

Creating tomorrow's  
scientists through 4-H

Master Gardeners  
sow seeds of success  
for communities

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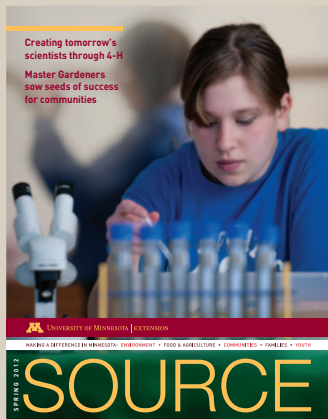
MAKING A DIFFERENCE IN MINNESOTA: ENVIRONMENT + FOOD & AGRICULTURE + COMMUNITIES + FAMILIES + YOUTH

SPRING 2012

SOURCE



UNIVERSITY OF MINNESOTA | EXTENSION



**ON THE COVER:** Kittson County 4-H'er Megan Nyegaard tests water samples she collected from nearby Two Rivers, using an underwater Remote Operated Vehicle (ROV) she built as a member of her local 4-H Aquatic Robotics team. The project is part of Extension's effort to develop the next generation of scientists, engineers and technology leaders through 4-H.

**Source** is published twice a year and is available online at [extension.umn.edu/source](http://extension.umn.edu/source).

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University of Minnesota Extension mission: Making a difference by connecting community needs and University resources to address critical issues in Minnesota.

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Printed using agri-based inks on recycled and recyclable paper.

# SOURCE

SPRING 2012

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## FROM THE DEAN

CELEBRATING 150 YEARS  
OF THE LAND-GRANT  
UNIVERSITY: LEARNING,  
DISCOVERY AND  
ENGAGEMENT FOR THE  
COMMON GOOD

**During the United State's Civil War, President Abraham Lincoln signed into law the Morrill Act, legislation that laid the groundwork for public research universities like the University of Minnesota.**

"The land-grant university system is being built on behalf of the people, who have invested in these public universities their hopes, their support, and their confidence," declared President Lincoln upon signing the Morrill Act on July 2, 1862.

Today, Extension delivers on that land-grant mission by connecting the public with scientific knowledge and expertise, improving economic, social and environmental conditions through research and education. Through research and educational programs like those highlighted in this issue of *Source*, Minnesota realizes a return on that investment, raising hope and strengthening confidence in our collective ability to address our most challenging issues.

This issue of *Source* highlights the many ways Extension keeps the land-grant vision alive and relevant today. Read how Extension's 4-H youth explore the sciences and improve water quality through aquatic robotics. Discover how Extension's Master Gardeners give back to their communities through community gardens. Find out how Extension ensures safe pork and healthy pigs, brings robotic milking to Minnesota dairies, and yields surprising findings on turfgrass. In addition, learn how Extension engages Ojibwe youth in science, puts locally grown food in school lunchrooms, and raises awareness of food insecurity in Minnesota.

Today, more than ever, Minnesotans needs trusted education that helps communities and individuals navigate in difficult times, making better decisions that benefit the common good.

Sincerely,

Beverly R. Durgan

*Dean, University of Minnesota Extension*

## BOOSTING INTERNET KNOW-HOW for community success

Research shows that most businesses and communities don't have websites, don't use social media to their advantage, and can't be found through online and mobile map searches—gaps that put local economies at a disadvantage.

Extension has gotten a closer look at Internet use by Greater Minnesota businesses since joining the Minnesota Intelligent Rural Communities (MIRC) initiative.

As part of the MIRC initiative, Extension is teaching 18 communities how to use broadband Internet technology to attract new business, visitors and residents.

"We've diversified our commerce using sites like eBay and Etsy," says arts advocate Lynn Kasma, a recent MIRC participant from New York Mills, Minn.

In Akeley, Minn., 79 percent of local businesses have taken advantage of the program; in Sebeka, Minn., 57 percent. More than 1,500 individuals have participated in the grant-supported workshops, benefiting the vitality of rural Minnesota.

