications, grantee-produced information products and other educational materials.



[www.sare.org](http://www.sare.org)

# SARE: Advancing the Frontier of Sustainable Agriculture in... Guam

## Project Highlight: *Sheet Mulch Using Cardboard and NFTs*

Weeds grow at a very fast pace in Guam. Hand weeding, herbicides, and bush cutting (commercial high powered gas trimmers) are common methods to suppress weeds. However, bush cutters can damage crops and be costly and hand weeding takes a lot of labor.

In this project, farmer Glen Takai proposed testing sheet mulch and nitrogen fixing trees (NFTs) as a solution. Sheet mulching is a layered method of mulching. Typical sheet mulching methods consists of initially laying single or multiple layers of cardboard over a targeted area. Cardboard layers can be topped with shredded/chipped organic waste material. Cardboard is an abundant resource on this remote island due to high imports, and it creates much waste into the landfill. The use of cardboard and NFTs as sheet mulch to manage weeds could also improve soil quality through adding organic matter.

The project has demonstrated significant differences in labor cost savings using sheet mulch compared to not using sheet mulch. Yield data shows that plants using sheet mulch produced significantly higher than plants not mulched. The common use of herbicides was completely eliminated. Lastly, the project promotes the idea of reduce, reuse, and recycle.

For more information on this project, see [sare.org/projects](http://sare.org/projects), and search for project number FW19-348.

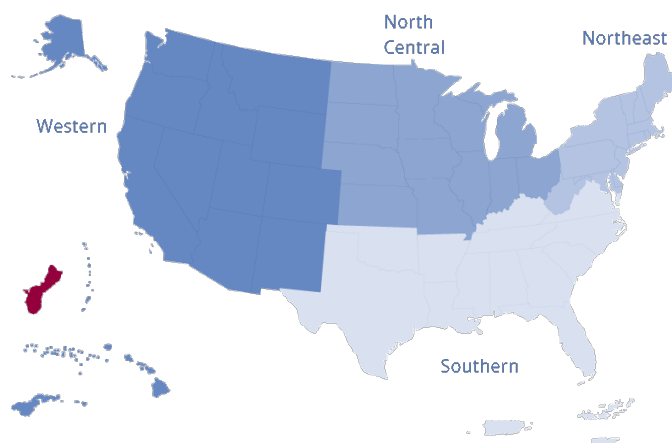
## SARE in Guam

[western.sare.org/state-profiles/guam/](http://western.sare.org/state-profiles/guam/)

**\$1,333,586**  
**in total funding**

**12 grant project**  
(since 1988)

For a complete list of grant projects state by state, go to [www.sare.org/state-summaries](http://www.sare.org/state-summaries)



# SARE in Guam

## Grants awarded 2019-2024

Total awards: **12 grants**

- 2 Farmer/Rancher
- 2 Research and Education
- 5 Professional Development Program
- 1 On Farm Research/Partnership
- 2 Research to Grass Roots

Total funding: **\$1,333,586**

\$35,612	Farmer/Rancher
\$654,254	Research and Education
\$413,072	Professional Development Program
\$58,401	On Farm Research/Partnership
\$172,247	Research to Grass Roots

Find a complete list of projects on page 3.

## Farmer and rancher impacts 2019-2024

SARE grantees have reported the following impacts from their projects:

**481 farmers participated in a SARE-funded project**

**31 farmers reported a change in knowledge, awareness, skills or attitude**

**10 farmers changed a practice**



Learn about local impacts at:  
[western.sare.org/sare-in-your-state/guam/](https://western.sare.org/sare-in-your-state/guam/)

## Contact Your SARE State Coordinator

SARE sustainable ag coordinators run state-level educational programs for Extension and other ag professionals, and many help grant applicants and recipients with planning and outreach. Visit [western.sare.org/state-profiles/guam/](https://western.sare.org/state-profiles/guam/) to learn more.

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SARE is funded by the USDA's National Institute of Food and Agriculture (NIFA).

This report includes summaries of competitive grant programs only. Some competitive grant programs that are no longer offered may be included or excluded from the totals in this report depending on the grant program and SARE region.

For detailed information on SARE projects, go to  
**[www.SARE.org](https://www.SARE.org)**



# AGRICULTURE PROJECTS FUNDED IN GUAM

by USDA's  
Sustainable Agriculture Research and Education (SARE) Program

Guam has been awarded \$2,781,806 grants to support 52 projects, including but not limited to, 11 research and/or education projects, 12 professional development projects and 23 producer-led projects. Guam has also received additional SARE support through multi-state projects.

