

FY 2020 Annual Report of Accomplishments and Results

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| Wisconsin |
| University of Wisconsin-Madison |
| Wisconsin Agricultural Experiment Station |
| University of Wisconsin-Madison Division of Extension |

I. Report Overview

The NIFA reviewer will refer to the executive summary submitted in your FY 2020 Plan of Work located in the Institutional Profile. Use this space to provide updates if needed.

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| <p>1. Executive Summary (Optional)</p> <p>At the University of Wisconsin-Madison, the Wisconsin Agricultural Experiment Station (WAES), which is part of the College of Agricultural and Life Sciences (CALs), and the Division of Extension (Extension) are partners who work together to generate new and exciting research-based knowledge. The partners then deliver that knowledge to Wisconsin’s residents and communities to help address challenges such as pesticide management. 2020 was a challenging year with the onset of the COVID-19 pandemic. While restrictions were placed on research and travel, our faculty and scientists were resilient and continued meeting project objectives. With rising new challenges, learning new technology platforms allowed us to continue our extension and outreach. Below are updates to our research and outreach programs.</p> <p>Scope of Education & Research: Smith-Lever funding provides about a fifth of Extension’s annual funds, and Hatch funding provides an estimate of 7 percent of annual research funds for CALs/WAES-same as last year. However, this funding provides the vital basis for research-based information and programming to individuals, communities, businesses, and local governments in Wisconsin. In addition, Smith-Lever funding provides the legal basis for additional funding provided by the State of Wisconsin. To reflect the vital nature of NIFA Capacity Funds for the people of Wisconsin, this report includes information from all programmatic activities at WAES and UWEX.</p> <p>For 2020, WAES supported 105 projects that covered all aspects of agriculture, dairy, food accessibility, nutrition, natural resources, as well as educating rural farmers and communities. In the midst of the pandemic, CALs was able to officially open the Meat Science and Animal Biologics Discovery building. This new and exciting endeavor will pave the way for new and innovative research in meat production, food safety, human health, and animal bio-products. We hope in a year or two, we will be reporting groundbreaking results that may come from this program. Thanks to \$8.8 million in state funding approved in the last Wisconsin biennial budget, we jointly launched the Dairy Innovation Hub with two comprehensive UW campuses with agriculture programs in River Falls and Platteville. This effort has already funded more than 50 dairy research projects at the three campuses (including UW-Madison).</p> |
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In 2020, Extension educators and researchers have reported over 370 000 direct outreach contacts. This includes participants from programs funded by state funds, federal funds, grant funds and nutrition education programs (EFNEP and SNAP-Ed). Extension researchers and educators have made an estimated 24.000 educational contacts through conferences, community events and fairs. Additionally, they have made an estimated 9.5 million educational contacts through television and radio, and an estimated 800.000 educational contacts via podcasts, digital videos and educational or scientific apps.

Scope of Volunteer engagement: Our mission is to empower the people of Wisconsin. To this end, we mobilize, educate and support 12,000 volunteers across the State of Wisconsin, supporting them in protecting and improving Wisconsin's communities, businesses and natural resources. Our flagship volunteer programs focus on youth development (Wisconsin 4-H), the preservation of Wisconsin's natural resources (Wisconsin Master Naturalist Program; Wisconsin Water Action Volunteer Program) and the support of local food systems and vibrant communities (Wisconsin Master Gardener Program). In 2020, Extension volunteers have provided over 300,000 hours of service; this is the equivalent of approximately 150 full-time employees.

Administrative Updates:

Appointment of Dr. Karl Martin as Dean and Director of the UW-Madison Division of Extension

The UW-Madison Division of Extension had been operating with an interim Dean since 2016. After an extensive nationwide search Dr. Karl Martin was appointed Dean and Director of the UW-Madison Division of Extension on May 1st, 2020.

Extension's Administrative Status at UW-Madison

The Division of Extension is a stand-alone Division at UW-Madison overseeing its own budget, personnel matters, and policies. The Dean of UW-Madison's Division of Extension reports to the Provost/Chancellor, serves on the Dean's Council and participates in the Chancellor's Leadership Committee.

Call to Action: Extension's Strategic Commitment to Inclusivity & Anti-Racism Work

Considering the Division of Extension's responsibility to remain relevant and responsive as a 21st century public-serving institution, we recognize the need for strategic and coordinated actions that help us form a more equitable, anti-racist, non-biased, and inclusive organization. In July 2020, our Office of Access, Inclusion, and Compliance coordinated with the Dean's Leadership Team to launch several strategic initiatives related to Inclusivity & Anti-Racism Work. These initiatives supplement the specific efforts already being taken by Extension's Institutes and Geographic Areas. Many of the Call to Action's initiatives include the creation of an ad hoc support structure (e.g. work group, steering committee, task force). Through these efforts, we are committing ourselves to explicit action in the following areas:

1. Denouncing racism and bigotry on multiple levels and in all aspects of our work, and promoting a shared understanding of how they not only run contrary to our organizational values but undermine our institutional credibility for strengthening and maintaining trust with our partners and members of the public
2. Increasing our investment in staff's understanding of issues that shape the historical, social, political context of Extension in Wisconsin, and how they influence our capacity to serve the public good.

3. Greater focus on reducing barriers and expanding access to Extension programs and services, with attention to Wisconsin residents and communities who have not historically benefitted from our current presence, programs, resources, and research in different areas of the state
4. Recognizing opportunities to redress long-standing gaps in attracting, hiring, and retaining a diverse workforce
5. Establishing greater accountability measures for generating positive, sustainable change that benefits Extension as a workplace, and the value and quality of our work

More information: <https://blogs.extension.wisc.edu/oaic/files/2020/10/CallToAction.pdf>

The College of Agricultural and Life Sciences has focused our anti-racism efforts in three areas during the past year:

1. Establishing an Equity, Diversity and Inclusion Office. The charge of this office is to lead the development of strategic equity, diversity and inclusion priorities; support CALS units in their EDI efforts; and support faculty, staff and students in underrepresented communities. A chief diversity officer will be hired to provide leadership and create the office, as well as assess the most immediate needs of our college.
2. Adopting hiring best practices to promote equity and diversity for all faculty, leadership, and collegiate administration position searches.
3. Implementing mandatory cultural competency training for all faculty and staff, as well as mandatory equity and diversity training for CALS graduate students. These trainings will be provided by campus or CALS.

Project Spotlights in this report

The following research and outreach highlights help showcase some of our recent efforts that address our critical issues.

