

CONSERVATION CATCHALL

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AISWCD Staff:

Richard Nichols,
Executive Director

Sherry Finn,
Administrative Assistant

Kelly Thompson,
Program Coordinator

Gina Bean,
Office Assistant

CREP Resource Specialists

Russell Blogg

Sheryl Phillips

Jeremy Pruden

Timothy Royer

Jake Vancil

STUDY CHALLENGES SOIL TESTING FOR POTASSIUM AND THE FERTILIZER VALUE OF POTASSIUM CHLORIDE

In the chemical age of agriculture that began in the 1960s, potassium chloride (KCl), the common salt often referred to as potash, is widely used as a major fertilizer in the Corn Belt without regard to the huge soil reserves that were once recognized for their fundamental importance to soil fertility. Three University of Illinois soil scientists have serious concerns with the current approach to potassium management that has been in place for the past five decades because their research has revealed that soil K testing is of no value for predicting soil K availability and that KCl fertilization seldom pays.

U of I researchers Saeed Khan, Richard Mulvaney, and Timothy Ellsworth are the authors of "The potassium paradox: Implications for soil fertility, crop production and human health," which was posted on October 10th by *Renewable Agriculture and Food Systems*.

A major finding came from a field study that involved four years of biweekly sampling for K testing with or without air-drying. Test values fluctuated drastically, did not differentiate soil K buildup from depletion, and increased even in the complete absence of K fertilization. Explaining this increase, Khan pointed out that for a 200-bushel corn crop, "about 46 pounds of potassium is removed in the grain, whereas the residues return 180 pounds of potassium to the soil -- three times more than the next corn crop needs and all readily available."

Khan emphasized the overwhelming abundance of soil K, noting that soil test levels have increased over time where corn has been grown continuously since the Morrow Plots were established in 1876 at the University of Illinois. As he explained, "In 1955 the K test was 216 pounds per acre for the check plot where no potassium has ever been added. In 2005, it was 360." Mulvaney noted that a similar trend has been seen throughout the world in numerous studies with soils under grain production.

Recognizing the inherent K-supplying power of Corn Belt soils and the critical role of crop residues in recycling K, the researchers wondered why producers have been led to believe that intensive use of KCl is a prerequisite for maximizing grain yield and quality. To better understand the economic value of this fertilizer, they undertook an extensive survey of more than 2,100 yield response trials, 774 of which were under grain production in North America. The results confirmed their suspicions because KCl was 93 percent ineffective for increasing grain yield. Instead of yield gain, the researchers found more instances of significant yield reduction.

The irony, according to Mulvaney, is that before 1960 there was very little usage of KCl fertilizer. He explained, "A hundred years ago, U of I researcher Cyril Hopkins saw little need for Illinois farmers to fertilize their fields with potassium," Mulvaney said. "Hopkins promoted the Illinois System of Permanent Fertility, which relied on legume rotations, rock phosphate, and limestone. There was no potash in that system. He realized that Midwest soils are well supplied with K. And it's still true of the more productive soils around the globe. Potassium is one of the most abundant elements in the earth's crust and is more readily available than nitrogen, phosphorus, or sulfur. Farmers have been taught to think that fertilizers are the source of soil fertility -- that the soil is basically an inert rooting medium that supports the plant."

(continued on page 7)



PRESIDENT'S MESSAGE - LONNIE WILSON

lonniewilson@gmail.com

I hope this finds everyone safe, sound and thankful with their fall so far. Since the last time we sent one of these out, the districts, mainly the employees have experienced some of the most stressful times in our history. I want to thank you for everything each and every one of you did to continue to deliver services to your customers to the best of your abilities with the hand you were dealt. Hopefully, Congress can find a way to resolve their differences and sit down to keep another issue like this from happening again. It is very important for you to contact your Representative in Congress to discuss the need to settle on a budget instead of a continuing resolution so this doesn't continue to happen. One other legislative opportunity in DC right now is the Farm Bill Conference currently ongoing. We are very fortunate that we have a very good Congressman, in my opinion, from Illinois assigned to this conference. That is Representative Rodney Davis from the 13th district here in Illinois. We have a very good relationship with his DC office and they are always glad to hear from the folks in Illinois. But, with the conference getting ready to start on the Farm Bill, I would recommend contacting the following members of the conference and discuss the following talking points with them along with any local issues you feel would be helpful in the process.

