

Sharing the difference CSU Extension makes in people's lives and their communities.

## Small acreage landowners learn to improve water use

*Irrigation audits help small acreage landowners take steps to improve management of irrigation water while conserving natural resources.*

### Situation

Colorado's small acreage landowners, new to farming and ranching, tend to overwater their fields and pastures due to aging, incorrectly installed and mismanaged irrigation systems. These often lead to excessive soil saturation and unwanted ponding or runoff. Overwatering can also cause weed infestations and increase mosquito outbreaks. In parts of the Western Slope, including the Grand Valley, excess irrigation also impairs downstream water quality and harms aquatic life by leaching salt and selenium out of the region's alkaline shale soils and into its rivers.

### Extension's Response

Colorado State University Extension launched the Small Acreage Irrigation Ambassador program in 2010 in the Grand Valley and surrounding Mesa County. The program identifies the source of irrigation inefficiencies, makes recommendations for improved irrigation management, and helps landowners better understand how plants, water, soil and weather interact.

Denis Reich, CSU Extension Western region water resources specialist, originally created the free service to reduce water waste (the amount of water that is not actually being used by crops), increase crop yields, control weeds and reduce the amount of selenium and salt leached by excess water. After successfully piloting the program two years ago, mosquito outbreaks were also identified as a common symptom of over-irrigation.

In 2011, CSU Extension expanded the program by partnering with the Mesa Conservation District, which received grant funding to hire a dedicated small acreage irrigation ambassador. Grantors included the Colorado Basin Roundtable (a branch of the Colorado Water Conservation Board), Grand River Mosquito Control District, Grand Valley Irrigation Company and Grand Valley Water Users Association. Reich continues to oversee the program.

The program runs April through October. Interested landowners schedule a visit with the ambassador during, or immediately following irrigation. During the audit, the ambassador looks for signs of excessive watering and records soil type, soil moisture, crop health, type of irrigation system, irrigation 'set length' (the amount of time water is applied to a field) and frequency. Within two weeks of the audit, landowners receive a report that details collected data and recommended next steps.

In 2010, Reich conducted 14 irrigation audits. In 2011 year, the ambassador visited 57 small acreage properties; 44 received audits.



### The Bottom Line

Helping small acreage landowners on Colorado's Western Slope learn how to improve their irrigation water management practices means they can:

- save time, money and resources;
- grow healthier and more abundant crops and pasture;
- keep mosquito populations in check; and,
- reduce the amount of salt and selenium that overwatering leaches into rivers.

### By the Numbers

In 2011

- Total landowner calls: 100
- Total ambassador visits: 57
- Total audits conducted: 44
- Total acres visited: 276.8
- Total acres audited: 212.2

## Results

To date, the Small Acreage Irrigation Ambassador program has provided 58 landowners with onsite feedback. For example, landowners using furrow irrigation systems might learn that water is not actually coming out of the pipe gates at a high enough flow rate to effectively water fields. Or they might learn that they have two soil types in different areas that absorb water at different rates, or that a blocked culvert is preventing sufficient field drainage. Audit reports detail these findings and help landowners understand how much water should be applied to their fields based on their irrigation system, soil type and crop or grass variety.

In early 2012, Reich derived a classification system to compare the irrigation water management practices of the 212 acres audited in 2011. The classification ranks how effectively, efficiently and uniformly irrigation water has been charging the soil.

Classification	% of audited acres	Indication
Poor	9	Excessive soil saturation and visible, unwanted runoff/ponding
Needs improvement	42	Excessive soil saturation or unwanted runoff/ponding
Adequate	38	Some excessive soil saturation with minimal unwanted runoff/ponding
Excellent	10	Good soil moisture and no unwanted runoff

Throughout 2012, CSU Extension and the Mesa Conservation District will assess the potential and actual management changes that landowners have made. Funding from the original CWCB-Colorado Roundtable grant plus additional contribution from partners will cover costs through the end of the year. Funds have also supported the production of a promotional video that can be accessed at: [www.ext.colostate.edu/irr\\_assess/sm\\_acre.html](http://www.ext.colostate.edu/irr_assess/sm_acre.html).

Improved irrigation water management benefits individuals, the community and the environment in several ways:

- Proper irrigation saves time and money spent controlling weeds and managing water problems. Neighbor disputes in small acreage communities are often over water. Reducing the amount diverted and applied can often improve the rural life experience for both parties.
- Hay, pasture and crops are more productive when evapotranspiration is kept in balance. Temperature, relative humidity, precipitation and other weather factors affect how much moisture evaporates from the soil and how much water plants transpire during photosynthesis.
- Reduced ponding limits the number of mosquito breeding sites. A potential reduction in mosquito populations increases the quality of life for area residents.
- Reducing excess runoff lessens the amount of salt and selenium, as well as unused nutrients and fertilizer that are transported into rivers. In furrow and flood irrigation, much of the unneeded water percolates below the root zone, mobilizing potential contaminants.

*“Roots need to respire when the sun goes down. If you’re water-logging the root system then you’re just stressing the plant. If you can help landowners feel OK about putting less water on, then they’re often relieved to learn they can spend less time irrigating with better results.”*

—Denis Reich, CSU Extension western region water resources specialist

*“From our perspective, the Small Acreage Irrigation Ambassador program has been a real success. We’ve instituted the program as part of our integrated pest management process. We would much rather deal with mosquito control from a water standpoint than through pesticides.”*

—Zane McCallister, manager, Grand River Mosquito Control District

## Salt & Selenium

The transport of salt and selenium into the Colorado River watershed is a big concern for Western water resource stakeholders. Irrigation leaches these highly concentrated and naturally-occurring minerals out of the soil. Over-irrigation compounds the problem. Salinity is mostly a concern for downstream agricultural users because of the ways it decreases crop yields. Selenium is a problem for local endangered fish species.

## Contact Information

Denis Reich  
CSU Extension and Colorado Water Institute  
Water Resources Specialist  
(970) 242-8683  
[denis.reich@colostate.edu](mailto:denis.reich@colostate.edu)