Global Food Security-Crops and Agronomic: *Investigating species composition and fungicide resistance of the potato early blight complex in Wisconsin for enhanced disease control- This project helped expand our understanding of the spatio-temporal dynamic of potato pathogenic Alternaria species and enhance current integrated control recommendations for sustainable potato production.*

Global Food Security-Livestock: |

1. *Helping beef producers ensure economic sustainability and improve profitability.* This program enables beef producers to better understand issues related to market strategies and maintaining building structures, allowing them to become or remain economically sustainable while raising a wholesome and nutritious product for consumers throughout the United States.
2. *Improving farm profitability and lifestyles through informed decision-making.* Extension's Farm Management Program provides research-based farm business management information, resources and decision-making tools to farmers and agribusinesses to improve business profitability and lifestyles through informed decision-making.

Global Food Security-Food Accessibility:

1. *Supporting safe and sustainable gardening in a Distancing Wisconsin.* This program supports Wisconsinites in being more sufficient in growing their own food and reducing negative environmental impacts when caring for plants, growing food and gardening.
2. *Supporting Wisconsin's Food Entrepreneurs of Color.* This program supports Black Indigenous and People of Color (BIPOC) entrepreneurs in building successful and diverse small food businesses through programming and resources that increase entrepreneurs' knowledge of key food business development topics, by enhancing their ability to make informed business decisions, and by fostering professional network expansion.
3. *Strengthening food security during Covid-19.* This program helped increase the understanding of food insecurity in key stakeholders such as food banks, local officials, entrepreneurs, and volunteers.

During the pandemic, the program enhanced communities' ability to provide a vital food security infrastructure, and families' ability to access the food they need.

Climate Change and Energy Needs: Resilience, stability, and productivity: From cultivars to cropping systems-Results from this project helped inform farmers, plant breeders, and agronomists as they worked to develop systems that are more resilient to climate change and more profitable long-term.

Sustainable use of Natural Resources:

1. *Evaluate deficit irrigation for potato production in Wisconsin-*This project led to the identify and the making of recommendations about the "sweet spot" of late-season potato irrigation management where neither over- nor under-irrigation will occur and optimal productivity and profitability can be obtained for the potato growers.
2. *Water WELLness: Ensuring safe drinking water for rural Wisconsin.* Through this program rural landowners are better prepared to provide safe drinking water to their families. The well water data generated through this program is used to identify groundwater quality issues and provide place-based education regarding the connection between land use and groundwater quality. This protects the health of rural residents and improves the quality of Wisconsin's water resources.

3. *The Southwest Wisconsin Geology and Groundwater (SWIGG) Project.* This project provides enhanced science-based understanding of groundwater quality in Southwest Wisconsin for both residents and state regulatory officials. Results to date show that groundwater contamination by nitrate and bacteria is common in southwest Wisconsin and that sources include humans, cows, and pigs as well as manure and agricultural fertilizers.

Nutrition: *Improved glycomacropeptide medical foods for phenylketonuria*—The overall goal of the proposed research was to fight obesity in children suffering from phenylketonuria by the development of glycomacropeptide-polysaccharide conjugates for use in new protein-rich foods. The PI aims to be the first to create medical foods for children and adults with phenylketonuria (PKU) that contain intact protein and fruit juice.

Food Safety: *Functional phenotyping of diverse small multidrug resistance transporters*—Scientists at the University of Wisconsin—Madison want to screen a variety of SMR transporters from diverse bacteria, focusing on those found in human and livestock pathogens. This project aims to assess the function of SMR transporters to better understand them and the threat they pose to human and animal health.

Education and Science Literacy:

Rivers2Lakes. This program helps teachers provide nature-centered science education and students connect to nature.

Rural Prosperity:

1. *Rent Smart: Putting people on the path to stable housing.* This program provides renters and community service providers with tools to achieve a positive rental history and learn about the rights and responsibilities of tenants and landlords. This helps residents attain and sustain affordable quality housing, which in turn reduces burdens on county and municipal public benefits systems.
2. *Improving the Capacity of Nonprofits to Address Complex Community Issues.* Extension' Organizational & Leadership Development Program builds the capacity of Nonprofits in the areas of: (1) organization policy, systems, and structures, (2) leadership, (3) fiscal resources, (4) programs and services, and (5) stakeholder and community engagement. As a result of Extension's work, nonprofits are more effective at responding to local needs, providing services and programs, and addressing complex community issues ranging from homelessness and social justice, to water quality and mental health.
3. *Youth In Governance.* This program brings youth voice to community issues and concerns while fostering the development of confident, independent, and motivated youth leaders.

Wisconsin Competitive Program: *Demographic Consequences of Attenuating Winters: Cryptic Declines of Ruffed Grouse throughout the Upper Midwest-climate.* The results of this study provide novel insights into the synergistic effects of winter climate and land use change on the conservation and management of one of North America's most iconic wildlife species.

2020 Annual Report of Accomplishments and Results (AREERA)

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II. Merit and Scientific Peer Review Processes

The NIFA reviewer will refer to your 2020 Plan of Work. Use this space to provide updates as needed or activities that you would like to bring to NIFA's attention.

| Process | Updates ONLY |
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| 1. The <u>Merit Review Process</u> | No updates |
| 2. The <u>Scientific Peer Review Process</u> | No updates |

III. Stakeholder Input

The NIFA reviewer will refer to your 2020 Plan of Work. Use this space to provide updates as needed or activities that you would like to bring to NIFA’s attention.

| Stakeholder Input Aspects | Updates ONLY |
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| <p>1. Actions taken to seek stakeholder input that encouraged their participation with a brief explanation</p> | <p>Because of public health guidelines to restrict the spread of COVID-19, nearly all of our events and discussions were held virtually this year. In some cases, we saw greater levels of participation because virtual meetings require less travel and are easier to schedule, but difficulties accessing broadband reduced the ability for some to participate through these formats.</p> <p>We met with the following groups to gain insights on current trends and needs:</p> <ul style="list-style-type: none"> UW Center for Cooperatives Advisory Board Integrated Pest and Crop Management Advisory Committee Wisconsin Potato and Vegetable Growers Association Wisconsin Cranberry Growers Association Professional Dairy Producers of Wisconsin The Wisconsin Corn and Soybean Growers UW Agricultural Nitrate Working Group Midwest Rural Energy Council Board of Directors Center for Integrated Agricultural Systems Citizen Advisory Council Food Research Institute Corporate Affiliates Center for Dairy Research Industry Affiliates |
| <p>2. Methods to identify individuals and groups and brief explanation.</p> | <p>Faculty, staff and administrative leaders in the college maintain close relationships with industry leaders and agricultural advocacy groups.</p> |

