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SDWRI Water News

South Dakota Water Resources Institute

Spring 2005

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Recommended Citation

South Dakota Water Resources Institute, "SDWRI Water News" (2005). *SDWRI Water News*. Paper 15.
http://openprairie.sdstate.edu/sdwri_news/15

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SDWRI

South Dakota State University, College of Agricultural and Biological Sciences

Water News
Volume 1 No. 1
Published Quarterly by
South Dakota
Water Resources Institute
Director: Van C. Kelley

104B Projects Funded

The South Dakota Water Resources Institute (SDWRI) is pleased to announce the following projects have been funded for 2005:

"The Influence of Manure Placement on Crop Yields and the Transport and Fate of Nutrient and Antibiotics," Principal Investigators: Sharon Clay, Professor of Plant Science, David Clay, Professor of Plant Science, and Gregg Carlson, Professor/Extension Specialist of Plant Science, all from South Dakota State University (SDSU).

"Fate of Disinfectants and Disinfection By-Products in Water Distribution Systems," Principal Investigator: Delvin DeBoer, Professor and Director of the Water and Environmental Research Center, SDSU.

"Water Conservation Using Automated Irrigation Water Management for Center Pivots," Principal Investigators: Hal Werner, Professor/Extension Specialist, Agricultural and Biosystems Engineering and Todd Trooien, Associate Professor, Agricultural and Biosystems Engineering, both from SDSU.

"Evaluating Phosphorus Loss on a Watershed Scale," Principal Investigators: Frank Schindler, Research Associate III, Chemistry and Biochemistry, David German, Research Associate III, SDWRI, Ron Gelderman, Professor, Plant Science, and Jim Gerwing, Professor/Extension Specialist, Plant Science, all of SDSU.

"Development of an Agglomeration Process to Increase the Efficiency of Limestone-Based Material to Remove Metals from Drinking Water," Principal Investigators: Arden Davis, Chairman of the Department of Geology and Geological Engineering, and David Dixon, Professor, Chemical Engineering, both from South Dakota School of Mines and Technology.

Nine pre-proposals were submitted to SDWRI. A panel of five reviewers from the U.S. Geological Survey (USGS), Department of Environmental and Natural Resources (DENR), Natural Resources Conservation Service (NRCS), the South Dakota Department of Agriculture (SDDA), and SDSU reviewed the pre-proposals.

The reviewers used a point system to narrow the selection to the final five proposals to be submitted to USGS under the 104b annual grant.

Youth Education

The First Annual Legislative Water Festival was held in Pierre January 12, 2005. The purpose of the event was to introduce legislators to a water festival and remind them of the necessity of educating younger generations about preserving one of nature's greatest resources--water.



Dave German, SDWRI, explains the aquatic food chain to South Dakota Secretary of State Chris Nelson.

Fourth-grade students from all over South Dakota are the target audience for water festivals. At this age, students understand the topics presented early enough in their development of values to adopt the positive environmental behaviors promoted by water festivals. A festival is designed to provide an opportunity for the students to apply water education knowledge learned in the classroom to "real life"



problem solving situations by providing a multi-topic, one-day water science fair to contribute to future water-awareness.



Becky Banks, EDWDD explains rainfall formation.

The Legislative Water Festival, held in the Capitol building rotunda, gave adults who have a hand in directing education an opportunity to view a small portion of the activities held during a festival. In South Dakota, water festivals are offered in Brookings, Aberdeen, Pierre, Huron, and Sioux Falls.

Staff on hand represented three water festivals to supply a small sampling of typical activities. The South Dakota Water Resources Institute (SDWRI) booth gave legislators a look at the aquatic food chain, beginning with different species of algae, continuing to zooplankton, and ending with scavengers (like crayfish) and turtles. The "Under the Microscope" booth allowed people the opportunity to view ten different microscopic organisms. SDWRI Research Associate David German said the adults had many of the same reactions as Fourth graders when they examine a specimen. "'Cool!' 'Gross!' and 'Wow!' were common reactions," he said.

Secretary of State Chris Nelson took a few minutes to peer through the microscopes and visit with German about aquatic life. "I haven't had the opportunity to look through a microscope since I was an animal science major at SDSU!" Nelson said.

