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, and search for project number FW19-348.

SARE in Guam

western.sare.org/sare-in-your-state/guam

$2,209,446 in total funding

48 grant projects

(since 1988)

For a complete list of grant projects state by state, go to www.sare.org/state-summaries
SARE Grants in Guam

Total awards: **48 grants**
- 10 Professional Development Program
- 22 Farmer/Rancher
- 4 On Farm Research/Partnership
- 10 Research and Education
- 2 Research to Grass Roots

Total funding: **$2,209,446**
- **$642,564** Professional Development Program
- **$219,820** Farmer/Rancher
- **$197,285** On Farm Research/Partnership
- **$977,530** Research and Education
- **$172,247** Research to Grass Roots

Find a complete list of projects on page 3.

SARE's Impact

- **53 percent** of producers report using a new production technique after reading a SARE publication.
- **79 percent** of producers said they improved soil quality through their SARE project.
- **64 percent** of producers said their SARE project helped them achieve higher sales.

Learn about local impacts at: 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-pages/guam to learn more.

Mark Acosta  
University of Guam, Cooperative Extension  
(671) 687-2028  
macosta@triton.uog.edu  

Bob Barber  
University of Guam Cooperative Extension  
(671) 787-7391  
bbarber@triton.uog.edu

USDA Sustainable Agriculture Research & Education

For detailed information on SARE projects, go to www.SARE.org

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.
Guam has been awarded $2,209,446 grants to support 48 projects, including but not limited to, 10 research and/or education projects, 10 professional development projects and 22 producer-led projects. Guam has also received additional SARE support through multi-state projects.

<table>
<thead>
<tr>
<th>RESEARCH AND EDUCATION GRANTS</th>
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<tbody>
<tr>
<td>Project #</td>
<td>Project Title</td>
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</table>
| 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  
CALS/AES, 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 |

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<th>RESEARCH TO GRASS ROOTS GRANTS</th>
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</table>
| 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 |
**PROFESSIONAL DEVELOPMENT PROGRAM GRANTS**

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<tr>
<td>WPDP22-006</td>
<td>Information Network for Sustainable Pacific Islands Research and Education (INSPIRE)</td>
<td>$98,653</td>
<td>Mark Acosta&lt;br&gt;University of Guam, Cooperative Extension &amp; Outreach</td>
</tr>
<tr>
<td>WPDP22-012</td>
<td>The promotion of Heat Stress awareness and Animal Nutrition for egg and hog production on Guam and the Western Region</td>
<td>$50,639</td>
<td>Dr. Jeng-Hung Liu&lt;br&gt;University of Guam&lt;br&gt;Christopher Byrd&lt;br&gt;North Dakota State University&lt;br&gt;Dr. Jennifer Young&lt;br&gt;North Dakota State University</td>
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<tr>
<td>PDP20-001</td>
<td>Fungal leaf spots: field, lab, and online tutorial for professionals in Guam and the Northern Mariana Islands</td>
<td>$66,013</td>
<td>Dr. Robert Schlub&lt;br&gt;University of Guam&lt;br&gt;Dr. Marin Brewer&lt;br&gt;University of Georgia&lt;br&gt;Dr. Robert Kemerait&lt;br&gt;University of Georgia&lt;br&gt;Dr. Kisha Shelton&lt;br&gt;University of Georgia&lt;br&gt;Dr. Leilan Sumabat-Dacones&lt;br&gt;University of Philippines</td>
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<td>EW14-006</td>
<td>Plant Disease Diagnostic Training for Agricultural Professionals in Guam and the Northern Mariana Islands</td>
<td>$63,900</td>
<td>Dr. Robert Schlub&lt;br&gt;University of Guam</td>
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<tr>
<td>EW09-012</td>
<td>Increasing Ecological Insect Pest Management on Guam Through Building Agriculture Professionals' Understanding of Semiochemicals</td>
<td>$59,990</td>
<td>Gadi V.P. Reddy, Ph.D.&lt;br&gt;University of Guam&lt;br&gt;Dr. Michael Ivie&lt;br&gt;Montana State University-Bozeman</td>
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<tr>
<td>EW08-018</td>
<td>Enhancing Ecological Disease Management on Guam Through Building Agriculture professionals' Understanding of Soil Nutrients</td>
<td>$49,962</td>
<td>Roger Brown, Jr.&lt;br&gt;University of Guam&lt;br&gt;Dr. Robert Schlub&lt;br&gt;University of Guam</td>
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<td>EW05-017</td>
<td>Capacity Building and Training in Commercial Aquaculture for Guam, Commonwealth of the Northern Marianas, and American Samoa</td>
<td>$90,000</td>
<td>Dr. L. Robert (Bob) Barber, Jr.&lt;br&gt;University of Guam, Cooperative Extension Service</td>
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<tr>
<td>EW05-007</td>
<td>Transfer of Research Based Knowledge in Agriculture in the American Pacific</td>
<td>$74,507</td>
<td>Dr. Manuel Duguies&lt;br&gt;Cooperative Extension Service</td>
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<td>EW99-002</td>
<td>People Improving Growth for Swine (PIGS) in Micronesia</td>
<td>$47,540</td>
<td>Dr. Manuel Duguies&lt;br&gt;Cooperative Extension Service</td>
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<tr>
<td>EW98-011</td>
<td>Portable Extension Office for Program Literature Exchange (PEOPLE)</td>
<td>$41,360</td>
<td>Dr. L. Robert (Bob) Barber, Jr.&lt;br&gt;University of Guam, Cooperative Extension Service</td>
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**FARMER/RANCHER GRANTS**