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| | <p>The dean and other leaders meet quarterly with the two largest farmer groups in Wisconsin: the Wisconsin Farm Bureau Federation and the Wisconsin Farmer’s Union. Once again, this year, the dean attended two meetings of the Wisconsin Agricultural Coalition; this group is made up of executive directors of each of the Wisconsin commodity groups.</p> <p>Programs in the college formed several new advisory groups this year to diversify perspectives:</p> <ul style="list-style-type: none"> · The Dairy Innovation Hub Steering Committee includes farmers and processors providing advice to all three UW agricultural campuses (Madison, Platteville and River Falls). · The UW–Madison Organic Collaborative is a new effort prioritizing participatory research from all types of organic producers. At least five of the faculty leaders in this area have received Hatch funding in the past. Through this effort, they are making strong connections with all types of organic producers to ensure their emerging research is farmer driven. · The USDA AFRI funded Grassland 2.0 project also launched Learning Hubs, hosted by local organizations or individuals to engage existing leaders and social networks in order to encourage continued co-learning beyond the lifespan of the project. |
| <p>3. Methods for collecting stakeholder input and brief explanation.</p> | <p>COVID-19 negatively impacted all sectors of Wisconsin’s agricultural economy, but dairy, which had already been in crisis, experienced even greater challenges. Through the Dairy Innovation Hub partnership with two other UW schools at Platteville and River Falls, we launched an online support form where farmers and processors could lodge any COVID-related questions for our experts.</p> <p>By moving some of our largest educational events online, we were able to attract new attendees and gather questions and input from elected officials, new farmers, long-time bankers and food consumers. Here are some of our largest public events:</p> <p>Dairy Summit</p> <p>Agricultural Outlook Forum</p> <p>Considerations for Landspreading Milk</p> |

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| <p>4. A Statement of how the input will be considered and brief explanation of what you learned from your stakeholders.</p> | <p>Public input informs choices at all levels of the college. The Seed to Kitchen project taps both chefs and vegetable farmers to provide input on new varieties of sweet corn, tomatoes, beets, carrots and other vegetables developed by a number of individual faculty. The chefs and farmers inform both which vegetables can be improved, and which characteristics are most desirable.</p> <p>The Dairy Innovation Hub Steering Committee has prioritized four areas for new faculty investments. Searches for four positions in rumen microbial physiology, dairy economics and agribusiness, nutritional sciences, and land & water stewardship are currently underway.</p> <p>Following a roundtable discussion with alumni of color, Dean Kate VandenBosch is launching a mentoring program for Black, Latinx and Indigenous students in the college. Finally, the college is in early stages of a facility master plan process and expects to gather input from a number of stakeholders on facility priorities into the future</p> |
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IV. Critical Issues Table of Contents

| No. | Critical Issues in order of appearance in Table V. Activities and Accomplishments |
|-----|---|
| 1. | Global Food Security-Crops and Agronomic Plants |
| 2. | Global Food Security- Livestock |
| 3. | Global Food Security-Food Accessibility |
| 4. | Climate Change and Energy Needs |
| 5. | Sustainable use of Natural Resources |
| 6. | Nutrition |
| 7. | Food Safety |
| 8. | Education and Science Literacy |
| 9. | Rural Prosperity |
| 10. | Wisconsin Competitive Program |

V. Activities and Accomplishments

Please provide information for activities that represent the best work of your institution(s). In your outcome or impact statement, please include the following elements (in any order): 1) the issue and its significance (e.g. who cares and why); 2) a brief description of key activities undertaken to achieve the goals and

2020 Annual Report of Accomplishments and Results (AREERA)

objectives; 3) changes in knowledge, behavior, or condition resulting from the project or program’s activities; 4) who benefited and how. Please weave supporting data into the narrative.

| No. | Project or Program Title | Outcome/Impact Statement | Critical Issue Name or No. |
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| 1. | <p>Investigating species composition and fungicide resistance of the potato early blight complex in Wisconsin for enhanced disease control</p> | <p>Issue:</p> <p>Potatoes are an important crop for Wisconsin, exceeding 70,000 planted acres and \$320 million in value. Early blight, a fungal disease caused by <i>Alternaria solani</i>, first appears as lesions on a potato plant’s leaves, progressing to significantly impact yield and quality. Brown spot, caused by a related fungus <i>Alternaria alternata</i>, has similar symptoms but less severe impacts on quality and yield. It is common for both pathogens to co-exist on a plant, and growers incur high expense trying to control these diseases with fungicides. In some regions, <i>A. solani</i> has developed significant resistance to a common class of fungicides called Quinone outside Inhibitors (QoI). The incidence, impact and fungicide resistance of these fungal species is not well understood, hindering recommendations for effective and sustainable control methods.</p> <p>What has been done:</p> <p>To address these issues, researchers at the University of Wisconsin–Madison began by sampling lesions on potato plants in several areas of Wisconsin to determine the <i>Alternaria</i> species and their mutant variants. They also sampled air above fields to study spore dispersal. This was done over several years and samples underwent DNA analysis. A consistently high incidence of <i>A. solani</i> (early blight) was found, with all the variants linked to fungicide resistance; incidence of fungicide-resistant mutants of <i>A. alternata</i> (brown spot) increased as each growing season progressed. Findings were confirmed in the lab where researchers used variants of both pathogens to test resistance to a QoI fungicide. Their data also suggested that <i>A. alternata</i> spores circulated more and were likely to come from the surrounding landscape where other plant hosts exist. Lastly, the researchers tested three potato cultivars — two commercial and one experimental — by exposing them to these pathogens. The commercial cultivars were both quite susceptible to the pathogens to varying degrees, but</p> | <p>Global Food Security-Crops and Agronomic Plants</p> |

2020 Annual Report of Accomplishments and Results (AREERA)

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| | | <p>the researchers determined the experimental breeding line shows promise as a future source of resistance to both diseases.</p> <p>Impacts:</p> <p>This project has resulted in a robust understanding of these two pathogens, informing new management strategies for control. Potato growers need to consider alternative fungicides, carefully select field sites and planting times, and be mindful of nearby crops that could host and spread these pathogens. The findings underscore how breeding for new resistant cultivars may hold a key to more sustainable production in the future.</p> <p>The project resulted in five peer-reviewed research papers; presentations at conferences, growers’ meetings, and extension and outreach events; and provided training and professional development for a PhD student, who supervised several undergraduate students. This research was a collaboration of scientists in the Departments of Plant Pathology and Horticulture.</p> | |
| <p>2.</p> | <p>Helping beef producers ensure economic sustainability and improve profitability</p> | <p>Wisconsin beef producers are continually seeking out strategies to ensure their economic sustainability and profitability. Understanding current market trends is key to maintaining operations that run in the black - but there are many other - often unexpected - issues that beef producers face, especially during emergencies. For example, facility management plays a key role in the profitability of beef enterprises. Damaged buildings lead to animals facing adverse winter and summer conditions, slowing down their rate of growth and ultimately leading to higher producer costs due to increased inputs such as feed. The cost of repairing or replacing damaged buildings can be high, and potentially threatening to farm businesses. During the 2018-2019 winter, several Wisconsin farm buildings collapsed due to heavy snow loads, many of which housed livestock. There were reports of damaged farm buildings from more than twenty-two counties in the state. Damage estimates from Buffalo County, where the highest amount of damage occurred, were over 10 million dollars.</p> <p>In response, University of Wisconsin-Madison Division of Extension Livestock Educators planned and conducted a series of in-person workshops in 8 locations</p> | <p>Global Food Security- Livestock</p> |

