Western Region Sustainable Agriculture Research and Education
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Final Results

SW98-060

Acequia conservation management

Location:
San Miguel County, New Mexico

Funding Period:
Sept. 1, 1998-Nov. 30, 2002

Grant Award:
$49,272

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For a list of agency participants, please scroll to the bottom of the report.

SUMMARY

In San Miguel County, N.M., acequia systems are the main form of irrigation. These historic irrigation ditches are community oriented and traditionally Hispanic. This project seeks to broaden the introduction of water management technology, a critical link in sustaining local agriculture. By applying modern technology to each distinctive acequia system in this drought-prone region, farmers will be able curb soil erosion, better manage soil moisture and fertility and improve their economic viability.

INTRODUCTION

Irrigation accounts for 75% of water use in New Mexico. In the Tierra y Montes Soil Conservation District, taking in most of San Miguel County, irrigation water is diverted from the Pecos and Gallinas rivers along with several smaller tributaries to supplement rainfall. New Mexico water law requires the systems to be used by priority dates, meaning the irrigation systems (acequias or ditches) with the oldest use dates get the water first. However, in most cases, the irrigators highest up on the system get the water first, which has resulted in many feuds, some deadly. The goal is to deliver water to all users on a system with irrigable land and water rights.

Acequias, among the first structures built when communities formed, were typically made by stacking rocks and brush across the stream. Many of these remain, but with considerable damage from floods. Also, much of the water that is diverted is lost through seepage, vegetation and evaporation (37%, according to the New Mexico State engineer office) before it reaches the farm headgate.

On the farm, water is lost from unlined ditches, poor design, poor maintenance and lack of measuring devices. Efficiency is affected by ineffective application methods and oftentimes long fields resulting in too much water applied at the head of the field and not enough at the end.

OBJECTIVES

This three-year SARE-funded project has five objectives.

1. Introduce 140 acequia irrigators to water management concepts and technologies using seven demonstration projects in San Miguel County
2. Teach water management by providing bilingual education materials to 640 irrigators at acequia meetings and elsewhere by the end of the second year
3. Use a bilingual video to increase irrigator knowledge of water management
4. Develop long-term goals to implement water management and conduct a follow-up survey and discussion with 640 irrigators in the program by the end of the second year
5. Implement water management improvements with 32 landowners by enrolling them in the Interstate Stream Commission re-loan program by the end of the second year

MATERIALS AND METHODS

Six participants were selected. Elevations for each irrigation turnout were surveyed, designs were drawn and new turnouts constructed according to NRCS specifications. Three irrigation turnouts were built during the off season in 1999 and four more built in the fall and winter of 1999 and 2000.

The new turnouts provided greater control over water. In two cases, pipes were installed to splitter boxes at the field's edge to slow water energy as it dropped from the ditch to the field, preventing erosion and providing control over direction. In the case of project participant Cathy Swedlund, the new turnout and piping allowed her to get water around a deep ditch, or arroyo, to 20 acres she had been unable to irrigate. The structure provided Daniel Garcia with the ability to check the water level in the irrigation ditch so it had enough flow to irrigate a difficult-to-reach area.

Soil moisture sensors from Irrometer Co. helped determine soil water content and over what period soil moisture content was reduced to 50%. While the sensors provided valuable feedback, their cost is prohibitive for most local irrigators, so project coordinator Stephen Reichert instructed participants to use the "Feel and Appearance Method" based on a booklet from NRCS

RESULTS AND DISCUSSION

Project participant fields suffer from slope, length of run, gophers and lack of head pressure or water supply. To overcome some of these obstacles, the project team is encouraging the farmers to use several methods:

Corrugations: Across uneven fields, corrugates improve water distribution for closely seeded crops like legumes and grasses. Several participants are using corrugates. Others had them before the project began, but they've filled in over time and not reestablished until the field is replanted.

Gated Pipe: Two participants, Justo Lucero and Gilbert Gallegos, have begun using simple forms of gated pipe systems that carry water across the field with openings every 24 to 30 inches for the water to spill into corrugates and flow across the fields. Lucero and Gallegos are currently at varying stages of development and each of their systems will be different in design and cost.

IMPACTS OF THE RESULTS/OUTCOMES

To have a long-term impact on irrigation and sustainability, the Tierra y Montes Conservation District must continue with education and financial incentives that sell irrigators on the benefits of improved, better managed irrigation. Simply pointing out to an irrigator his or her problems is not enough. Through tours of successful farms, irrigators are able to see and apply ideas to their own situations. In addition, a video produced using project participants has been reproduced in English and Spanish and made available to acequia users.

"We always hear from participants that seeing other operations impresses them most," says Reichert. "Some are animated to initiate similar practices on their land."

ECONOMIC ANALYSIS

Small operators with economic and labor constraints need assistance programs to offset out-of-pocket costs. For example, two adjoining landowners are paying off land they bought for $10,000 an acre several years ago. However, the land has several of the area's typical irrigation problems, and a remedy for just a small portion of the acreage would cost $10,000, including a buried pipeline and gated pipe, costs not likely to be recovered through added production.

Even though low-interest funds have been available for farmers to make improvements, only a few have made inquiries, and most of those lose interest when loan security in the form of a mortgage is mentioned. Another handicap is outdated farm equipment. So even though the only costs of the water in the northern New Mexico acequia system are modest yearly dues and participation in ditch clean-up, few are inclined to take the risk of investing in irrigation improvements.

PUBLICATIONS

Information about the project includes a 2002 summary of the acequia users, a video titled "Acequia Irrigation in San Miguel County" in English and Spanish and a pamphlet, "Determining the best time to irrigate."

Presentations were made in Mora and Las Vegas, New Mexico, to nearly 100 people, including teachers, students and local producers. Another presentation, in Onate, New Mexico, to local farmers included a showing the video and discussion of how one can work toward improving an irrigation system.

Tours were held in 2001 and 2002 in the El Pueblo and Villanueva areas with more than 25 joining to observe a half dozen fields showing alternative crops and irrigation.

Meetings were also held in the Las Vegas, Pecos and El Pueblo areas with more than 50 attendees, including representatives from Cooperative Extension, the NRCS, the Office of the State Engineer, New Farms Cooperative and the Santa Fe Farmers Market. About 30 acequias were represented.

FARMER ADOPTION

Several farmers with steady water supplies are installing some form of pipeline or gated pipe system. To accommodate the systems, they are working on their irrigation scheduling and management. One participant, Alfredo Romero, is considering emulating a drip irrigation system that he saw on one of the tours, and two others are looking into drip or sprinkler systems for garden plots.

Reichert says that more new practices and improved systems will come when irrigators have a financial buffer that provides confidence to initiate improvements and when water conservation can be shown to produce monetary gains by allowing the water user to lease the conserved water.

AREAS NEEDING MORE STUDY

The growers need to see studies on different methods of irrigation at the local level, including drip, sprinkler and gated pipe and how they compare with traditional flood irrigation in terms of installation costs and rates of return.

“Even though some of our users are beginning to adapt to drip or sprinkler in a limited way,” says Reichert, “having these comparisons and experience could help educate and convince them of the advantages and disadvantages of one system over another.”

In addition, he says, local farmers could use information on alternative crops that can help sustain small farmers; assistance in developing markets for local production; and greenhouse production methods that might help offset the short growing season.

Major Participants

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