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<tr>
<td>FW19-348</td>
<td>Sheet Mulch Using Cardboard and NFTs</td>
<td>$11,000</td>
<td>Glenn Takai&lt;br&gt;Takai Farm</td>
</tr>
<tr>
<td>FW17-014</td>
<td>My Boars Are In Iowa</td>
<td>$13,597</td>
<td>Eddie Saure&lt;br&gt;Eddie Saure</td>
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</tbody>
</table>
FW17-050  Ducks in a Row: Raising Ducks on Guam for Production and Pest Control  $19,206  Maegan Paloma  
FW16-030  Rotating Paddock-style Systems in Tropical Environments  $17,196  Hertha Van Beurden  
FW16-015  From Peewee to Large Eggs  $11,393  Alex Coloma  
FW15-041  Raising Black Soldier Fly Larvae as Chicken Feed in a Tropical Region  $8,232  Chelsa Muna-Brecht  
FW08-313  Kona to Guam Weaving the Farmer Chef Network  $19,625  Phoebe Wall  
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  
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.  
FW05-013  Recycling Fish Waste to Fertilize Guam Farms  $19,809  Ernie Wusstig  
FW04-302  Greenhouse Water Barrier  $10,871  Pete Terlane  
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
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<tr>
<td>OW22-375</td>
<td>5 Future Trainers: Developing a farmer run agriculture production monitoring program for the Farmer’s Cooperative Association of Guam (FCAG)</td>
<td>$58,401</td>
<td>Jesse Bamba University of Guam</td>
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<td>OW15-031</td>
<td>Seven Trees, Seven Practices: Demonstrating Agroforestry in the Western Pacific</td>
<td>$47,899</td>
<td>Dr. L. Robert (Bob) Barber, Jr. University of Guam Cooperative Extension Service</td>
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<td>OW14-026</td>
<td>Screening tomato varieties for suitability on Guam in response to the arrival of Tomato leaf curl Guam virus in the Western Region</td>
<td>$49,500</td>
<td>Dr. Robert Schlub University of Guam</td>
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<td>OW10-322</td>
<td>Local Feed Formulation for Goats</td>
<td>$41,485</td>
<td>Dr. Manuel Duguies Cooperative Extension Service</td>
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Total funding from the USDA SARE program to Guam

$2,209,446

For further information on projects, contact Western SARE at (406) 994-4789 or wsare@montana.edu.
Sustainable Agriculture Research and Education (SARE) is funded by USDA’s National Institute of Food and Agriculture (NIFA).