12-1994

Water Current, Volume 26, No. 6, December 1994

Water Current

University of Nebraska Water Center/Environmental Programs

Vol. 26 No. 6
December 1994

Inside

wASTe management problem focus of '95 seminars

"Water Quality and the Waste Management Hierarchy" is the topic for the 1995 Water Resources Seminar Series.

A total of 14 weekly seminars will focus on aspects of waste management as they relate to water quality, emphasizing prevention, then minimization, treatment and disposal.

The series will begin Jan. 11 and continue through April 26. All seminars will take place from 3 p.m. to 4 p.m. on Wednesdays in 116 L.W. Chase Hall on the University of Nebraska-Lincoln East campus.

As usual, the seminars will be available as either a credit course or public lecture. The seminar is offered for one-hour credit in the UNL departments of Agronomy; Biological Systems Engineering; Civil Engineering; Forestry, Fisheries & Wildlife; Geography; Geology; and Natural Resources.

For the first time, the seminars will be available via satellite.

This year, the series is being organized by the Department of Biological Systems Engineering and the Water Center/Environmental Programs unit, UNL.

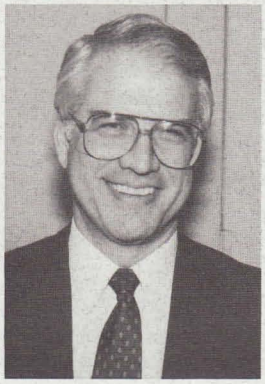
Topics will include consumer issues, industry issues, nonpoint source issues, recycling, composting, remediation, hazardous waste and many other waste- and water-related topics.

A total of 13 weekly seminars will focus on aspects of waste management as they relate to water quality, emphasizing prevention, then minimization, treatment and disposal.

For more information about the series, please contact the Water Center/Environmental Programs unit at (402) 472-3305.

For information about availability via satellite, please call 1-800-755-7765.

From the Director



Bob G. Volk

Front pages of many Nebraska newspapers featured stories on the report "Tap Water Blues" produced by the Environmental Working Group.

The report claimed that millions of Midwestern residents are at risk because they are drinking surface water containing excessive levels of herbicides. The U.S. Environmental Protection Agency is currently studying the report.

Although the report did not contain incorrect data, I question the calculations that led the authors to conclude that residents are at risk. One could take the same data and conclude that our drinking water is exceedingly safe.

The Nebraska Department of Health routinely requires testing of all public drinking water systems, and if the water contains contaminants, it notifies cities in violation immediately.

Another interesting aspect of the report is that it appears the data was based on water samples taken directly from rivers and streams, not from our faucets. To determine risks associated with drinking water, it would seem more appropriate to test water samples from actual drinking water.

The Water Center/Environmental Programs unit, UNL, received numerous calls in regard to the report. In response, we prepared an informational kit that contains fact sheets on the herbicides covered in the report. We also included information on water testing and an extension circular that provides information on pesticides used in Nebraska. These packets are available free; just call or write and we will send you one. (Address below in box)

The Water Sciences Laboratory, UNL, has prepared an in-depth report, "Assessment of Pesticide Occurrence of Nebraska Ground Water," for the Nebraska Department of Agriculture. The results of this study will be made available over the next few months after Department of Agriculture officials have had time to study future well monitoring recommendations.

We hope to publish a new groundwater atlas based on this report.

We appreciate the cooperation of the Conservation and Survey Division, UNL; the Nebraska departments of Health and Environmental Quality; the U.S. Geological Survey; and the Natural Resources Districts in providing data for the assessment.

Finally, I want to remind everyone that the spring Water Resources Seminar series on water quality and waste management will begin in January. I also hope to see many of you at the annual water conference, March 13-15, 1995 in Lincoln.

Bob Volk

WINNERS

Thanks to all readers who responded to our survey regarding a directory of water resources. Congratulations to J.R. Mead of Central City, John Klosterman of David City and Jeremy Reineke of Grand Island, the winners of our survey drawing.

Each winner received a water-related publication.