The MIRC project is funded through an American Recovery and Reinvestment Act grant to the Blandin Foundation of Grand Rapids.

**To learn more about Extension's MIRC initiative, visit [extension.umn.edu/community/mirc](http://extension.umn.edu/community/mirc)**



Through the MIRC partnership, rural and small-town businesses learn Internet skills needed to gain a competitive edge.

# Testing THE WATERS

## 4-H'ers explore watershed science in Minnesota.

Extension 4-H's aquatic robotics project engages youth in math and science, encouraging them to solve scientific questions by designing and carrying out real experiments. First piloted in 2011, the project will expand to reach about 3,350 youth in 67 counties through 4-H after-school programs and camps.



The aquatics robotics project is part of Extension 4-H's effort to develop the next generation of scientists, engineers and technology leaders in Minnesota. A study of positive youth development by Tufts University shows that young people who participate in 4-H excel in school and the sciences. In fact, they are more likely to pursue a career in science, engineering or computer technology than their peers.

"We want kids to learn engineering, but also to have a hands-on experience applying their skills to something they can relate to—keeping Minnesota's lakes, rivers and streams healthy," says Extension educator Joe Courneya. "By providing these learning opportunities for Minnesota youth in science, we're building a foundation that could lead to careers available right in our own backyard."

4-H'ers learn how to build and program the Remote Operated Vehicle (ROV), and using an engineering approach, they explore how to adapt it to monitor water quality in local bodies of water. Standardized protocols and training methods are used to guide 4-H volunteers and youth in the gathering of water samples.

Megan Nyegaard, a member of Kittson County's 4-H aquatic robotics team, was trained to collect aquatic macroinvertebrate samples. Organisms that are large enough to be seen with the naked eye, macroinvertebrates are good indicators of water quality. But first the team had to figure out how to adapt their ROVs to collect the samples.

"We attached a PVC pipe to the ROV to scrape and stir up the bottom of the river



**4-H'ers collect and analyze water samples from Northwest Minnesota's Two Rivers, using aquatic robots they engineered.**



so we could take samples at deep levels,” says Megan. “Then we added a net to collect the macroinvertebrates. We did a lot of test runs. We had problems at first getting the ROV to be level and do what we wanted it to do, but we figured it out.”

Partnerships make the aquatics robotics project possible in Minnesota. The U.S. Office of Naval Research provided its SeaPerch ROV to teach youth science, engineering and technology skills. Extension educators added the curriculum components related to watershed science.

Kittson County 4-H is also partnering with the Two Rivers Watershed District to guide 4-H’ers in the area’s River Watch program. Students take monthly samples to test the water for ph, nitrates, dissolved oxygen and other indicators of the quality of the water and what can live in it. The samples are verified by a certified lab and results are reported to the Minnesota Pollution Control Agency.

“These 4-H’ers are collecting real data that will be distributed for analysis and help us look at what waters are impaired,” says Dan Money, Two Rivers Watershed District administrator. “This is very important work that wouldn’t happen without Minnesota 4-H.”

**For more information about the 4-H aquatic robotics project, visit [extension.umn.edu/go/1104](http://extension.umn.edu/go/1104)**



## DID YOU KNOW?

■ Young people who participate in 4-H are more likely to pursue a career in science, engineering or computer technology than their peers.

■ Girls who participate in 4-H are more than twice as likely to participate in science, engineering or computer technology programs than their peers.

Source: Tufts University, 4-H Study of Positive Youth Development



Sherburne County 4-H’ers Ben, left, and Matt Vrchota tour the University of Minnesota campus as they contemplate next steps in their science education.

## 4-H helps youth ENGINEER THEIR FUTURES

Brothers Ben and Matt Vrchota, members of the Sherburne County 4-H aquatic robotics team, say their 4-H experiences are influencing their career direction and choice of college.

