

# SOURCE

Magazine of Extension research & education | Spring-Summer 2015

## Perennial impact

Extension's Master  
Gardener program  
extends value  
well beyond  
growing season

Red River Valley

4-H Science of Agriculture

Aquatic Invasive Species

# SOURCE

SPRING-SUMMER 2015

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 UNIVERSITY OF MINNESOTA | EXTENSION

## Questions sprouting up?



What's this weed?  
How much should I water?  
What grows in shade?  
How can I attract butterflies?  
Do I need to fertilize?

Find gardener-friendly tips from University of Minnesota Extension experts: [www.extension.umn.edu/Garden](http://www.extension.umn.edu/Garden)



**ON THE COVER:** Extension's Master Gardener program delivers high-quality experiences, getting people outside for hands-on education through partnerships with others in the community.

For more information on programs and services, visit our website at [extension.umn.edu](http://extension.umn.edu).

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

## From the Dean

Extension donors make a difference



Bev Durgan, Dean

Through Extension, our dedicated volunteers and participants are able to make a difference by engaging in their passions—whether that passion is in agriculture, leadership, youth development, gardening, communities, environment or families.

Today, more and more people are realizing they can make an even bigger difference in these areas with a financial gift of support to Extension. With these generous gifts, Extension is able to fund additional positions, provide scholarships, engage in new research and reach more people with education.

To honor the generous contributions of Extension's friends and donors, we are launching the University of Minnesota Extension Dean's Circle. This giving society honors donors who have made cumulative gifts of \$5,000 or more to any

Extension program or the Minnesota 4-H Foundation. Donors of \$25,000 and above also become members of the University's President's Club.

You can learn more by checking out our giving website ([www.extension.umn.edu/donate](http://www.extension.umn.edu/donate)) or talking with our development director, Jane Johnson (612-626-3717, [johns350@umn.edu](mailto:johns350@umn.edu)). We will be reaching out to our current and past donors of \$5,000 and above to welcome them as charter members of the Dean's Circle.

You can also learn more about the impact of donors in this issue of *Source*. I invite you to read a profile of Master Gardener Pam Hartley. Discover how Extension's agriculture research and education continues to succeed thanks to the support of individuals, organizations and commodity groups, while the new and exciting 4-H Science of Agriculture program is growing through generous gifts.

We appreciate your investment in Extension research and education to create a stronger Minnesota—whether through your volunteer time, your support or through your gift.

Sincerely,

Beverly R. Durgan  
Dean, University of Minnesota Extension

## PROUDLY 4-H GROWN

Connect with 4-H  
Alumni & Friends

Did you know there is an alumni community for Minnesotans who grew up in Extension 4-H? We are more than 50,000 strong, but incomplete without you.

Joining the Minnesota 4-H Alumni & Friends Community is free. You will reconnect with other proud alumni, discovering ways to support 4-H across our state.

Find us on Facebook and Twitter @MN4HGIVE to share memories with 4-H friends from days gone by. If you're looking to build your professional network and find jobs that value your 4-H experience, join our Minnesota 4-H alumni group on LinkedIn.

Visit our website  
<http://z.umn.edu/4HALumni>  
to raise your hand today  
and say, "Yes! I'm  
proudly 4-H grown!"



Minnesota 4-H State Ambassadors, 1989



Extension Master Gardener volunteers complete rigorous training and spend at least 25 hours each year teaching communities how to garden and get the most out of the nutritious food they produce.

# Teaching in the garden

Positive outcomes of Extension’s Master Gardener program extend well beyond growing season in communities and homes across Minnesota

Every year, Minnesotans benefit from the efforts of more than 2,300 University-trained Master Gardener volunteers, who give more than 130,000 hours of service to make their communities more sustainable.

It’s an exciting time for Extension’s Master Gardener Volunteer Program. The program’s ability to get people outside for hands-on education is at an all-time high.

Since the national program came to Minnesota in the 1970s, the University-trained volunteers have covered everything from soil preparation to rain gardens, and have reached everyone from retirees to budding young growers.

“Extension offers a chance to learn, network and give back to our communities,” says Denise Moen, a Master Gardener intern in Scott County. “Together we can turn the next generation on to the wonders of the garden.”