Talking Points:

Conservation in the Farm Bill

- Our nation's farmers and landowners deserve to have long-term certainty to effectively and efficiently manage their land, resources and businesses for the years ahead
- Locally-led conservation is critical in supporting America's long-term environmental and economic stability.
- Not only do Farm Bill conservation programs play a key role in supporting clean air, clean water and productive soils, they also help producers avoid unnecessary regulation, and support our nation's long-term economic and food security.

Technical Assistance – Support Senate Language

- The Senate version gives TA decision-making authority to the Secretary of USDA for effective implementation of conservation programs.
- USDA has greater knowledge of financial needs on the ground, and this flexibility allows a greater number of constituents/producers to access financial assistance.
- OMB will still decide amount of money given to NRCS, USDA will still send reports to OMB.

Overall Title II Budget – Support Senate Funding Levels

- The House version cuts \$6.9 billion out of \$60 billion across Title II over 10 years.
- The Senate version cuts \$5.9 billion out of \$60 billion across Title II over 10 years.

Compliance – Support Senate Agreement

- Conservation Districts are strong advocates for an effective crop and natural resource safety net in the Farm Bill.
- The conservation compliance agreement reached earlier this year, supported by NACD and a broad group of environmental and agriculture groups, ensures at a policy level the thoughtful implementation of compliance that balances the need for natural resource conservation with a robust agriculture economy.
- Tying conservation compliance to crop insurance will further the conservation of natural resources, while protecting producers' bottom line.

Sodsaver – Support Senate Version of National Sodsaver

- We support the Senate's national sodsaver provision to address crop insurance inequities and preserve habitats for game species on native sod and on grasslands producers cannot certify have ever been cropped.
- In the past, NACD has supported an identical provision in the Protect our Prairies Act by Reps. Kristi Noem (R-SD) and Tim Walz (D-MN). The House Farm Bill version currently has a regional sodsaver provision, but we endorse a national one.

The House conferees include:

- Rep. Frank D. Lucas (R-OK), Chairman of the House Agriculture Committee 202-225-5565
- Rep. Rodney Davis (R-IL) 202-225-2371
- Rep. Collin Peterson (D-MN), Ranking Member of House Agriculture Committee 202-225-2165

The Senate conferees include:

- Sen. Debbie Stabenow (D-MI), Chairwoman of the Senate Agriculture Committee 202-224-4822
- Sen. Thad Cochran (R-MS), Ranking Member of the Senate Agriculture Committee 202-224-5054

These five legislators will have an extreme amount of input to this conference and every call to suggest a position on title II will help establish a stable basis for our cause. Explain as leadership that you feel they represent more than just their district and you support the stated title II points (Talking Points).

I want to thank everyone that has contributed to the Envirothon Bridge Fund. It is exceeding our goal and will be used to promote a great program. I am so glad our national leadership has found a way to keep this alive and moving forward. I applaud their ability to partner with others and create a strong Envirothon for the future. We just need to find a way to help these folks get through these next few months till they are able to become established again. I feel these funds from all the states will help with this.

On the state level, the General Assembly was in session and did not address the pension issue again. The Pension Reform Conference Committee, which was formed last June, still has not drafted a bill to resolve the debt. This was the group that was going to be the bipartisan solution by this time if I remember correctly. Illinois is already saddled with \$100 billion in unfunded pension debt. That's over 22% of the general revenue fund each year. This flat out needs to stop and no matter what your feelings or politics, you need to be discussing this with your state legislators. They have to resolve this in November, in my opinion, or come spring session, we will be looking at major issues with funding programs in GRF and with bring forward any new bills or amendments to existing programs.

I look forward to seeing some of you at winter training and at the some of the LUC meetings coming up! If not, have a great month! Enjoy the changing of the season! If you're on the farm, I hope harvest was plentiful and safe! Ours is complete and better than expected, we truly are blessed here on our little farm. Once again, I don't say it enough. Thank you for everything you do to conserve our precious lands and waters.



EXECUTIVE DIRECTOR'S NOTES - *RICH NICHOLS*

rich.nichols@aiswcd.org

It's hard to believe October is gone already. I feel like I'm just getting ready for fall – not winter.