“The water quality work we’re doing in 4-H opened my mind to environmental engineering as a possible career,” says Ben, 16, who is considering studying at the U or Michigan Tech.

Matt, 14, is contemplating mechanical or civil engineering and would like to attend the U, Michigan Tech or Massachusetts Institute of Technology.

As members of the 4-H aquatic robotics team, the brothers have been tackling scientific questions at the request of the Sherburne County Soil & Water Conservation District. The county’s inquiry: Could the team use the same Remote Operated Vehicle (ROV) it builds and programs in 4-H to collect dissolved oxygen and temperature readings at different depths of Big Lake?

“Our team split into groups to figure it out,” says Matt, who helped design the experiments. “I worked on pressure sensors that would show how deep the robot was when it took a reading.”

The team also modified the ROV to hold a waterproof box to keep the computer on the robot dry. “My job was programming it to take the data,” says Ben. “We had to figure out how to get it to record the data correctly.”

Data the team collects are being used to help monitor the health of the lake. Temperature readings that are hotter or colder than typical for a season can signify that something is wrong. Levels of dissolved oxygen in the water indicate what plants and animals can live there.

The Sherburne County 4-H aquatic robotics team will also use what they have learned to guide other 4-H’ers as they begin asking similar questions.

For more information about 4-H programs in Minnesota, visit [extension.umn.edu/youth/mn4-h](http://extension.umn.edu/youth/mn4-h)



## Sowing seeds of success

**Extension’s Master Gardener volunteer program helps Minnesotans give back in their communities.**

More than three decades after its founding, Extension’s Master Gardener program is as fresh as its vegetables. Since 1977, the statewide program has become a go-to source of information—interpreting and disseminating University of Minnesota research to the public, helping address the state’s critical needs, such as access to fresh food and protecting natural resources, and growing green thumbs in communities throughout the state.

Betty Seims is not one to plant squash. It takes up too much space and chokes out the other vegetables. But Jeanette Fryhling, with whom Seims manages two plots in the city’s community garden, has an idea. “There’s a young man who has a plot in the garden. He plants a traditional Native American Three Sisters garden: corn, then beans, which grow up the corn, and squash surrounding.”

Such knowledge sharing among generations is common at the Cambridge community garden, established in 2009 as a joint venture between Master Gardeners, the Isanti County Environmental Coalition and the City of Cambridge. “It was originally a vacant piece

of land, owned by the city,” says John Nordin, Master Gardener volunteer and community garden cofounder. “Three years later, with 60 plots and more than 100 participants, it feels like a carnival. It’s a happy place.”

Cambridge Mayor Marlys Palmer agrees. “I refer to it as a ‘victory garden’ because it has been such a victory—for the people who work so hard there and for the entire community,” she says. “It brings together young and old.”

The Cambridge community garden is just one example of Master Gardeners giving back in their communities. In its 35th year, the Master Gardener program continues to thrive, attracting new members each year and proving essential



**(Top) Cambridge Community Garden plot-holder Betty Seims gets some seedling transplant help from Isanti County Master Gardener John Nordin and two budding horticulturists.**



to the state, the University and the public. It has 2,269 active members whose dedication is apparent in having passed an extensive certification process: an interview, 48 hours of classroom training, and a minimum of 50 hours of volunteering.

From there, the real work begins. “Communities drive our agenda,” says Julie Weisenhorn, state director of Extension’s Master Gardener program. “Whatever education or information communities request, we fulfill from manning hotlines and answering online questions to running diagnostic clinics and information fairs, teaching classes, and helping establish community gardens.”

Additionally, they work with University of Minnesota scientists and educators, tending research plots, collecting data, and interpreting results for the public. “That’s a core value of our program,” says Weisenhorn, “to connect the citizens of Minnesota with University information and show them how to apply it in their daily lives.”