Water Current

is a publication of the Water Center/ Environmental Programs unit at the University of Nebraska-Lincoln.
Bettina Heinz Hurst — Editor

Water Center/Environmental Programs
103 Natural Resources Hall
P.O. Box 830844
Lincoln, NE 68583-0844
Phone: (402) 472-3305
Fax: (402) 472-3574
Internet: bhurst@unlinfo.unl.edu

Bob G. Volk — Director
Roy F. Spalding — Associate Director, Water Sciences Laboratory Director
Edward F. Vitzthum — Coordinator of Environmental Programs
Robert D. Kuzelka — Assistant to the Director

This newsletter is published with partial financial support from the Department of the Interior; U.S. Geological Survey. The content does not necessarily reflect the views and policies of the Department of the Interior, nor does mention of trade names or commercial products constitute endorsement by the U.S. Government.

Glossary of water-related terms

Editor's Note: This is the last excerpt of the "Glossary of Water-Related Terms," published as NebGuide G93-1191-A by Cooperative Extension, UNL.

The guide was co-authored by William Kranz, David Gosselin, DeLynn Hay and James Goeke.

Part-per-million (ppm) is a measure of concentration of a dissolved material in terms of a mass ratio (milligrams per kilogram, mg/kg). One part of a contaminant is present for each million parts of water. For water analysis, parts per million often is presented as a mass per unit volume (milligrams per liter, mg/l). There are 1 million milligrams of water in 1 liter.

pH is a numerical measure of the acidity or alkalinity of water. The pH scale ranges from 1 (acidic) to 14 (alkaline).

Point source (PS) pollution is the source of surface or groundwater pollution that originates from a well-defined source. Examples include: industrial effluent; large animal containment facilities; city waste water treatment discharges; or chemical spills. Point sources commonly are associated with pipeline discharges of some type.

Precipitation is the process where water vapor condenses in the atmosphere to form water droplets that fall to the earth as rain, sleet, snow or hail. Nebraska's long-term annual precipitation varies from 16 inches in the west to 34 inches in the southeast. Annual deviations can be greater than 30 percent.

Recharge area is the area where water predominantly flows downward through the unsaturated formation (zone) to become groundwater.

Runoff is precipitation or irrigation water that does not infiltrate but flows over the land surface toward a surface drain, eventually making its way to a river, lake or an ocean.

Spring is the point of natural groundwater discharge to a soil surface, river or lake.

Watersheds are regional basins drained by or contributing water to a particular point, stream, river, lake or ocean. Watersheds range in size from a few acres to large areas of the country. In Nebraska, Natural Resource Districts (NRDs) were established along watershed boundaries. In many cases an individual watershed is divided into more than one NRD.

Water table is the upper level of a saturated formation where the water is at atmospheric pressure. The water table is the upper surface of an unconfined aquifer.

Policies topic of '95 conference

Water-related policies on local, state and federal levels will be in the spotlight at the annual Nebraska Water Conference March 13-15, 1995.

The conference, "Water — Understanding a Resource," will take place at the Burnham Yates Conference Center and Cornhusker Hotel in Lincoln.

An electronic information fair will kick off the conference the evening of Monday, March 13. Special hands-on demonstrations of electronic means of accessing water information from data banks and networks will be offered.

The first plenary session on Tuesday, March 14, will focus on the effects of major federal policies. Speakers will discuss the future for the reauthorization of the Federal Safe Drinking and Clean Water acts, the federal Farm Bill and federal environmental protection legislation.

A panel featuring staff members from Nebraska's congressional delegation and the governor's office will respond to the speakers.

Nancy Marzulla, co-chair of the U.S. Federal Circuit Court of Appeals Natural Resources Committee and president and founder of Defenders of Property Rights, will speak at the luncheon.

In the afternoon, information sharing sessions will cover topics such as agricultural chemical management and regulation, solid waste management, wetlands delineation and planning, groundwater protection management and drinking water safety and standards.

Dan Kingkade, educational consultant for the Methodist Employee Assistance Program in Omaha, will provide entertainment during the awards banquet Tuesday night.

