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DEVELOPING A HANDBOOK FOR UTILIZING LIVESTOCK AS A TOOL IN NOXIOUS WEED CONTROL IN NINE WESTERN STATES

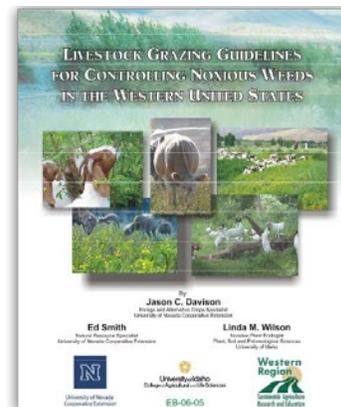
FROM THE FIELD

The Challenge

The Bureau of Land Management defines a noxious weed as: "A plant that interferes with management objectives for a given area of land at a given point in time." Three hundred noxious species can be found on U.S. rangelands. Examples in the West include, but are not limited to, cheat grass, spotted knapweed, leafy spurge, and yellow star thistle. The high costs of noxious weed invasion, both environmental and economic, have been well documented. Noxious weed invasion has led to

increased soil erosion and reduced carrying capacity for livestock and wildlife, among other impacts. Effective control of noxious weeds regularly ranks as one of the highest agricultural concerns in the West. Control methods commonly used, such as herbicides and controlled burning, have become more restricted; leaving ranchers and land managers to seek alternatives.

Researchers, ranchers, and land managers have recognized that livestock grazing can be a valuable and selective noxious weed management tool. In 2004, Jay Davison, University of Nevada Cooperative Extension, found that known techniques had not been summarized into a



useful format. This weakness had led to slow adoption of livestock grazing as a management tool. Davison and colleagues designed

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Staci Emm

FROM THE FIELD

As an Extension Educator with the University of Nevada, Staci Emm is acutely aware of the distinct challenges American Indian producers on reservations face. The reservations and their tribal governments have unique historical, cultural, political, and

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socio-economical conditions that need to be understood by agricultural professionals in order to succeed in their work with American Indian producers. Engaging American Indian producers in designing effective educational outreach from the outset would support agricultural professionals in appreciating the different conditions and creating programs tailored to these special challenges. Almost every reservation works with a USDA agency, so Emm designed her Western SARE Professional Development Program project People of the Land II: Sustaining Agriculture on American Indian Lands in the Four-Corners Region (EW11-006) to address knowledge gaps between needs

identified by American Indian producers and tribes and the USDA. As Emm states, "sustaining the economic viability of American Indian agricultural operations and their communities on American Indian reservations requires agricultural professionals to learn how to develop outreach plans that enhance quality of life for Indian farmers and ranchers and society as a whole."

By the project's completion, at least 700 agricultural and natural resource professionals and educators in the Hopi

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THERE MUST BE A BETTER WAY

This spring I attended the graduation ceremony for my son who completed his undergraduate degree. I especially enjoyed the speaker at the college convocation, Deborah Marriott Harrison. She is the granddaughter of J. Willard Marriott, founder of Marriott International, the hotel chain. She spoke of the corporate culture of Marriott International and described how her grandparents began their company during the depression years in Washington, DC. She described her grandparents as resilient, innovative, and positive. She explained that one goal of Marriott International was to create opportunities for people.

This pretty well describes the vision and culture of Western SARE with regards to sustainable agriculture in the BIG west. We support an agriculture that is resilient and innovative. At our last Administrative Council meeting we spent a fair bit of time talking about our desire for more innovation in the project proposals we receive. Rather than trying to define innovation in an agricultural context, I'd like to share a couple of stories regarding agricultural innovation.

Dan Brockman is a Wisconsin cranberry producer. For some 50 years cranberries for processing had been harvested with a machine affectionately known as an 'egg beater'. It consisted of a drive unit that carried four to six rotating heads that created turbulence in the water of a flooded bed and that would remove the fruit from the vines. Typically it would take two harvesters, each with an operator, two to three hours to harvest a five acre bed. Each of the heads was driven by a hydraulic motor. If a hydraulic line broke, oil would be released into the bed, rendering all of the fruit in the bed unmarketable.



**WESTERN SARE
REGIONAL
COORDINATOR'S COLUMN**

Teryl Roper, Ph.D.