It’s no small action. This can mean great advancements for the state’s critical environmental needs, such as protecting natural habitat, identifying and eliminating invasive species, and avoiding chemical runoff and water waste.

At the Cambridge community garden, Master Gardeners share such information alongside members’ tips on a bulletin board, helping Seims and Fryhling grow the fresh vegetables they provide the senior activity center each week. Extra produce often fills a bin close to the road for community members to help themselves.

“The garden is wonderful for seniors,” says Seims. “I love the feeling that I’m doing something worthwhile for our community.”

**To find out more about Extension’s Master Gardener program, visit [extension.umn.edu/master-gardener](http://extension.umn.edu/master-gardener)**

## GREENER GARDENING PRACTICES

It’s fairly easy to be green, say Anoka County citizens. A 2011 survey of those who participated in Anoka County Master Gardener program offerings found that

- 28 percent used fewer pesticides
- 32 percent reduced their watering
- 32 percent planted more vegetables after taking the classes.

Simple steps based on University research had an enormous effect, from selecting the right plant for the site (one that won’t require excessive chemicals to thrive) to watering at the right time of day for maximum hydration.

“We provide an environmental stewardship message in most everything we do,” says Lynne Hagen, Anoka County Master Gardener program coordinator. In Anoka County: Message received.

For more information about Master Gardener offerings in your area, visit [extension.umn.edu/garden/events](http://extension.umn.edu/garden/events)



Master Gardener volunteers multiply the productivity of researchers by maintaining and evaluating research plots, such as cold-hardy roses.

## BRINGING RESEARCH TO BLOSSOM

Without Master Gardeners, Extension educator Kathy Zuzek would have to clone herself many times over. Zuzek researches the hardiness of roses with test sites throughout the state. She works closely with Master Gardener volunteers throughout Minnesota who maintain plots and evaluate results, enabling Zuzek to test the plants in the state’s various climates and conditions.

“Using my key, they evaluate the plants on a three- to four-week repeat cycle throughout the growing season for several years,” she says.

Extension horticulturist Vince Fritz’s research also benefited from Master Gardeners, who formed a sensory panel to determine at what level of bitterness a

vegetable becomes unpalatable. The more bitter the vegetable, the higher level of phytonutrients it contains, which is better for health—if one can get it down.

“Vegetables that have a high phytonutrient concentration are thought to have preventative benefits against various forms of cancer,” says Fritz, who works to find agricultural connections to disease prevention.

Fritz relies heavily on Master Gardener volunteers and not just for the bitter tasks. They also aid him in the field, collecting data and tending crops.

“We trust the training and knowledge base of our Master Gardeners,” says Zuzek. “They are as passionate about the field as any of us who teach or do research.”

**For answers to your gardening questions using the U’s research-based information, visit [extension.umn.edu/garden/ask](http://extension.umn.edu/garden/ask)**

# The rise of robotic milking

Here's something to think about the next time you pour milk on your morning cereal: robots may have helped provide that milk. Minnesota's dairy industry is experiencing a boom in robotic milkers that is leading to less stress for farmers and cows.

"Milking is a repetitive task that benefits from being done exactly the same each time," says Extension educator Jim Salfer. "That's what makes it just a perfect fit for robots."

Robotic milking seems to be a perfect fit for Minnesota's dairy farms, too. The state leads the nation in number of robotic milkers, according to Extension dairy scientist Marcia Endres, after the first was installed in 2006. That growth has been driven by great service, knowledgeable salespeople and interested producers, says Endres, who is conducting research on automated milking systems (AMS), another term for robotic milkers, with Salfer and other Extension dairy team members.

Salfer predicts that more than half of Minnesota farms will be using robotic milkers in another 20 to 30 years, which could bolster the state's economy. The sixth-largest dairy state, Minnesota also exports some \$191 million in dairy products annually.