The legislature was in town last week for the first half of their annual veto session. For the most part it was a very lackluster session. There really weren't many vetoed bills they felt they needed to address and they called the normal three day session over at noon the second day. There were some hearings held but most of those were for information purposes only and didn't result in any activity. One of the hearings was on SB1739, the gaming bill that was held over from the session that ended last May. Apparently there are still some problems with the bill - notably the gaming authority that will be set up by the City of Chicago to oversee the Chicago casino. The State Gaming Commission has some problems with the idea, even though they will have complete oversight over the Chicago gaming authority. Regardless, they just don't like the idea of another body having authority over gaming in Illinois. I guess I can understand that given Chicago's history of politics and corruption.

Anyway, the hearing did allow for some airing of concerns and perhaps paved the way for some compromises that will allow the bill to finally be passed by both chambers and approved by the Governor. What a day that will be if it ever does happen!

On the national level, conferees are working on the two bills passed by the House and Senate trying to reach a compromise that will allow the Farm Bill to finally move forward to reality. The senate version treats conservation better than the House version, mostly because there is not quite as much of a reduction in funding over the life of the next Farm Bill. However, there are some policy differences in the Senate version that tend to favor locally led conservation activities more so than the House version does. There are other differences but overall the Senate version is the better choice for Illinois.

Regardless of the debate that is going on over the Farm Bill, it is good to actually see Congress doing something constructive after the Federal shutdown which was anything but constructive.

I received several reports from the SWCDs regarding how they were able to conduct business during the shutdown. Most were able to continue serving their customers as they normally would have thought the ease of providing the services was not quite what it would have been without the inconvenience of using personal cell phones, personal computers and other materials that were able to be taken from the office prior to locking the doors on October 1st.

I want to commend the employees who chose not to let the inconveniences stand in their way and who found a way to continue to operate the district's programs. Directors should be proud of their employees and the dedication to the job and to the district's customers that was shown by those employees.

It is my hope that no employee will be penalized in any way for circumstances and conditions that were beyond their control. It is unfair to penalize a district employee for not being able to use the office when the federal employees will receive full back pay and benefits for the days they were unable to work. Federal employees were not given the option to take earned time off since the government was shut down, and technically speaking, from October 1 – October 17 the federal employees were unemployed.

I just hope the Congress will act on a budget soon so there will be no threat of another shutdown in January when the continuing resolution expires or in February when the temporary debt ceiling expires. I think we deserve better from our elected officials and I think that a budget should be passed so the federal agencies could have some certainty regarding their operations and the American people could have some assurances that the government will be able to provide needed and necessary services. However, government being government, I have learned not to expect very much from my elected officials – state or federal.

In the meantime, it's the end of October and Thanksgiving can't be far away. Maybe I should be concentrating more on being thankful for the good things we have rather than bemoaning politics and politicians.

Have a great new month!

Rich



PROGRAM COORDINATOR'S PAGE - KELLY THOMPSON

kelly.thompson@aiswcd.org

Kelly will not have a report in this month's issue. Instead, we are providing the following for your information.

HYPOXIA ISSUES IN THE GULF OF MEXICO

The Mississippi River Basin is home to much of the United States' fertile crop land. Though we need our food and energy crops, their production has led to an increase in the levels of nutrients such as nitrogen and phosphorus in our water sources. Increasing nutrient levels affects our rivers, lakes, and oceans. Single cell plants, called phytoplankton, feed off the increased nutrients, and in doing so start a cascade of events that leads to low oxygen levels in the water bodies. This low oxygen condition is called hypoxia. The result is dying fish and a poor ecosystem, called a "dead zone."

The dead zone in the Gulf of Mexico, where the Mississippi meets the ocean, has received much attention in the last decade, and led to the creation of the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force.

"We need to see an increase in the rate of implementing practices that lower nutrient export," says Matt Helmers, PhD, of Iowa State University, and member of the Soil Science Society of America. "Cover crops not only decrease the amount of nitrogen and phosphorus leaving the fields, but they improve the soil in other ways. Subsurface drainage bioreactors -- often called wood chip trenches -- and specialized wetland systems also reduce nutrient export."