On Wednesday, March 15, the second plenary session will address effects of major state policies.

Speakers will offer policy updates on interstate issues with emphasis on Nebraska and Kansas but including Wyoming and Colorado and instream flow allocations. Panels will respond to both topics.

The conference will conclude March 15 after the luncheon and the business meeting of the Water Conference Council. Conference sponsors are the Nebraska Water Conference Council, the Conservation and Survey Division and the Water Center/ Environmental Programs unit, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

A conference brochure will be available in early January. A registration form will appear in the February *Water Current*.

Researchers try to outsmart hardy pests

Termite damage to buildings amounts to more than $1 billion annually in the United States.

Shripat Kamble spends most of his day with two kinds of insects many prefer to avoid: cockroaches and termites.

The University of Nebraska-Lincoln researcher said these hardy pests deserve attention because cockroaches can prompt health concerns and termites can cause property damage.

The most important insect pests in Nebraska's households and public places, cockroaches can be present in almost any place inhabited by humans. They move quickly and are especially active at night. Characteristically, they hide in cracks or between surfaces that provide darkness and cover.

"Cockroaches can eat almost anything, but they especially like starchy food and meat products. However, they'll also feed on glue, wall paper, dead animals and such," said Kamble, a member of the Water Center/Environmental Programs unit.

Kamble evaluates effectiveness of products intended for controlling these pests. He also examines resistance mechanisms in insects.

There are 55 species of cockroaches in the United States, but only five of these are troublesome in Nebraska. Of these, the German cockroach is the most common and most difficult to control.

The need for cockroach control stems from the threat of disease transmission. The insects can carry microorganisms that cause human diseases including food poisoning, dysentery and diarrhea. Other reasons to control cockroaches include their repulsive odor and ability to cause allergic reactions in some people.

The hardy German cockroaches have been found to be immune to currently used pesticides. UNL doctoral student Suresh Prabhakaran of Coimbatore, India, who is scheduled to graduate in December, has found out why. In three years of research, he has isolated an enzyme, isozyme E6, which the cockroaches use to develop insecticide resistance.

"That will help us develop new products with a new chemical that will bypass that particular enzyme," said Kamble, Prabhakaran's adviser.

However, new chemicals are no cure-alls, because the pests continually adapt to them.

"Every five to six years, you have to come up with something new. The insect is always able to survive somewhere," Kamble said. "Sometimes they are able to outsmart the human race."

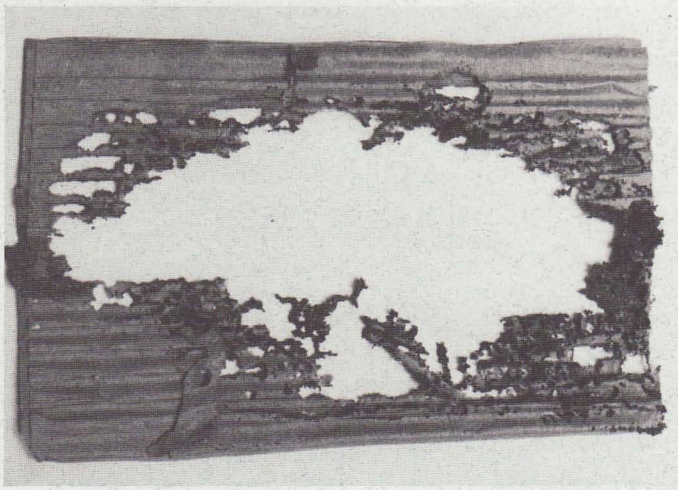
The key to effective cockroach control lies not in chemicals, but in prevention.

Sanitation is one of the most effective and most necessary elements of cockroach control. It is also the easiest and cheapest.

"No matter how many or what kind of chemicals you use, nothing is as important as sanitation," Kamble said.

Cockroaches cannot live without food, water and shelter. Food particles on shelves or floors, unwashed dishes left overnight on the counter and dirty pet dishes and litter boxes all are sources of food for cockroaches.