I'm pretty confident that Dan Brockman dreamed of a better harvester as he sat on a beater harvesting his crop. He came up with a better way. His invention runs a horizontal bar just over the surface of a flooded bed and this pinches the fruit from the vines. His 'Ruby Slipper' harvester attaches to a small multi-purpose tractor and a single operator can harvest a five acre bed in about an hour. The Ruby Slipper does not have any hydraulics beyond that found on any small tractor. He was also innovative in patenting the slipper harvesting process and not just the device.

Bryce Wrigley is a barley farmer near Delta Junction, Alaska. While there is some local demand for barley in the greater Fairbanks area, it is a finite market and shipping of raw barley any distance is prohibitively expensive. Bryce bought milling equipment and established a mill on his farm. They produce flour, barley cereal, barley couscous, and barley based baking mixes such as pancake mix. These value added products are sold in local outlets, as well as via mail order

through the Internet. They've been able to develop a loyal market for a premium product.

I am convinced that much innovation in every industry originates with practitioners who are involved in mundane work thinking there must be a better way - and they find one. What is your innovation? Have you thought of an improved process, a different market, a new process that could make your farming better? If so, we'd like to help you validate that the new way is an improvement - and not just different.

If we think about the challenges facing western agriculture today (drought, urban encroachment, pest management, international markets, labor shortages) the need for innovation is obvious. I predict that increasingly scarce water will prompt both innovation in water delivery and greater adoption of existing technology.

Positive people believe that innovative solutions to today's problems exist. I look forward to the future with optimism. The western region has some of the brightest and most resilient and innovative people found anywhere. Working together we can be successful.

Grants made by Western SARE are really about creating opportunities for people to solve problems. We invest in projects that have a high probability of solving a problem that faces a regional agricultural sector. We invest in people by giving them resources to buy expertise and supplies to ascertain if their innovation will work. We can't provide funding without proposals. We encourage you to look at wsaregrants.usu.edu and see if we can be your partner. ■

"I am convinced that much innovation in every industry originates with practitioners who are involved in mundane work thinking there must be a better way—and they find one. What is your innovation?"

- Teryl Roper

*Western SARE Regional
Coordinator*

DETERMINATION OF GAS EMISSIONS FROM MANURE SOURCES IN ANIMAL FEEDING OPERATIONS

FROM THE FIELD

The Challenge

Animal feeding operation (AFOs) air pollutants can cause public health and environmental problems, such as decreased local-scale air quality and increased rates of asthma. AFOs also emit greenhouse gases which contribute to climate change. Best management practices (BMPs) have been developed and can help mitigate emissions; however, developing effective BMPs requires accurate on-farm determination of emissions that reflects region-specific climatic conditions and operation practices. Environmental conditions in the semi-arid region of the West differ from conditions in the East where BMPs have been developed and require a gaseous emission measurement system, according to Utah State University graduate student Pakorn Sutitarnnontr. He states “establishing an accurate and reliable measurement system is critical for demonstrating the most effective BMPs in reducing environmental impacts of livestock production in the Western region.”

Searching for a Solution

To reduce the environmental impacts of livestock production in the West and minimize greenhouse gas emissions, thereby improving the sustainability of livestock production, Pakorn designed the Western SARE graduate student project Determination of Gas Emissions from Manure Sources in Animal Feeding Operations (project number GW13-006). His specific objective was to measure and develop understanding of animal manure-based gas emissions in development of site-specific best BMPs and improvement of current practices. He used a novel

Measuring Gas Emissions from Manure Sources

¹Pakorn Sutitarnnontr, ¹Enzhu Hu, ²Rhonda Miller, ³Markus Tuller, and ¹Scott B. Jones
¹Dept. of Plants, Soils and Climate, Utah State University, Logan, UT
²School of Applied Sciences, Technology, and Education, Utah State University, Logan, UT
³Dept. of Soil, Water and Environmental Science, University of Arizona, Tucson, AZ

One of the major sources of air pollution is decomposition of livestock wastes. According to the Census of Agriculture, currently, there are approximately 55,000 dairy and beef cattle (including calves) in Cache County. Air emissions from animal operations include ammonia (NH₃), nitrous oxide (N₂O), nitrogen oxides (NO_x), methane (CH₄), volatile organic compounds (VOCs), hydrogen sulfide (H₂S), particulate matter (PM₁₀ and PM_{2.5}), and odor. Most emissions are from area sources such as cattle feedlots, wastewater lagoons, or from agricultural fields amended with manure or sewage.

Dairy cows in freestall barns with ready access to feed bunks, water sources, and stalls for resting.

