



OKLAHOMA

water news

MONTHLY NEWSLETTER OF THE OKLAHOMA
WATER RESOURCES BOARD

Gerald E. Borelli, Chairman

Earl Walker • L.L. Males • John B. Jarboe • Ralph G. McPherson • Gary W. Smith • Ernest R. Tucker • Robert S. Kerr, Jr. • R.G. Johnson

Drip Irrigation Best on Shrubs, Vineyards, Orchards, Gardens

What do you do when your vegetables need water? If you're like most Oklahomans, you turn on the faucet and use the hose or sprinkler to drench the area. When saturation is complete, the mission is accomplished.

That practice may someday be replaced by a method of nourishing the plants at an even pace, a system that dramatically reduces the quantity of water used and carries some surprising side benefits as well.

Drip irrigation—the application of water directly to the root zone of individual plants—is not new. Discovered by an Israeli engineer who noted that a tree beneath a dripping spigot seemed to grow more quickly than trees nearby, the system has been used successfully in Israel and England for more than 25 years.

Its numerous advantages, though, have made increasing numbers of Oklahomans take notice. By putting water exactly where it's needed—at the base of the plant—gardeners can face Oklahoma's hot, dry summers secure in the knowledge that their plants will remain healthy while water is being conserved.

The conventional "flood" method of watering is not very efficient. As much as 70 percent of the water is lost to evaporation before it has a chance to benefit the plants. Weeds and grass infringing in the garden are watered just as much as the vegetables, and often walkways, garden borders and the leaves of the plants are unnecessary recipients of the moisture, too.

Depending on soil type, the water may not penetrate very deep or very fast. It usually takes about 40 minutes to water 100 square feet 12 inches deep with a hose or sprinkler. As a result, plants grow shallow roots close to the surface in order to get at the water. In most vegetables, shallow roots mean weaker plants, smaller yields and greater vulnerability to drought.

The idea behind drip irrigation is to supply small amounts of water to the plants at frequent, even daily intervals, dripping at precisely the rate necessary for growth. Little or nothing is lost to evaporation, and the plants get water at a uniform and uninterrupted pace.

Because dripped water is concentrated in a very small area, it penetrates deeply and quickly, taking as little as 15 minutes for the water to reach a depth of one foot. The pattern of water beneath the ground encourages deep, healthy roots and vigorous growth, preventing moisture stress.

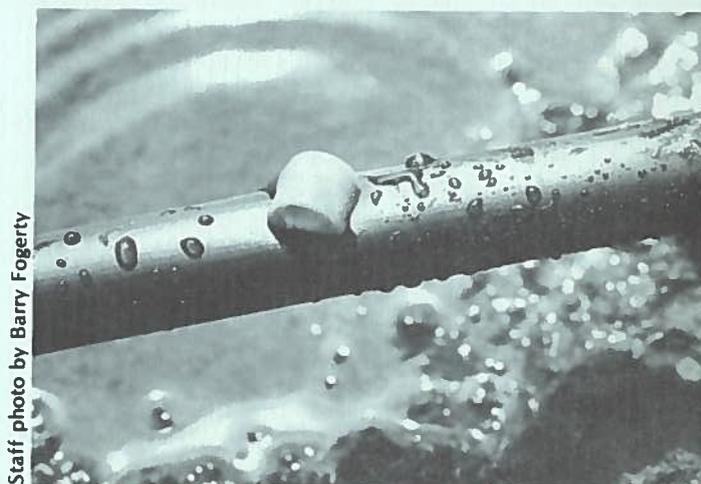
Agricultural engineers estimate that drip irrigation may use as much as 50 to 75 percent less water than conventional watering methods.

Another advantage of drip irrigation is the lowered incidence of certain plant disease. Since moisture is on the soil and not on the plants themselves, some foliage diseases have a more difficult time infecting the plant.

For the gardener, drip irrigation can be a timesaver. With the addition of a mechanical timer, the vegetables can get all the water they need as often as they need it without further intervention.

The essential item in drip irrigation is the emitter, a fixture with a tiny hole that allows water to be released very slowly. When plugged into a flexible hose, the emitter releases as little as one gallon of water per hour. Emitters are usually spaced about every two feet in the hose to form a continuous wetting pattern down the length of the row.

Continued on page 2



Staff photo by Barry Fogerty

A tiny emitter, about half the size of a thumbtack, is an essential item in drip irrigation. The technique of slowly dripping water at the base of a plant can save as much as 75 percent of the water used in traditional garden and lawn watering.

Col. Tilton Replaces Col. Harmon in Tulsa District Corps Office

Col. Franklin T. Tilton will replace Col. James J. Harmon as District Engineer of the U.S. Army Engineer District in Tulsa in mid-August. Harmon, who came to Tulsa in September 1980, will assume Tilton's previous command in Germany.

The Tulsa District is responsible for Army Engineer water resource programs in Oklahoma, the southern half of Kansas and northern Texas including the Panhandle, and for the design, engineering and construction required at nine military bases in Oklahoma and Arkansas. Corps responsibilities in the state also include operation and maintenance of the Oklahoma portion of the McClellan-Kerr Arkansas River Navigation System.

