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Water Current

Water Center ***University of Nebraska*** **August 1988**

Pacific Northwest Destination of Annual Water Resources Fall Tour

An irrigation research scheduling project using satellites and computers for information about evapotranspiration rates and crop water needs is one of the highlights of the 17th annual fall Water Resources and Irrigation tour Sept. 10 through 17 to the Pacific Northwest.

This project is at Oregon State's Hermiston Agriculture Research and Extension Center. OSU's Dean of the College of Agricultural Sciences Roy Arnold will be luncheon speaker before the visit. Arnold, former vice chancellor of the UNL Institute of Agriculture and Natural Resources, will compare Oregon's agriculture with Nebraska's.

Another former Nebraskan from Schuyler, James Jura, will explain the Bonneville Power administration at Portland, Ore. Jura, a Bonneville administrator, will explain the largest supplier of electricity in the U.S.

At the Washington State University Irrigation Agricultural Research and Extension Center, Lin Faulkner, formerly of Kansas State University, will host a visit to the WSU Research Center and a hops farm.

A highlight of the tour will be a visit to the Grand Coulee Dam, a $4 billion project that was begun in 1933 and finished in 1941. The Columbia Basin Project irrigates over 500,000 acres and the lake behind the dam stores nearly 10 million acres of water with a surface area of 82,230 acres. "It's the second largest concrete dam in the world," Les Sheffield, extension farm management specialist at the University of Nebraska–Lincoln, said.

From U.S. Ecology, Inc., while in

(See p. 2—Annual)

Roger Gold to Direct UNL Water Center

Roger Gold, coordinator of environmental programs was appointed interim director of the UNL Water Center June 1. Irv Omtvedt, vice chancellor for Agriculture and Natural Resources said that this appointment reflects an expanded emphasis in the water area for IANR at the University of Nebraska–Lincoln.

"The program focus for the Water Center will be broader than previously administered by the UNL Water Resources Center which was a part of the Conservation and Survey Division," Omtvedt said. He pointed out that concerns about water quality and quantity have emerged as a major concern in Nebraska and nationally.

"We are asking Dr. Gold," Omtvedt said, "to provide leadership in developing a well-coordinated, well-balanced, innovative program that addresses the priority problems and issues associated with water in Nebraska. Water quality has been targeted as a high priority program thrust for both IANR and the University of Nebraska."

Roger Gold

Dr. Bill Powers was director of the Water Resources Center for eight years. He will continue to be active in water-related research and teaching programs as a professor in the Department of Agronomy.

As interim director of the Center, Gold will serve as Interim Assistant Dean and Director for Water Programs in the Agricultural Research Division and the Cooperative Extension Service.

Before his appointment Gold served as head of the Department of Entomology and Coordinator of Environmental Programs. In his new post, he will continue to be responsible for Environmental Programs.

Since joining the UNL faculty in 1977, Gold has been an active participant in numerous water-related projects. They include: the Maple Creek Model Implementation Project, Hall County Water Quality Special Project, Long Pine Rural Clean Water Project and most recently the Burlington Northern Foundation Water Quality Project.

(See p. 3—Gold)

We've Moved!

Water Center on East Campus

Since the beginning of the Water Center, we've seen several homes. The most recent was the four-year housing within the Conservation and Survey Division on City Campus in Nebraska Hall.

Now we're back out on East Campus in the Natural Resources Hall. Phone number remains the same: 402-472-3305.

EPA Releases Booklet on Groundwater Protection

Potential contamination impacts in ground water are explored in a 60-page report from the U.S. Environmental Protection Agency, "Protecting Ground Water: Pesticides and Agricultural Practices." It spells out potential impacts of agronomic, irrigation and pesticide application methods on groundwater.

Marian Mlay, director of the EPA Office of Ground Water Protection, said, "This report provides state and local water quality and agricultural officials with technical information to help in the development of programs to protect ground water from pesticide contamination."

She said that encouraging sound choices and management of pesticides is an important element of ground-water protection programs at all levels of government. Spelled out are pesticide properties conducive to leaching, methods to reduce pesticide contamination of groundwater, pesticide application factors, irrigation practices and other practices to reduce contamination potential.

She explained pesticide properties that are conducive to leaching as "recent public concern." Physical and chemical characteristics of a pesticide that may be conducive to leaching include: water solubility, soil adsorption, volatility and soil dissipation.

Pesticides and related chemicals that have the greatest potential for leaching, according to the report, are fungicides, herbicides, insecticides, nematicides and seed protectants.

On the other hand, the method and timing of irrigation and pesticide application also creates site conditions that are conducive to pesticide leaching. "With some irrigation methods soils are kept at or near full saturation and this promotes leaching."

A carefully adopted plan for pest management plays a significant role, EPA said, in helping reduce the potential for pesticide leaching to groundwater. Factors of a successful plan include:

—Choosing a pesticide with low leaching potential,

—Properly timed pesticide application relative to climate, crop stage and weed and insect populations,

—Controlling the volume and frequency of application and using the correct form of pesticide.