Cattle manure from feedlots is commonly stored either in piles on concrete (above) or in a lined lagoon.

A closed dynamic chamber measures gas buildup to estimate emissions from soil surface-applied manure.

A multiplexed automated chamber system is employed for evaluation of manure management practices.

emission measurement system that can be used to develop site-specific BMPs and to evaluate and improve efficiency of currently available BMPs for livestock producers in the West.

What Was Learned

Pakorn successfully developed an automated multiplexing system for chamber-based monitoring of greenhouse and regulated gas emissions from manure sources which was used to examine spatial and temporal variability in emissions associated with manure management practices. The system can measure 15 different gasses at the same time.

After development of the system, Pakorn measured gaseous emissions from AFOs in the Intermountain West to recommend site-specific BMPs.

According to Pakorn, “the measurement results of gaseous emissions from different timings of incorporation (of manure) ..., suggest that NH₃ and CH₄ emissions can be significantly decreased with the immediate

incorporation applications. CO₂ emissions can be decreased up to 40% and 18% with the incorporation within 24 hours and within 72 hours, respectively. NH₃ emissions can be decreased up to 50% and 13% with the incorporation within 24 hours and within 72 hours, respectively. CH₄ emissions can be decreased up to 67% and 39% with the incorporation within 24 hours and within 72 hours, respectively.”

Impacts

At least 50% of the livestock producers participating in the education and outreach programs are expected to implement BMPs to reduce gas emissions from farming operations.

Where to Learn More

Annual and Final Reports in SARE Database:
mysare.sare.org/mySARE/ProjectReport.aspx?do=viewProject&pn=GW13-006

PI Contact:
Pakorn Sutitarnnontr
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Brian Higginbotham
USU Extension

Peg Perreault
EPA Region 8

Bruce Petersen
Nevada State Conservationist

Kent Wasson
Peaks & Prairies

LIVESTOCK AS A TOOL FOR NOXIOUS WEED CONTROL

(continued from page 1)

a Western SARE Professional Development Program project Developing a Handbook for Utilizing Livestock as a Tool in Noxious Weed Control in Nine Western States (EW04-004) to summarize information concerning the use of livestock grazing to control important noxious weeds in nine western states, package the information in a readily useable format, and to disseminate the information to targeted audiences.

Searching for a Solution

Davison and his team set goals to:

- Develop a list of noxious weed species for California, Colorado, Idaho, Montana, Nevada, Oregon, Washington, Wyoming, and Utah.
- Collect, review, and summarize current knowledge about livestock grazing as a control method for each noxious weed species.
- Present this information in a handbook and distribute to Cooperative Extension, NRCS, and others.
- Evaluate program impact.

To meet the objectives, Davison and his team conducted an in-depth literature review, interviews with researchers, and a survey of grazing management practitioners. The knowledge gained from these efforts was to be used to develop a handbook, website and journal article, and as part of presentations in all nine states. The project was to ensure that Cooperative Extension, NRCS, and other personnel were more knowledgeable; livestock grazing as a noxious weed control tool would become more effective and widespread; and there would be a focal point

for communication, information, and collaboration.

What Was Accomplished

Based on the information gathered, Davison and his team published and distributed Livestock Grazing Guidelines for Controlling Noxious Weeds in the Western United States as a handbook and a CD, as well as posting online. The creation and distribution of the handbook led to increased levels of awareness and knowledge of livestock grazing as a weed management tool. Evaluations show that recipients of the handbook are using it on a regular basis with 95 percent of users reporting it as somewhat to very useful, and 92 percent of the users reporting increased knowledge and awareness of the subject. The information in the handbook was shared with others by 61 percent of the users, while 20 percent cited it, 12 percent used it to design a grazing system for noxious weeds, and eight percent used it to teach a workshop.

Impacts

- The handbook was distributed beyond the targeted audience, with approximately 36 percent of the recipients of the handbook working outside of Cooperative Extension or NRCS.
- The handbook was highlighted before approximately 240 Bureau of Land Management employees during the Integrated Pest Management classes taught six times by the authors. This partnership between BLM and the authors had not occurred before, according to Davison.
- About 30 percent of handbook users reported implementing grazing pre-

scriptions described in the publication.

- Nearly 80 percent indicated that their willingness to prescribe livestock grazing for noxious weed control had increased as a result of using the handbook.