## Growing partnerships

One shining example of success is the teaching gardens in many parts of the state, where communities gather for regular learning opportunities relevant to local needs and interests.

For instance, Evenings in the Garden is an annual series sponsored by the Carver-Scott Extension Master Gardeners offering summer classes in the teaching garden on the Scott County fairgrounds in Jordan.

Recently, a group of teens attended from the Scott County Juvenile Alternative Facility. “These young people came from homes where life, in one way or another, was complicated at best,” says Deb Tomczyk, a Master Gardener who developed Evenings in the Garden. “They worked hard to be selected to attend.”

Tomczyk recalls one young man who initially sat on the fence and watched a tree planting demonstration, but he slowly became more engaged. Soon, he was asking the session leader about jobs in landscaping. “He left the

session thinking about applying for that work the very next day,” says Tomczyk.

Extension Master Gardeners nurture partnerships with dozens of community and government entities, and work with University faculty to create a research-based curriculum. This is all part of Extension’s overall effort to deliver high-quality learning experiences with local relevance.

One such partnership is with the Scott County Clean Water Education Fund. “Because of our partnership, both of our organizations can do more, reach more, and have a powerful, lasting and cost-effective impact,” says Diane Hrabe, coordinator with the Scott County program.

## Reaching the next generation

Getting people outside for hands-on education through partnerships with schools, farmers markets and community groups is key to program success. Case in point: the Colorful Growers project, part of a Winona County nonprofit called Project FINE.

Colorful Growers provides youth with a unique entrepreneurial experience. Participants plant and tend a plot at the Stone Point Park community gardens, and then sell their crops at local venues.

“We reached out to a local Master Gardener volunteer for expertise,” explains Fatima Said, Project FINE director. “The youth gained knowledge of the time and care necessary to grow food and a greater appreciation for fresh local produce. They’re also developing leadership skills and confidence.”

“We’re empowering volunteers to share research and best practices,” says Tim Kenny, statewide director of the program. “In the process, we’re promoting healthy people, healthy plants and a healthy planet.”

Plans are underway to build a new physical home for Master Gardeners at the Minnesota Landscape Arboretum, according to Kenny. There, volunteers will develop new educational opportunities, and build on projects that have already proven successful.

## PAYING IT FORWARD

Education that builds community. That’s one of many benefits Extension’s Master Gardener program provides. And it’s one of the main reasons Pam Hartley created an educational endowment fund.

“I’ve learned so much, so starting an educational fund was a way to give back,” says Hartley, who has served as a Master Gardener in Anoka and Ramsey counties.

Hartley’s fund supports programming across the region, such as the Master Gardener presence at the Minnesota State Fair. “Thousands of people visit our booth, bringing in samples and photos of problems from their yards,” notes Hartley. “They value the University information we share with them.”



Minnesotans like Pam Hartley, Master Gardener volunteer and donor, are inspired to give time and money to help grow more gardening education.

Want to help Master Gardeners continue to thrive and grow? Look for “Master Gardener Fund” at [www.extension.umn.edu/donate](http://www.extension.umn.edu/donate)

## MIX IT UP!

Summer brings on the impulse to grow something beautiful. Consider varieties that, combined in containers, provide food for both you and pollinators.



FOR YOU

**BRIGHT LIGHTS CHARD** has edible leaves that can be cooked like spinach or added to salads and sandwiches.

**GENOVESE BASIL** is easy to grow—harvest the top part of the plant and it will regrow from the stem all summer long.

**FLAT-LEAF PARSLEY** is a good plant to tuck into the edges of a container.



FOR POLLINATORS

**PERSIAN CARPET ZINNIA** attracts pollinators with vibrant blooms of yellow, orange and red.

**VERBENA BONARIENSIS** is covered with small, purple, nectar-filled flowers.

**DILL FLOWERS** offer nectar and pollen to visitors, as well as dill seed for your pickles in the fall.

# Red River Valley connections

Extension addresses issues that cross state lines with a spirit and system of collaboration

Formed by the glacial Lake Agassiz, the Red River Valley spreads across the border of Minnesota and North Dakota. The fertile soils create a rich bed for crops, making agriculture the top employer and economic driver. Research and education about threats to those crops keep the region healthy, benefiting the economy and environment of both states.