2020 Annual Report of Accomplishments and Results (AREERA)

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| | | <p>that incorporated the emergent issues of facility management with the more traditional topics related to economic sustainability. Understanding building maintenance allows producers to house their animals away from adverse weather conditions and in safe environments, leading to increased animal growth, decreased animal injury due to buildings falling on cattle, and increased producer profits.</p> <p>In the workshop sessions, 249 agriculture professionals (representing 56,000 head of beef) learned about best management practices to meet current markets, and how to ensure adverse winter weather does not damage livestock housing facilities. Workshop participants represented a wide range of agriculture industry representatives including farmers with cattle feeding operations, cow calf producers interested in learning about the other segments of the industry, allied industry representatives including livestock nutritionists, veterinarians, agricultural lenders, and representatives from livestock markets.</p> <p>Our evaluations strongly indicate Extension’s workshops that focus on pertinent and emerging beef industry issues have a significant impact on farm operations. Evaluations indicate 70% of our 2020 workshop participants intended to make changes on their operations based on what they learned through Extension. More than half of 2020 participants had participated in similar workshops in the past; of those returning participants, 80% confirmed they implemented management changes due to previous Extension workshops. This group of participants also indicated these changes increased farm revenue by approximately \$11 to \$25 per head of beef.</p> | |
| <p>2</p> | <p>Improving farm profitability and lifestyles through informed decision-making</p> | <p>Agriculture is central to a prosperous Wisconsin, contributing more than \$100 billion annually to our state’s economy and nearly 12% of our state’s employment (providing over 435,000 jobs). Running a successful farm business is increasingly challenging and the current economic situation continues to have an impact financially for many farms. Much uncertainty exists for commodity markets and several factors influence prices, including weather, trade agreements for important export markets, the economy overall, and the continued impact of the coronavirus outbreak. Weathering these uncertainties depends on farm owners successfully managing their farm’s financials,</p> | <p>Global Food Security- Livestock</p> |

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| | | <p>effectively managing their workforce, considering alternative enterprises as appropriate, or all three. When the time comes, farm owners also need to have an effective transition strategy to provide for themselves as they shift towards retirement.</p> <p>In response, Extension’s Farm Management Program provides research-based farm business management information, resources and decision-making tools to farmers and agribusinesses to improve business profitability and lifestyles through informed decision-making. Farmers and agriculture professionals who participate in Extension Farm Management Program educational offerings increase their knowledge in farm business management in order to make good decisions for their business, themselves and their families. By learning about resources and strategies for farm business planning, Wisconsin farmers are equipped to have important conversations and can develop plans that lead to successful farm businesses. In 2020, the Farm Management Program had more than 28,000 direct educational contacts (online and in person), and more than 32,000 educational contacts via digital videos, podcasts and apps. County-based educators, faculty and state specialists additionally reported an estimated 900,000 educational contacts from delivering educational information via radio and television.</p> <p>For example:</p> <ul style="list-style-type: none"> • Over 300 Wisconsin farmers attended price risk management educational programs held in over 30 counties in 2019 and 2020. Participants found the information helped improve their understanding of the federal programs (94%). • Through our “Becoming the Employer of Choice Program”, approximately 150 farmers learned how to create a positive workplace environment by improving skills in conflict management and employee motivation. As a result of the training, farmers increased in knowledge around how to manage conflict (58% increase), how to create a positive farm business culture (62% increase) and how to develop a motivated workforce (61% increase). • Over 75 farmers and farm owners attended five regional farm succession workshops. Through this program, farmers are better prepared to plan for farm succession and/or transition. Participants reported that they learned about tools to help them develop their vision and goals for the | |
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| | | <p>farm business (on average increasing their understanding by 1.2 points on a 5-point scale). In addition, 92 percent said they planned to seek out resources and/or professionals to help in their farm succession planning; and 90 percent said they plan to implement one or more steps in their farm succession plan.</p> <p>Link to the Farm Management Website: https://farms.extension.wisc.edu/</p> | |
| <p>3</p> | <p>Supporting safe and sustainable gardening in a Distancing Wisconsin</p> | <p>Vegetable gardening is important to many Wisconsin households with more than 440,000 households (19%) purchasing vegetable plants over a one-year period and 320,000 households (14%) purchasing vegetable seeds over a one-year period. Approximately 1.5 million adults in Wisconsin (32%) have a garden of some kind. At the same time, nearly 11% of Wisconsin households are food insecure, meaning they are less likely to access safe, affordable foods. Households at greatest risk for food insecurity are poor, single headed households, households of color, and households with children (USDA ERS, 2017). Furthermore, with the negative effects brought about by COVID, Wisconsin Extension Educators observed consumers having increased awareness of where their food comes from. These consumers have demonstrated renewed interest in safely growing their own food.</p> <p>Due to the pandemic, stay-at-home orders and fear over disease transmission, many Wisconsinites sought alternative ways to learn about home horticulture and gardening. Furthermore, the pandemic seemed to cause some people to start gardening for the first time or take on home gardening beautification projects. For example, interest seems to span people living in multi-unit complexes with access to no land appropriate for gardening, to single detached homes with some access to land.</p> <p>In response, the Extension Horticulture Program moved to an online teaching approach to support the gardening and horticulture efforts of the people of Wisconsin. Updating and maintaining web-based resources and social media presence were keyways to provide research-based information, and live streaming lectures and workshops were one of the primary ways Extension’s Horticulture Program reached audiences.</p> | <p>Global Food Security-Food Accessibility</p> |

