



United States Department of Agriculture
Natural Resources Conservation Service

Agricultural Water Enhancement Program

AWEP

HELPING PEOPLE HELP THE LAND

February 2011

Through AWEP, NRCS provides support for projects that conserve and improve water quality, use irrigation water efficiently, mitigate the effects of drought and climate change and take other actions that benefit water resources.

Project Partners

- Western Shasta Resource Conservation District (WSRCD)
- Anderson-Cottonwood Irrigation District (ACID)
- Cottonwood Creek Watershed Group (CCWG)

Project Objectives

- Improve water use efficiency
- Improve flows and outlets
- Improve water quality

Conservation Practices

- Irrigation pipeline
- Above-ground multi-outlet pipe
- Surface irrigation system
- Critical planting area
- Tailwater recovery
- Irrigation water management
- Land leveling
- Land smoothing
- Pasture and Hayland Planating
- Structures for Water Control
- Brush Management

ACID Water Efficiency Improvement Project

Addressing Water Conservation Concerns in the Anderson-Cottonwood Irrigation District

The ACID AWEP project is improving irrigation efficiency and water quality for water users within the Anderson Cottonwood Irrigation District (ACID) service area. Earthen ditches that carry water from the ACID canal to agricultural fields are being replaced with more efficient pipes.



ACID, a 32,000-acre irrigation district in Shasta and Tehama counties, was formed in 1914 to assist producers along a 109-mile long water distribution system for irrigation purposes. The ACID system of canals and landowner laterals delivers irrigation water to more than 800 farmers and ranchers. Agriculture in the district includes grazing for beef cattle, sheep and goats; hay; orchards; and a growing number of organic producers.

Some of the ditches (laterals) are more than 100 years old. Weeds clog the flow. Blackberries grow along the banks, attracting gophers and squirrels that undermine the banks and cause the sides to collapse. The resulting seepage drains the ditches of as much as 20-50 percent of the water directed toward farmers' fields and ranchers' pastures.

A 1982 study detailed several problems with the ACID delivery system. Seepage along the main canal and laterals created wet areas on adjacent agricultural lands, encouraged mosquitoes and water-loving plants, and reduced agricultural production. Diversion structures, lateral turnouts and on-farm turnouts had been improved only slightly since 1919, and flashboards did not properly seal. Turnout structures had been modified by individual landowners by adding pipes or other temporary structures to increase turnout capacity. These additions weakened banks, increased water losses and in some cases reduced lateral capacity by obstruction.



In 2010, Western Shasta Resource Conservation District (RCD), in partnership with ACID and Cottonwood Creek Watershed Group, successfully applied for AWEP funding to help farmers in the irrigation district implement conservation practices to improve water efficiency and water quality.

Using \$2.8 million in AWEP funding from NRCS, the grant is helping to pay for lateral improvements over a four-year period. Participating ACID customers pay 10 to 25 percent of the cost of replacing the lateral, depending on the project.

The ACID canal stretches from the city of Redding to Cottonwood. Each privately owned lateral connects eight to 12 customers to the canal. Twenty-three priority laterals (serving 115 producers) were identified within the ACID system as having the most infrastructure degradation of private irrigation laterals, but all producers within the district can apply for AWEP and might be added to the priority list. All applications are evaluated using established ranking and screening criteria. Priorities include volume of water saved and total participation by all producers on a lateral.

The first five projects, started in the summer of 2010, had a \$661,000 combined budget. Design work was done by Vestra, a Technical Service Provider, and NRCS. Each lateral was different, so the cost of each project varied.

As of February 2011, more than 12,182 feet of underground pipeline has been installed to reduce water loss, 55 modern water control structures have been completed, critical area plantings have been established on seven acres for erosion control, and 72 acres are under contract for irrigation improvement for water savings.

Water savings from replacing open ditches with pipelines and on-farm improvements are expected to range from 1.5-2 acre feet per acre per year. The water conserved annually will result in direct benefits to the California-Bay Delta, including an increase in the volume of water stored and improved flexibility for the timing of releases.

The project will improve ACID's operational efficiency and increase available flows at turnouts for on-farm deliveries, increasing the efficiency of individual irrigators. Higher downstream flows will increase the area irrigated with each acre foot of water delivered. Another benefit of this project will be the elimination of ponding and flooding impacts to neighboring lands due to seepage losses.



Weeds growing inside the ditches and along the banks were obstructing water flow and causing the ditch sides to collapse. Open ditches need work to repair damage caused by vegetation growth or cattle-induced erosion. While more expensive than ditch maintenance, putting down pipe makes a more efficient, longer lasting lateral.



Many of the existing flash board water control structures were nearly a century old (left). These structures are being replaced with more efficient concrete boxes with screw gates or slip gates (middle and right).



The size of pipe put in to replace the ditch depended on the ditch's size. The pipes used were 18 inches or 24 inches in diameter. Workers put the pipe in the old ditches then covered them with soil and mulch. Plantings will then be established over disturbed areas for erosion control.