AMS essentially lets cows milk themselves, freeing up valuable time for farmers. Over time, the system also helps improve milk quality. The cows like it, too. Instead of being herded into the parlor two or three times a day in groups, each cow can move at her own pace and approach the AMS to get milked whenever she wants.



Photo: James Rajotte/New York Times/Redux

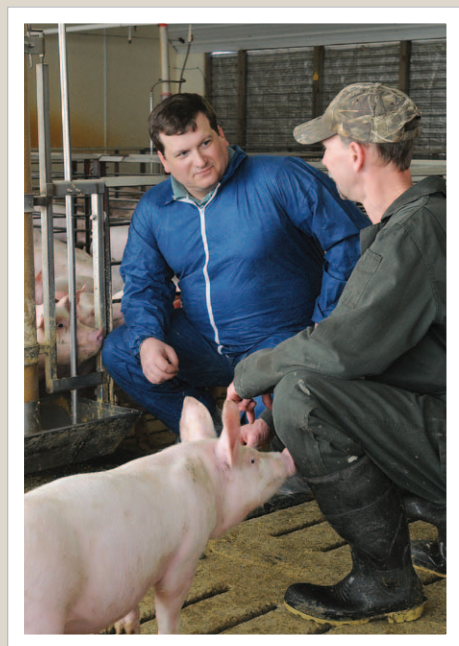
**Extension conducts research on robotic milking systems, which benefit cow health, milk quality and life on the dairy farm.**

And what are the benefits for producers? Most farmers surveyed by Extension cited quality of life as the main reason to switch to AMS. They still work as many hours, but their schedule is much more flexible.

"So many farmers told us, 'I could never go to my kids' games, and now I never miss one,'" says Salfer.

**For more Extension dairy resources, visit [extension.umn.edu/dairy](http://extension.umn.edu/dairy)**

## Ensuring safe pork AND HEALTHY PIGS



**Mark Whitney, left, Extension swine specialist, works with Doug Wenner, past Minnesota Pork Board president, to educate farmers about improving animal welfare and meat quality.**

People shopping for meat are increasingly considering more than just price. They want assurance that the meat is free of contaminants and that the animal was treated well.

Extension swine specialist Mark Whitney says producers have always been conscientious of treating their pigs well. "After all, we're in this industry because we like working with animals." But Whitney has noticed increased demand that producers document that they raise pigs in a humane manner.

To help meet this need, Extension offers a certification program developed by the National Pork Board called Pork Quality Assurance Plus (PQA Plus), which addresses food safety and animal welfare. Research-based education such as this also helps foster a successful swine industry in Minnesota, an industry which supports 22,500 jobs and accounts for \$7.6 billion in economic activity.

PQA Plus includes a certification course and a site assessment. The curriculum covers topics such as the responsible use of antibiotics.

"It gives producers and farm workers confidence and helps them demonstrate their professionalism," says Extension educator Diane DeWitte, who teaches PQA Plus in Blue Earth and Le Sueur counties.

Extension also teaches a complementary program called TQA (Transport Quality Assurance) for those involved in transporting pigs. It addresses the effects of animal handling, facility design and transportation on swine welfare and pork quality.

Treating pigs well is not just the right thing to do—it's also good for business. Pigs that experience stress produce lower quality meat; DeWitte says a stressful trip to the processing plant can reduce the value of a pig's meat.

Extension's swine team has certified more than 2,000 Minnesota producers in the past five years in PQA Plus and TQA. Producers must be re-certified every three years.

**For more information on Extension pork production resources, visit [extension.umn.edu/swineproduction](http://extension.umn.edu/swineproduction)**



# Turfgrass research yields surprise

## How fertilizing your lawn can improve the environment

A fertilized lawn may help you compete with the neighbors when it comes to curb appeal, but did you know it also has important environmental benefits?

University of Minnesota research is helping us discover that healthy, fertilized lawns—once viewed as polluters—can benefit soil and water quality if fertilizer recommendations are followed.