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| | | <p>In 2020, Extension Horticulture reached 28,500 participants through its outreach activities. This includes online learning opportunities in various formats, in-person programming when it was deemed safe, and one-on-one plant care solutions through submission of samples to insect and plant disease diagnostic labs. Through online and safe in-person education, Extension supported Wisconsinites in successfully growing their own food and to help them be better stewards of their environment as gardeners. Across all outreach efforts most learners indicated that their knowledge or understanding increased due to participating in one of the Extension events. For example: Evaluation results from a subset of seven programs focusing on both growing plants for food, and on growing plants for a better environment indicate that a majority of participants (67% to 80%; n=832) plan to make changes as result of the educational intervention. A follow up end-of-season evaluation across these seven programs indicates that 64% (529 out of 832) of responding participants implemented practices based on what they learned.</p> <p>Through Extension's Horticulture Program, people in households and commercial horticulture practitioners are becoming more sufficient in growing their own food and reducing negative environmental impacts when caring for plants, growing food and gardening. This ensures that residents are supported in producing food in a self-sufficient, safe and sustainable way.</p> <p>Website: https://hort.extension.wisc.edu/</p> | |
| <p>3</p> | <p>Supporting Wisconsin's Food Entrepreneurs of Color</p> | <p>Business ownership serves as an important vehicle for wealth creation, especially for members of economically disadvantaged communities. Research shows that, in Wisconsin, Black, Indigenous and People of Color (BIPOC) have disproportionately low levels of business ownership and have demonstrably weaker relationships with key people and institutions in the small business development field, such as lenders. Language barriers and lack of in-house legal and accounting expertise can also make it difficult for BIPOC small business owners to take advantage of federal assistance programs such as the Paycheck Protection Program, making their businesses more vulnerable during economic downturns.</p> | <p>Global Food Security-Food Accessibility</p> |

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| | | <p>Despite these statistics, the food sector has some of the highest representation of BIPOC business ownership in Wisconsin and continues to be an arena in which BIPOC entrepreneurs pursue opportunities to develop new businesses and products. Because food businesses are subject to unique regulatory requirements, food business entrepreneurs require training in food safety protocol, licensing, and regulations that are not typically covered by traditional small business assistance providers.</p> <p>In response to this, Extension launched its Food Entrepreneurship Ecosystem Development Initiative in 2020. Extension’s goal is to increase the proportion and enhance the success of BIPOC entrepreneurs, limited English speakers, recent immigrants, and others experiencing structural barriers to food business entrepreneurship in Wisconsin. The Program works with partners across Extension and the state to support BIPOC food entrepreneurs in Wisconsin by creating spaces for them to connect with each other and with other existing infrastructure, expertise, and markets in culturally, technologically, and linguistically accessible ways. In 2020, Extension launched three major efforts that reached over 650 entrepreneurs and technical assistance providers:</p> <ol style="list-style-type: none"> 1. Extension developed English- and Spanish-language guides for food cart operators to safely and successfully operate during the Covid-19 pandemic. The guides were distributed directly to over 350 entrepreneurs and service providers. 2. Extension delivered a series of online English- and Spanish-language food safety and licensing trainings that reached more than 160 food entrepreneurs and facility managers. 3. Extension organized a virtual Start-Up Summit that provided 151 food entrepreneurs with information, connections, and resources to help launch and sustain successful food businesses. Regional sessions (representing four areas of the state) complemented statewide offerings by providing opportunities for place-based networking and learning about local resources. Regional sessions were organized by county-based Extension educators in Crawford, Bayfield, Brown, and Dane counties and included entrepreneur panels, resource organization panels, pitch session networking, and updates on farmers markets and other marketing efforts. | |
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2020 Annual Report of Accomplishments and Results (AREERA)

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| | | <p>The evaluation of the summit demonstrated increased knowledge on key food business development topics, appreciation for the inclusive approach to programming, and participants’ intent to use information gained to start and/or improve their food businesses. For example, evaluation data showed self-reported knowledge gains up across all training and workshop categories with the greatest increases in topics such as “How to find resources to support your business” (72% average increase), “How to innovate/pivot in order to sustain a food business during challenging times” (59% average increase), and “Understanding trends in the food sector during the pandemic” (56% average increase).</p> <p>Through the Food Entrepreneurship Ecosystem Development Initiative, Extension contributes to the vitality of Wisconsin communities by supporting Black Indigenous and People of Color (BIPOC) entrepreneurs in building successful and diverse small food businesses through programming and resources that increase entrepreneurs’ knowledge of key food business development topics and connectivity to state and regional small business development networks.</p> | |
| <p>3</p> | <p>Strengthening food security during COVID-19</p> | <p>Food insecurity contributes to poor mental and physical health, cognitive and behavioral challenges in school, and more difficult family functioning. The pandemic was particularly devastating to food security because it disrupted the four foundations of food security: economic security, access to strong federal nutrition programs, a robust emergency food network, and a vibrant food system. Before the pandemic, one in 10 Wisconsin households were food insecure, with higher rates among vulnerable groups including children, racial and ethnic minorities, people with disabilities, and low-income households. Disparities in food security between Black and white households in Wisconsin were among the country's highest. The number of adults reporting that they sometimes/often don't have enough to eat more than doubled, from around 3.5 percent in the years preceding the pandemic to 7.5 percent during the pandemic. The share of adults with children who reported their children sometimes or often didn't get enough to eat increased from around 4% to 13% during the first months of the pandemic. These were unprecedented increases, far surpassing the maximum rates during the Great Recession of the late 2000s.</p> | <p>Global Food Security-Food Accessibility</p> |

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| | | <p>Disparities across race and ethnicity persisted in the pandemic period, with 40% of Black adults who live with children reporting that their child did not always get enough to eat in the past week.</p> <p>Food banks, local officials, entrepreneurs, and volunteers came together to address food security. To address the issue adequately, they required a shared, evidence-driven understanding of the problem's extent and the underlying causes. In response, Extension compiled extensive state and local data related to food security and its underlying foundations and collaborated with partners to learn about using the emergency food system during the pandemic. For example, in collaboration with UW-Madison researchers, Extension maintained a data and mapping interface with extensive state and local data related to food security. This online resource collected 2,315 pageviews prior to March 2021, with an average visit lasting more than 5 minutes. Based on USDA funding, a state specialist is working on model-based strategies to estimate how the risk of food insecurity varies around the state. Based on our evidence-driven work, we developed and widely shared a theoretical framework of food security designed to support organizations in addressing food security as a systemic issue (“Table Legs Framework”). Partners at the state and local level are increasingly using the framework for food security.</p> <p>In addition to these system-focused efforts, local Extension educators have increased the availability of timely information to help households access food resources during the pandemic. The pandemic has created disruptions in food access stemming from lost income, loss of school meals, and service disruptions at food pantries. Additionally, safety and health concerns around retail food access was exacerbated. In 2020, state and local staff focused on developing and disseminating user-friendly information related to accessing food. Extension provided educational information on policies and systems for:</p> <ul style="list-style-type: none"> • Accessing out-of-school meals • Changes in FoodShare and other state and federal food assistance programs • Information on how to access and use local food pantries • Financial resources to address income shortfalls • Information on retail food access, safe ways to shop, using FoodShare online, safe ways to secure local healthy foods, and more. | |
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| | | <p>Food security information was shared locally via media and newsletters in 46 counties. These and related efforts capitalized on UW-Madison Extension's unique positioning at the interface of research-based knowledge, insight into community needs and capabilities, and strong local partnerships. Collectively, programming in this area helped increase stakeholders' understanding of food insecurity, communities' ability to provide a vital food security infrastructure, and families' ability to access the food they need.</p> <p>WI Extension Food Security Covid response Website: https://fyi.extension.wisc.edu/covid19/2020/05/07/...</p> <p>WI Food Security Project: https://foodsecurity.wisc.edu/</p> | |
| <p>4</p> | <p>Resilience, stability, and productivity: From cultivars to cropping systems</p> | <p>Issue:</p> <p>In the face of global climate change, there is a growing need for productive, resilient and stable agricultural systems that can endure increasingly frequent climactic crises. To this end, methodological tools are needed to study the stability and resilience of various agricultural systems, in order to identify cultivars and cropping systems that optimize these goals. Results will help inform farmers, plant breeders, and agronomists as they work to develop systems that are more resilient to climate change and more profitable long-term.</p> <p>What has been done:</p> <p>A research team at the University of Wisconsin–Madison used a large database from existing alfalfa cultivar trials from across the nation and oat cultivar trials from multiple locations in Wisconsin. The researchers also capitalized on the Wisconsin Integrated Cropping Systems Trial (WICST), which has nearly 30 years of data comparing conventional and organic cash grain and dairy forage systems. Using weather and yield data, they identified “normal” and “crisis” (i.e., extreme) weather years for each crop or system at each location. Using these databases, the team explored stability and resilience in annual and perennial cultivars and cropping systems.</p> | <p>Climate Change and Energy Needs</p> |