Post-Project Activities and Impacts

The handbook is still posted on the University of Nevada Cooperative Extension's website (listed below), Google Books, and other websites listing grazing management resources. Davison says that he receives requests for a printed copy of the handbook yearly, even 10 years after publication. He also states that more ranchers and land managers are implementing the practices highlighted in the handbook than when he first began the project.

Where to Learn More

Annual and Final Reports in SARE Database:

mysare.sare.org/mySARE/ProjectReport.aspx?do=viewProj&pn=EW04-004

Handbook:

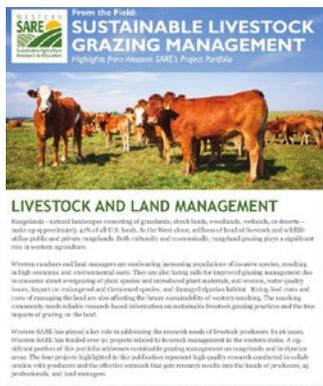
unce.unr.edu/publications/files/ag/2006/ebo605.pdf

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Please see article on page 5 for information on downloading the full report: Sustainable Livestock Grazing Management. ■





SUSTAINABLE LIVESTOCK GRAZING MANAGEMENT REPORT RELEASED

Western SARE recently released its latest “From the Field” publication, Sustainable Livestock Grazing Management. This 12-page report highlights four successful Western SARE-funded projects addressing livestock grazing on rangelands and riparian areas.

Western ranchers and land managers are confronting increasing populations of invasive species, resulting in high economic and environmental costs. They are also facing calls for improved grazing management due to concerns about overgrazing of plant species and introduced plant materials,

soil erosion, water quality issues, impact on endangered and threatened species, and damaged riparian habitat. Rising feed costs and costs of managing the land are also affecting the future sustainability of western ranching. The ranching community needs reliable research-based information on sustainable livestock grazing practices and the true impacts of grazing on the land.

Western SARE has played a key role in addressing the research needs of livestock producers. In 26 years, Western SARE has funded over 90 projects related to livestock management in

the western states. A significant portion of this portfolio addresses sustainable grazing management on rangelands and in riparian areas. The four projects highlighted in this publication represent high quality research conducted in collaboration with producers and the effective outreach that gets research results into the hands of producers, ag professionals, and land managers.

Download a PDF of this report at westernsare.org/Learning-Center/Fact-Sheets/Sustainable-Livestock-Grazing-Management. ■



Alaska Farmer Mike Emers



ALASKA SUSTAINABLE AGRICULTURE CONFERENCE STEADILY GROWS

The annual Alaska Sustainable Agriculture Conference was held in Fairbanks the first week in March. Jim Freeburn, Western SARE PDP Coordinator served as the kickoff speaker for the conference. Attendance continues to grow and the 2015 conference was attended by 228 people, an increase of 40 over the 2014 conference. People from 28 different communities attended.

Alaskan agriculture is richly diverse, and independence and creativity are strong pillars of support for the ag industry there. Because of the size of the conference much of the conference was conducted with concurrent sessions. Topics such as muskox farming, reindeer herding, garlic production, cilantro growing, honey bees, turnips, earthworms, and burgeoning cut

flower industries were covered in the concurrent sessions. All of the Alaska Agriculture and Horticulture Extension Agents attended and gave presentations. According to SARE State Coordinator Steve Seefeldt, “this conference is the go to meeting for Alaska agriculture and provides all of Alaska’s Extension Agents a chance to interact with growers from the entire state.” Seefeldt and Darcy Etchevery spearheaded the conference, which will be held in the Anchorage area in 2016 as part of a new rotation.

SARE Graduate Student Grant recipient Laura Starr gave an excellent presentation on her muskox research project. She covered the economics of muskox and kiviut production from the legal issues to the product value.

Starr states that “several modeled enterprise scenarios showed potential for profitable muskox farming. Raising traditional livestock in Alaska’s extreme climate presents unique challenges. Producers expressed keen interest in the possibility of muskoxen as a sustainable livestock option.”

The Alaska Conference has continued to grow and is now recognized as one of the premier agricultural educational events in the State of Alaska. Support from Western SARE has enabled this conference to become a mainstay for Alaskan Agriculturalists.

PDFs of all presentations can be found at uaf.edu/ces/ah/sare/conference/archive/. ■

PEOPLE OF THE LAND II PUBLISHED *(continued from page 1)*



school system were provided a curriculum about the Hopi tribe. More will participate in future training workshops, and there are hopes that a similar product will be created for the Navajo tribe.

