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Water Current

Third Festival of Color attracts thousands of visitors

A crisp fall day and interest in water-conserving landscaping drew a record 4,200 visitors to the Festival of Color Sept. 9. The annual lawn and garden open house sponsored by the UNL Department of Horticulture at the Agricultural Research & Development Center near Ithaca stressed environmentally sound landscaping and gardening practices.

Crowd favorites included the landscaping talks and demonstrations as well as the guided tours through the site, a new feature this year, said Amy Greving, festival co-coordinator. As in previous years, many visitors brought in plants to be diagnosed by Institute of Agriculture and Natural Resources experts.

Vendors and a food court rounded out the event for the visitors. "The number of vendors participating shows the good partnership between the university and private business," Greving said.

Youth education events were expanded this year as youngsters learned how to test lake water for turbidity by using a secchi disk, built wells in cups and played the "Water Wheel of Fortune."

Visitors received a copy of "Creating Your Own Festival of Color with Perennial Flowers," which includes a list of perennials best adapted to the broad range of growing conditions in Nebraska.

"The festival is an important aspect of our outreach activities because it reaches an urban audience interested

in environmentally safer practices. These lawn and garden practices have a direct impact on water quality and water conservation," said Bob Volk, director of the Water Center/Environmental Programs unit, which helped sponsor the event. The U.S. Environmental Protection Agency Region VII also supported the event through the Nebraska Department of Environmental Quality because of the festival's emphasis on preventing nonpoint source pollution and conserving water.



Orin and Dolores Graff, Davey, take a close look at a landscaping display during the Festival of Color Sept. 9 at the Agricultural Research and Development Center near Ithaca. Photo — Mark Hanson/IANR

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SEER satellite program off to promising start



Bob G. Volk

from the **DIRECTOR**

On Tuesday afternoons, more than 100 science teachers in Nebraska meet at 15 downlink sites to participate in a new water education program.

The Satellite Educational and Environmental Research (SEER) program, sponsored by the University of Nebraska-Lincoln, has begun its weekly series of satellite broadcasts. In the spring, the teachers will implement a curriculum focusing on water in their schools.

Although it is too late to join the program now, you might be interested in visiting one of the sites and seeing how the program works. Contact us for more details.

The last few weeks offered several excellent outreach events. I hope many of you had a chance to visit the Festival of Color at Ithaca. More than 4,000 visitors attended and were very complimentary about the program and the abundance of free advice and materials. Congratulations to the UNL Department of Horticulture and the Agricultural Research and Development Center for sponsoring this fine event.

Also, I hope that many of you had a chance to visit Husker Harvest Days in Grand Island. The weather was great, as were the educational

opportunities. The Institute of Agriculture and Natural Resources building hosted more displays than ever, and many visitors took advantage of visiting with UNL faculty and staff.

Gov. Ben Nelson's Water Quality Mandate Strategy Committee continues to meet and evaluate results of the three pilot test communities study. As I indicated in the last *Water Current*, the intent of the strategy is to help communities find cost-effective ways of complying with unfunded water quality mandates. As the committee finalizes its strategy, additional small communities with water quality problems will be identified and brought into the program.

Good news from the budget report! It appears that the U.S. Geological Survey 104 program, which had been threatened to be eliminated, has been put back into the House and Senate budget versions.

In the Water Center/Environmental Programs unit, plans are under way for the 1996 Nebraska Water Conference March 11-13 in Omaha. The topic will be the Missouri River. See you there!

Water Current

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Nitrate contamination links South Korea, Nebraska

Nebraska's history of nitrate contamination is a draw for Zang-Kual U. The South Korean professor is on a mission to prevent nitrate contamination on Cheju-do Island.

U. is a professor in the Department of Agricultural Chemistry at Cheju National University on Cheju Island. He has a research and teaching appointment and specializes in nitrogen management and groundwater quality.

He spent his summer at the University of Nebraska-Lincoln, which has a partnership with Cheju National University that has facilitated academic exchanges for years.

Cheju Island is one of South Korea's eight provinces and its only island province. The island measures 73 by 31 kilometers (1,826 km²) and has 520,000 inhabitants. Its semi-tropical climate is characterized by high rainfall (1,800 mm per year). The island itself is a volcanic formation, and the highest mountain on Cheju is a 1,950-meter high non-active volcano, Mt. Hallasan. The volcanic soil is porous, and groundwater provides the island's water for drinking and agricultural water.

