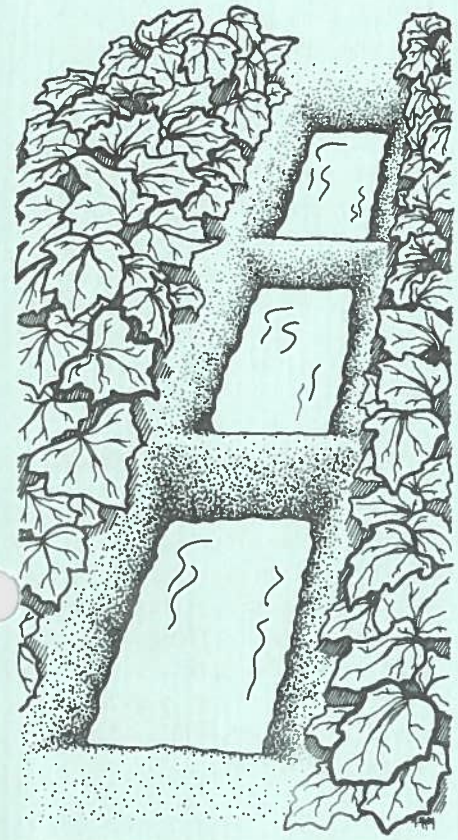
OK Water NEWS



MONTHLY NEWSLETTER
OF THE OKLAHOMA
WATER RESOURCES BOARD

Furrow Dikes

Small reservoirs capture water along the row. Most cost-effective conservation practice around.

As Oklahoma farmers face up to the possibility of lean profits painfully whittled by dry weather and high-priced or depleted irrigation water, more and more look into preparing their land with furrow dikes.

Furrow dikes are mounds of soil mechanically installed in the furrow, creating a small basin in front of each dam. When it rains more than the soil can soak up readily, the d kes hold water until it has time to infiltrate.

Research conducted by the High Plains (Texas) Underground Water Conservation District No. 1 proves it's the single most cost-effective conservation practice that water-short farmers can implement. The small reservoirs that harvest precipitation along the rows significantly increase crop yields and profits.

A Texan admonished, "Don't pray for rain if you don't take care of what you get."

Water is the limiting factor in crop production on the High Plains. Water sources are precipitation and groundwater from the Ogallala aquifer. The precious 15 to 20 inches of annual precipitation that falls over the region makes conservation critical. The case for conservation is further strengthened by water supplies dwindling at an alarming rate in some portions of the Ogallala.

This giant groundwater basin underlies the Oklahoma Panhandle and portions of some western counties, as well as parts of five other agricultural states whose food and fiber crops make enormous contributions to the nation's economy.

Studies conducted on the Texas High Plains show that 65 percent of the annual precipitation falls just before and during the summer growing season. Two-thirds of it occurs in amounts of less than one inch which is entirely absorbed. The remaining precipitation occurs in three to five events with rainfall amounts of one to five inches. It is these few intense rainfalls farmers hope to catch and utilize.

Furrow dikes seem ideal to capture the rainfall of the few short, intense rains that often contribute two or three inches in a single shower. The furrow dikes contain the rainfall until it infiltrates the soil. Furrow dikes and other conservation measures can slow the withdrawal of water from the Ogallala, reduce water costs associated with production and perhaps significantly increase crop yields.

High Plains researchers measured rainfall and runoff in a 3-year study to find that no runoff occurs on level land

Continued on page 2

Dikes, continued from page 1

of loamy soil. Runoff amounts to 1.74 inches on land with a slope of two inches per hundred feet (or 0.2 percent); 2.51 inches with a slope of 0.5 percent; 3.08 inches on a 0.9 percent slope and 3.61 inches on a 1.2 percent slope. On the four graded tracts, runoff averages 2.73 inches per acre per year.

It is critical that farmers use precipitation efficiently and conserve groundwater.

Earlier research using furrow dikes on dryland grain sorghum compared yields on diked versus undiked acres over a 5-year period. The diked area increased the average annual yield of grain sorghum by 420 pounds per acre. Similar increases were noted in yields of wheat and dryland cotton in diked versus undiked acreages.