Tilton is a 1961 graduate of the U.S. Military Academy at West Point and holds a master's degree in operations research (engineering) from Stanford University. He also is a graduate of the Army Command and General Staff College and the Army War College. He is a registered professional engineer in the state of Virginia.

Tilton has served in the office of the Army Deputy Chief of Staff for Operations and Plans, commanded an Engineer Battalion, was an instructor and assistant professor at West Point, and engineer advisor to the Mississippi Army National Guard.

Drip Irrigation, continued from page 1

One disadvantage of the system is its susceptibility to clogging. Since minerals, sand particles and residue often find their way to the opening the water trickles from, a filter is a must for above or below-ground systems.

New technology is eliminating some of the bugs in earlier systems, says Bill Geer, horticultural extension agent for Oklahoma County.

"Drip irrigation is much more efficient than conventional overhead watering systems. The water saved is tremendous, and crop response is improved, too. Quite a few gardeners are using it now. It's really catching on," he says.

The usefulness of the technique doesn't stop at vegetable gardens. Some form of drip irrigation is now in place on about 125 Oklahoma farms, according to the latest irrigation survey compiled by Delbert Schwab, Oklahoma State University extension irrigation specialist. Orchards, vineyards and commercial horticulture suppliers comprise most of the drip-irrigated acreage.

Schwab says the cost-per-acre of \$1200 that might be required for drip irrigation use on traditional Oklahoma crops makes it cost-prohibitive unless agricultural commodity prices turn around. Nevertheless, it has its place. "Drip irrigation allows one to irrigate a lot of plants with a limited water supply. It's also good in landscaping, vegetable gardening, orchards and vineyards because

Courtesy of U.S. Army Corps of Engineers



Col. Franklin T. Tilton

not as much hose is required, cutting down on the cost. The potential for saving water is great," Schwab says.

Yet, it is in municipalities where drip irrigation may ultimately be most valued. It's in the summer when personal water use skyrockets by as much as 30 percent, as people turn on the faucets to nourish vegetables, shrubs, flowers and grass. The sudden increased usage sometimes puts demands on municipal water systems that cannot be met, resulting in water rationing.

Drip irrigation is not a cure-all, but combined in adequate numbers with other outdoor water-conserving measures like mulching and the planting of native, low water-using vegetation, demands on water systems can be lessened considerably. In drought-prone Oklahoma, such an advantage could make drip irrigation a wave of the future.



1984 SMU Conference Calls for Papers

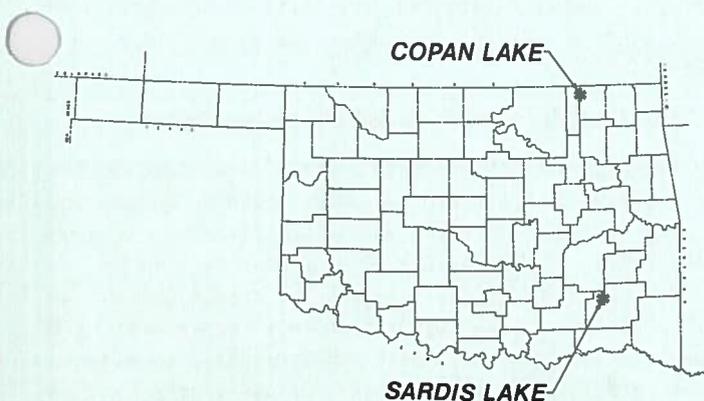
Papers are being sought for an interdisciplinary conference on meeting the municipal, agricultural and industrial water needs of the Southwest, according to Conference Chairman Michael Collins of Southern Methodist University. With a theme of "Water for the 21st Century: Will it be There?," the conference is set for April 3-5, 1984, on the SMU campus.

Topical areas include water needs, demands and availability; competition for water resources; water conservation and reuse; protection of ground and surface waters; and increasing availability and reducing demand.

Continued on page 4

A keynote speech by Roy Clark, country music star, highlighted the Copan Lake dedication ceremonies, along with music by the Fort Sill Army Band and a flyover salute by the Tactical Fighter Group of the Oklahoma National Guard. The dedication was held at

Continued on page 4



Dedications at Sardis and Copan Bring Celebrities to New Lakes

Dedication ceremonies at two state lakes last month brought out bands, barbecue, dignitaries, precision flyers and hundreds of Oklahomans relishing the summer weather and entertainment.

Third District Congressman Wes Watkins was the featured speaker June 4 at ceremonies dedicating Sardis Lake on Jackfork Creek in southeastern Oklahoma. The ceremony followed by a barbecue lunch also attracted Maj. Gen. Hugh G. Robinson, Division Engineer for the Southwestern Division of the Corps of Engineers; Col. James J. Harmon, Tulsa District Engineer; State Senators Gerald Dennis, Roy Boatner and Gene Stipe; and State Representatives E.A. "Red" Caldwell, Frank Harbin and Kenneth Converse.