Citrus fruit, flowers and vegetables are the main crops. In recent years, construction of greenhouses

has begun to protect crops from the wind and make year-long production possible.

Cheju's history of wells and citrus production spans about 30 years. Farmers began to produce citrus fruit in the 1960s. In the 1970s, the government drilled the first groundwater wells. But a problem common in the United States soon surfaced here as well.

"Farmers apply more than the recommended amount of fertilizer," U. said. Excess fertilization creates problems, U. said.

With Cheju's heavy summer rains, fertilizer runoff is a significant problem. U. estimates that 90 percent of the fertilizer application is inefficient and leads to leaching.

Groundwater quality on Cheju is excellent, and groundwater is a prized economic resource. For example, the island's groundwater supplies Korean Airlines with drinking water. But in 1989, U. found two wells with nitrate levels exceeding the international health standard of 10 parts per million (ppm).

"At the time, I thought the contamination could stem from city drainage," U. said.

However, in the next few years, other scientists found more than 20 wells with nitrate levels higher than 10 ppm. "Nitrate contamination is increasing," U. said.

But before countermeasures can be taken, the source of contamination needs to be found, he said. City drainage, fertilizer application or animal waste could be the culprits.

U., who had been to Nebraska in 1990, decided to spend some time in Nebraska this year because of the history of nitrate contamination here. This also allowed him to research U.S. scientific literature on the topic, which dates back farther than that of other countries. He brought eight water samples with high nitrate



Farmer's house on Cheju island

levels from Cheju to have them analyzed here.

U. said he appreciates the expertise of Roy Spalding, director of the Water Sciences Laboratory at the University of Nebraska-Lincoln, and of the lab staff. An analysis of the N₁₅ ratio, made possible by instrumentation in the Water Sciences Laboratory, helped him identify the sources of the nitrate in the samples.

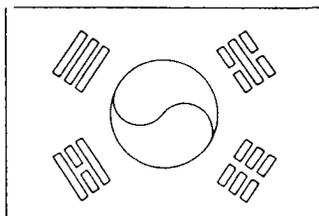
Cheju's history of wells and citrus production spans about 30 years. Farmers began to produce citrus fruit in the 1960s. In the 1970s, the government drilled the first groundwater wells.

The nitrate in one of the samples stemmed from animal waste, in two of the samples from organic sources and in five of the samples from chemical fertilizer.

"The results are critical to our project. We have to know where the nitrate is coming from," U. said.

U. plans to publish the results of his research upon his return to South Korea. His plans also include setting up a laboratory that allows analyses of the N₁₅ ratios and initiating further international cooperation between the Water Sciences Lab and Cheju National University.

— by Bettina Heinz Hurst, communications associate, UNL



**South Korea
(Tae Han Min'guk)**

Area: 98,480 km² (slightly larger than Indiana)
Location: Eastern Asia
Population: 45 million
Capital: Seoul

Federal Conjunctive Use Kansas vs. Nebraska?

Background: The water of the Republican River is allocated between Nebraska, Kansas and Colorado by the 1943 Republican River Compact. Kansas claims that Nebraska is using more than its compact share and is threatening to sue Nebraska in federal court to enforce the compact. J. David Aiken, water and agricultural law specialist at the University of Nebraska-Lincoln, answers a few frequently asked questions about the dispute.

Is the Kansas threat to sue Nebraska a serious one?

Yes. While there are some legal points in Nebraska's favor should Kansas sue Nebraska, the lawsuit would be expensive to defend and the outcome uncertain.

Tell us a little about the Republican River Compact.

The 1943 Republican River Compact divides the river flow between Nebraska, Kansas and Colorado. Kansas water officials now believe Nebraska groundwater pumping in the Republican Basin exceeds our compact share. Significantly, however, Kansas has yet to claim that our groundwater pumping has deprived them of their share of Republican streamflow. In fact, Nebraska Department of Water Resources officials indicate Kansas has been deprived of its full share only once in the half-century of the compact's existence, in 1991.

What do Nebraska water officials think about this?

Nebraska's position is that the compact only addresses surface water, not groundwater. Nebraska's position is also that groundwater withdrawals in Nebraska are not depriving Kansas of its compact allocation.

What is likely to happen if the lawsuit is filed?

Kansas has sued Colorado over the same issue on the Arkansas River. In the lawsuit the U.S. Supreme Court has made two important rulings.

