

Water for 2060 Advisory Council

Minutes of Crop Irrigation Efficiency Workshop, 1:00 P.M., February 18, 2014
OWRB Board Room, 3800 N. Classen Blvd., Oklahoma City, Oklahoma

ATTENDEES:

Advisory Council Members and Representation:

Bob Drake, Agriculture (Davis)
Dan Galloway, City of Stillwater
Russ Doughty for Charlette Hearne,
Oklahomans for Responsible Water Policy
(Broken Bow)
Mark Helm, Dolese (Oklahoma City)
Trent Smith, Small Business (Choctaw)
Kevin Smith, Ward Petroleum (Enid)

J. D. Strong, Chair, Oklahoma Water Resources
Board (Oklahoma City)
Joe Taron, Pottawatomie County Development
Authority (Shawnee)
Jerry Wiebe, Oklahoma Panhandle Agriculture
& Irrigation (OPAI) (Hooker)
Nathan Kuhnert, Devon Energy

OWRB Staff and Consultants:

Cole Perryman, OWRB
Lauren Sturgeon, OWRB
Jennifer Wasinger, OWRB
Owen Mills, OWRB
Darla Whitley, OWRB
Sara Gibson, OWRB
Derek Smithee, OWRB
Rick Wicker, OWRB

Kent Wilkins, OWRB
Brian Vance, OWRB
Julie Cunningham, OWRB
Terri Sparks, OWRB
John Rehring, Carollo Engineers
Anna Childers, CH2M Hill
Bryan Mitchell, CH2M Hill

Speakers:

Fred Fischer, Panhandle (OPAI)
Jerry Wiebe, Panhandle (OPAI)
Mark Nichols, Lugert-Altus Irrigation District

Chris Stoner, State Conservation Engineer, NRCS
John Rehring, Carollo Engineers

Other Attendees:

Michael Taylor, ODEQ
Jeff Moore, OPAI
Gina Long, OPAI
Pat Long, OPAI
Jason Becker, OPAI
Reid Shrauner, Self
Darren Buck, OPAI
Johnathan Moore, Farmer
Johnny Moore, Farmer

Ryan Hall, Rockwater Energy Solutions
Russell Isaacs, OPAI
Alice Isaacs, OPAI
Marla Peek, Oklahoma Farm Bureau
Bonita Hammontree, Self
James Hammontree, Self
Scott Arthaud, OPAI
John Grunewald, Farm Credit
Leon Richards, OPAI

Introductions and Goals for Today

Mr. J.D. Strong, OWRB Executive Director and Advisory Council Chairman, opened the meeting by welcoming the attendees and noting that the last meeting was to inform and solicit ideas on public water supply, while this meeting would focus on crop irrigation efficiencies. Mr. Strong then asked the Council members and attendees to introduce themselves. Mr. John Rehring, Carollo Engineers, facilitated the meeting. He gave a brief update on previous meetings and went over today's agenda and logistics for the meeting.

Existing Practices and Programs in Crop Irrigation Conservation and Reuse

Several speakers were invited to participate in the meeting, starting with agriculture producers from southwest and northwest Oklahoma that provided insights on the following:

- Existing conservation/reuse practices: What's working for you now?
- Current incentives/disincentives for water-efficient practices and education programs
- Additional conservation: What's holding you back?

PowerPoint presentations from Mr. Fischer and Mr. Rehring are posted to the Water for 2060 website (<http://www.owrb.ok.gov/supply/conservation.php>).

Mr. Fred Fischer, from Oklahoma's Panhandle region, gave a slide presentation and shared information regarding his irrigation practices and water-efficient technologies. In his presentation and subsequent group discussion, Mr. Fischer covered the following issues.

- Stressed the importance of the advanced technology already available and being used by many agriculture producers
- Discussed his on-farm demonstration project using drip irrigation
 - GPS technology is being used to guide tractor when putting in hose for drip
 - Potential problems in germinating seeds with a drip system, especially in sandy soils – Mr. Fischer shared practices he employed to deal with this issue
 - Resulting crop yields were average or a little better than with center pivot sprinkler systems
 - Still using as much water as with sprinkler system, and potentially more at times
- Reviewed center pivot sprinkler nozzle technology including “wobbly” nozzles that simulate large raindrops
 - Less loss of water from wind
 - Can throw water long distances
 - Reduces ponding and evaporation losses
- Talked about emerging satellite technology to guide practices by specific management zones
 - Incentive to cut back on fertilizer and water in lower production areas
 - Using variable rate technology, can program sprinkler arm to reduce amount of water applied to specific areas (e.g., lowland areas where less water is needed)
 - Cost about \$200 per sprinkler drop-down to install
 - Telemetry technology (cell phone and web-based) allows monitoring of areas being watered and center pivot position and pressures