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| | | <p>The results are complex. Researchers found that alfalfa cultivars differ in stability and resilience, and these variables represent two different dimensions of long-term cultivar performance. Some cultivars were highly resilient, while others were highly stable. This was consistent across locations. Furthermore, there are multiple types of resilience. For example, “resilience to drought” and “resilience to excess moisture” were not associated. A similar result was found for the oat cultivars: resilience and stability were not associated, and different cultivars were highly resilient or highly stable. At the cropping system level, crop rotations with more perennials were more stable than crop rotations with annual crop only. Furthermore, crop rotations with more diverse crops were more resilient to drought over 30 years.</p> <p>Impacts:</p> <p>Across datasets, researchers found that stability and resilience are different and complimentary dimensions of the performance of cropping systems in the face of climate change. They are explained by different traits. Additionally, it is necessary to evaluate more than one resilience indicator when comparing cropping systems. Overall, the results show that cropping systems with increased levels of diversity and perenniality are needed to optimize stability and resilience of cropping system outputs.</p> <p>The team and lead researcher, who is an extension specialist, shared these findings with farmers, agriculture industry members, agricultural researchers and extension agents through numerous meetings, conferences, newsletters and articles. This project helped support the graduate training of one master’s student.</p> | |
| 5 | <p>Evaluate deficit irrigation for potato production in Wisconsin</p> | <p>Issue:</p> <p>Due to concerns about the sustainability of water resources in Wisconsin, the state’s potato and vegetable industry is committed to maximizing water use efficiency. Wisconsin growers are actively exploring deficit irrigation to improve on-farm water management, an approach where they use less irrigation water</p> | <p>Sustainable Use of Natural Resources</p> |

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| | | <p>than they traditionally have. The goal of this project is to identify an optimal irrigation regime for potato productivity in the Central Wisconsin climate.</p> <p>What has been done:</p> <p>A research team at the University of Wisconsin–Madison evaluated the impact of five different deficit irrigation regimes on the yield, quality and storability of six popular potato varieties (Hodag, Lamoka, Russet Burbank, Russet Norkotah, Silverton and Snowden). The experimental regimes all started in late July, during the late-bulking stage of the crop, and consisted of irrigation at 125%, 100%, 75% and 50% of crop evapotranspiration (the amount of water transpired by the crop). The researchers also used the field data to calibrate and validate a computer model they are developing that links water use and potato yield. The researchers found that over-irrigation does not provide a significant benefit to yield or quality.</p> <p>Impacts:</p> <p>The researchers’ findings suggest that deficit irrigation during the late-bulking stage can work for growing potatoes in Wisconsin. The data help validate a more sustainable approach to grow potatoes in the state, an approach that can help reduce pressure on precious water resources. The lead researcher, who is an extension specialist, shared these findings with Wisconsin potato growers at various meetings and conferences, as well as through newsletters and articles. This project helped support the graduate training of one Ph.D. student.</p> | |
| 5 | Water WELLness: Ensuring safe drinking water for rural Wisconsin | <p>Private wells are the primary water source for approximately one-third of Wisconsin residents. Approximately 9% of private wells are above accepted health guidelines for nitrate-nitrogen in drinking water. Between 15-25% of private wells contain coliform bacteria - an indicator of potential pathways for harmful pathogens that enter a well water system. Private wells do not benefit from the day-to-day oversight of municipal water systems, therefore well owners must act as their own water utility managers and must make informed decisions about their household drinking water.</p> | Sustainable use of Natural Resources |