Helmers admits the "challenges are more complex than changing the inputs to our crops," such as corn and soybean. And, because there are not short-term financial gains to most of the practices that reduce nutrient export, the industry may be slower to adopt change. "If we don't show reduced nitrogen and phosphorus export, we may see regulation."

ILLINOIS UPDATE: The Nutrient Reduction Strategy Policy Group has been meeting on this issue now since March. The policy group, convened by the Illinois Environmental Protection Agency, includes diverse representation from agricultural groups, environmental organizations, state and federal resource agencies, water treatment facility organizations, and higher education institutions. The group has reviewed information prepared by the University of Illinois and others concerning the major contributing areas of the state, the magnitude of the problem, the targeted reduction goals, practices that will help reduce nutrient contributions and a number of other factors that will eventually be considered in the strategy development process.

Task groups have been formed and will meet in December to start working on the agricultural and urban non-point sources for nutrients and point sources for nutrients. These groups will each identify specific practices and strategies for implementing the practices as well as attempt to define a time line for meeting reduction goals. The task groups will meet for an unspecified time but will be charged with reporting to the policy group by February with their recommendations. The policy groups will then review the recommendations and incorporate them into the state's overall nutrient reduction strategy. The goal is to have a completed state strategy in place by April 2014.

Lonnie Wilson and Richard Nichols will both serve on the agricultural non-point task group and Kelly Thompson will serve on the urban non-point task group.



ADMINISTRATIVE ASSISTANT'S UPDATE - SHERRY FINN

sherry.finn@aiswcd.org

Greetings! Everyone--below, please find a copy of the 2014 IL Envirothon Letter of Intent. This must be completed and submitted to the Co-Coordinators (Brooke & Natalie) by December 13, 2013 or submitted to Brooke at Winter Training. If your SWCD did not receive its emailed copy of the letter please contact the AISWCD as soon as possible. We appreciate the information you submit with the letter of intent, because it is very important in gathering info for future grants and donations to the Envirothon fund. The dates for the IL Envirothon are set for April 30 and May 1, 2014 at the U of I 4-H Memorial Camp at Monticello, IL. The National Envirothon event will be held on July 20-24, 2014 at the University of Georgia in Athens, Georgia. The 5th Category is "Sustainable Local Agriculture/Locally Grown". Your IL Envirothon Packets will be handed out at the Winter Training by the Co-Coordinators. Good luck to all LUCs and FFA Teams.



2014 ILLINOIS ENVIROTHON LUC LETTER OF INTENT

2014 Illinois Envirothon – Wednesday, April 30 – Thursday, May 1, 2014
4-H Memorial Camp @ Monticello, Illinois

Please fill out and return this form by December 13, 2013. This form is a pdf fillable form for your convenience. All LUC contacts must attend or have a designated person to pick up the materials at Winter Training. Please send me an e-mail and let me know who will be attending.

Land Use Council #: _____ LUC Contact Name: _____

LUC Contact's Phone Number: () _____

LUC Contact's E-mail Address: _____

Date of LUC Competition: _____

Location of LUC Competition: _____

Please list the counties and estimate the number of students that plan on participating at your 2014 LUC competition. Also list of the number of students reached per county for the 2013 competition year. These numbers will be used as a marketing tool when approaching sponsors for funding support.

COUNTY NAME	ESTIMATION OF '14 PARTICIPANTS	ACTUAL '13 PARTICIPANTS
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
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Please note that the Illinois Envirothon is Wednesday, April 30 and Thursday, May 1, at Allerton 4-H Memorial Park in Monticello. The National Envirothon competition will be at the University of Georgia in Athens, Georgia on July 20 – 24, 2014. The 5th category is "Sustainable Local Agriculture/Locally Grown". LUC contacts will receive informational packets at Winter Training. It will be your responsibility to get a copy of this information out to your participating counties. If you have any questions, please contact:

ENVIROTHON CO-COORDINATORS: BROOKE BAKER & NATALIE MAHLER
ILLINOIS ENVIROTHON – 3605 N IL ROUTE 47, SUITE B; MORRIS, IL 60450
PHONE: 815/942-0359 X3 FAX: 815/942-5379
BROOKE.BAKER@IL.NACDNET.NET OR NATALIE.MAHLER@IL.NACDNET.NET

Conservation Power: Today's Actions – Tomorrow's Rewards!!



