Farm to Fork: Connecting Youth with Sustainable Agriculture

by Ron Daines

Thanks to a grant from Western SARE, hundreds of southwest Colorado school children and their teachers know more about food and the farmers and ranchers who produce it.

Under the SARE grant – “Farm to Fork: Connecting Our Youth with Sustainable Agriculture” – the recipients developed a grade school curriculum, matching “producer professors” to subjects that teach elementary-age students in the Pueblo area about sustainable agriculture.

“It all starts with the first seed being planted – that first step in getting our children and youth involved with programs and projects that are a part of agriculture,” said grant coordinator Tisha Casida, who operates That’s Natural! Marketing and Consulting in Trinidad. “The benefit is knowing that someday these seeds being planted with our youth will grow into a healthy and strong group of people who value sustainable agriculture and all the benefits that come with being stewards of the land and consumers who demand food from a healthy value chain.”

This chain of agricultural education and awareness was born with Western SARE’s Southwest Subregional Conference in Albuquerque in 2008. The 100 or so people attending, including Casida, determined that educating continued on page 3

Predicting Straw Yield On The Go

by Ron Daines

As interest grows in the use of straw as a cellulosic source for ethanol, producers will be faced with a tough decision: whether to harvest the straw for ethanol or retain it for its environmental services.

It may be possible to do both, based on research into on-combine sensing techniques for straw yield, conducted by Dan Long and a team from the USDA-ARS Columbia Plateau Conservation Research Center near Pendleton, OR.

“It’s been my dream to see if we can use these sensors to predict straw yield on the go,” said Long at a sustainable agriculture seminar in November at Utah State University’s Plants, Soils and Climate Department.

Long noted that the current inventory of straw availability is based on whole-state or whole-county surveys.

“But there’s not much information on straw availability within fields,” he said. “Site-specific information is needed.”

Long, research leader at the ARS unit in Pendleton and a Western SARE Administrative Council member, explained that his study describes a technique that applies information from grain yield and grain protein maps to map levels of straw within farm fields. Excess straw identified within fields could be harvested for feedstock for biofuels, leaving enough to protect the soil.

Small plot measures were begun in 2008 looking at six spring wheat cultivars grown under three moisture regimes and five nitrogen rates. Harvest measures included grain yield, protein, crop height and straw yield.

Long said the experiments, which gave a wide range of yields, resulted in a high correlation between the straw continued on page 4
In one of the truly great debates of the United States Senate, Senator Daniel Webster, in his reply to Senator Hayne, stated the following: "When the mariner has been tossed for many days in thick weather, and on an unknown sea, he naturally avails himself of the first pause in the storm, the earliest glance of the sun, to take his latitude, and ascertain how far the elements have driven him from his true course. Let us imitate this prudence, and, before we float farther on the waves of this debate, refer to the point from which we departed, that we may at least be able to conjecture where we now are. I ask for the reading of the resolution..."

The great orator, Senator Webster, was eloquently stating the obvious — that periodically we must look back to the "resolution;" or, in our case, the SARE-enabling legislation. This legislation initiated and has provided guidance to what is now the USDA-NIFA Sustainable Agriculture Research and Education (SARE) program. As we review this enabling legislation and the further legislation that helps define the SARE program, it is clear that one task is the basis of all we do within the SARE program. The foundation upon which all of our efforts rest — is the fact that “SARE effects change by issuing and managing competitive grants.”

— V. Philip Rasmussen, Western SARE Coordinator

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youth about agriculture was among the top priorities for Southwest agriculture. SARE’s six other subregional conferences mirrored the importance of youth education. As part of a $50,000 post-conference commitment from SARE, Casida and Dennis Lamm, state SARE coordinator for Colorado, applied for and received the grant to educate youth.

The project team developed a curriculum for first through fifth graders. It covered the meaning of “sustainable,” the importance of seeds, growing a garden and starting a farm, beneficial insects, grass-fed and pasture-raised livestock and the importance of eating local. Ten replicable lessons were presented in two field days to more than 80 students in the Sangre de Christo Arts Center in Pueblo.

“Teachers find it useful in keeping the kids’ attention, and the lessons can be easily manipulated to incorporate additional lessons involving arithmetic, writing and science,” said Casida.

Another activity that engaged the SARE project participants was a “Green Day” celebration for 300 kindergarten through fifth grade students organized by second grade educator Linda Robida of Heritage Elementary School in Pueblo. (See the following article “Heritage School Harvesters Go Green.”)