First, wells near the stream are legally considered to be part of the stream and thus subject to the compact. Second, the court will not referee interstate conflicts where no harm results from the alleged violation of an interstate agreement.

So if Kansas sues Nebraska, but is unable to show that Nebraska's alleged overuse has harmed Kansas, the Supreme Court will likely refuse to hear the case?

Yes. Unfortunately, there is no guarantee of this result. Kansas may be able to demonstrate harm. If it does, the odds of victory tilt significantly in Kansas' favor. Even if Kansas were ultimately unsuccessful in its legal challenge, defending our interests would cost the state millions of dollars. If we lost, our potential legal liability could reach \$70 million.

What is the state doing in response to Kansas' threatened lawsuit?

Governor Ben Nelson established the Nebraska Water Council to make conjunctive use recommendations to the Unicameral. LB108, based on council recommendations, was introduced in 1995 and is likely to be adopted by the Unicameral in 1996. Nebraska water officials believe Kansas will sue Nebraska if LB108 is not adopted in 1996.

In addition, Nebraska has proposed to Kansas that the water disputes be mediated. Kansas has agreed to that, which is a positive step.



J. David Aiken

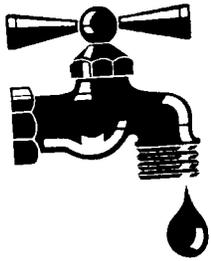
What is LB108 all about?

LB108 embraces the concept of local control by allowing natural resources districts (NRDs) to adopt conjunctive use controls as NRDs adopt groundwater controls now under the Nebraska Ground Water Management & Protection Act. However, NRD conjunctive use controls could be adopted only if compelling need existed, a significant constraint.

What happens if Kansas sues Nebraska and wins?

Kansas is winning its Arkansas River conjunctive use lawsuit against Colorado. Colorado groundwater irrigators will have to provide replacement water of perhaps 50 percent of their pumping to compensate for reduced streamflow into Kansas. If Kansas and Colorado cannot agree on how to do this, the federal court will likely require all Colorado irrigation wells in the Arkansas valley drilled after the 1949 compact to be abandoned. If Kansas were able to win a similar federal court ruling on the Republican, the consequences would be devastating to that irrigated valley and our state.

Adopting LB108 to allow NRD and perhaps state conjunctive use regulations to deal with these situations would be preferable to having a federal judge make these decisions.



Nebraska Water News

Money down the river

According to the June issue of "The Splash," a publication of the U.S. Environmental Protection Agency Region 7, a herd of 100 cows produces \$9.23 a day in fertilizer.

A 1,000-pound beef cow produces about 63 pounds of manure a day, which contains .33 pounds of nitrogen, .12 pounds of phosphate and .26 pounds of potash.

If a herd of 100 cows stays in the woods, or along a streambank or pond for 150 days per year, a net loss of \$1,385.50 of fertilizer would occur. This fertilizer could have been used for pasture improvement.

Demo project receives IANR team award

The Mid-Nebraska Water Quality Demonstration Project received the Team Award of the Institute of Agriculture and Natural Resources (IANR) Aug. 10 in Clay Center. The \$10,000 award will support the project. The team reports more than 6,600 educational contacts with individuals through more than 60 field days and meetings from 1990 through 1994.

The project has involved 18 organizations and 113 people on committees, and 35 producers have been involved in demonstrating one or more of the 16 Best Management Practices encouraged by this project.

The project area includes 3.4 million acres of cropland and more than 10,000 producers. Educational programs have potentially led to reduced nitrogen application of 17.7 million pounds, saving farmers about \$2.3 million; reduced routine use of atrazine by 28 percent; and at least 700 surge valves installed.

Symposium to address aquifer connection

The Groundwater Foundation's Fall Symposium "Making the Connection from Aquifer to Tap" will be Oct. 18 at the Downtown Ramada Inn, Lincoln.

Bob Barles of the U.S. Environmental Protection Agency's Office of Ground Water and Drinking Water in Washington, D.C., will deliver the opening address, "An Overview of Source Water Protection for Groundwater."

The list of national speakers includes Hal Williams, president of The Rensselaerville Institute; Dusty Hall, environmental manager of the City of Dayton, Ohio; and Jon Witten, community wellhead protection consultant, Boston.

For more information, contact The Groundwater Foundation at 1-800-858-4844.