Office Assistant's Information - Gina Bean

gina.bean@aiswcd.org

Reduce, Reuse, Recycle When It Comes to Halloween Costumes This Year!

These past couple months have been filled with what I like to call "After Annual Meeting Activities" such as survey counting, thank you letters, clean up and filing of materials, etc. I'm learning that Annual Meeting means that it is an all year process. It keeps me busy and I'm loving being able to do my part. At Annual Meeting I did a craft using recycled materials. Almost anything can be used again at least once and made into something different.

Need a Halloween costume but don't want to pay the \$40 or more from the stores? Why not use items around the house that you would typically throw away? With a little imagination you can take simple items you already have such as plastic bottles, cardboard, old t-shirts, and cans and turn them into something creative and different. The best part is you saved trash from going into the dumpsters.

Below are some ideas I found online, but really the possibilities are endless.



Visit these sites for instructions and more ideas...

Card Board Transformer courtesy of:
<http://www.oueverydayearth.com/top-10-green-halloween-costumes/>

Lego costume courtesy of:
<http://www.instructables.com/id/LEGO-Halloween-Costume/>

Rocket Man courtesy of:
<http://blacklemag.com/design/make-superhero-costumes-with-recycled-materials/>

Owl courtesy of:
<http://www2.fiskars.com/Sewing-Quilting/Projects/Holiday/Halloween/Easy-Halloween-Costumes>

Recycle Bin courtesy of:
<http://thegrimeygatsby.com/2012/10/23/green-gatsby-for-a-grimey-halloween/>



Gina Bean



ISWCDEA CORNER - SHERRY HUFFSTUTLER
ISWCDEA REGION ONE REPRESENTATIVE

website: <http://www.il.ncdea.org>

Greetings!

I hope all of you enjoyed your time away from the office as a result of the government "shutdown". For those districts that were trying to work from home or had made arrangements to work from a non-governmental business, I applaud your efforts. I know that it was a crude way of conducting business when almost everything employees needed was inaccessible. But now that the "shutdown" is over, we can move forward.

With that thought in mind, the Winter Training session for employees is almost here. The date has been set for December 3rd and 4th, at the Northfield Inn, Springfield. The theme for the event is: "Team Conservation". Your ISWCDEA is in the process of organizing the event with the hope that the sessions and speakers will be beneficial to you in your career. If you have any ideas or topics that you wish to be placed on the agenda or would like to be discussed please contact your ISWCDEA region representative.

The registration fee for the Winter Training will be \$15. Payment should be made payable to: ISWCDEA and sent to Henry County SWCD in c/o of Sharon Matson, AC. Also, as a reminder to you, the 2014 dues are due by 12/31/13. The cost is \$10. The dues help offset the ISWCDEA costs for the annual meeting, winter training and summer conference.

We hope that all employees will be able to attend the December Training on the 3rd and 4th. Not only is it a time of learning but, dare I say it, a time to have some fun!

Until next time.

Sherry

STUDY CHALLENGES SOIL TESTING FOR POTASSIUM AND THE FERTILIZER VALUE OF POTASSIUM CHLORIDE

(continued from page 1)

Khan and his colleagues pointed out that KCl fertilization has long been promoted as a prerequisite for high nutritional value for food and feed. To their surprise, they found that the qualitative effects were predominantly detrimental, based on a survey of more than 1,400 field trials reported in the scientific literature. As Khan explained, "Potassium depresses calcium and magnesium, which are beneficial minerals for any living system. This can lead to grass tetany or milk fever in livestock, but the problems don't stop there. Low-calcium diets can also trigger human diseases such as osteoporosis, rickets, and colon cancer. Another major health concern arises from the chloride in KCl, which mobilizes cadmium in the soil and promotes accumulation of this heavy metal in potato and cereal grain. This contaminates many common foods we eat -- bread, potatoes, potato chips, French fries -- and some we drink, such as beer. I'm reminded of a recent clinical study that links cadmium intake to an increased risk of breast cancer."

While working in the northwestern part of Pakistan three decades ago, Khan was surprised to discover another use for KCl fertilizer. "I saw an elderly man making a mud wall from clay," Khan said. "He was using the same bag of KCl that I was giving to farmers, but he was mixing it with the clay. I asked why he was using this fertilizer, and he explained that by adding potassium chloride, the clay becomes really tough like cement. He was using it to strengthen the mud wall."