A five-year Extension study examined the amount and quality of runoff from test plot lawns with various levels of fertilizer used. Results showed that unfertilized lawns resulted in greater phosphorus runoff than lawns kept healthy with fertilizer treatments.

“Homeowners sometimes think fertilizer is bad for water quality, but our research shows that’s not always true,” explains Brian Horgan, Extension turfgrass specialist and one of the study’s authors. “The health and density of the lawn was what made the difference, and good fertilization practices create healthier, denser lawns.”

The longest-running study on turfgrass runoff in the Upper Midwest, University research showed that 80 percent of the runoff occurred during the winter, when soils were frozen.

Healthy turfgrass can improve surface water by stabilizing soil against water and wind erosion and reducing runoff. It can improve groundwater by filtering water as it passes through and using microorganisms in the root zone to break down contaminants. The infiltration process also helps recharge groundwater supplies, according to Horgan. Other factors influencing water quality include how compacted soil is and what species of turf is used.

The results of this study are informing the Minnesota Pollution Control Agency’s update of stormwater best management practices. For the first time, a healthy lawn may qualify as a stormwater credit.

Lawns that contribute to slowing runoff and filtering water mean cleaner lakes, rivers, and drinking water for Minnesota. And competing with the neighbors? Well, appearance shouldn’t be the basis for judging your lawn’s level of environmental friendliness, Horgan cautions.

“Grass doesn’t have to look green all the time to be healthy. It’s very hard for homeowners to accept that with our ‘Keeping Up With the Joneses’ attitude.”

**For more lawn-care research and resources, visit [extension.umn.edu/turfgrass](http://extension.umn.edu/turfgrass)**



## HOW TO GET AN ECO-FRIENDLY LAWN

Here are some things you can do to help your lawn be a water-quality booster:

- **Get a soil test.** This will tell you what nutrients need to be supplemented with fertilizer. For information on how to submit a pint-sized sample to the U of M Soil Testing Laboratory, visit [soiltest.cfans.umn.edu](http://soiltest.cfans.umn.edu). Tests cost \$15-20 each.
- **Consider a drought-tolerant grass variety.** These grasses go semi-dormant during the hottest months and require little maintenance.
- **Don’t overwater.**
- **Fertilize once a year.** A good rule is to do it every Labor Day weekend.

For more information on maintaining sustainable urban landscapes, visit [extension.umn.edu/garden/lawns](http://extension.umn.edu/garden/lawns)



**According to Extension turfgrass research, a healthy lawn is an environmental asset because dense, growing grass prevents runoff and controls erosion.**

## Time is ripe for farm to school

The timing has never been better for the farm to school movement. One out of three children are overweight or obese, according to the Centers for Disease Control and Prevention. National health care costs continue to rise, fueled in part by more total cases of cardiovascular disease and diabetes.

In an effort to improve child health, new federal guidelines for school meals will begin to take effect during the 2012-13 academic year. The revamped standards call for twice as many fruits and vegetables, more whole grains and less sodium for school breakfasts and lunches.

In Minnesota, Extension and many key partners are working to ensure farm to school continues to grow.

“Our goal is to provide as many school-age children as possible with the chance to eat and learn about fresh, local foods,” says Stephanie Heim, Extension farm to school educator. “We want to reinforce healthy eating habits at a young age to ensure they are carried into adulthood. At the same time, farm to school keeps more food dollars close to home and helps support farmers.”

Extension bolsters statewide efforts by educating students, school food-service staff and farmers—and by building the capacity for farm to school in Minnesota communities. “We work with community members to address unique challenges in their areas,” Heim says.

A new documentary by Extension, the Minnesota Department of Health and Twin Cities Public Television (TPT) explores the economic



**Minnesota’s farm to school programs, with Extension as a key partner, build healthy, sustainable communities.**

advantages and remaining challenges for farm to school. The story is told through interviews with Minnesota farmers, school administrators, food service staff and others.