- Identified incentive needs for additional water efficiencies
 - More advanced technology
 - New efficient application techniques
 - Monitoring equipment helps efficiency
 - One size does not fit all
- Water saving ideas
 - Genetic engineering (e.g., drought resistant crops)
 - Group insurance restructure—for example, had to continue watering to secure crop insurance payment, even after crop was ruined by hail
 - Install hot water circulating pump in houses
- Question—How does “no till” relate as a practice in western Oklahoma?
 - No till is prevalent, but it is more “minimum till.” Many producers are also doing strip till, which is a great improvement; they do not till if they do not have to, because of water loss.

Jerry Wiebe, also from the Panhandle, followed up with a short presentation on the history of sprinkler technology.

- Incentives
 - No one wants to see the Ogallala depleted, so there is an inherent incentive for water efficiency
 - No longer any tail pits in the region; there is essentially no runoff from today’s center pivot and drip irrigation systems

Mark Nichols, Lugert-Altus Irrigation District and Tillman County, talked about cotton irrigation in southwest Oklahoma.

- Lugert-Altus irrigation history
 - Producers could do more to help with efficiencies than the District management
 - Canals and concrete ditches—some lined and some not—are not very efficient
 - More producers started looking at drip irrigation
 - About 30-40 percent of irrigated lands in the district are now using drip
 - Goal—no water leaves the district, it’s fully utilized for beneficial uses
 - There are tail water pits in the district, but that water is pumped back up to use
 - Overall, the district members are not using less water, but yields are much larger, i.e., using the same amount of water to increase yields
 - Lugert-Altus Lake is now at 16 percent capacity—no water available from the lake for irrigation in 2011 and 2013.
- Tillman County irrigation practices
 - Primary systems are center pivot irrigation
 - NRCS has helped replace many antiquated systems, especially over the last five years
 - Bubbler systems on flatter land work well
 - Very sandy soils, so drip might not work as well as in other areas
 - Water is very shallow—50 to 60 foot wells—often must connect several wells together to get enough yield for irrigation
 - NRCS has spent \$5 million in Jackson County over the last six years to help with conservation (drip irrigation, tail water recovery, other improvements)
- Incentives

- NRCS pays up to 40% of system improvements—such incentives have been a tremendous help in water efficiency improvement
- Goal is to get all of Lugert-Altus converted to drip
- Question—please clarify how using the same amount of water with drip results in better yields
 - Drip is more efficient, so the plant is able to use a greater percentage of the water applied, which results in larger yields.
- Question—are “no-till” practices used in southwest Oklahoma?
 - All land in drip irrigation is no-till; not able to till the land, so no-till is primarily used where furrow or flooding systems are used for irrigation

John Rehring, Carollo Engineers, gave a presentation relating his experience in working on the *Panhandle Regional Water Plan (PRWP)*.

- Vision was to take the 2012 OCWP Update down to the Panhandle region level
- Water use has tapered off since the late 1960s due to advances in irrigation technology
- Public water supply needs are projected to greatly increase in Texas County
- USGS & USDA data show that water use has decreased, irrigated acres have remained flat, yet the market value of agricultural products from the Panhandle has increased—this indicates that efficient water management strategies can support a vibrant economy
- What works/does not work – PRWP looked at economics of OCWP conservation scenarios
 - Costs of converting to drip irrigation are equivalent to \$4.60/1,000 gallons saved
 - Switching to different crops—corn to wheat and sorghum—have enormous economic impacts, even if water saved is used to plant additional water-efficient crops
 - Conclusion of the PRWP – efforts to build on past successes and further enhance efficiencies are key strategies in meeting the region’s long-term water needs

Chris Stoner, State Conservation Engineer, talked about NRCS’s conservation initiatives.