East Dakota Water Development District (EDWDD) representative Becky Banks demonstrated different as-

pects of weather. She used various models to show cloud formation, tornados, and rainfall occurrence. Her tornado demonstration allowed legislators a visual look into the vortex of a tornado. Banks also had the opportunity to explain the importance water plays in the weather cycle to several kids who stopped by after school. She also visited with Thomas Van Norman, the legislator from Eagle Butte about planning a water festival for his area.

Anne Lewis, the Information and Education Project Administrator on Project WET (Water Education for Teachers) South Dakota, was on hand to explain a display depicting water history. The display showed how water was used in ice form to keep storehouses cool and how to let the ice delivery service know how much ice was needed. The display also included a plunger and washboard for washing clothes and a wooden water bucket.

Jay Gilbertson, manager of EDWDD, said he thought the festival went well. "I got lots of positive comments from the Brookings area legislators and others. There was a lot of interest," he said. "I believe that this was very effective at getting our message out."

Since 1992, water festivals have delivered a strong water conservation message. In the past 14 years, 82,000 fourth graders have been armed with the knowledge necessary to preserve and protect our state's water supply.

Rain Simulation

A phosphorus research initiative that began with a literature survey in 2000 and conference in 2001 led to a research project to determine the relationship between soil test phosphorus (STP) and runoff phosphorus on soils in eastern South Dakota.

Field day demonstrations as well as demonstrations of indoor rain simulation were held for local farmers as well as cooperating agency personnel this past year.

Presentations about project results were also made to the Soil Science Department at the University of Wisconsin, the SDSU Agricultural Engineering Department Soil Moisture Workshop and to DENR.

Angela Guidry was hired in Fall 2002 as a PhD student in the Atmospheric, Environmental and Water Resources Program at SDSU. This is the first time SDWRI has been able to support a PhD student in more than 20 years. Guidry's research project is enti-



Angela Guidry explains the rain simulator operations to producers at DakotaFest.

tled "Establishing a Relationship between Soil Test Phosphorus (P) and Runoff Phosphorus for South Dakota Soils Using Simulated Rainfall." One of the objectives of the phosphorus research initiative was to provide data to DENR so that regulations for manure application based on scientific data from South Dakota could be developed. The Environmental Protection Agency (EPA) issued new National Pollutant Discharge Elimination System (NPDES) regulations for Concentrated Animal Feeding Operations (CAFOs) which became effective February 12, 2003. DENR developed technical standards for manure management that would meet EPA requirements based on data from the phosphorus research project.

Ron Gelderman and Jim Gerwing, two of the pro-

Manure Application Guidelines

Olsen Soil Test P,	Erosion estimate (sheet and rill), tons/a				
	<4		4-6		>6
	Filter strip		Filter strip		
0-6 inch ppm	yes	no	yes	no	
0 - 25	N need	N need	N need	N need	none
25 - 50	N need	N need	N need	P removal	none
50 - 75	N need	P removal	P removal	P removal	none
75 - 100	P removal	P removal	P removal	P removal	none
>100	none	none	none	none	none

ject's principle investigators, used lab sorption data on the vienna soil to recommend manure application guidelines. The new standards state that manure may

only be applied to soils containing less than 100 ppm phosphorus. Prior to this study, the only guideline in place stated that producers could apply manure to any field as long as nitrogen requirements were met for the crop being planted; therefore, producers were applying more phosphorus than necessary.

Producers have accepted the new DENR standards because they are simple, utilize data generated in South Dakota, and use farming techniques that producers are familiar with. They were also developed by experts from the state who are well-known and credible to producers.

Because of their superior leadership and creativity in developing a technical standard for nitrogen and phosphorus nutrient management plans in South Dakota, DENR nominated Gelderman and Gerwing for an External EPA Environmental Award.

CONGRATULATIONS GENTLEMEN!!

Upcoming RFPs

SDWRI would like remind researchers that the deadline for submission of proposals for the USGS 104G Competitive Grant is February 22, 2005. The USGS request for proposals can be found at the National Institutes for Water Research's web site, www.niwr.org. The required format is also a link on the SD WRI homepage <http://wri.sdstate.edu>.

For questions or comments on any of the articles found in this newsletter, please contact:
South Dakota State University
South Dakota Water Resources Institute
AE 211 Box 2120
Brookings, SD 57007

Phone: (605) 688-4910
Fax: (605) 688-4917

Email: Jennifer.Pickard@sdstate.edu
Web page: <http://wri.sdstate.edu>

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