UNL scientists try to control cockroaches with a variety of means.



Cockroaches feed on almost anything, including glue and wall paper. Sanitation is the key to effective cockroach control, scientists say.

"We're trying different techniques such as baiting technology," Kamble said.

Insecticide gel baits are placed at key points. The insects then ingest a toxic dose of a chemical. Biological control of cockroaches is also being evaluated. A fungus, *Metarhizium anisopliae*, provides more than 90 percent control of resistant and susceptible populations of German cockroaches under laboratory conditions. More research is needed to document its field performance, Kamble said.

When people observe just one or few cockroaches, they should use a sticky trap to determine the level of an infestation.

"The cockroaches can't get out of the sticky traps," Kamble said. "It's a one-way ticket for cockroaches."

Sticky traps are recommended to control light infestations or to monitor cockroach populations.

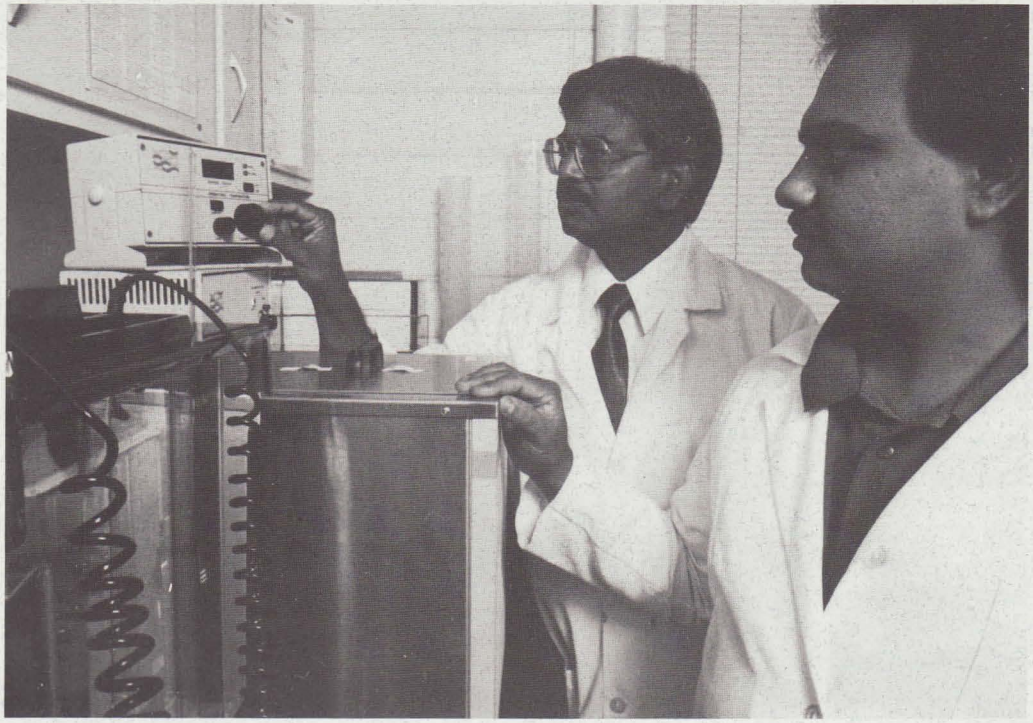
Insecticide sprays should be the last resort.

"People are so scared of the insects. In some cases, chemical control is not really needed. However, people are becoming more cautious in using insecticides," Kamble said.

Another common Nebraska pest Kamble keeps track of is termites.

Termite control is approximately a $1.5 million industry in Nebraska, which gives an indication of the scope of the problem, he said. In the United States, termite damage to buildings amounts to more than $1 billion annually.

Subterranean termites, the most destructive of all termite species, account for 95 percent of the damage.



UNL scientist Shripat Kamble and graduate student Suresh Prabhakaran investigate insecticide resistance mechanisms in cockroaches by analyzing enzymes that the cockroaches use to develop resistance.

Two subterranean species exist in Nebraska.