- Current focus is on increasing application efficiencies, whereas past emphasis was on increasing sprinkler system efficiencies, which accomplished an increase in savings from 70 to 90 percent
- NRCS is encouraging producers to focus more on the net profit per acre, rather than yield per acre, which in some cases may result in changes to crop selection and water use practices while maintaining or increasing economic vitality
- Opportunities to increase efficiency in irrigation water management
 - Additional outreach and education
 - Soil monitoring
 - Best utilization of equipment and tools
 - Incentives to take land out of irrigated production and plug wells, where that makes sense
- Look beyond borders of one farm; just because one person doesn’t use it, doesn’t mean the next person won’t
- NRCS promotes
 - Less intensive using crops or genetically improved
 - Focusing more on net profit per acre, rather than yield per acre, which in some cases may result in changes to crop selection and water use practices while maintaining or increasing economic vitality
 - Energy efficiency in pumps
- Conservation Innovation Grants—not research but demonstration technology; not necessarily conservation priority—also energy, soil management, etc.

- Irrigation is greatest user of water, but what do we get in return from other sectors' water use? One gallon has cumulative effort through other industries, i.e. manufacturing, fertilizer, etc.
- Environmental Quality Incentives Program (EQIP) -- \$1.5 million in funds for irrigation/agriculture conservation in Oklahoma; need is significantly greater than available funds

Brainstorming: Incentives and Education Programs

The group discussed potential incentives and education programs for enhancing water efficiency in crop irrigation, building on the information presented and discussed above.

Potential Incentives

- Manage water supply/aquifer for long-term viability; most irrigators want to have viable water supplies available for future generations
- Operations: energy use and energy costs are correlated to water use
- Increased crop yields through efficiencies (e.g., drip systems)
- Drought can serve as a reminder and incentive to manage supplies efficiently
- Economics will drive how much water is used—"necessity is the mother of invention"
- Cost of pumping water is going to be a stronger incentive as the price of energy goes up
- Support promotion of profit-based rather than yield-based farming practices
- Recognition that water quality will decrease with decreasing supply availability

Information Sharing Opportunities

- Alternate crops
- Financial incentives
- Revise insurance requirements to not require irrigation after it's known a crop won't make a yield
- Rehabilitate, repair, and replace infrastructure with more efficient equipment (e.g., nozzles): cost share programs, best management practices

Existing Obstacles to Increasing Efficiency

- Upfront costs
- Farmers' lack of confidence in performance of higher-efficiency equipment and practices; may work well in some areas, but not others — local validation needed
- Available irrigation efficiency technology already in place in many areas; need to come up with something else to drive incentives
- Water ownership – groundwater is a property right, but stream water laws may encourage water use to protect water rights
- Invasive species: salt cedar is a big problem, but it is not very cost-effective for ranchers to eradicate individually, and benefits of eradication may have more benefit to downstream users
- Some meeting attendees noted that irrigation efficiencies are already high in the Panhandle, so there is no need for additional incentives

Needs

- Validation that technology works
- Benefit/cost analyses of adopting conservation measures
- Organizational/financial

- Grant technical assistance important; quality of request/proposal can influence approval
 - Education needed on grant process
 - Consider mechanism to provide assistance
 - Need mechanism to track available grants and distribution/application process
 - Pre-development planning grants from USDA may be available
- Link deposit program through OWRB's Clean Water SRF Program could be a "creative" option to match grant funds from other sources and/or provide another option for funding energy and water efficiency
 - Producers can access loans at below market interest rates from local participating banks
 - Has been successful in states like Iowa, Arkansas, Ohio and Texas
 - Program never launched in Oklahoma due to extremely low interest rates at the time it was considered
 - OWRB needs to reevaluate the program based on today's environment
- Technology
 - Many in the Panhandle are using irrigation systems that are already 80-95% efficiency, i.e. reaching diminishing returns
 - Achieving the last 5% to reach 100% water efficiency is challenging and expensive
 - Need structural change in technology that is not there right now
 - Need more information on variable rate technology—only four years old so may hold potential for future savings
 - Most producers in Panhandle/Western Oklahoma are already using available technology
 - Review OCWP's conservation background information to see where use of irrigation efficiencies are not being widely used; consider focusing efforts in those areas

Mr. Rehring emphasized that the goal of the Water for 2060 Advisory Council is to develop incentives to help save water, not mandates. While some of the participants indicated that they were already saving as much water as practically possible, he asked that the group concentrate on incentives that might induce others to engage in more water efficient practices, for example, what happened or what circumstances induced you to save water? How did you get there? He encouraged the group to think about further incentives and to e-mail him with any additional ideas they might have.

Next Steps and Group Resources

Mr. Rehring suggested that the next meeting be dedicated to pulling all of the public water supply and Irrigation conservation ideas together, and possibly think about other water use sectors as well. He noted that it is time to start thinking about what to present to the Legislature for consideration. The group will be asked to help identify the best date for the next meeting, which will be set for May or June 2014.