Based on feedback from teachers, students and producers, Casida said the curriculum has been a huge success. She said awareness in the curriculum has grown, with at least 15 additional schools expressing interest. Likewise, a growing number of producers want to become involved, and it is hoped that more students get “out on the farm with their hands in the dirt.”

In addition, several schools in southern Colorado are implementing school gardens and conducting projects that involve students growing their own food, for example, through hydroponics.

The SARE-funded project has prompted Casida and her colleagues to develop additional educational activities. In 2011, the group will host the Chile Chili Fest in Colorado Springs with the goal of reaching a wide group of consumers in a 10-county area. The schedule will be announced on Casida’s That’s Natural website, www.thatsnatural.info.

They are also taking their educational expertise and outreach to farmers markets and festivals, at the same time engaging farmer and rancher participants in those venues to become involved in the educational efforts.

Further, Casida’s engagement with SARE prompted her to apply for and receive a Western SARE Sustainable Ag Tour grant, which will take participants to A Wren’s Nest Farm, operated by Paul and Tammy Alhadef, who, in turn, have expressed interest in participating in the classroom or inviting student and youth groups to visit their farm.

Heritage School Harvesters Go Green

by Ron Daines

More than 300 kindergarten through fifth grade students at Heritage Elementary School in Pueblo have a better understanding of their environment and how agriculture fits in, thanks to a school-wide “Green Day” learning extravaganza that focused on environmental literacy.

The four-hour event, held April 30 and coordinated by Linda Robida and Ann Goddard of Heritage Elementary, arose from a $1,000 Sustainability Grant from Bechtel Corp. Students and staff used the grant to purchase hydroponic aerogardens for all classes to grow and harvest herbs, vegetables and flowers.

Robida said so much enthusiasm arose from the active involvement on a school campus that the idea of an all-school learning event blossomed.

Presenters, including Western SARE grant recipient Tisha Casida, who taught a sustainable agriculture food lesson, covered topics that included soil, organic farming, animal care and ecologically sound practices.

An eight-year-old Beulah girl even brought baby chicks and her own fresh eggs for sale from her local business.

The ground-breaking event was held in conjunction with the 40th anniversary of Earth Day. Robida said the “Heritage School Harvesters” looked forward to practicing Earth-friendly concepts by recycling, replenishing and respecting the year all year long.
When it comes to farm success, “production is no longer the only measure.” Success is also characterized by adapting to changing consumer preferences. Or by addressing quality-of-life concerns. Or tackling environmental impacts like air and water quality, agriculture chemicals, greenhouse gases and carbon sequestration.

Producers and researchers can better understand these new metrics of success through systems research – looking at interactions among multiple components rather than at individual components alone.

Dr. Kim Kroll, associate national director of the Sustainable Agriculture Research and Education program, made those observations in October during a Plants, Soils and Climate seminar at Utah State University titled “Sustainable Agriculture Systems Research, A Guide for Researchers.”

Kroll observed that well-crafted systems research can address multiple goals, engaging stakeholders in co-discovery teams and addressing problems from the producers’ perspectives, ultimately improving understanding of interactions among components in complex systems.

Kroll comes to his subject well-versed. He joined SARE as associate director in 1996 after nine years with the Rodale Institute Research Center where he was a cropping systems agronomist. At the USU seminar, part of a series on sustainable agriculture and producer-led research, he guided students and faculty through the various aspects of systems research.

There is no “one-size-fits-all design” for systems research, said Kroll, but rather a range of experimental design options. He emphasized that site selection for systems research is critical in predicting straw yield on the go.

While straw yields can be estimated from measures of grain yield, protein and crop height on the combine during harvest, Long said on-combine lidar (light detection and ranging) measures are potentially useful, and that the future work will focus on refining the Lidar sensor.

Based on the research to date, it appears that in some areas the wheat crop may yield only enough straw to return to the soil for environmental services, like erosion control, soil tilth, water management and carbon sequestration. In high-yielding areas, however, there may be enough straw to provide not only feedstock for biofuels, but other traditional uses like animal feed and bedding, straw board and paper.

“There’s not enough straw within fields to do both (harvest and retain straw) in the low-rainfall zone of the inland Pacific Northwest where less than 12 inches per year are received,” said Long. But higher rainfall and irrigated areas may tell a different story.
CONSERVATION TILLAGE IN ORGANIC SYSTEMS WORKSHOP

Organic producers, representatives from NRCS, ARS and Conservation Districts, extension educators and university specialists participated in the Western SARE-funded Conservation Tillage in Organic Systems Workshop on November 15 in Modesto, CA. The workshop was co-sponsored by the University of California Cooperative Extension and USDA-NRCS. In addition to assisting with funding, Western SARE was involved through a presentation given by Robert Newhall, Western SARE deputy coordinator.