By staying on top of issues, Extension helps farmers learn about threats. Pictured: Andy Robinson (left), U of M Extension and NDSU Extension potato specialist, with Justin Dagen, potato grower from Karlstad, Minn.

As the sun rises over Justin Dagen's potato field, farmed by his family for 134 years, Dagen finds three tiny insects stuck in his liquid aphid trap. He seals the container and mails it to the University's



Ian MacRae, U of M Extension entomologist, (right) with Andy Robinson, U of M Extension and NDSU Extension potato specialist.

Northwest Research and Outreach Center in Crookston. At this moment, other growers throughout the Red River Valley are doing the same thing.

Soon after, Andy Robinson, a potato specialist who works for both University of Minnesota Extension and the North Dakota State University Extension Service, sends the growers customized reports containing information they need to make precise management decisions that protect their crops while conserving resources.

## Data drives action

The Red River of the North physically divides Minnesota and North Dakota. Moorhead and Fargo are often considered twin cities, forming a cultural and economic center. A variety of crops are grown on both sides of the river besides corn and soybeans. The region also ranks high in potatoes, sugarbeets, canola, wheat and other small grains.

Robinson and two other specialists hold positions shared between the Extensions of

both North Dakota State University and the University of Minnesota. As dual-state researchers and educators, they respond to challenges on both sides of the border. That's because, for example, if the aphids found by Dagen are the type that serve as a vector for the crop-robbing Potato Y virus, both sides of the river may suffer if growers don't act.

"Growers have to be vigilant, and they need data," says Robinson. He formulates recommendations based on real-time data provided by Ian MacRae, U of M Extension entomologist. MacRae studies the aphid situation, using strategies from a simple jar trap to advanced drone technology. Understanding what types of aphids are active at what levels helps farmers know when and how to treat, as well as when not to take action. The goal is to prevent crop damage, but with fewer chemicals.

"The Potato Y virus is just one of our challenges," says Dagen. "There's also flood, drought, blight, fertility issues and Colorado potato beetles. I rely on Extension for help with all of these, and it's always a moving target."

## Sweet history, strong future

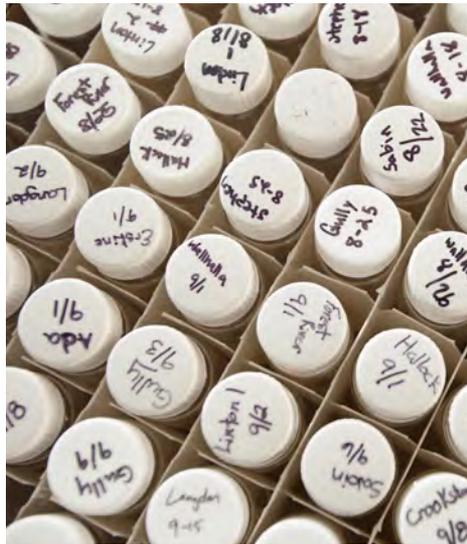
A variety of Extension positions have been shared across this border since the late 1960s, beginning with sugarbeet specialist Alan Dexter, who addressed weed control problems facing the region's growers.

"Now, more than ever, sugarbeet growers deal with production challenges like weeds and diseases, but they don't want to manage these at the expense of the environment," says Tom Peters, weed specialist. Peters and Mohamed Khan work with sugarbeet growers in both states.

"Sugarbeet growers contribute funding for shared positions because they provide effective, practical science-based solutions," says Tom Knutsen, vice president of Minn-Dak Farmers Cooperative. "They don't say, 'You have to do this.' Extension specialists say, 'Here's the science, and I hear what you're saying too. Now let's find a road map.'"

"This way of working across the border is successful in the Red River Valley, where our two states form such a tight community," says Betty Younggren, a Kittson County commissioner who serves on the county's Extension committee.

"Kids from both states play hockey together and take swimming classes together," adds Younggren. "So it just makes sense to work together on the issues most important to our future."