Emm began with collecting data from American Indian producers using a needs assessment. The survey and focus groups assessed perceptions of quality of life on reservations as related to agriculture and natural resource management. The data also identified opportunities and obstacles related to implementing USDA programs on tribal lands.

The project's specific objectives were:

1. Increase the knowledge, skills, and actions of USDA and other agricultural and natural resource professionals regarding the cultural, social, political, and economic environment relevant to developing sustainable agricultural operations in reservation environments.
2. Sustain the economic viability of American Indian agricultural operations in the

Four Corners region (four states) through implementation of USDA programs.

3. Increase the ability of agricultural professionals to develop effective outreach plans to better fit the needs of a particular reservation environment, tribal culture, and individual Indian agricultural producer.

The project produced a curriculum for USDA professionals about the Hopi Tribe. The curriculum includes chapters that specifically address the following:

1. The Hopi—our people of long ago;
2. Hopi land base;
3. Hopi tribal governance;
4. Agricultural irrigation and water rights on the Hopi Reservation;
5. Agricultural and natural resource challenges on the Hopi Reservation - results of a needs assessment;
6. Focus group research methodology and results; and
7. Implementing agricultural and natural resource programs on the Hopi Reservation.

Emm printed 900 copies of this curriculum. She says that USDA-NRCS in Arizona requested six copies; the Hopi Tribe received 750 copies and implemented the curriculum into the Hopi school system and tribal government; and five copies were sent to USDA-FSA in Arizona.

The curriculum will be available on the Western SARE website and the University of Nevada Cooperative Extension's website at a future date.

Learn More

Annual and Final Reports:
mysare.sare.org/mySARE/ProjectReport.aspx?do=viewProject&pn=EW11-006

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"Hopi – People of the Land will serve the Hopi people in different ways. It provides very concise and useful information for Hopi programs and non-profits for writing grants. It has attracted the interest of people as a teaching tool and will likely make its way into curriculum at Hopi Jr./Sr. High School in cultural and natural resource classes. The needs assessment in the books is extremely useful for the Hopi Department of Natural Resources, Hopi Conservation District and University of Arizona Cooperative Extension Hopi Reservation Office when it comes to program planning."

*- Matthew Livingston
Hopi FRTEP Agent on
Hopi Reservation,
University of Arizona*



REGIONAL DISTRIBUTION NETWORKS CASE STUDIES

A sustainable food system is dependent on a variety of actors, so University of California-Davis researchers conducted case studies of distribution networks in California to examine the existing relationships between producers and other firms that facilitate a values-based supply chain. Gail Feenstra, David Visher, and Sherman

Hardesty created the publication *Developing Values Based Distribution Networks to Enhance the Prosperity of Small and Medium Sized Producers: Full Study* to address the financial, policy, and entrepreneurial factors that influence the development of these emerging distribution networks. The publication was an outcome of the Western SARE funded

project *Developing Regional Distribution Networks to Enhance Farmer Prosperity: Retail Value Chain (SW10-810)*.

The publication can be downloaded at westernsare.org/Learning-Center/SARE-Project-Products/Regional-Distribution-Networks-Case-Studies. ■



2015 FUNDED PROJECTS

At Western SARE's spring meeting held in February, the Administrative Council approved 35 grant proposals for a total of over \$2.9 million.

Researchers, ag professionals, farmers, and ranchers will be seeking answers to questions such as:

- The feasibility of summer berry brambles in Colorado
- The best sustainable pest management approaches for high tunnel screenhouse production in the tropics
- If feedlot-based performance cattle are limiting ecological services for rangeland ecosystems in northern mixed-grass prairies
- How to improve winter cover Crop establishment and efficiency in processed vegetable production in the Willamette Valley



The following two pages list approved projects; for summaries, please visit westernsare.org/Projects/Funded-Projects-by-Year/2015-Projects.

LIST OF 2015 FUNDED PROJECTS

ALASKA

Professional Development Grant: EW15-022, “High Tunnels at High Latitudes: Sustainable Crop Production for Alaska,” Principal Investigator: Steven Seefeldt, Alaska; \$32,315.

Professional + Producer Grant: OW15-030, “Insect IPM Protocols for Fresh Cut Peonies: Protecting a new Alaskan Export Crop,” Principal Investigator: Steven Seefeldt, Alaska; \$48,872.

CALIFORNIA

Farmer/Rancher Grant: FW15-018, “Growing a Regional Seed Producers Network in the Rogue Valley, Oregon,” Principal Investigator: Eric George, California; \$23,203.