## RESEARCH AND EDUCATION GRANTS

Project #	Project Title	SARE Support	Project Leaders
SW23-954	Guam's Upgrowing Agricultural Markets (GUAM): Developing Profitable Local Food Markets and Sustainable Agriculture for Small Island Economies	\$349,981	Kuan-Ju Chen University of Guam Dr.Tongzhe Li University of Guelph Dr.Fred Schumann University of Guam Dr.L. Jen Shaffer University of Maryland, College Park
SW19-906	Reducing tree decline of Casuarina equisetifolia in Guam through replacement of bacterial wilt infected trees and research into the bacterial microbiomes of trees and associated termites	\$304,273	Dr.Robert Schlub University of Guam
SW09-304	Replacing Feed Imports With Local Feed Resources in the Western Pacific	\$47,207	Dr.Manuel Duguies Cooperative Extension Service
SW09-067	Island to Island, Farmer to Chef: Ag Agricultural Marketing Proposal	\$133,967	Dr.L. Robert (Bob) Barber, Jr. University of Guam Cooperative Extension Service
SW08-067	Decline of Casuarina equisetifolia: A Loss to Pacific Island Agroforestry	\$140,680	Roger Brown, Jr. University of Guam Dr.Robert Schlub University of Guam
SW05-00B	Preservation of Traditional Medicinal Plants on Guam	\$18,615	Dr.L. Robert (Bob) Barber, Jr. University of Guam Cooperative Extension Service
SW02-048	Alternative Housing Structure for Livestock and Poultry in Micronesia	\$26,857	Dr.Manuel Duguies Cooperative Extension Service
SW01-017	Commercial Production of Tropical Mushrooms Grown Organically	\$36,081	George Wall CALSAES, University of Guam

SW99-048	Evaluation and implementation of nitrogen fixing species in hedgerow intercropping in Marianas	\$132,000	Mari Marutani College of Nat. & Appl. Sciences, Univ. of Guam
SW99-047	Strengthening through Education the Sustainability of Solanaceous Crop Production in the Western Pacific Region	\$16,000	Dr.Robert Schlub University of Guam
SW98-041	Evaluation of Processing Food Refuse and By-products for Growing Finishing Swine	\$121,850	Farouq Abawi University of Guam

#### RESEARCH TO GRASS ROOTS GRANTS

Project #	Project Title	SARE Support	Project Leaders
WRGR22-003	Developing the Economic Sustainability and Viability of Value-added Products on Guam	\$99,376	Kuan-Ju Chen University of Guam Tanisha Aflague College of Natural and Applied Sciences, University of Guam Jian Yang
RGR20-003	Expanding Small-scale Sustainable Agroforestry Demonstration Plots in the Western Pacific	\$72,871	Joseph Tuquero University of Guam Mark Acosta University of Guam, Cooperative Extension Engly Ioanis College of Micronesia Land Grant Programmm

#### PROFESSIONAL DEVELOPMENT PROGRAM GRANTS

Project #	Project Title	SARE Support	Project Leaders
WPDP23-004	Increasing Capacity of Aquaculture Farmers in Guam with On-Farm Hatchery Demonstration for All-Male Tilapia Production.	\$98,668	David Crisostomo University of Guam Sea Grant Johnny Borja University of Guam Sea Grant
WPDP23-016	Pesticide Safety Education for Pacific Island Educators and Stakeholders	\$99,099	Jesse Bamba University of Guam Kerry Richards PCASH
WPDP22-006	Information Network for Sustainable Pacific Islands Research and Education (INSPIRE)	\$98,653	Mark Acosta University of Guam, Cooperative Extension & Outreach
WPDP22-012	The promotion of Heat Stress awareness and Animal Nutrition for egg and hog production on Guam and the Western Region	\$50,639	Dr.Jeng-Hung Liu University of Guam Christopher Byrd North Dakota State University Dr.jennifer young North Dakota State University

PDP20-001	Fungal leaf spots: field, lab, and online tutorial for professionals in Guam and the Northern Mariana Islands	\$66,013	Dr.Robert Schlub University of Guam Dr.Marin Brewer University of Georgia Dr.Robert Kemerait University of Georgia Dr.Kisha Shelton University of Georgia Dr.Leilan Sumabat-Dacones University of Philippines
EW14-006	Plant Disease Diagnostic Training for Agricultural Professionals in Guam and the Northern Mariana Islands	\$63,900	Dr.Robert Schlub University of Guam
EW09-012	Increasing Ecological Insect Pest Management on Guam Through Building Agriculture Professionals' Understanding of Semiochemicals	\$59,990	Gadi V.P. Reddy, Ph.D. University of Guam Dr.Michael Ivie Montana State University-Bozeman
EW08-018	Enhancing Ecological Disease Management on Guam Through Building Agriculture professionals' Understanding of Soil Nutrients	\$49,962	Roger Brown, Jr. University of Guam Dr.Robert Schlub University of Guam
EW05-017	Capacity Building and Training in Commercial Aquaculture for Guam, Commonwealth of the Northern Marianas, and American Samoa	\$90,000	Dr.L. Robert (Bob) Barber, Jr. University of Guam Cooperative Extension Service
EW05-007	Transfer of Research Based Knowledge in Agriculture in the American Pacific	\$74,507	Dr.Manuel Duguies Cooperative Extension Service
EW99-002	People Improving Growth for Swine ( PIGS ) in Micronesia	\$47,540	Dr.Manuel Duguies Cooperative Extension Service
EW98-011	Portable Extension Office for Program Literature Exchange (PEOPLE)	\$41,360	Dr.L. Robert (Bob) Barber, Jr. University of Guam Cooperative Extension Service