Extension helps farmers understand challenges such as insect pests, weeds and plant diseases to protect all types of crops. Crops in the Red River Valley include potatoes, sugarbeets, canola, wheat and other small grains, as well as corn and soybeans.

## Red River Valley at a glance

- No. 1 Employment sector: Agriculture, forestry, fishing & hunting
- No. 1 in Minnesota for crop cash receipts: Polk County
- Sugarbeet acres in region: 600,000
- Top-producing region for red potatoes in nation

## Giving back through leadership

Thirty years ago, Extension, local advisors and supporting organizations created the Red River Valley Emerging Leaders Program. The program creates and sustains a network of community leaders focusing on agriculture, natural resources and other issues. More than 1,000 individuals have participated, completing four main goals:

1. Develop an understanding of self and community
2. Build skills in leadership and relationships

3. Broaden understanding of complex issues and legislative processes
4. Set personal goals to "give back" to their community

"We have a new group every year, and it's always exciting to see where their path takes them next," says Jody Horntvedt, Extension educator in leadership and civic engagement. "Hundreds of alumni today are working on local issues, serving as leaders in state commodity groups, and representing Minnesota on national boards."



Even the smallest communities can remain vital with the engagement of residents like Christina and David Lien, Red River Valley Emerging Leaders alumni from Flom, Minn.

# 4-H and the Science of Agriculture Challenge

Minnesota youth conduct research to address complex issues



The first program of its kind in the country, the 4-H Science of Agriculture Challenge aims to ignite excitement about agriculture, increase ag science literacy and expand the pipeline of youth pursuing agriculture-related careers.

Youth teams conduct research on areas of interest, from bees to biodiesel to breeding standards, as part of the 4-H Science of Agriculture Challenge. One team studied their passion: bees, with the help of their team coach. Pictured: Kristen (left), Justin and Sophie Weeldreyer.



Sixteen-year-old Justin Weeldreyer always thought bees were the coolest miracles of nature, living off the honey they make and

building intricate hives. He put his interest to work by conducting research with four other Washington County 4-H youth as part of the new 4-H Science of Agriculture Challenge.

“Overwintering is a big problem for Minnesota beekeepers,” says Justin. “Big producers pack up and send their hives someplace warm, but smaller businesses and hobbyists can’t afford that and just hope their bees survive.”

## Ag experts mentor 4-H’ers

Twenty 4-H Science of Agriculture Challenge teams across the state are working with local experts to identify ag-related issues in their communities and develop science-based solutions. Justin’s team works with Dustin Vanasse, a Twin Cities beekeeper who sells honey through his business, Bare Honey. Dustin, who studied at the University of Minnesota College of Food, Agriculture and Natural Resource Sciences, breeds honeybees that are better adapted to Minnesota winters. The team studied Dustin’s hives and hives belonging to members of the Minnesota

Hobby Beekeepers Association. They researched the amount of honey the bees need, hive design and species, and studied how these factors affected bee survival and productivity after winter.

“It’s so important that young people get involved, and understand and connect with where their food comes from,” says Vanasse. “From crops of fruits and veggies, to the alfalfa needed by cows to produce the milk in their ice cream—bees are critical to our food production system.”

“There’s not a lot of data about what we’re studying,” Justin says. “Our 4-H project is going to mean something to people.”

## Youth researchers today; ag leaders tomorrow

The new 4-H Science of Agriculture Challenge provides a hands-on learning experience to inspire the next generation of agriculture leaders in Minnesota.

“This challenge is designed to let youth drive the research, exploring and building on what piques their interest,” says Josh Rice, Extension science of agriculture specialist. For example, teams can use remote-control helicopters to scout weeds, develop business plans for community food gardens or design aquatic robots to research invasive species.

Areas teams are exploring include

environment, animal science, technology and biotechnology, economic issues, food, fiber, and energy. A sampling of current projects includes:

- Soil management and groundwater (Dakota County)
- Food waste from farm to table (Meeker County)
- Breeding standards for sheep (Otter Tail County - West)
- Uses for methane from dairy cows (Nicollet County)

Teams will present their results at a two-day event June 17-19 on the University of Minnesota St. Paul campus. An awards

celebration and challenge fair will showcase their work and connect them with agribusiness community representatives who are eager to meet the next generation of ag leaders. The event will also include judging presentations, career workshops and campus tours.