Shock chlorination topic of NebGuide

A new Cooperative Extension publication describes the procedures for shock chlorination of private water systems.

"Shock chlorination is the most widely suggested treatment if test results indicate that a water supply is contaminated with bacteria," said William Kranz, irrigation specialist at the University of Nebraska Northeast Research and Extension Center near Concord. Shock chlorination introduces chlorine to eliminate bacteria in private wells.

Kranz; DeLynn Hay, water resources specialist at the University of Nebraska-Lincoln; and Al Ackerman, Nebraska Department of

Health, co-authored the NebGuide "Shock Chlorination of Domestic Water Supplies" (G95-1255A).

Unlike public water supplies that are regularly tested to ensure the water is safe to drink, individuals using private water supplies are responsible for testing for contamination. Shock chlorination is recommended when test results indicate presence of bacteria, when a new well is completed, when the distribution system is opened for repairs or maintenance, following contamination by flood water and to control iron and sulfur bacteria.

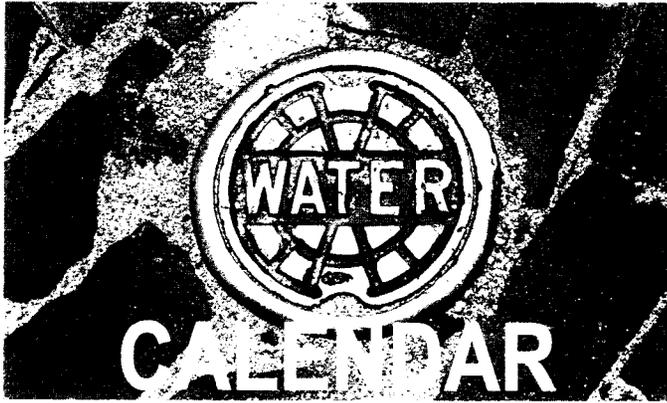
The publication gives step-by-step instructions for shock chlorination and includes a chlorine solution calculation worksheet. To obtain a free copy, contact your local Cooperative Extension office or the Water Center/Environmental Programs unit, UNL.

Water on the Web

The Water Current newsletter is now available on the Web as well. Address of the site is <http://ianrwww.unl.edu/ianr/waterctr/wchome/html>.

When checking out the Web, don't forget to visit <http://ianrwww.unl.edu/ianr/wcrec/water/index.html>. This is a new site on water research produced by the NU West Central Research & Extension Center, North Platte. You can also access the site through the Water Center home page.

The Arizona Water Resources Research Center has launched a new World Wide Web site for local partnership groups in the United States addressing natural resource, land use or environmental issues. The address is <http://ag.arizona.edu/partners/html>.



OCTOBER

Oct. 16-18: 40th Annual Midwest Groundwater Conference, Columbia, MO.

Oct. 18: Annual Groundwater Symposium of The Groundwater Foundation. "Source Water Protection: Making the Connection from Aquifer to Tap." Ramada Hotel, Lincoln. Contact The Groundwater Foundation, (402) 434-2740.

Oct. 23-27: WEFTEC '96: The Water Environment Federation's 68th Annual Conference and Exposition. Miami. Contact WEF at 1-800-666-0206.

Oct. 26-27: "Reaching the Limits: Stretching the Resources of the Lower Rio Grande." 40th Annual New Mexico Water Conference, Las Cruces Hilton. Sponsored by New Mexico Water Resources Research Institute, Las Cruces, N.M.

Oct. 28: Nebraska Fish Farmers Association Bi-Annual Meeting.

Oct. 30-Nov. 2: National Water Resources Association Annual Conference, Honolulu.

NOVEMBER

Nov. 2-3: Wyoming Water Law. Second Annual Conference. Cheyenne, WY. To register, contact CLE International, 1541 Race St., Suite 100, Denver, CO 80206, 1-800-873-7130.

Nov. 5-9: American Water Resources Association's 31st Annual Conference and Symposium, Houston. Contact John S. Grounds, Bechtel, 3000 Post Oak, Houston, TX 77252-2166, (713) 235-4921.

Nov. 12-14: 16th Annual International Irrigation Exposition and Technical Conference, Phoenix Convention Center, Phoenix. Sponsored by The Irrigation Association. Call (703) 573-3551.

Nov. 12-16: American Water Works Association Water Quality Technology Conference, New Orleans.

