Addressing Water Management Issues in the Drought-Stricken Great Basin

TOOLS AND TRAINING TACKLE THE CHALLENGE OF REMAINING PROFITABLE WITH LESS WATER

By Stacie Clary, Western SARE

“According to Carol Bishop, Extension Educator with the University of Nevada Cooperative Extension, policies that have been used in arid climates in the West to enforce water conservation on agricultural producers utilizing irrigation are not always effective (Wilson and Needham, 2006).”
In addition to the environmental impacts, farmers and ranchers in the Great Basin of the western region find it challenging to remain profitable with less water, as more water is allocated to residential, municipal, and industrial uses.

According to Carol Bishop, Extension Educator with the University of Nevada Cooperative Extension, policies that have been used in arid climates in the West to enforce water conservation on agricultural producers utilizing irrigation are not always effective (Wilson and Needham, 2006). Changes in water management are an alternative to imposing policies such as laws and taxes. To address water management problems, producers can reduce the amount of water applied to crops, change water delivery methods, or switch to alternative crops that use less water.

Bishop designed a curriculum for producers and agricultural professionals in the Great Basin about such alternative, low-water use crops, and the continuing severe drought has created a high demand for these materials.

**SEARCHING FOR A SOLUTION**

Bishop created the Western SARE Professional Development Program project, Economic Evaluation of Alternative (low-water use) Crops for the Great Basin, to “educate producers with pertinent information about alternative low-water use crops and the associated decision-making tools developed to implement them.” She anticipated disseminating the information through seminars, with all major learning methods covered, for ag professionals. The goal was that by the end of the project program participants would have an enhanced ability to effectively deliver knowledge and skills to farmers and ranchers.

The project’s specific objectives were for the participants to:

- Understand the economic, political, and environmental benefits of reducing water use in agriculture
- Understand the basic agronomy of alternative crops available to producers in the Great Basin
- Understand the components of evaluating the economic feasibility of low water use crops

In Nevada’s Walker River Basin, agricultural water rights have been over allocated. At Walker Lake, a rare freshwater terminal lake in northern Nevada, water has been diverted from the lake’s inflows for irrigation purposes at five major agricultural areas along the tributary rivers for over 150 years (Partners, 2007). Results from these diversions include a 145-feet drop in lake level and increases in lake salinity. These outcomes are reducing the habitat and populations of various threatened and endangered species.
• Have the ability to use the IRRIG-AID spreadsheet (an irrigation strategy and decision-making tool)
• Create plans to introduce seminar curriculum and other SARE resources into producer programming
• Work one-on-one with producers to evaluate the economic feasibility of alternative low-water use crops on their farm/ranch
• Have the ability to provide an overview of the benefits of utilizing the IRRIG-AID spreadsheet tool and demonstrate its use to producers
• Assist agricultural producers in implementing low-water use crops on their farm/ranch
• Assist producers with the measurement of changes in water use and resulting environmental improvements such as water and soil quality
• Assist producers with the measurement of changes in profitability and economic sustainability of alternative crop use

Bishop and her team created a handbook of the curricula, a user manual for IRRIG-AID, and a CD containing the IRRIG-AID spreadsheet, copies of the PowerPoint presentations for the five modules, and a document with links to all websites cited in the curricula and links to further assistance. These were distributed to all participating educators. Workshops were held in various locations and were conducted by video in addition to the in-person workshops.

WHAT WAS LEARNED
According to Bishop:
• Ninety-seven percent of workshop attendees would attend future workshops on agricultural water management and/or alternative crops.
• On a scale of 1 to 5, the average rating for curriculum content was 3.84.
• The average increase in knowledge gained over all curriculum subjects was 44%.

Of those responding to the six-month follow-up survey:
• 43% have introduced workshop curriculum and other SARE resources into producer programming;
• 39% have worked one-on-one with producers to evaluate the economic feasibility of alternative low water use crops on their farm/ranch;
• 35% assisted agricultural producers in implementing low-water use crops on their farm/ranch;
• 35% assisted producers with the measurement of changes in water use and resulting environmental improvements such as water and soil quality;

PICTURED: Water irrigation pipe and dry fields in Great Basin/shutterstock.com
• 35% assisted producers with the measurement of changes in profitability and economic sustainability of alternative crop use;  
• 82% have incorporated some of the material presented in the workshop into their operation/job.

During the project, 1,250 copies of the curriculum were distributed. Eighty-six ag professionals participated in the project's official workshops. In addition, program summaries and posters were presented at events for educators, USDA agencies, and private businesses, among other audiences.

IMPACTS
The Evaluating Alternative Low-Water-Use Crops for the Great Basin curriculum was selected as a national communication award finalist for a bound book by the National Association of County Agricultural Agents.

Testimonials from participants include:
• “I am better prepared to answer questions from producers and provide educational programs to help producers with water deficits.”
• “I am more knowledgeable about alternative crops that may be planted instead of alfalfa in low water years and how they may fit into FSA programs.”
• “The course helped me with crop selection and pricing.”
• “Alternative low H2O use crops will strongly be considered for my alfalfa operation.”
• “I can help to implement growing crops to use less water through pipes, sprinklers, and drip, depending on the crop.”

POST-PROJECT ACTIVITIES
Since the completion of her project, the severe drought has continued in the region, and there has been such high demand for the curriculum that Bishop published another 250 copies. CDs have been distributed at regional workshops, especially those sponsored by beginning farmer/rancher and risk management programs, and on reservations in multiple states. The information has proven to be very useful. To reach out to even more ag professionals and producers, the publications have been posted to the University of Nevada's Extension web page (unce.unr.edu/programs/sites/drought/) on “Living with Drought.”

Spin-off products include additional fact sheets, such as determining profitability. Bishop is assisting with a $4.5 million USDA-NIFA project, led by University of Nevada Cooperative Extension’s Staci Emm, entitled, “Native Waters on Arid Lands,” which brings together scientists, 1862 and 1994 land-grant institutions, and tribal communities of Great Basin and Southwest to address agricultural water challenges. All of these efforts have helped lead to an increasing amount of low-water use crops being planted in place of higher-water use crops, such as alfalfa, especially in northern Nevada.

PICTURED: Dry canal in Nevada/C. Bishop