“It’s so gratifying to witness these young people’s eyes light up with curiosity and discovery,” says Dorothy Freeman, Extension associate dean for youth development and state 4-H director. “As the University’s youth development program, the 4-H Science of Agriculture Challenge is a cutting-edge learning experience.”

**To learn more, visit:**  
[z.umn.edu/4Hscienceofagriculture](http://z.umn.edu/4Hscienceofagriculture)



## MEETING THE NEED

### ISSUE: SHORTAGE OF AG LEADERS

- The U.S. faces a shortage of scientists and professionals that are “ag literate.” There currently aren’t enough graduates to meet needs. (USDA survey)
- 25,700 new jobs for management and business, and 14,600 new jobs in agriculture and science engineering, are created annually. (Bureau of Labor Statistics)

### SOLUTION: 4-H

- Youth who participate in 4-H excel in school and science, and are more likely to pursue a career in science, engineering or computer technology than their peers. (Tufts University)
- 4-H participants take more sciences courses in high school than other youth, and at a higher level. (Heck, Carlos, Barnett & Smith, 2012)
- 4-H’s new Science of Agriculture Challenge gets youth excited about pursuing agriculture education and careers.

## Help grow the next generation of agricultural leaders

Extension needs the generous support of businesses and individuals that care deeply about the future of Minnesota agriculture and the development of our next generation of ag leaders.

**DONATE:** Financial contributions will ensure that the 4-H Science of Agriculture Challenge continues and grows for years to come. Donations will fund staff positions and provide support for youth teams to do research and participate in events.

**VOLUNTEER:** Knowledgeable adults who can guide the curiosity and creativity of youth are crucial to this program. Volunteers can serve as local team coaches or as expert mentors.

Visit [www.extension.umn.edu/youth/give](http://www.extension.umn.edu/youth/give) to learn about giving opportunities.

# Science below the surface

Extension engages businesses, communities in protecting Minnesota waters



Nick Phelps, Extension aquaculture specialist, is one of several Extension faculty members engaging citizens in preventing the spread of harmful microbes and other aquatic invasive species that can hurt Minnesota's industries and way of life.

All spring, Greg Oswald of Oswald Fisheries has been busy raising minnows in special protective ponds. “Our health-certified minnows are great for catching walleyes and muskies,” says Oswald, whose business is headquartered in Ellendale. He also has contracts to provide them as feed for state-fed game fish.

But fish can get sick. When they do, they pose a threat to other fish that are crucial to our enjoyment of Minnesota's 11,000 lakes and rivers—and to Minnesota's \$4.8 billion sport fishing industry.

“Minnesota's multi-million dollar baitfish industry, with both farmed and wild-harvested fish, is the second largest in the nation,” says Nick Phelps, an Extension aquaculture specialist and faculty member with the U of M College of Veterinary Medicine, who conducts research and education to help protect the state's waters.

“The industry is important because all fish used for bait in Minnesota must be raised or harvested here,” says Phelps. A 1960s ban on

importing live baitfish was intended to protect the industry in Minnesota, but kept in place to prevent the spread of invasive species and disease.

Phelps reaches out to educate anglers about how to prevent the spread of diseases. He and his team at the University's Veterinary Diagnostic Laboratory have developed a new lab test that detects viral hemorrhagic septicemia in two days versus the previous test that took 28 days. Early detection and assurances are keys to preventing spread and keeping businesses up and running.

“We need assurances that regulations don't unnecessarily put businesses on lockdown,” says Oswald. “Nick and others at the University established a protocol system, allowing our tested and certified product to be transported and accepted.”

## Engaging Minnesotans

While Phelps pursues viruses in the baitfish industry, the University is working to protect the state's waters against several other organisms. Sue Galatowitsch, a restoration ecologist who leads the University's new Minnesota Aquatic Invasive Species Research Center, recently convened more than 200 lakeshore association representatives and community leaders to the St. Paul campus to highlight ongoing research and how they may be involved in the future. “In addition to harmful microbes, we have fast-moving issues like zebra mussels, so we have to use an adaptive process that engages citizens,” she says.