The one-day workshop aimed to bring together producers who have developed innovative approaches in applying conservation tillage principals to organic systems with agriculture professionals, education educators and university specialists to learn from each other and generate ideas for new solutions or approaches that can be pursued through research, on-farm experimentation and equipment or product development. The challenge in front of the participants is that while organic production relies heavily on tillage to incorporate fertility amendments such as composts and cover crops and to control weeds, conservation tillage systems rely heavily on herbicides to control weeds and require specialized farming equipment. Organic weed control, organic fertility management and field preparation, all under reduced tillage, were discussed.

The participants met in roundtables and developed lists of goals of reducing tillage in organic systems, most important benefits of reduced tillage to each person, what it would take to increase use of conservation tillage techniques in organic operations and next steps. Importantly, the group provided items needed in a research agenda for conservation tillage in organic systems:

- Identify the necessary elements of an organic conservation tillage system
  - Cover crops
  - Residue management
  - Weed control
  - Planting method for cash crop
  - Other

- Design experiments that are simple and can be easily replicated on grower’s fields
  - Use commonly available tools
  - Develop a systematic set of measures

- Develop whole systems that are specific to a single crop and region
  - Replicate across farm scales
  - Perhaps use UC IPM Year-Round Programs as model

- Use risk analysis to help growers determine feasibility
  - Quantify benefits
  - Ascertain costs

Specific research/development ideas included:

- Guest worker program to provide hand cultivation labor
- Develop breeding programs for organic conservation tillage (cash and cover crops)
- Intercrop cash crops and cover crops
- A spreader with wings to distribute compost and nutrients below soil surface
- Research on animal options for weed control with respect to food safety
- Document economic principles over time for conventional and small-scale producers
- Credits for carbon sequestration, reduced C footprint
- Develop regional test plots and/or demonstration sites, including different sizes of farms
- Long-term research, at least three years
- Spike-type transplanter that can plant into heavy residue or mulch
- Determine if surface residue deplete soil organic matter, concentrating nutrients at the surface
- Determine the N loss from surface residue through volatilization

Newhall presented Sustainable No-Till Options and the Western SARE program. He presented to the audience specific findings from research on sustainable no-till options, as well as the top ten mistakes. He demonstrated how to use the SARE database to discover projects underway and past project results, highlighting successful SARE-funded sustainable no-till option projects. He then urged them to consider SARE as an opportunity to receive funding to find their own answers.

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Robert Newhall

All participants were invited to continue the discussion via the UCANR Collaborative Tools system.
“Systems research requires different thinking, but the rewards are immense — there’s great excitement in getting the results and seeing them put in place.”

— Kim Kroll, National SARE Associate Director

Developing Well-Crafted Systems Research

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and that a system must be studied intact. Research plots should be large enough for farm-size equipment, with different entry points in the crop rotation and with adequate replication.

He said systems research takes time, patience (planning alone can take up to a year) and good leadership, so building the research team is critical.

“When building a functional team, remember that motivation varies,” said Kroll.

“Cultures are different and work paces are different, so group integration is a challenge. You will need democratic leadership with a culture that’s conducive to free discourse.”

For the project leader: “You need an effective, inspirational one.”

Kroll emphasized the importance of engaging producers. Innovators and early adopters, who can provide strong support for systems research projects, can often be found in the network of current and previously funded SARE grants.

“Farmers and ranchers define the systems — they know what’s realistic,” said Kroll. “And they can bring ideas to the university research station.” He added that the research team should share credit with producers and involve them in outreach and education.

Once the research team is in place, as in any research project, it must define the research scope, match the experiments to the goals, use the appropriate size, design the statistical analysis and conduct financial planning, meaning finding grant dollars.

Kroll listed some of the challenges of conducting agricultural systems research:

• Equity between small and large farms
• Farmer compensation
• Staff continuity
• Non-tenured faculty
• Uncontrolled experiments, meaning things change, so adaptive management is helpful
• Integrating animal production
• Long-term funding

“Systems research requires different thinking,” said Kroll, “but the rewards are immense — there’s great excitement in getting the results and seeing them put in place.”

Administrative Council Changes

Sandy Halstead, U.S. Environmental Protection Agency Region 10, joined the Western SARE Administrative Council in November 2010, replacing Peg Perreault of U.S. EPA Region 9. The EPA holds a seat on the Administrative Council, and the three regions in SARE’s Western region rotate terms.