Sardis Lake, formerly called Clayton but renamed for the town it inundated, will be filled in stages, reaching an elevation of 593 feet this year then raised three feet each year until it reaches 599 feet above mean sea level. The lake will cover 14,360 acres and have a shoreline of 117 miles.

Courtesy of U.S. Army Corps of Engineers



Congressman Wes Watkins and Maj. Gen. Hugh Robinson greet each other at the unveiling of a plaque at the Sardis Lake dedication June 4.

ACTIVE CONSERVATION STORAGE IN SELECTED OKLAHOMA LAKES AND RESERVOIRS AS OF JUNE 20, 1983

PLANNING REGION LAKE/RESERVOIR	CONSERVATION STORAGE (AF)	PERCENT OF CAPACITY
SOUTHEAST		
Atoka	122,300	98.5
Broken Bow	910,167	99.1
Pine Creek	77,700	100.0
Hugo	157,600	100.0
CENTRAL		
Thunderbird	107,058	100.0
Hefner	77,200	100.0
Overholser	16,700	100.0
Draper	72,800	72.8
SOUTH CENTRAL		
Arbuckle	62,525	99.9
Texoma	2,637,700	100.0
Waurika	203,100	100.0
SOUTHWEST		
Altus	109,134	82.1
Fort Cobb	82,337	100.0
Foss	177,923	73.0 ¹
Tom Steed	82,471	92.7
EAST CENTRAL		
Eufaula	2,329,700	100.0
Tenkiller	627,500	100.0
Wister	27,100	100.0
Sardis	298,252	98.6 ¹
NORTHEAST		
Eucha	79,567	100.0
Grand	1,491,340	99.9
Oologah	544,240	100.0
Hulah	30,594	100.0
Fort Gibson	365,200	100.0
Heyburn	6,600	100.0
Birch	19,054	99.2
Hudson	200,300	100.0
Spavinaw	30,000	100.0
Copan	39,075	90.0—
NORTH CENTRAL		
Kaw	428,600	100.0
Keystone	616,000	100.0
NORTHWEST		
Canton	97,500	100.0
Optima	2,068	— ¹
Fort Supply	13,900	100.0
Great Salt Plains	31,400	100.0
STATE TOTALS	12,174,705²	98.9²

1. In initial filling stage

2. Temporarily lowered for maintenance

3. Conservation storage for Lake Optima not included in state total

Data courtesy of U.S. Army Corps of Engineers, Bureau of Reclamation, Oklahoma City Water Resources Department, and City of Tulsa Water Superintendent's Office.

Continued from page 3

the lake site, two miles west of Copan and nine miles north of Bartlesville. Following the ceremonies, participants and spectators adjourned to the parking lot of the Dewey Bank for the bank's annual barbecue, held this year in honor of the new lake.

The 4850-acre lake, dedicated 21 years after its authorization in 1962, will provide flood control, water supply, water quality, fish and wildlife propagation and recreation for northeastern Oklahoma communities.

Mainstream, continued from page 3

Abstracts may be submitted to Collins until August 15 at SMU's School of Engineering and Applied Science, Dallas, Texas, 75275.

\$32 a Year Would Repair Infrastructure

Although the nation's public works infrastructure may be crumbling in some areas, water systems across the country are in relatively good shape, according to a recent survey of the nation's 50 largest water utilities.

The survey by the American Water Works Association indicates that the average homeowner's yearly water bill would need to be increased only from \$113 to \$145 to take care of all infrastructure repair and restoration during the next 10 years.

AWRA Conference/Symposium in October

Management of flood waters and regional and state water resources management will be two topics considered in detail when members of the American Water Resources Association gather for their 19th Annual Conference and Symposium October 9-13 in San Antonio, Texas.

The conference will revolve around the analysis and control of land drainage and flood waters, featuring 20 technical sessions on such topics as stormwater quality, flood control planning, floodplain management and remote sensing. The symposium accompanying the conference will use 15 more sessions to cover such topics as interbasin transfer, changing roles in financing and state and regional groundwater management.

A complete preliminary program and registration information may be obtained by contacting AWRA Executive Director Kenneth Reid at 5410 Grosvenor Lane, Suite 220, Bethesda, MD, 20814.

Courtesy of U.S. Army Corps of Engineers



Unfurling a Corps of Engineers flag at the Copan Lake dedication June 18 are Congressman Mike Synar, Maj. Gen. Hugh Robinson, entertainer Roy Clark, George Schumacher, president of Copan Lake Association, U.S. Senator Don Nickles and George Downs, Copan Lake Association director.

This monthly newsletter, printed by the Central Printing Division of the State Board of Public Affairs, Oklahoma City, Okla., is published by the Oklahoma Water Resources Board as authorized by James R. Barnett, executive director. Ten thousand copies are printed and distributed monthly at an approximate cost of 20 cents each.

MARY E. WHITLOW, Editor

STEVE LINDLEY, Writer

MIKE McGAUGH, Layout

OKLAHOMA WATER NEWS

Oklahoma Water Resources Board
1000 N.E. 10th P.O. Box 53585
Oklahoma City, Okla. 73152

BULK RATE
U. S. POSTAGE
PAID

Oklahoma City, Okla.
Permit No. 310