In addition, methods of application affect pesticide leaching to groundwater. Aerial pesticide application may not always be uniform and may drift from the target site to surface water or adjacent fields.

Planting pest resistant varieties is an increasing non-chemical pest control method. The report says that about 75 percent of U.S. acreage is planted "with pest-and disease-resistant crop varieties." This reduced the usage of insecticide significantly between 1971 and 1982.

Another way to give crops a competitive edge over insects and weeds is to plant before weed emergence. For example, an early crop canopy in narrow rows gives corn a better start and this also slows water movement in the soil and reduces the pesticide leaching potential.

Finally, the EPA cited a 1984 University of Nebraska report showing that avoiding excess irrigation and frequency limits the potential for pesticide leaching.

(Annual—from p. 1)

Hanford, Wash., the group will hear about the storage of low-level radioactive waste at the Hanford U.S. Department of Energy site. Other highlights include stops at Joseph Dam, the end of the salmon migration; Lake Chelan, fed by 27 glaciers and 59 streams, where the area "looks like Switzerland"; visits to a llama ranch, a winery, a vegetable processing plant and the Columbia Wildlife Refuge.

Planes will depart from Lincoln, Omaha and Denver, or the tour can be begun in Portland for those who would be vacationing in the area. And there are Sept. 9 or 10 air departures.

The annual out-of-state tour is co-sponsored by the Nebraska Water Conference Council and the UNL Institute of Agriculture and Natural Resources. Tour chairman is J. Michael Jess, director of the Nebraska Department of Water Resources, with Sheffield, who may be reached at (402) 471-1773, the tour director.

Research Review

Recent Projects Completed by UNL Scientists

Research funded under Section 104 of P.L 98-242 of the Water Resources Act of 1984 allocated to state water research institutes that has been concluded at the University of Nebraska–Lincoln includes:

—Soil Type, Tillage and Precipitation Pattern as Factors Influencing Groundwater Recharge and Surface Water Supplies: Alice Jones, agronomy; Elbert Dickey, agricultural engineering; and Kenneth Hubbard, Center for Agricultural Meterology and Climatology.

This two-year research evaluated and predicted the influence of soil type, tillage and precipitation patterns on potential groundwater recharge and surface water supplies.

—Assessing Agricultural Drought Impact: The Development of a Crop Specific Index for Winter Wheat and Corn. Donald A. Wilhite and Kenneth G. Hubbard, Center for Agricultural Meterology and Climatolgy.

With this three-year research, crop specific drought indices for winter wheat and corn for the central Great Plains were developed to determine influences of weather and drought on crop growth, development and yield.

—Conservation of Soil and Water Utilizing Interrow Tillage Techniques: William L. Kranz, Northeast Research and Extension Center; and Dean E. Eisenhauer, South Central Research and Extension Center.

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Water Center

Roger Gold
Interim Director

Pat Larsen
Editor

Christine Grant
Editorial Assistant

Natural Resources Hall
402-472-3305
University of Nebraska
Lincoln, NE 68583-0844

Water Quality Initiative Teams Gear Up for Nebraska Water Quality Priority Initiative

Enhancing water quality is one of the six priority initiatives of Nebraska Cooperative Extension programming for the next three-to- five years, according to Leo Lucas, UNL Extension programming director.

The water quality initiative will have three major components, according to Roger Gold, coordinator of this initiative.

The Water Quality Priority Initiatives are:

—To provide a safe and adequate domestic water supply; team leader: DeLynn Hay, extension specialist in agricultural engineering;

—To reduce nitrates in groundwater; team leader: Dick Wiese, extension soils specialist in agronomy; and

—To reduce pesticides and other synthetic organic contaminants in groundwater; team leader: Larry Schulze, pesticide extension specialist in environmental programs.

Each team has prepared a "plan of work" that defines the situation, objectives, action and evaluation for the priority initiatives.

Water quality is one of the six major issues that was identified by contacts and surveys throughout Nebraska. Nationally, the Cooperative Extension System identified initiatives that are critical to the economic, social and environmental welfare of Americans. Water Quality was also included in the national initiative.

The issue, according to Gold, is that contaminants from many sources that include agriculture, have affected our water quality. "We need to ensure that Nebraskans have adequate and quality ground water for now and for our children and grandchildren."

Educational programs will be developed for the three teams that will include existing Extension programs as a base with an emphasis on special audiences. Action plans for the future include:

Domestic Water Quality Team

This team is focusing on educational transfer systems for well construction and abandonment, domestic water testing, alternatives for providing safe and adequate water in order for private water-supply owners and the public to increase their understanding of the occurrence and movement and quality of water that provides domestic water. The impact of human activity on these water resources is another concern of this group.

Groundwater Nitrate Team

Nitrogen fertilizer in residual soil and in irrigation water, proper irrigation scheduling and nitrogen management, determining a reasonable yield goal are focuses of this group's concerns. This team is considering educational methods for diverse publics to provide information about nitrates in the ecosystem.