"The man's understanding was far ahead of mine," continued Khan, "and helped me to finally realize that KCl changes the soil's physical properties. Civil engineers know this, too, and use KCl as a stabilizer to construct mud roads and foundations." Mulvaney mentioned that he had demonstrated the cementing effect of KCl in his soil fertility class, and that calcium from liming has the opposite effect of softening the soil. He cautioned against the buildup philosophy that has been widely advocated for decades, noting that agronomic productivity can be adversely affected by collapsing clay, which reduces the soil's capacity to store nutrients and water and also restricts rooting.

Khan and Mulvaney see no value in soil testing for exchangeable K and instead recommend that producers periodically carry out their own strip trials to evaluate whether K fertilization is needed. Based on published research cited in their paper, they prefer the use of potassium sulfate, not KCl.

Source: [ScienceDaily](http://www.sciencedaily.com), 28 Oct. 2013 University of Illinois, ACES. "Study challenges soil testing for potassium and the fertilizer value of potassium chloride."



Legislative Update - Mike Hoffmann

October veto session

The General Assembly came back to Springfield for two days for the first half of the annual fall veto session. With only a handful of bills having been vetoed by the Governor, there was not a lot on the agenda. In fact, legislative leaders trimmed one day from the schedule: instead of the scheduled Tuesday through Thursday session, lawmakers went home after completing business on Wednesday afternoon. Only a few legislative measures were dealt with, none affecting SWCDs. The General Assembly returns to complete the veto session during the first week of November; they are scheduled to be here the 5th through the 7th.

Gaming

One issue of interest was discussed during first half of legislative veto session – the ongoing saga of the gaming bill. The House Executive Committee held a “subject matter only” hearing (meaning there would be no vote taken) to take testimony on the bill that moved through the Senate last year, but eventually did not get called in the House - [SB1739](#).

The House sponsor of the bill, Rep. Bob Rita (D-Cook Co.), wanted to get input from interested parties, especially the Illinois Gaming Board, which has expressed reservations about the regulatory structure surrounding the Chicago casino (which would have oversight from a Chicago gaming authority as well as the state Gaming Board). Opposition to the bill remains from some of the existing casinos, who fear competition from slots at the race tracks, and from Illinois Church Action on Alcohol & Addiction Problems. Most of the testimony, however, was from supporters of the bill, including horsemen and downstate supporters of agriculture. No one expressed any opposition to the funding for SWCDs or other Ag interests in the bill (see below).

Rep. Rita indicated that he intends to move forward with the gaming bill, but did not give a time frame. We believe that it is unlikely to be considered in the remaining week of the fall veto session. If not, then we will again be working on the bill in next year’s regular session of the General Assembly.

Downstate Budget Initiatives in SB 1849 (House Amendment #2, November 7, 2011)

Transfer to the Partners for Conservation Fund for Soil and Water Conservation Program	\$12.5m
State Fairgrounds Infrastructure Improvement Fund	\$10.0m
County Fairs funding	\$6.0m
Cooperative Extension: match 100% of local funds	\$5.0m
Future of Agriculture Fund (for county fairs, FFA, extension)	\$5.0m
Transfers to Parks and Conservation Fund for operations and grants	\$3.0m
IL Historical Sites Fund	\$3.0m
IL Forestry Fund	<u>\$1.5m</u>
Total	\$46.0m

REMEMBER: KEEP YOUR STATE LEGISLATORS EDUCATED ON SWCD ACTIVITIES

Mike



NITROGEN FERTILIZER REMAINS IN SOILS, LEAKS TOWARDS GROUNDWATER FOR DECADES

Nitrogen fertilizer applied to crops lingers in the soil and leaks out as nitrate for decades towards groundwater -- "much longer than previously thought," scientists in France and at the University of Calgary say in a new study.

Thirty years after synthetic nitrogen (N) fertilizer had been applied to crops in 1982, about 15 per cent of the fertilizer N still remained in soil organic matter, the scientists found.

After three decades, approximately 10 per cent of the fertilizer N had seeped through the soil towards the groundwater and will continue to leak in low amounts for at least another 50 years.

The study was led by researcher Mathieu Sebilo at the Université Pierre et Marie Curie in Paris, France, and by Bernhard Mayer in the U of C's Department of Geoscience, and included several research organizations in France.