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| | | <p>In response, Extension’s Water WELLness program provides private well owners with access to water testing kits, that are subsequently analyzed in a certified lab. We also share science-backed information that is designed to help them keep drinking water safe for their families. Extension mainly targets rural landowners, who are most likely to rely on private wells as their primary source of drinking water. Our well testing packages include the most commonly recommended well tests and are arranged in a way that makes it easy for people to understand which tests to perform. In 2020, 4,522 households submitted water samples from their individual private wells. In addition, Extension has had 491 educational contacts with individuals, where we provided one-on-one consulting and educational sessions related to well testing and results.</p> <p>The water quality information that we generate in collaboration with Wisconsin residents is integrated into the “Wisconsin Well Water Viewer”, a data-driven online tool that helps paint the picture of groundwater quality in the state. The general public, conservation professionals, and local officials access this information to learn about well water quality in their area. This helps them decide on where to target conservation efforts, or where to focus additional educational strategies related to groundwater quality and/or safe drinking water.</p> <p>Because these efforts are locally driven, Extension works closely with county Land and Water Conservation Departments, Health Departments, Zoning and other local entities. For example, following their involvement in Extension’s well testing program, officials in five counties (Chippewa, Green, Sauk, St. Croix and Dodge) initiated formal well water trend monitoring studies to address community concerns regarding water quality. Additionally, collected information from Extension’s Water WELLness program is used in state-wide initiatives. For example, the Wisconsin Department of Natural Resources utilized Extension’s well-water testing data when updating Wisconsin’s Administrative Rules related to water runoff (NR151- Nitrate Targeted Performance Standard) in 2020.</p> <p>Link to the WellWaterViewer: https://www.uwsp.edu/cnr-ap/watershed/Pages/WellWaterViewer.aspx</p> | |
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| <p>5</p> | <p>The Southwest Wisconsin Geology and Groundwater (SWIGG) Project</p> | <p>Approximately 44% of the population in Wisconsin’s Grant, Iowa, and Lafayette Counties rely on private groundwater wells. Collectively, these residents are served by over 18,000 wells. Private wells are not monitored or regulated by federal, state, or local government; instead, homeowners are responsible for the maintenance and testing of their private well, including any treatment or corrective action to address contamination. Shallow, fractured carbonate rock underlies much of these three counties, and groundwater in this setting is often highly vulnerable to contamination from surface sources. The Wisconsin DNR recently enacted new rules (NR 151) governing manure application over similar areas in eastern Wisconsin, but the rules did not apply to southwest Wisconsin because little research had been done to evaluate groundwater quality in that region. There was a clear need and desire for an evaluation of well-water quality in these three counties.</p> <p>In response, the SWIGG project was designed to 1) evaluate private well contamination in three counties (Grant, Iowa, and Lafayette) using indicator bacteria (total coliform and E. coli) and nitrate based on randomized synoptic sampling events; 2) assess well construction and geological characteristics (e.g., well age, depth to bedrock) that affect total coliform and nitrate contamination; and 3) identify the source of contamination in a subset of total coliform- and nitrate-positive wells once per season using microbial tests that distinguish between human, bovine, and swine fecal sources.</p> <p>In Phase one we conducted two samplings over two different 3-day periods of randomly-selected wells from the three counties (840 wells in all) and tested these samples for total coliform, E.coli, and dissolved nitrate. Total coliform is a measure of non-pathogenic bacteria commonly found in soil and at the land surface. The presence of total coliform in well water is often an indicator of contamination from surface sources. E.Coli is a type of fecal bacteria that can cause illness. Dissolved nitrate (NO3) is a nutrient common in fertilizers and manure and can have human health impacts if present above the drinking water standard of 10 milligrams per liter. In Phase two we carried out four rounds of subsampling of wells found to be contaminated in Phase one, with the goal of determining the fecal source of the contamination (distinguishing between humans, cattle, or swine). In Phase three (currently underway) we are</p> | <p>Sustainable use of Natural Resources</p> |
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| | | <p>comparing the sample results to hydrogeologic factors such as land use, local geology, and well construction.</p> <p>Staff at Extension’s Wisconsin Geological and Natural History Survey worked with USGS and USDA scientists as well as with Extension’s county-based staff to carry out the sampling program. The team initially sampled 830 wells and collected 138 follow-up samples. The initial results of the study, released at the beginning of 2019, showed that 42% of the sampled wells in the three counties exceeded drinking water recommendations of either bacteria, nitrate, or both. These results grabbed the attention of local citizens and state regulators and were in part responsible for Governor Evers' declaring 2019 the Year of Clean Water in Wisconsin and the establishment of the bipartisan Speaker's Task Force on water quality. Subsequent sampling rounds (138 wells) of the contaminated wells using sophisticated microbial source tracking have found fecal microbes originating from humans, cattle, or swine in many wells, demonstrating that local land use is contributing to contamination. Some of these microbes, such as salmonella and cryptosporidium are potentially pathogenic to people or animals, and in those cases the well owners were immediately notified.</p> <p>Project Link: https://wgnhs.wisc.edu/southwest-wisconsin-groundwater-and-geology-study-swigg/</p> | |
| <p>6</p> | <p>Improved glycomacropeptide medical foods for phenylketonuria</p> | <p>Issue:</p> <p>Phenylketonuria (PKU) is a congenital metabolic disorder affecting a person’s ability to process phenylalanine (Phe), one of the essential amino acids in food and a “building block” of proteins. Phe is in most foods including meats, eggs, dairy, soy, grains, fruits and vegetables. PKU can result in a dangerous buildup of Phe in the body, causing cognitive impairment. People with PKU typically require a low-Phe diet. Special formulas called “medical foods” serve as protein replacements, supplying the body with other essential amino acids. But such a restrictive diet is difficult to follow. Failure to adhere can result in mental confusion, emotional problems, and learning disabilities in children.</p> <p>Glycomacropeptide (GMP) — the only protein in nature that does not contain Phe — is found in cow’s milk and is capable of improving the health and quality of life of people with PKU. GMP is a byproduct of the cheesemaking process</p> | <p>Nutrition</p> |

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| | | <p>found in whey and can be purified and incorporated into a variety of medical foods and drinks. Past research at the University of Wisconsin–Madison shows that a GMP-enriched diet can help control Phe levels in those with PKU and help them feel fuller after eating.</p> <p>What has been done:</p> <p>In an effort to more efficiently purifying and using GMP, researchers at the University of Wisconsin–Madison undertook a three-prong approach. First, they applied a positive charge to a special filter and found that when purifying GMP from whey they could achieve 90% GMP purity with one-stage filtration and 97% purity with three-stage filtration. They also investigated if they could improve GMP’s suitability for food and beverage production by focusing on a process that makes proteins more dissolvable, heat stable, and better emulsified. Using the sugar maltodextrin, which is far less expensive than dextran used in existing processes, the researchers’ method of improving GMP resulted in a much higher yield and in less time. Lastly, the researchers investigated how improved proteins perform when reincorporated into liquid foods.</p> <p>Impacts:</p> <p>This project resulted in new, more efficient and cost-effective processes for purifying GMP and modifying it for higher performance in foods and beverages. These could improve the nutrition, health and quality of life of people with PKU, and make medical foods more affordable and varied. The charged filtration technology was granted a patent in 2020. Such filtration typically requires added water that ends up as wastewater, but this invention does not require added water, resulting in environmental benefits and a lower cost of producing medical foods.</p> <p>This project — involving a collaboration of researchers in the Departments of Food Science and Nutritional Sciences — resulted in four peer-reviewed research papers and a PhD dissertation. It provided training and professional development for one graduate student.</p> | |
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| <p>7</p> | <p>Functional phenotyping of diverse small multidrug resistance transporters</p> | <p>Issue:</p> <p>Small multidrug resistance (SMR) transporters are pumps that move a range of toxic substrates, including antibiotics and antiseptics, out of bacteria and render the bacteria resistant to these toxins. These transporters are found in clinical and foodborne pathogens, healthcare settings, wild and domesticated animals, and food products, posing a great threat to human health and beyond. However, only a few transporters have been studied in the lab. Several recent discoveries suggest that the SMR family might be much more diverse than previously thought and emphasize the need for broader study. Scientists at the University of Wisconsin–Madison want to screen a variety of SMR transporters from diverse bacteria, focusing on those found in human and livestock pathogens. They aim to assess the function of SMR transporters to better understand them and the threat they pose to human and animal health.</p> <p>What has been done:</p> <p>To reach these goals, researchers tested the expression of different SMR transporters in bacteria and the response of those bacteria to antibiotics, antiseptics, and other compounds. Researchers compared the metabolic function of bacteria expressing either the functional version of the SMR transporter or a functionally dead mutant. Upon exposure to some compounds, bacteria expressing the active transporter had higher metabolic activity than those expressing the non-functional transporter. However, there were some compounds for which bacteria expressing the active transporter had lower metabolic activity. This suggests that a transporter can be detrimental to bacteria. These data confirm that the small multidrug "resistance" transporters don't always confer resistance. All of the transporters tested conferred resistance to some substrates and susceptibility to others, and the behavior was widespread in human and livestock pathogens. Further experimentation indicated that a transporter can cause susceptibility through a novel mechanism by which the compound breaks the machinery of the transporter and results in impaired bacterial growth.</p> <p>Impacts:</p> | <p>Food Safety</p> |
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2020 Annual Report of Accomplishments and Results (AREERA)