Calendar

Sept. 9-17: Nebraska Water Resources and Irrigation Tour to the Pacific Northwest.

Oct. 4: Third annual University of Nebraska Water Policy Forum, State Aquarium, Gretna; "Drought Identification and Response," Don Wilhite

Sept ~~Oct.~~ 24: Nebraska Water Conference Council fall meeting, breakfast, 9:30 a.m., Nebraska Room at Nebraska Center's North Wing.

Nov. 1: Nebraska Groundwater Foundation Fall Symposium. Theme: Interrelationship between surface and groundwater. Keynote speaker: Christine Olsenius of the Minnesota Freshwater Foundation. For more information, call Susan Seacrest, 402-423-7155.

Water Quality and Pesticides

Known methods of ground water contamination by pesticides include infiltration through the soil, spills and accidents, improper pesticide storage and disposal and back flow into wells. The pesticide team hopes to increase the awareness of potential risk of chemical movement into groundwater with an educational program about groundwater management.

Review

Action plans of the Water Quality Priority Initiative will be reviewed before definite plans are formed that will enable teams to reach their goals.

(Gold—from p.1)

In addition, Gold serves on national, state and IANR committees and task forces concerned with water issues and problems. Among them are: the Extension Water Quality Initiatives Task Force, U.S. Department of Agriculture; the Nebraska Water Quality Management Technical Committee; and the Nebraska Rural Clean Water Program Steering Committee. He is a member of the IANR Water Policy Committee and chairs the Chemigation Task Force and Extension Water Coordinating Committee.

A native of Utah, Gold holds bachelor and master degrees in zoology and biological sciences respectively from the University of Utah. He received his Ph.D. degree in entomology from the University of California-Berkeley.

He joined the University of Nebraska from the University of Arizona as coordinator for Environmental Programs and was appointed head of the Department of Entomology in 1985.

Gold's research interests are in the areas of pest management and pesticides. He is the author of numerous research and extension publications.

Omtvedt said the University is "indeed fortunate to have an individual with Dr. Gold's leadership abilities and experience appointed to this extremely important position."

This newsletter was published with funds that were in part provided by the U.S. Geological Survey, Department of the Interior, as authorized by the 1984 Water Resources Research Act.

Conservation Called For On Annual Water Resources Tour

Water conservation, flood prevention and water recreation in southeast and eastern Nebraska are compatible. Toss in soil conservation methods, such as streambank protection and tree planting, and you've got the goals of the four Natural Resources Districts that were visited during the 16th annual Nebraska Water Resources and Irrigation Tour.

The Lower Platte NRD, Lincoln; Lower Big Blue, Beatrice; Nemaha at Tecumseh; and the Papio at Omaha put on their best "bib and tuckers" for the 100 persons on the 2-day trip. Participants endured 100-plus degree temperatures on July 14; and the following day, while in the Ashland-Gretna area, they narrowly missed a tornado touchdown at Omaha and Council Bluffs.

Following a tour and luncheon at Valmont Industries, Inc., Valley, Durward B. "Woody" Varner, University of Nebraska Foundation, asked "what are we doing to conserve Nebraska's precious water?" He reminded that Nebraska water that flows down the Missouri River into the Gulf of Mexico "is lost forever."

"I hurt when I think of water that's generated in Nebraska and is lost," the founder of the Nebraska Water Conference Council said. "Nebraska has a renewable gold mine in its Ogallala Aquifer," Varner said. The state is sitting on top of an aquifer equivalent in size to Lake Huron.

"Where are we going," Varner, former NU president, asked. He mentioned seeding of crops by center pivot, the importance of aquifer recharge, efficient use of water and water quality.

Citing water quality as the "most haunting" dimension of Nebraska's future, he said, "we don't have the technology to reverse the contamination already in our groundwater."

Varner stressed that there's nothing more important to Nebraska than its water industry, although it has no common voice in the state legislature. He called for a strong water industry lobby in the Nebraska Unicameral.

DeWitt Mayor Dorothy Mahloch traced the history of flooding of DeWitt that included the $5 million damage to the town in 1984. "We're determined not to let this happen again," Mahloch said, as she pleaded for more flood control in the area.

At Homestead National Monument near Beatrice, Irv Omtvedt, UNL vice chancellor for agriculture and natural resources, said, "It's fitting to be at the homestead where Daniel Freeman's symbol of agricultural development began." Freeman filed a claim for one of the first homesteads Jan. 1, 1863 at Brownville, Neb.

Omtvedt tied together three pieces of federal legislation that helped open up the West:

—The Homestead Act of 1862, under which settlers could claim 160 acres of land by paying a small filing fee.

—The Morrill Act that established Land-Grant colleges, signaling the nation's commitment to investing in agricultural education.

—Establishment of the U.S. Department of Agriculture.

Nebraska Water Resources Center
The University of Nebraska–Lincoln
113 Nebraska Hall
Lincoln, NE 68588-0517

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