"These termites feed mainly on wood and wood products containing cellulose," Kamble said.

Kamble examines pesticides registered for termite control. In particular, he investigates their fate in the environment, which is unknown. Kamble's research takes into consideration the different soil types and seeks to determine the degradation of compounds in soil and water.

Insecticide is injected into the soil to create a chemical barrier between the soil and the wood in the home.

Kamble investigates whether the applications of insecticide are as uniform as they need be to be effective for termite control.

Doctoral student Robert W. Davis of Lincoln, has been involved in projects dealing with distribution and fate of insecticides used for termite control. For his Ph.D. work, Davis is assessing the distribution of selected insecticides in sandy and clay soils.

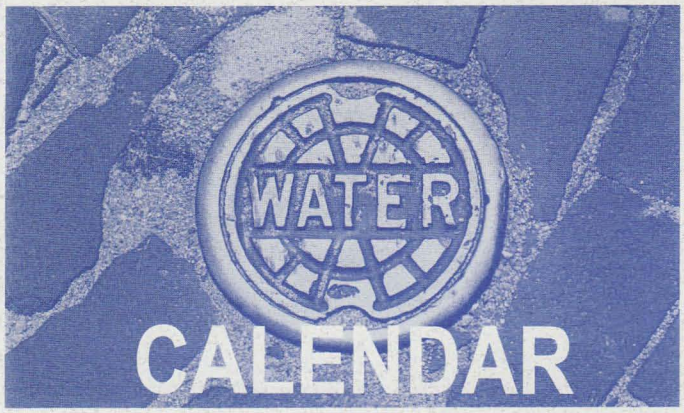
Preliminary research also involves developing bait for termites, which termite workers would take back to the colony. This method of termite control has been successfully used in Florida, but its fate in Midwestern climate is unknown.

Termites have the ability to adjust the depth of their colony in soil depending on temperature and moisture requirements. During the cold Nebraska winters, termites may move 18 to 20 feet below soil surface.

Kamble's work is supported by the Agricultural Research Division and the Water Center/ Environmental Programs unit, UNL; state and federal grants; and private industry.

"People are so scared of the insects. In some cases, chemical control is not really needed. However, people are becoming more cautious in using insecticides."

— Shripat Kamble
UNL scientist



December

Dec. 12-13: "Protecting Ground Water: Promoting Understanding, Accepting Responsibility, and Taking Action." Washington, D.C., Renaissance Hotel. Sponsored by Terrene Institute in partnership with U.S. EPA. Contact Terrene Institute, Washington, D.C., (202) 833-8317 (phone).

Dec. 23-Jan. 3, 1995: UNL Closedown.

January

Jan. 11: Water Resources Seminar, 3 p.m. to 4 p.m., 116 L.W. Chase Hall, UNL, and via satellite.

Jan. 18: Water Resources Seminar, 3 p.m. to 4 p.m., 116 L.W. Chase Hall, UNL, and via satellite.

Jan. 23-27: Urban Pest Management Conference, Lincoln.

Jan. 25: Water Resources Seminar, 3 p.m. to 4 p.m., 116 L.W. Chase Hall, UNL, and via satellite.

Jan. 30-31: Nebraska Association of Resources Districts Legislative Conference, Cornhusker Hotel, Lincoln. Contact NARD, (402) 474-3383 (phone).

February

Feb. 1: Water Resources Seminar, 3 p.m. to 4 p.m., 116 L.W. Chase Hall, UNL, and via satellite.

Feb. 5-9: National Association of Conservation Districts Convention, New Orleans Marriott, New Orleans. Contact NACD Service Dept., League City, Texas, (713) 332-3402 (phone).

Feb. 8: Water Resources Seminar, 3 p.m. to 4 p.m., 116 L.W. Chase Hall, UNL, and via satellite.

Feb. 15: Water Resources Seminar, 3 p.m. to 4 p.m., 116 L.W. Chase Hall, UNL, and via satellite.

Feb. 22: Water Resources Seminar, 3 p.m. to 4 p.m., 116 L.W. Chase Hall, UNL, and via satellite.