Farmer/Rancher Grant: FW15-029, “High Desert High Tunnels: Farmer-to-Farmer,” Principal Investigator: Laurie Wayne, California; \$5,183.

COLORADO

Farmer/Rancher Grant: FW15-046, “Feasibility of Summer (floricane) Brambles in Colorado,” Principal Investigator: Amy Kafka, Colorado; \$14,571.

Farmer/Rancher Grant: FW15-057, “Supplemental Heating of High Tunnels by Energy-Producing Compost Piles,” Principal Investigator: Amy Yackel Adams, Colorado; \$15,000.

Research and Education Cooperative Grant: SW15-008, “The Feasibility of Cover Crops in Dryland Cropping Systems in SW Colorado and SE Utah,” Principal Investigator: Abdelfettah Berrada, Colorado; \$249,269.

GUAM

Farmer/Rancher Grant: FW15-041, “Raising Black Soldier Fly Larvae as Chicken Feed in a Tropical Region,” Principal Investigator: Chelsa Muna-Brecht, Guam; \$8,232.

Professional + Producer Grant: OW15-031, “Seven Trees, Seven Practices: Demonstrating Agroforestry in the Western Pacific,” Principal Investigator: Bob Barber, Guam; \$47,899.

HAWAII

Professional + Producer Grant: OW15-019, “Sustainable Pest Management Approaches for High Tunnel Screenhouse Production in the Tropics,” Principal Investigator: Koon-Hui Wang, Hawaii; \$49,989.

IDAHO

Professional + Producer Grant: OW15-032, “Madison County Healthy Soil Initiative,” Principal Investigator: Greg Blaser, Idaho; \$50,000.

MONTANA

Professional Development Grant: EW15-009, “Conservation and Augmentative Biological Control in the Northern Plains - Providing Tools for Agriculture Professionals,” Principal Investigator: Gadi V.P. Reddy, Montana; \$68,182.

Farmer/Rancher Grant: FW15-039, “Making the Most of Fine Fleece: Environmental, Economic, and Social Costs and Benefits of Alternative Markets for Sheep Wool,” Principal Investigator: Linda Poole, Montana; \$10,646.

Professional + Producer Grant: OW15-026, “Are Feedlot-based Performance Cattle Limiting Ecological Services for Rangeland Ecosystems in Northern Mixed-Grass Prairies?,” Principal Investigator: Emily Glunk, Montana; \$49,961.

Research and Education Cooperative Grant: SW15-028, “Examining, Optimizing, and Building Capacity for Montana’s Local Beef to School Supply Chain,” Principal Investigator: Carmen Byker, Montana; \$220,021.

NEW MEXICO

Professional Development Grant: EW15-011, “Developing Digital Tools to Improve Soil Sampling and Analysis for Sustainable Agriculture in the Western U.S.,” Principal Investigator: Robert Flynn, New Mexico; \$59,356.

Professional Development Grant: EW15-023, “Sustaining the Future of Navajo Rangelands via Mobile Learning Tools to Promote Enhanced Vegetation Management,” Principal Investigator: Jerry Hawkes, New Mexico; \$62,260.

Farmer/Rancher Grant: FW15-037, “Aerated Compost Tea, a Field Guide to Production Methods, Formulas and Application Protocols,” Principal Investigator: Minor Morgan, New Mexico; \$14,560.

Farmer/Rancher Grant: FW15-045, “Lavender Intercropping and Soil Management,” Principal Investigator: Kemper Barkhurst, New Mexico; \$13,665.

Research and Education Cooperative Grant: SW15-015, “Implementation of Genetic Selection for Grazing Distribution to Make Cattle Grazing in the Western U.S. More Sustainable,” Principal Investigator: Derek Bailey, New Mexico; \$271,217.

OREGON

Professional Development Grant: EW15-014, “Collaborative Approaches to Increase the Integration of Functional Agricultural Biodiversity in Western Farming Systems,” Principal Investigator: Gwendolyn Ellen, Oregon; \$67,699.

Professional Development Grant: EW15-020, “Growing the Field for Organic Conservation: Training on NRCS CAP 138 and NOP Conservation Standards,” Principal Investigator: Sarah Brown, Oregon; \$73,447.

Farmer/Rancher Grant: FW15-054, “Evaluating Market Opportunities of Conventional vs. GMO-free Broilers,” Principal Investigator: Jared Pruch, Oregon; \$4,003.