Halstead, who previously sat on the Administrative Council from 2003-2006, has lived and worked in the Yakima Valley since 1999 as a biologist in a one-person field office for EPA. She has expertise working with producers, researchers, conservation agencies and rural communities. Prior to joining EPA, she managed a 90-acre farm where she researched agro-ecology for Michigan State University. Halstead remained active with Western SARE after leaving the Administrative Council, most recently facilitating at the Alaska Subregional Conference.

Perreault became the EPA representative on the Administrative Council in early 2006. She is an Environmental Scientist and the Senior Pesticide Specialist for U.S. EPA Region 8, Pollution Prevention, Pesticides, and Toxics Program in Denver. She serves as the project officer for Colorado and Wyoming pesticide programs and as the regional coordinator for the Pesticide Environmental Stewardship Program and the Pesticide Applicator Certification and Training Program. Perreault hopes to remain active with Western SARE as an Administrative Council Alumni.
IN THE NEWS

Beef Production Convention

The Southeast Wyoming - Western Nebraska Beef Production Convention took place in Torrington, Wyo. November 23. Partially funded by a grant from the Western SARE PDP, the event attracted approximately 120 attendees from the two states. The program covered a wide array of topics of interest to cattle producers. John Ritten presented on the economics of different livestock production systems that vary from the conventional practices. Later calving and retained ownership of yearlings can possibly be more profitable than the conventional high feed cost system. Techniques and benefits of winter and irrigated pasture grazing were also discussed. Larry Cundall, member of the Western SARE Administrative Council and local rancher, offered several suggestions in his presentation “Research, What Do We Need and How Do We Get it - A Ranchers Perspective” on research that would benefit producers and what role Western SARE might play. Cundall desires “university research to help us find new innovative ways to increase profits while sustaining our natural resources and enhance our families’ quality of life.

Small Dairy Resource Book

Small Dairy Resource Book is available online only. Download it for free at www.sare.org/publications/dairyresource.htm. Vicki H. Dunaway, of the Hometown Creamery Revival, evaluates the pros and cons of more than 150 resources, from the most current information in print and online, to obscure, out-of-print publications that are useful for their timeless knowledge. Resource formats include books, periodicals, videos, websites and others on a wide range of topics related to farmstead dairy processing. Extension agents and other agricultural educators also will find this cohesive guide a valuable source of information. Resources are broken into the following categories:

- Ice cream
- Dairy processing
- Dairy animals
- Business and marketing
- Butter
- Other dairy foods
- Food safety
- Feeds and grazing

Originally published in 2000, The Small Dairy Resource Book was updated in 2010 with new entries and revised contact and price information for listed resources.

Follow Western SARE

Western SARE now uses Twitter to send out information on grant deadlines, funded projects, research results, postings of presentations and updates to the website. Follow us at twitter.com/westernsare.
THE PIVOTAL SCIENTIFIC FOUNDATION OF THE SARE PROGRAM

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diagram to help guide our efforts.

After our foundational efforts, our next job is to ensure that we are providing adequate and correct information regarding our Calls for Proposals to those who wish to apply to the SARE program.

Congress specifically asked the SARE program for yearly reports (through the Secretary of Agriculture) regarding the scientific findings of ongoing projects. Congress also directed that this information should be made available to growers (farmers, ranchers and other producers from all of the various elements of American agriculture). SARE was also charged to provide information from SARE projects to the scientific community so that scientists and producers could validate SARE research results. In addition, SARE continually strives to make information available to “agriculture as a whole” from all of our SARE projects. The National SARE office has worked diligently to have an online reporting system that can be queried by anyone possessing adequate internet access. In addition, the SARE Outreach office has prepared numerous books, pamphlets and other publications to ensure that science-based research results are easily obtained by agricultural practitioners.

Lastly, if SARE ever possesses additional resources, we hope to eventually educate consumers regarding the benefits of purchasing sustainably grown agriculture products.

Nevertheless, the Western SARE AC and staff realize that our primary role – the foundation of all other important activities – is to properly solicit, collect and evaluate proposals. Next, the task is to initiate the funded proposals and see them through to a successful conclusion. Finally, we are to ensure that the results are communicated to the end user.

We keep these functions, the very foundation of SARE, in our minds as we attempt to effectively administer the Western SARE program. The subregional conferences have, additionally, given direction to us that SARE should find ways to fund more systems projects over a longer period of time (at least a decade).

As we approach the New Year, the Western SARE staff and Administrative Council commit to you that we will keep the foundational activities of the program at the center of all that we do. Our wish to you is for a happy, prosperous and sustainable New Year.