March

March 1: Water Resources Seminar, 3 p.m. to 4 p.m., 116 L.W. Chase Hall, UNL, and via satellite.

March 7: Nebraska Children's Groundwater Festival, Grand Island. Contact The Groundwater Foundation at (402) 434-2740 or 1-800-858-4844.

March 8: Water Resources Seminar, 3 p.m. to 4 p.m., 116 L.W. Chase Hall, UNL, and via satellite.

March 10-12: Nebraska Environment Education Association Conference, Hastings. Contact Kristin Gottschalk , Wahoo, (402) 443-4675 (phone)

March 13-15: Annual Nebraska Water Conference, "Water: Understanding a Resource," Burnham Yates Conference Center and Cornhusker Hotel, Lincoln. Contact Water Center/Environmental Programs, UNL, (402) 472-3305 (phone).

March 23-24: Ozark Cavefish Conference II, Springfield, Mo. Contact Brian Canaday, (417) 895-6880 (phone), (417) 895-6910 (FAX).

March 24: Earth Wellness Festival. A County-Wide Event for Fifth-Graders. 9 a.m. to 4 p.m., Southeast Community College, Lincoln. Contact Arlene Hanna or Soni Ericksen, 444 Cherrycreek Road, Lincoln, NE 68528-1507, (402) 441-7180 (phone).

March 29: Water Resources Seminar, 3 p.m. to 4 p.m., 116 L.W. Chase Hall, UNL, and via satellite.

April

April 5: Water Resources Seminar, 3 p.m. to 4 p.m., 116 L.W. Chase Hall, UNL, and via satellite.

April 12: Water Resources Seminar, 3 p.m. to 4 p.m., 116 L.W. Chase Hall, UNL, and via satellite.

April 19: Water Resources Seminar, 3 p.m. to 4 p.m., 116 L.W. Chase Hall, UNL, and via satellite.

April 23-26: "Water Conservation in the 21st Century: Conservation, Demand, and Supply." Salt Lake City. Contact J. Paul Riley, Utah State University, Logan, UT 84322-4110, (801) 750-2783 (phone).

April 26: Water Resources Seminar, 3 p.m. to 4 p.m., 116 L.W. Chase Hall, UNL, and via satellite.

May

May 8-10: "Planning for a Sustainable Future: The Case of the North American Great Plains," Lincoln. Contact Donald Wilhite, International Drought Information Center, P.O. Box 830728, University of Nebraska, Lincoln, NE 68583-0728. (402) 472-6707 (phone), agme002@unlvm.unl.edu (e-mail).

May 14-18: American Institute of Hydrology Annual Meeting, Denver. Contact AIH, (612) 379-1030 (phone). Contact AIH, 3416 University of Hydrology, 3416 University Avenue SE, Minneapolis, MN 55414-3328, (612) 379-1030 (phone), (612) 379-0169 (fax).

July

July 17-19: North Central Regional Meeting, American Society of Agronomy, "Agricultural Management to Protect Water Quality," Grand Island, College Park.

Reflections on a year well spent

by Bob Kuzelka, associate professor and assistant to the director, Water Center/ Environmental Programs, UNL

Moving a program from concept to reality offers either an academic, or a planner, the opportunity to visit a different world. After 25 years as a planner with six of them as an instructor, it was a chance I didn't want to miss.

Since Jan. 1, 1994, I have spent the majority of my time as director for the Nebraska-based Groundwater Foundation's Groundwater Guardian program. This is a program designed to support, recognize and connect communities protecting their groundwater.

I had been serving as a consultant to the foundation on the program for almost two years. This included working with Susan Seacrest, foundation president, from when she first began to talk about such a program for the foundation.

Bob Kuzelka

The first task of the year was to recruit communities to test the program as detailed in a draft guide. With the help of many, eight communities were enlisted. Their range of geographic, demographic and hydrogeologic settings was far beyond my expectations.

By August it was clear that all eight had successfully completed the program and would become Groundwater Guardians for 1994. This decision was made with approval from the program's international management team and Seacrest.