Their paper, "Long-term fate of nitrate fertilizer in agricultural soils," was published this week in the Proceedings of the National Academy of Sciences of the United States of America.

The findings show that losses of fertilizer N towards the groundwater occur at low rates but over many decades, says Mayer, U of C professor of geochemistry and head of the Applied Geochemistry Group.

That means it could take longer than previously thought to reduce nitrate contamination in groundwater, including in aquifers that supply drinking water in North America and elsewhere, he says.

"There's a lot of fertilizer nitrogen that has accumulated in agricultural soils over the last few decades which will continue to leak as nitrate towards groundwater," Mayer says.

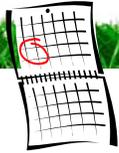
Canada and the U.S. regulate the amount of nitrate allowed in drinking water. In the 1980s, surveys by the U.S. Environmental Protection Agency and the U.S. Geological Survey showed that nitrate contamination had probably impacted more public and domestic water supply wells in the U.S. than any other contaminant.

Mayer is an internationally recognized expert in the use of stable isotopes to track contaminants in the environment.

The French-U of C study is the first that tracks, using stable isotope "fingerprinting," the fate of fertilizer N remaining in the soil zone over several decades.

The research team used a stable isotope of nitrogen, N-15, as a tracer to track fertilizer nitrogen applied in 1982 to sugar beet and winter wheat crops on a pair of two-metre-square plots at a site in France. Over the 30-year study, the researchers measured the amount of N-15 labelled fertilizer N taken up by plants and they quantified the amount of fertilizer N remaining in the soil.

The novel aspect of their study was that they subsequently determined the long-term fate of this fertilizer N 'pool' retained in the soil. Their measurements of seepage water from locations two metres deep in the soil revealed the amount of fertilizer nitrate leaking towards the groundwater.



MARK YOUR CALENDAR!

- Veteran's Day - November 11, Holiday, Office Closed
- Thanksgiving - November 28 & 29, Holiday, Office Closed
- Winter Training - December 3 & 4 Northfield Inn Springfield, IL

2013—2014 QUARTERLY BOARD MEETING DATES

- December 2013 Quarterly Board Meeting - December 9th & 10th - Northfield Inn - Springfield, IL
- March 2014 Quarterly Board Meeting - March 11, Northfield Inn - Springfield, IL - Executive Committee Meeting - March 10, IDOA
- June 2014 Quarterly Board Meeting - June 9th & 10th - Northfield Inn - Springfield, IL

NITROGEN FERTILIZER REMAINS IN SOILS, LEAKS TOWARDS GROUNDWATER FOR DECADES

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The team found that 61 to 65 per cent of the N-15 fertilizer applied in 1982 was taken up by the sugar beet and wheat plants over the 30-year study.

However, 32 to 37 per cent of the fertilizer N remained in the soil organic matter in 1985 or three years after application, while 12 to 15 per cent still lingered in the soils after three decades.

Between eight to 12 per cent of the fertilizer N applied in 1982 had leaked in the form of nitrate toward groundwater during the 30 years, and will continue to leak at low rates "for at least another five decades, much longer than previously thought," the study says.

The scientists predict that about 15 per cent of the initially applied fertilizer N will be exported from the soils towards the groundwater over a time span of almost one century after the 1982 fertilizer application.

Mayer speculates that if the same research were done in Alberta, the findings would be similar in terms of fertilizer uptake by plants and nitrogen retention in the soils, although Alberta's comparatively dry climate and different geology might slow the rate of nitrate seeping towards the groundwater.

Nitrate contamination of aquatic ecosystems can be reduced by farmers following the 4Rs of nutrient stewardship: applying the right fertilizer source at the right rate, the right time and the right place (see <http://www.nutrientstewardship.com/what-are-4rs>).

Source: [ScienceDaily](http://www.sciencedaily.com), 21 Oct. 2013 University of Calgary. "Nitrogen fertilizer remains in soils, leaks towards groundwater for decades."

AISWCD Mission: *To represent and empower Illinois' SWCDs*

4285 N. Walnut Street Rd.
Springfield, IL 62707



Phone: (217) 744-3414
Fax: (217) 744-3420
www.aiswcd.org