Professional + Producer Grant: OW15-005, “Integrated Clubroot Control Strategies for PNW Brassica Producers,” Principal Investigator: Dan Sullivan, Oregon; \$49,554.

Professional + Producer Grant: OW15-007, “Improving Winter Cover Crop Establishment and Efficiency in Processed Vegetable Production in the Willamette Valley,” Principal Investigator: Ed Peachey, Oregon; \$49,464.

Research and Education Cooperative Grant: SW15-021, “Developing Winter Squash into an Economically Viable Crop and Important Regional Food in Oregon,” Principal Investigator: Alexandra Stone, Oregon; \$282,279.

Research and Education Cooperative Grant: SW15-058, “Understanding Pest and Disease Transmission Dynamics and Effects of Agrochemicals on Honey Bee Colonies Pollinating Crops in the Western States,” Principal Investigator: Ramesh Sagili, Oregon; \$248,025.

UTAH

Research and Education Cooperative Grant: SW15-003, “Training Cattle to Graze Medusahead and Avoid Velvet Lupine: A New Tool to Sustain the Economic Viability of Livestock Operations in the Western U.S.,” Principal Investigator: Juan Villalba, Utah; \$249,909.

Research and Education Cooperative Grant: SW15-029, “Improving Tart Cherry Sustainability,” Principal Investigator: Brent Black, Utah; \$230,154.

WASHINGTON

Professional Development Grant: EW15-012, “Implications of Water Impacts from Climate Change: Preparing Agricultural Educators and Advisors in the Pacific Northwest,” Principal Investigator: Joe Harrison, Washington; \$75,000.

Farmer/Rancher Grant: FW15-024, “Do Soil and Foliar Applied Minerals Improve Soil Health, Nutrient Density, and Flavor in Organic Blueberries?,” Principal Investigator: Larry Bailey, Washington; \$14,969.

Farmer/Rancher Grant: FW15-035, “Assuring the Supply of High Quality Triploid Oysters for the Pacific Region,” Principal Investigator: David Nisbet, Washington; \$24,992.

Farmer/Rancher Grant: FW15-044, “Cover Crops for Hop Production in Semi-arid Yakima Valley, Washington,” Principal Investigator: Sarah Del Moro, Washington; \$15,444.

Professional + Producer Grant: OW15-008, “Optimizing Nitrogen Management on Organic and Biologically-intensive Farms,” Principal Investigator: Douglas Collins, Washington; \$49,997.

Research and Education Cooperative Grant: SW15-061, “Developing Agronomic Strategies to Optimize Production of Quinoa and Hulled Barley on No-till Farms in the Palouse Region of Idaho and Washington,” Principal Investigator: Kevin Murphy, Washington; \$223,119.



WESTERN SARE RELEASES CALLS FOR PROPOSALS

FUNDING FOR RESEARCHERS, AG PROFESSIONALS, AND PRODUCERS

The 2016 Calls for Proposals for four Western SARE grant programs have been released. Descriptions of each program and links to the full Call can be found at westernsare.org/Grants/Types-of-Grants.

The four grants programs include:

- Research & Education Pre-proposal
- Professional Development
- Farmer/Rancher
- Professional + Producer

Research & Education projects involve scientists, producers, and others using interdisciplinary approaches to address issues related to sustaining agriculture. Pre-proposals are due 1 pm MDT June 3, 2015. Following scrutiny by a technical review panel, presenters of the best pre-proposals will be asked to submit full proposals, due in

November 2015 with notification in March 2016.

Professional Development projects focus on training agricultural professionals to help them spread knowledge about sustainable agriculture concepts and practices. Proposals are due noon MDT, October 28, 2015 with notification in March 2016.

Farmer/Rancher projects are conducted by agricultural producers with support and guidance from a technical advisor. Producers typically use their grants to conduct on-site experiments with results that can be shared with other producers. Multiple farmers or associations may qualify for a higher level of funding. Proposals are due 1 pm MDT, December 2, 2015 with notification in March 2016.

Professional + Producer projects are similar in concept to the Farmer/Rancher Grants with a few key differences. Instead of a

producer serving as the project coordinator, an agricultural professional coordinates the project. Farmers or ranchers serve as project advisors. Proposals are due 1 pm MDT, December 2, 2015 with notification in March 2016.

The 2016 Call for Proposals for the Graduate Student Grants has previously been released and proposals will be accepted until 1 pm MDT May 13, 2015. Successful applicants will be notified in August.