The documentary aims to spark conversation about food-system challenges and new approaches to economic development. It first aired on TPT in March, and can be viewed online and at special regional screenings across Minnesota.

**For more information on farm to school, the documentary and regional screenings, visit [extension.umn.edu/farm-to-school](http://extension.umn.edu/farm-to-school)**

## Putting food insecurity on the map

Food assistance is available for low-income individuals and families, but many in need don’t know they are eligible or are too proud to ask for assistance. Of those Minnesotans who are eligible for food assistance, now

called Supplemental Nutrition Assistance Program (SNAP), only 65 percent apply, according to the USDA. That includes just 41 percent of eligible seniors. The result? Meals that are woefully inadequate or skipped altogether.

The problem worsens in food deserts—low-income communities without easy access to healthy, reasonably priced food. St. Louis County, for example, is home to some 30,000 low-income individuals, many who live in rural areas west of Duluth and must travel more than 10 miles for the groceries they need to put a healthy meal on the table.

Recently, Extension partnered with the University of Minnesota Duluth and Second Harvest Northern Lakes Food Bank to pilot a Geographic Information System (GIS) project. The goals were to map areas of food insecurity—where people lack access to enough food to meet their basic needs—and provide a more complete picture of available resources.

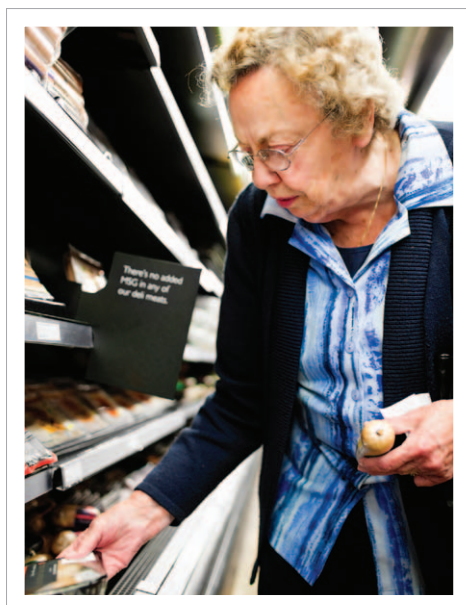
The pilot included the development of

a robust database that adds insight to federal and state data. Information includes locations and hours of grocery stores, food shelves, soup kitchens, farmers markets and community gardens. The ongoing project will identify gaps in the county’s food-security safety net.

“It’s really about better health,” says Betsy Johnson, Extension health and nutrition educator, adding that people in rural areas are challenged to find nutrient-rich fresh produce with the north’s shorter growing season. “Unfortunately, nutrient-empty, processed food is more widely available.”

Johnson says the GIS project will help partners match needs to resources more efficiently. “Through Extension’s Simply Good Eating nutrition education program—and in partnership with Second Harvest—we can help overcome many barriers to better health and nutrition.”

**For more information on Extension’s nutrition education programs, visit [extension.umn.edu/nutrition](http://extension.umn.edu/nutrition)**





# Igniting excitement for science

## Collaboration makes math and science meaningful for Ojibwe youth.

Science education on northern Minnesota's White Earth Indian Reservation has improved considerably since Extension teamed up to engage students in science, technology, engineering and math (STEM) through a 4-H model of learning.

Extension and the reservation began the cooperative effort 14 years ago to address community members' concerns about low math and science test scores. The White Earth Academy of Math and Science summer school program was developed, and three years ago, an annual science fair was added to complement year-round learning.

"The collaboration succeeds because it draws on the strength of relationships with elders and teachers to connect the curriculum to Ojibwe culture," says Deb Zak, Extension northwest regional director. "The students learn STEM concepts, while honoring and nurturing traditional practices and values."

The model is also strengthened by a national 4-H STEM initiative.