Field crops utilize water in two ways — for plant growth and fruit development. Each inch of water applied beyond the plant's needs for development of stalks, roots, stems and leaves can be expected to yield a predictable quantity of fruit. For each inch of water available above the plant needs, cotton will yield 30–40 pounds per acre; grain sorghum, 300–400 pounds per acre; and wheat, two to three bushels per acre.

Furrow dikes are also extremely useful to irrigation farmers with sprinklers and in alternate row irrigation patterns.

As the benefits of the practice became evident, diking equipment modernized, evolving into faster, more compact, more efficient attachments to other farm machines.

If High Plains farmers opt not to implement furrow diking, but instead, pump from the aquifer an equivalent of the average annual runoff (2.73 inches) groundwater for irrigation will cost them about $8 to $12 per acre. Further, guardians of the aquifer remind that the water pumped this year will not be available for use in years to come.

Information and photos courtesy High Plains Underground Water Conservation District No. 1, Lubbock, Texas.

mainstream

NWRA and GMDA to Merge

As approved by their respective boards, the Ground Water Management Districts Association will join the National Water Resources Association as its "Groundwater Management Caucus." The union grew from NWRA's stronger interest in groundwater issues and GMDA's need for a better informational link with Washington, D.C.

At the 1986 convention of NWRA, the annual meetings of the two organizations will be combined. The NWRA has traditionally represented surface water interests in the 17 "reclamation states" of the west, but recently has demonstrated increased interest in groundwater issues.

Mungle Replaces Solomon

Mason Mungle of Atoka has been selected as the new executive director of the Oklahoma Conservation Commission. He replaces Leonard A. Solomon, who retired in October 1985, after 25 years of service.

Mungle, a graduate of OSU with a Masters Degree in animal nutrition, served the commission as a Conservation District Director. He and his wife, Frances, operate a 1200-acre dairy farm in Atoka County.

"Today, our soil, water and related natural resources are under great pressure. It is my hope that together, with the Conservation Districts of Oklahoma, we will be able to insure the wise use, best management and conservation of the state's natural resources," he noted in accepting the appointment.

Furrow diking equipment of early design provided shovels which trailed along the ground mounding dirt, then lifting at regularly spaced intervals to form dikes in the row.

Buy a Drink of Water?

Purified, carbonated and flavored water dispensed by vending machines is showing up in some cities. Pure, distilled, salt-free water for use in low-sodium diets and baby formula is available, along with pure, carbonated water and flavored waters dispensed in two-liter bottles. Other machines offer the option of bagged salt-free ice made from purified water.

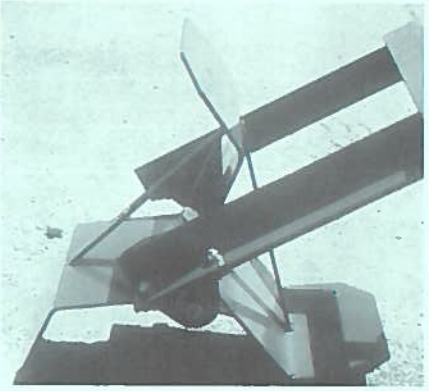
The vending machine, which costs over $10,000, makes its products from ordinary city water. It takes in water, processes and purifies it, then pipes some to another vending machine which dispenses six chilled carbonated flavors.

Americans World's Thirstiest

According to statistics gathered by the US Geological Survey, Americans lead the world in per capita water use with 1,900 gallons per day. Next are the Canadians with 1270 gpd; then the Soviets with 950 gpd; the Japanese with 690 gpd; and the Mexicans with 530 gpd. (All figures are based on total water consumption.)

TOLL-FREE 24 HR.
Pollution HOT LINE
1-800-522-0206
in OKC 271-4468

Newer models have paddle-like blades to make smaller dikes and operate at a higher speed than earlier equipment.



River Compacts Convene in March

All four interstate stream compacts to which Oklahoma is a party will meet in March, according to J.A. Wood, OWRB Stream Water Division chief.