The Western SARE Administrative Council will select reviewed proposals that are innovative, diverse in content, subject matter, and geography; demonstrate tangible outcomes; and provide readily adaptable technologies and information suitable to the adoption of sustainable farming and ranching systems by producers in the western region. ■

WATER MANAGEMENT IN SONOMA COUNTY GRAPE PRODUCTION

FROM THE FIELD

The Challenge

As in all of California, water is a scarce resource in Sonoma County, a region in Northern California with more than 400 wineries and almost 60,000 acres of vineyards. Wine grape growers face increasing competition from different interests, various regulations, and a need to protect

threatened and endangered salmonids found in the local watershed. To meet these challenges, producers must improve their water use efficiency for both frost protection and irrigation. If they can do so, they would be able to maintain grape production while at the same time minimizing impacts on stream flows critical to salmonid survival. The use of water for frost protection and seasonal irrigation specifically in vineyards has come under scru-

tiny by California's State Water Resources Control Board and the National Marine Fisheries. According to Karen Thomas of the Sonoma County Winegrape Commission, their regional wine grape growers needed "information on alternatives to frost protection using overhead sprinklers, on irrigation management strategies to reduce water use, and on Best Management Practices for

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GRAPE PRODUCTION *(continued from page 10)*

water conservation when frost protecting and irrigating grape vines.” In order to provide this information, Thomas designed the Western SARE Professional + Producer project Water Management in Sonoma County Grape Production (OW12-008).

Searching for a Solution

To meet growers’ needs, Thomas’ project included a spring frost workshop along with other outreach and aimed to give guidance for the best decision-making for frost protection. The team worked with producers to fine-tune their irrigation scheduling and duration based on soil and plant water status data, vine observations, and overall strategies for wine grape production. Soil and plant moisture status were measured at vineyard sites, giving producers exposure to the technologies. The demonstration plots were located on two sites with very different soils. The team applied different irrigation regimes to different blocks and made commercial-scale wines from each block to compare to one another in tastings. The project team shared the demonstration results through workshops and field days, newsletter articles, and on the Sonoma County Winegrape Commission’s website.

What was Learned

According to Thomas, the project “demonstrated a water management technique for drip irrigation that relies on measurement, both of soil moisture and plant moisture status. The above and below ground measurements provide an excellent picture of the soil moisture

dynamics of the vineyard. This gives us the confidence to push our vines further into levels of controlled stress that have benefits well beyond that of water conservation. It also allows us to produce riper fruit at lower brix while preventing excessive stress that could lead to reduced vineyard productivity and lower yields... The irrigation management demonstrations produced dramatic results. Plant and soil water status measurements resulted in delayed irrigation initiation compared to standard practices in both demonstration vineyards. Then, irrigation frequency and duration were optimized to minimize irrigation water movement beyond the active root zone. The total irrigation water supplied in the two years was 8% to 32% of crop ET at the Red Fan vineyard and 11% to 24% of crop ET at the Landslide vineyard. Those percentages are below typical deficit irrigation targets of 60% or more using crop ET models to manage irrigation.”

Impacts

Thomas maintains that Sonoma County growers have increased adoption of frost protection BMPs and use of weather station data to improve accurate decision making about frost protection.

Three frost/drought workshops were held and one Water Conservation Field Day event. These events were attended by 477 producers and partners. A survey following the Water Field Day indicated a number of producers will change practices or investigate wind machines as an alternative frost protection method. All respondents indi-

cated they would change practices based upon the irrigation management presentation.

Post-projects Activities and Impacts

By sticking with good science and best practices, the Sonoma County Winegrape Commission is assisting producers meet the challenges provided by both Mother Nature and the politics surrounding an endangered species in a region with increasing urban-ag interface. According to Thomas, the area’s wine grape growers continue to adopt the project’s recommended practices. Because of the on-going drought in California and the need to minimize impacts to an endangered species, producers affirm the importance of changing practices in favor of greater water efficiency. To that end, the Sonoma County Winegrape Commission continues to sponsor frost protection and irrigation workshops that remind them of the recommended practices and keep them motivated toward making changes. Importantly, they have been able to demonstrate to producers that saving water saves money.

Where to Learn More

Annual and Final Reports in SARE Database:
mysare.sare.org/mySARE/ProjectReport.aspx?do=viewProj&pn=OW12-008

Sonoma County Winegrape Commission Sustainability website:
sonomawinegrape.org/sustainability ■





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