Nov. 19-20: Groundwater Guardian Conference. Oak Brook, IL. Contact The Groundwater Foundation, Lincoln, at 1-800-858-4844.

DECEMBER

Dec. 3-5: Nebraska Water

Resources Association and the Nebraska State Irrigation Association Annual Conference. "New Directions in Water." Ramada Inn, Kearney. Contact Sara Kay at (402) 474-3242.

JANUARY

Jan. 4-8: CONSERV96, "Responsible Water Stewardship," Orlando, FL. Sponsored by American Society of Civil Engineers, American Water Resources Association (AWRA) and American Water Works Association. Contact AWRA, 6666 W. Quincy Ave., Denver, CO 80235.

Jan. 10: Water Resources Seminar Series on Platte River Management, UNL. Contact Water Center/Environmental Programs, UNL, (402) 472-3305.

Jan. 15-17: Nebraska Turfgrass Conference.

Jan. 17: Water Resources Seminar Series on Platte River Management, UNL.

Jan. 24: Water Resources Seminar Series on Platte River Management, UNL.

Jan. 31: Water Resources Seminar Series on Platte River Management, UNL.

FEBRUARY

Feb. 7: Water Resources Seminar Series on Platte River Management, UNL.

Feb. 14: Water Resources Seminar Series on Platte River Management, UNL.

Feb. 15: Deadline for communities to enter the Groundwater Guardian program. Contact The Groundwater Foundation, Lincoln, at 1-800-858-4844.

Feb. 21: Water Resources Seminar Series on Platte River Management, UNL.

Feb. 28: Water Resources Seminar Series on Platte River Management, UNL.

MARCH

March 5: Children's Groundwater Festival, Grand Island. Sponsored by The Groundwater Foundation, Lincoln. Contact The Groundwater Foundation at 1-800-858-4844.

March 6: Water Resources Seminar Series on Platte River Management, UNL.

March 11-13: "The Mighty Missouri — Past and Future." Annual Nebraska Water Conference, Red Lion Hotel, Omaha. Contact Water Center/Environmental Programs, UNL, (402) 472-3305.

March 27: Water Resources Seminar Series on Platte River Management, UNL.

APRIL

April 3: Water Resources Seminar Series on Platte River Management, UNL.

April 8-11: Nonpoint Source Pollution Workshop. Sponsored by the Nebraska Department of Environmental Quality.

Poll shows **WATER** top natural resources concern

LINCOLN — Water issues are a big concern for many, and environmental regulations are necessary to address these concerns.

Those are the findings of a Gallup poll conducted for the Natural Resources Conservation Service earlier this year.

DeLynn Hay, water quality extension specialist at the University of Nebraska-Lincoln, said he finds it interesting that water was the top issue mentioned by respondents.

80 percent of those polled said they thought laws protecting wetlands were about right or had not gone far enough.

Water-related issues, including quality, availability, irrigation and flooding, were the most frequently mentioned natural resources issues, accounting for a total of 39 percent of the responses. The most frequently mentioned single responses were water quality and water availability.

"Water is going to continue to be an issue," Hay said.

Water and air pollution were the top natural resources problems individuals identified in their communities. One-fourth of participants reported water pollution problems and almost one-fourth reported air pollution problems. One-fifth of participants reported that there were no natural resources problems in their communities.

Contrary to political representations of public opinion, the poll indicates strong public support for maintaining or toughening restrictions designed to protect soil and water.

While Congress is in the process of relaxing environmental regula-

tions, 80 percent of those polled said they thought laws protecting wetlands were about right or had not gone far enough. Designation and protection of wetlands has become a hotly debated issue in the reauthorization of the Clean Water Act.

Hay said that given the demographics of the survey, the results in regard to the wetlands question did not surprise him.

"Only a small number of agricultural producers was included in the sample. With a higher number, I think the answer may have been different," Hay said.

A sample of 1,250 persons participated in the survey. Less than 1 in 10 (7 percent) was a farmer or rancher. Seventeen percent of the respondents lived in a rural area.

Farmers and ranchers were less likely than non-farmers/ranchers to report that laws protecting agricultural wetlands had not gone far enough.

Given the small number of agricultural producers represented, Hay said he was somewhat surprised to find that individual farmers received the highest ranking as environmental caretakers. Individuals were asked to rank selected groups including agriculture,

individual farmers, corporate farms, manufacturers and the timber industry on their environmental caretaking, ranging from "serious polluter" to "excellent caretaker." The ratings were not significantly associated with whether the participant was a farmer or rancher.