Along the way the communities helped to refine and redefine the program. They, along with the team and Seacrest, confirmed that the program was ready to launch. A revised program guide was published, and a conference was held. The promotion efforts netted in over 400 communities with an interest in the program. 150 attended the November conference.

Just prior to the conference each test-year community was recognized at a local ceremony which were as varied as the locations. But, whether at a southern fish fry, before 100 fifth-grade Native Americans or in the most formal council chamber, I was well rewarded for my extra efforts this year.

Oh, by the way, your community should enter the program and become a Groundwater Guardian. Just call 1-800-858-4844. Tell them Bob sent you.

Mailing List Update

We are updating our mailing list. If you have a change of title, name, and/or address, or would like to have your name added or removed from the Water Current mailing list, please complete this form. If you know of individuals who might be interested in receiving our publications, please submit their names.

Please: ☐ revise my address ☐ delete me from your list ☐ add to your list

Name: _____

Address: _____

City, State, Zip: _____

Send update to:

Water Center/Environmental Programs
103 Natural Resources Hall, University of Nebraska-Lincoln, P.O. Box 830844
Lincoln, NE 68583-0844 • Phone (402) 472-3305 • Fax (402) 472-3574

Scientific conference "in the bush"

The International Specialized Conference "River Basin Management for Sustainable Development" will begin with breakfast "in the bush" and end with listening to animals in their natural habitat.

Registration deadline for the conference, which will take place May 15-17, 1995, in Krüger National Park, South Africa, is Jan. 31, 1995.

Organizers are the South African National Committee of the International Association of Water Quality, the River Basin Management Technical Division of the Water Institute of Southern Africa and the South African National Parks Board.

Contact Alan H. Vicory, Jr., c/o Ohio River Valley Water Sanitation Commission, 5735 Kellogg Avenue, Cincinnati, OH 45228; (513) 231-7719 (phone); (513) 231-7761 (FAX).

Symposium spurs water discussion

Participants at the Groundwater Foundation's annual symposium taste unlabelled water samples Oct. 18 in Lincoln. Conference attendees preferred bottled water (54 percent) to Lincoln tap water (36 percent) and distilled water (21 percent).

True to its title, the annual symposium of the Groundwater Foundation challenged scientists and concerned citizens to address pressing water issues.

Titled "The Drinking Water Challenge," the 10th annual symposium on Oct. 18 drew about 200 participants.

Keynote speaker Eric Olson of the Natural Resources Defense Council, Washington, D.C., released data and conclusions from "Tap Water Blues," a report of the Environmental Working Group that suggests Midwestern residents are exposed to exceedingly high levels of pesticides in drinking water.

Joan Rose, a water pollution microbiologist at the University of Southern Florida, Tampa Bay, called attention to the threat of viruses in drinking water. Very little research has been conducted on microbial contamination, which she said poses significant health threats to children and the elderly.

About 140 different types of viruses that may affect human health exist in water, and by relying on bacterial indicators for water quality standards, a whole group of contaminants is missed, she said.

Jack Daniel, director of Nebraska Health Department's drinking-water section, noted that the state has not seen an outbreak of water-borne illness since 1960.

Dr. Dennis Weisenburger of the University of Nebraska Medical Center, Omaha, presented preliminary research results indicating an association between two kinds of birth defects and high levels of concentration of the herbicide atrazine and between high nitrogen use areas and non-Hodgkin's lymphoma.

Overall, he said, current research shows a correlation between health risks and areas of intense agricultural production.

Panel discussions on the reauthorization of the Safe Drinking Water Act and the Clean Water Act rounded out the conference in the afternoon.

WATER CENTER/ENVIRONMENTAL PROGRAMS
103 Natural Resources Hall
University of Nebraska
P.O. Box 830844
Lincoln, NE 68583-0844

NON-PROFIT ORG.
U.S. POSTAGE
PAID
Lincoln, Nebr.
Permit No. 46

Printed with soy ink on
15% post-consumer recycled paper