Extension's research-based 4-H model means that youth get to take charge of their learning with the guidance of adults trained in youth development. During the science fair, students present projects to four University faculty members and graduate students, who serve as judges. Zak says she's seen participation double to nearly 90 students in just a few years.

Test scores, as well student attitudes about STEM, have improved. After taking part in the five-week summer school, 55 percent changed their minds and agreed they would like a job that involves science, mathematics and/or engineering.

And the science teachers?

"The teachers are more engaged than ever and have a better idea of how to work with the kids to put together a quality project," Zak says. "They see it as a great way to get the kids to learn science."



An annual science fair has sparked interest in science careers on Minnesota's White Earth Indian Reservation. Test scores are also up as a result of collaboration between the White Earth community and Extension.

For more information on Extension's White Earth Reservation Academy program, visit [extension.umn.edu/whiteearth](http://extension.umn.edu/whiteearth)

## Quality matters in positive youth development

When choosing a youth program, most people think about convenience, affordability and whether the activities are interesting and fun. But these factors alone are not enough.

A growing body of research shows that high-quality youth programs focused on building social and emotional skills can lead to young people earning better grades, enhanced leadership skills, improved self-esteem and better ability to interact with others.

Extension has been researching the 64 indicators needed to create a positive youth development program. The indicators fall under four categories following Maslow's hierarchy of needs: a safe environment, a supportive environment, interaction and engagement.

"All of these indicators need to happen every day—with every young person—to receive the benefits that lead to positive youth development," says Deborah Moore, Extension youth development program quality leader.

In addition to offering 4-H programs that are based on these indicators, Extension works with other youth-serving organizations to provide the latest research in positive youth development.

For more information on improving the impact of youth programs, visit [extension.umn.edu/go/1098](http://extension.umn.edu/go/1098)

### WHAT MAKES A HIGH-QUALITY YOUTH PROGRAM?

- 1 ENVIRONMENT IS SAFE**  
Psychologically, emotionally and physically safe for youth
- 2 ENVIRONMENT IS SUPPORTIVE**  
Youth encouraged to build their skills, learn while doing and learn to manage conflict
- 3 OPPORTUNITIES FOR INTERACTION WITH ADULTS AND OTHER YOUTH**  
Youth lead and mentor, partner with adults and experience belonging
- 4 YOUTH ACTIVELY ENGAGE IN THEIR LEARNING**  
Youth plan, make choices and reflect on their learning



# UNIVERSITY OF MINNESOTA EXTENSION

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## U of M celebrates 150 years of land-grant mission

This year marks the 150th anniversary of the Morrill Act of 1862, legislation that allowed for the creation of the nation's land-grant colleges and universities.



In the early 1900s, boys and girls were given improved "Minnesota 13" corn seeds from the University Farm while participating in "corn club" contests.

Under the act, signed into law by President Abraham Lincoln during the Civil War, each eligible state received federal land to be used toward establishing and funding the educational institutions.

Today, the University of Minnesota is part of the national network of land-grant institutions with a mission to address critical public issues through teaching, research and outreach.

Extension delivers on the University's land-grant mission, working with Minnesotans to address important issues and creating a better world for future generations by:

- Improving our environment
- Keeping food safe and affordable
- Ensuring Minnesota communities are strong
- Helping families make better decisions
- Preparing youth to be tomorrow's leaders

Through the decades, Minnesotans have turned to Extension for help improving their lives. Extension research and education made a difference as they struggled to feed their children during

the Great Depression, learned how to grow victory gardens during World War II, fought off bankruptcy during the farm crisis of the 1980s, and battle childhood obesity today.

From Warroad to the White Earth Reservation to Winona, Extension extends the reach of the University into every corner of the state, making the land-grant mission as vital and strong in 2012 as it was in 1862.

For stories and videos about how the U's land-grant mission has strengthened Minnesota, visit [extension.umn.edu/history](http://extension.umn.edu/history)