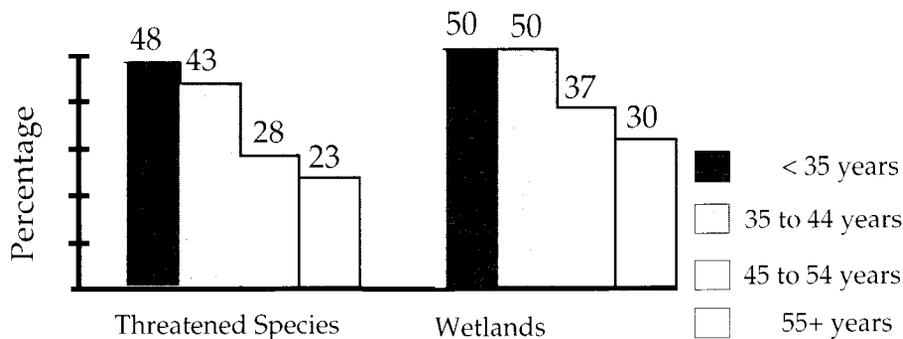
Participants were also asked whether they thought farming's impact on natural resources should be regulated in the same ways as the impact of manufacturing and industry. Fifty-seven percent said farming's impact should be regulated in the same way, 40 percent said it should not. Farmers and ranchers were less likely to favor regulation, although more than 4 in 10 of farmers and ranchers favored regulation. The most frequent response to reduction of elimination of government involvement was "completely inappropriate."

Hay said he was surprised at perceptions of current levels of agricultural pesticides and fertilizer in the food and water supply.

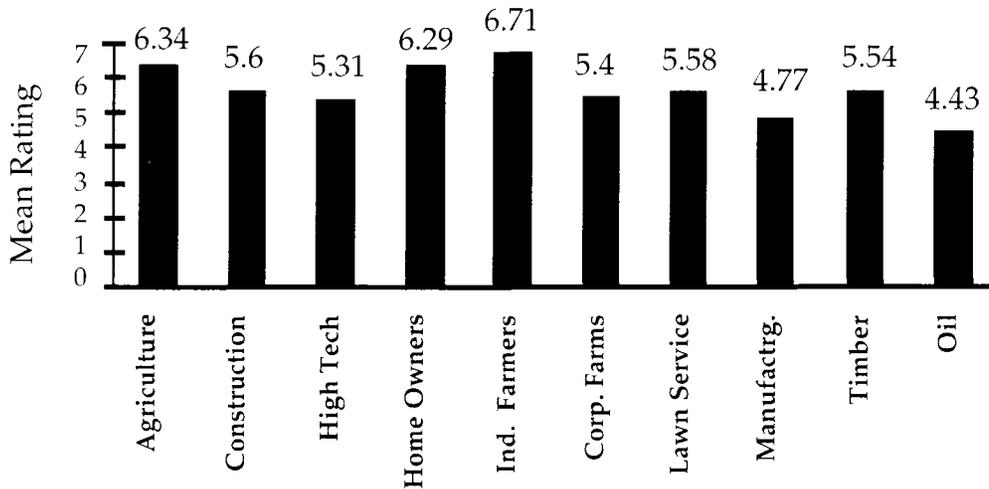
Only about 1 in 10 participants agreed strongly that food and water supplies were safe. On the other

Survey. Continued on Back.

Percentage of Persons Reporting Protection Laws Have Not Gone Far Enough



Mean Ratings of Environmental Caretaking



Survey. Continued from Page 7.

hand, about one-third disagreed strongly that water and food supplies were safe. Of those polled, 49 percent disagreed that food was safe and 56 percent disagreed that water was safe.

"I guess I was a little surprised

that the disagreement was that high. Essentially, 50 percent or more of the respondents have the perception that food and water are not safe because of pesticides and fertilizer," Hay said.

Respondents rated the environmental state of their own communities highest (mean score of 6.27 on a scale of 1 to 10 where 10 is excellent)

and that of the entire earth lowest (5.14). That people tend to rate their own communities better than others is a common finding in such surveys, Hay said. "Many people think they don't have any problems but that others do," Hay said.

— by *Bettina Heinz Hurst*, communications associate

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