Commissioners to two compacts involving the Arkansas River will meet March 6 in Tulsa at the Sheraton Kensington Hotel. Representatives of Kansas and Oklahoma will attend a meeting of the Kansas-Oklahoma Arkansas River Compact, and Arkansas and Oklahoma commissioners will attend a meeting of the Arkansas River Compact to which those states are parties.

Dr. Lloyd E. Church of Wilburton and John O. Moffitt of Fort Gibson represent the state on the Arkansas-Oklahoma Arkansas River Compact Commission. Jacques Cunningham of Tulsa and Tracy Norwood of Tahlequah are Oklahoma commissioners to the Kansas-Oklahoma Arkansas River Compact. James R. Barnett, OWRB executive director, is also a member of both Arkansas River compact commissions.

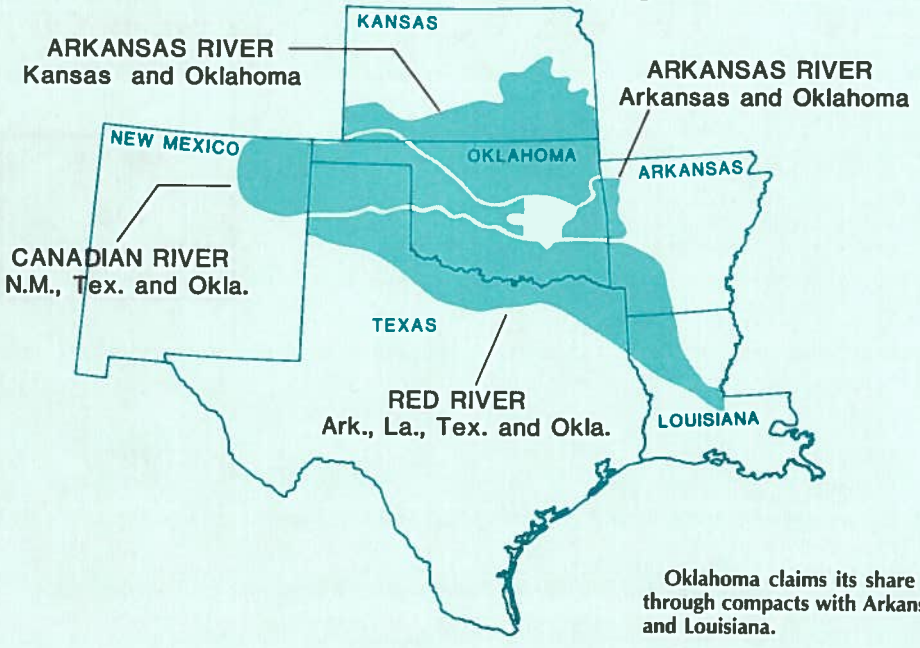
On March 12, Oklahoma, Texas and New Mexico, member states in the Canadian River Compact Commission will meet at Bureau of Reclamation offices in Amarillo, Texas. Representing Oklahoma in that forum will be Bob D. Johnson of Guymon.

On March 28, commissioners from Oklahoma, Louisiana, Texas and Arkansas will convene in Hot Springs, Arkansas, for a meeting of the Red River Compact Commission at the Sheraton Lakeshore Hotel. L.L. Males of Cheyenne and James R. Barnett of the Water Resources Board will participate on behalf of Oklahoma.

Commissioners to the interstate stream compacts are appointed by the governor.

Stream Water Division Chief Wood said the water future in the western United States could be characterized by one word—competition. He pointed out that the demand for fresh water is doubling every 20 years, and that Oklahoma is among the 17 western states that account for 80 percent of the nation's total water use. It's the job of the OWRB Stream Water Division to assure that Oklahoma fares well in the competition for water with neighboring states. The division assists Oklahoma's compact commissioners by providing the background information concerning conservation storage projects, water quality and water quantity that is necessary in negotiating fairly with the other states.

Wood said it is the purpose of the interstate agreements to promote interstate harmony and remove causes of present and future controversy. "The compacts don't eliminate tensions, but they do provide a forum in which most problems can be addressed and resolved without lengthy and costly litigation," he said.



Oklahoma claims its share of water from interstate rivers through compacts with Arkansas, Kansas, New Mexico, Texas and Louisiana.