This opens the door to further collaboration with Extension specialists,

like Phelps, and regional and local Extension educators. “We have a long way to go to discover how to manage aquatic invasives,” says Galatowitsch. “Increased cooperation is going to be critical among the University, Extension, the DNR, fishing and recreation industries, and other partners.”



## Closing the research gap on invasive species

No reliably proven treatment options exist yet for many aquatic invasive species. The Minnesota Aquatic Invasive Species Research Center at the University of Minnesota was formed in 2012 to develop new tools to measure, control and eradicate invasive plants, fish and invertebrates. Beginning in 2015-2016, Extension faculty within the Center will develop plans to:

- Engage citizens in scientific research trials on Minnesota lakes, ponds and rivers
- Train educators and volunteers on population monitoring and reporting before and after various treatments
- Gather and analyze data, then share discoveries with citizens



## 2014 farm bill changes landscape

### Extension education helps farmers navigate options

The federal farm bill is intended to build stability into agriculture—and security for farmers—to help ensure a reliable, affordable food supply. Helping farmers make solid business choices translates into a stronger economic foundation in Minnesota, where agriculture is the second-largest industry.

More than 15,000 farmers and farm advisers recently attended Extension crops and dairy seminars on the 2014 farm bill. Many more used Extension’s online farm bill tutorials.

Cokato farmer Kevin Dahlman learned how to plan for the impact of the 2014 farm bill on his corn and soybean operation. “The information presented made it real and manageable for farmers as we look at the tools we have to make decisions,” says Dahlman, co-owner of a Wright County-based seed company. He credits Extension with presenting realistic scenarios as agricultural economists predict market volatility for the coming years.

### Federal farm policy shifts

Previous farm bills emphasized direct payments to farmers to help them withstand poor harvests and low prices. The 2014 bill shifts from direct payments into a risk-management model. Dairy producers can

revise their choices yearly; crop growers are locked into five-year decisions.

“This is the most complex farm bill yet. But it’s also a strong program, presenting farmers with the opportunity to make thoughtful choices, using online tools to guide their selections,” says Bob Craven, Extension agricultural economist in the University of Minnesota Center for Farm Financial Management. “It’s an important step, one that can help keep farms intact.”

The farm bill mandated that Extension nationwide partner with the U.S. Department of Agriculture’s Farm Service Agency (FSA) on education. In Minnesota, FSA staff and Extension educators and economists fanned out to 72 counties for the seminars. U.S. Rep. Collin Peterson, who represents Minnesota’s 1st Congressional District and is recognized as a driving force behind the 2014 Farm Bill, attended dairy and crops sessions.

“The work done by Extension economists and crop and livestock specialists at our land-grant universities during program sign-up was more important than ever,” says Peterson, the ranking member on the House Agriculture Committee. “Their knowledge and education help farmers navigate their options in the new farm bill and determine the best safety net for their farm.”

## Wellness through wiser eating

### Aiming for a healthier Minnesota where everyone can thrive

Extension nutrition educators improve lives through the Supplemental Nutrition Assistance Program education (SNAP-Ed) program. SNAP funding is authorized through the farm bill.

“We emphasize the importance of being proactive—not waiting until costly chronic health problems set in,” says Mary Caskey, Extension’s SNAP-Ed associate program director.

By joining forces with partners, Extension changes society for the better when it comes to nutrition:

- Wabasha County health care and social services professionals refer at-risk individuals to Extension’s SNAP-Ed classes to promote lasting diet and lifestyle changes.
- In Todd County, partnerships with local health care providers focus on preventing type 2 diabetes through healthier eating and exercise.
- In Otter Tail County, Extension Master Gardeners and civic groups delivered 400 pounds of fresh produce to an area food shelf. Meal preparation classes followed, resulting in participants reporting more vegetables in their diets.





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Photo provided by Minnesota Pork Board.



Extension helps Minnesota farm families like the Boerbooms feed a growing world.

**U of M Extension research and education help farmers make better decisions through programs in:**

- 4-H youth development
- Adult leadership training
- Family financial management
- Responding to invasive species
- Farm profitability
- Water quality

## Together, we create a stronger Minnesota

Minnesota farmers put University knowledge to work every day