#### FARMER/RANCHER GRANTS

Project #	Project Title	SARE Support	Project Leaders
FW23-414	Local Feeds for Poultry Farming on Guam	\$24,612	Thomas Tanaka, Jr. PCS INC
FW19-348	Sheet Mulch Using Cardboard and NFTs	\$11,000	Glenn Takai Takai Farm

FW17-050	Ducks in a Row: Raising Ducks on Guam for Production and Pest Control	\$19,206	Maegan Paloma Maegan Paloma
FW17-014	My Boars Are In Iowa	\$13,597	Eddie Saure Eddie Saure
FW16-030	Rotating Paddock-style Systems in Tropical Environments	\$17,196	Hertha Van Beurden Paradise Natural Farm
FW16-015	From Peewee to Large Eggs	\$11,393	Alex Coloma Agriculture
FW15-041	Raising Black Soldier Fly Larvae as Chicken Feed in a Tropical Region	\$8,232	Chelsa Muna-Brecht P.U.N.G.Co Farms
FW08-313	Kona to Guam Weaving the Farmer Chef Network	\$19,625	Phoebe Wall University of Guam Dr.L. Robert (Bob) Barber, Jr. University of Guam Cooperative Extension Service
FW08-048	Living Mulch on Guam	\$13,000	Laila Pierson
FW08-046	Growing Papaya Using Aquaculture Effluent in an Automated Drip Irrigation System	\$14,800	David Crisostomo
FW06-026	Multi-crops on Plant Beds on Guam	\$5,915	Laila Pierson
FW05-003	Wastewater Delivery System for Irrigation and Soil Enrichment on Guam	\$4,570	John Benaventa Triple B Farms
FW05-312	Maximizing Production Efficiency in a Three-Stage Integrated Agriculture System Using Taro, Tilapia, Aquatic Plants and Fancy Guppies	\$9,951	Dr.L. Robert (Bob) Barber, Jr. University of Guam Cooperative Extension Service
FW05-013	Recycling Fish Waste to Fertilize Guam Farms	\$19,809	Ernie Wusstig
FW04-302	Greenhouse Water Barrier	\$10,871	Pete Terlane Guam Department of Agriculture

FW04-104	Lei Making and Marketing - A New Approach to Marketing	\$6,750	Antoinette Okada
FW02-017	Decreasing Dependence on Man-Made Fertilizers for Crop Production in Tropical Limestone Soils	\$5,200	Ernie Wusstig
FW00-064	Adopting Health Programs and Improving Weaning Facilities in Management of Piglet Diarrhea on Guam	\$7,085	Ricardo Cruz, Jr.
FW99-031	Genetic Upgrading and Improving Goat Management Practices on Guam	\$6,000	Loella Armstrong
FW99-015	Mushroom Production	\$3,950	David Nelson
FW97-054	Use of Sunnhemp in Cucumber Production	\$4,300	Felix Quan
FW96-030	Vegetable Soybean Cultivar Trials	\$3,020	Felix Quan
FW96-029	Dry-Extrusion of Wet Garbage for Swine Feeding	\$4,350	George Pangelinan

#### ON FARM RESEARCH/PARTNERSHIP GRANTS

Project #	Project Title	SARE Support	Project Leaders
OW22-375	5 Future Trainers: Developing a farmer run agriculture production monitoring program for the Farmer's Cooperative Association of Guam (FCAG)	\$58,401	Jesse Bamba University of Guam Joseph Tuquero University of Guam
OW15-031	Seven Trees, Seven Practices: Demonstrating Agroforestry in the Western Pacific	\$47,899	Dr.L. Robert (Bob) Barber, Jr. University of Guam Cooperative Extension Service
OW14-026	Screening tomato varieties for suitability on Guam in response to the arrival of Tomato leaf curl Guam virus in the Western Region	\$49,500	Dr.Robert Schlub University of Guam
OW10-322	Local Feed Formulation for Goats	\$41,485	Dr.Manuel Duguies Cooperative Extension Service

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**Total funding from the USDA SARE program to**



# Guam

## \$2,781,806

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For further information on projects, contact Western SARE at (406) 994-4785 or [wsare@montana.edu](mailto:wsare@montana.edu).

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