Here are 14 Tips for Tornado Safety

Oklahoma is second only to Texas in the average annual number of tornados, registering 83 such events to Texas' 119. May is the month Oklahomans experience the most violent weather, so keep these facts in mind as the tornado season approaches.

- Tornados average 30 mph, but may travel at speeds ranging from stationary to 70 mph.
- While most move from southwest to northeast, their direction can be erratic and may change suddenly.
- Don't flee in an auto. Seek or remain in a sturdy shelter. Even a ditch or ravine provides better shelter than a car.
- Most structures have sufficient venting to allow for the sudden drop in atmospheric pressure. Opening a window is not recommended. Opening the wrong window can actually increase damage.
- Most damage is caused by the tornado's violent winds, but most injuries and deaths result from flying debris.
- Stay away from windows and exterior doors.
- Tornado wind speeds increase with height within the tornado, so basements and cellars are safest; closets, bathrooms near the center, on the lowest floor of a sturdy structure are next-best; lower floors and small, inside rooms or stairwells, if you're caught in a high-rise.
- At night or during heavy rain, the only clue to a tornado's presence may be its train-like roar.
- Although most tornados occur between 3 p.m. and 7 p.m., they can occur at any time with little or no warning.
- Plan in advance. Know the safest areas of your home and move to them at first signs of danger. You may have only seconds to act.
- Because mobile homes have large surface-area-to-weight ratios, they

Continued on page 4

Tips, continued from page 3

are easily overturned by high winds. Even if tied down, they should be evacuated for more substantial shelter.

- Sixty-two percent of the tornados that occur each year fall into the weak category, with winds of 100 mph or less and accounting for three percent of the tornado deaths.
- One out of three tornados is strong, with winds of 200 mph, an average path length of nine miles, and a width of 200 yards. Such storms cause 30 percent of tornado deaths.
- Only two percent are violent, but they account for 70 percent of all tornado deaths. Average path lengths and widths are 26 miles and 425 yards, with 300 mph winds.

ACTIVE CONSERVATION STORAGE IN SELECTED OKLAHOMA LAKES AND RESERVOIRS
AS OF FEBRUARY 18, 1986

PLANNING REGION LAKE/RESERVOIR	CONSERVATION STORAGE (AF)	PERCENT OF CAPACITY
SOUTHEAST		
Atoka	113,100	91.0
Broken Bow	918,100	100.0
Pine Creek	77,700	100.0
Hugo	157,600	100.0
CENTRAL		
Thunderbird	105,858	99.9
Hefner	70,000	92.8
Overholser	15,200	95.6
Draper	80,700	80.7
SOUTH CENTRAL		
Arbuckle	62,571	100.0
Texoma	2,560,715	97.0
Waurika	203,100	100.0
SOUTHWEST		
Altus	34,645	26.0
Fort Cobb	68,057	86.8
Foss	119,081	48.8[2]
Tom Steed	69,937	78.6
EAST CENTRAL		
Eufaula	2,200,894	94.5
Tenkiller	627,500	100.0
Wister	27,100	100.0
Sardis	299,518	99.0
NORTHEAST		
Eucha	79,567	100.0
Grand	1,395,080	93.5
Oologah	544,240	100.0
Hulah	30,594	100.0
Fort Gibson	357,907	98.0
Heyburn	6,600	100.0
Birch	18,491	96.3
Hudson	200,300	100.0
Spavinaw	30,000	100.0
Copan	43,400	100.0
Skiatook	———	———[1]
NORTH CENTRAL		
Kaw	411,614	96.0
Keystone	616,000	100.0
NORTHWEST		
Canton	97,421	99.9
Optima	3,000	———[1]
Fort Supply	13,792	99.2
Great Salt Plains	31,400	100.0
STATE TOTALS	**11,590,361**	**91.8[3]**

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.

This monthly newsletter, printed by the Central Printing Division of the Office of Public Affairs, Oklahoma City, Oklahoma, 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.

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OKLAHOMA WATER NEWS
Oklahoma Water Resources Board
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Oklahoma City, Okla. 73152

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