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| | | <p>This work has provided insight into multidrug resistance in bacteria, an important field in human health and beyond. Scientists found that transporters can confer susceptibility to some substrates and described a novel mechanism of susceptibility. They are using the data generated by this project to seek additional funding to assess the feasibility of targeting SMR transporters to combat the growing problem of antibiotic resistance.</p> <p>The results of the study were shared with other researchers in the field in the form of posters and presentations at national seminars. One manuscript has been submitted, and a second manuscript is in preparation. One graduate student worked on this project with assistance from four undergraduate researchers. These students received training in vector design, cloning, biosafety, bacterial assays and mor</p> | |
| <p>8</p> | <p>Rivers2Lake helps teachers go virtual and students connect to nature</p> | <p>Lake Superior contains 10% of Earth's freshwater and is the cleanest of the Great Lakes. Protecting this resource is essential for Northern Wisconsin communities. To help prepare the next generation of Great Lakes stewards, the Rivers2Lake education program at Extension's Lake Superior National Estuarine Research Reserve uses the Lake Superior watershed and the St. Louis River as a foundation for educator and student learning, increased Great Lakes literacy, and engagement.</p> <p>Each year the Rivers2Lake Education program works with a cohort of teachers, helping them to integrate the Lake Superior watershed and the St. Louis River into their curriculum. The program provides extended training, mentoring, and resources to teachers to support them in creating inquiry-based and outdoor experiences for students. The Rivers2Lake program serves PK-12 teachers and students in schools and districts in Wisconsin's Lake Superior Watershed and the St. Louis River Watershed, which straddles Wisconsin and Minnesota, including the Fond du Lac Band of Lake Superior Ojibwe (Chippewa) Reservation.</p> | <p>Education and Science Literacy</p> |

2020 Annual Report of Accomplishments and Results (AREERA)

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| | | <p>In 2019 and 2020, Extension staff in Minnesota and Wisconsin collaborated to assess the impact of the Rivers2Lake Program by surveying elementary teachers in the Superior School District in order to better support Superior School District teachers. The teachers expressed that using outdoor and inquiry-based learning is beneficial to students and supports their social and emotional learning, but they identified a lack of time, materials and resources to provide these experiences. Following participation, evaluation demonstrated that Rivers2Lake helped reduce these obstacles and others, including lack of outdoor access, lack of ideas for what to do or how to do it, and lack of comfort bringing students outside.</p> <p>When COVID-19 hit, Rivers2Lake teachers and education staff at the Lake Superior Reserve needed a new way to support teachers and their students. In response, Extension quickly pivoted to producing videos and online curriculum in a series called <i>Nature Nibbles</i>. The <i>Nature Nibbles</i> series was developed to reach elementary children, a high percentage of which are considered economically disadvantaged, 47.7% according to Wisconsin DPI. The Superior School District, struggling to include adequate science instruction in virtual learning, shifted all elementary students to <i>Nature Nibbles</i> as the formal district science curriculum. Through this effort, Extension reached 2,365 elementary students, and we worked with 14 educator partners who helped design and distribute the curriculum. The program also showed teachers how to safely use the outdoors spaces they have on site, such as play spaces and fields, to their advantage. The events and field trips hosted by Rivers2Lake helped show teachers the opportunities for outdoor education that are throughout their local community. Program evaluation of this effort in response to COVID indicated an increase in teachers' comfort when bringing students outside, as well as an increase in ideas for what to do for outdoor and inquiry-based teaching.</p> | |
| 9 | <p>Rent Smart: Putting people on the path to stable housing</p> | <p>To afford the average two-bedroom apartment in Wisconsin, a renter needs to earn a minimum of \$17.27/hour. The average Wisconsin renter earns only \$14.32/hour. The U.S. Department of Housing and Urban Development (HUD) defines cost-burdened families as those who pay more than 30 percent of their income for housing and may have difficulty affording necessities such as food, clothing, transportation, and medical care. 87.5% of extremely low-income Wisconsin residents (with incomes of 0-30% of the area median income) are</p> | Rural Prosperity |

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| | | <p>housing cost-burdened. Struggling to pay rent translates into individuals and families having a hard time meeting their other financial obligations—e.g. utilities, medical expenses, and food—and can put a strain on public support systems.</p> <p>Education for both renters and community service providers who support them can lead to better tenant/landlord relationships and can help people attain and maintain safe and affordable housing. The economic impacts of the COVID-19 pandemic have increased the number of Wisconsin residents who are seeking assistance from community service providers. As these people work to stay in their rental properties or to secure new rental homes, social service providers need the information and skills to help their clients keep roofs over their heads.</p> <p>In response, Extension is using and continuously updating a research-based and peer-reviewed modular curriculum, Rent Smart. In the modules, participants learn to evaluate how much a rental unit will cost and determine whether the renter can afford it. Participants learn how to check out the rental property and landlord, the application process, determining who’s responsible for maintenance, repairs, and care, communication strategies, and rental agreements. Through this information, Rent Smart strengthens renters’ ability to achieve financial stability. Further, the curriculum helps community service providers to reduce their clients’ reliance on public benefits and supports. Due to the COVID-19 pandemic, Extension shifted from in-person, county-based courses to online, statewide trainings.</p> <p>Extension offered online train-the-trainer events for community service providers so they can use Rent Smart with their clients. In 2020, Extension had 208 participants in train-the-trainer events; these participants represented more than 100 nonprofit and local government organizations/agencies from 12 states. In evaluations from the train-the-trainer courses for community service providers 92% of participants said they feel able to help vulnerable clientele overcome housing challenges after taking the course compared to 47% before the course. 87% feel equipped to help clients find affordable and quality housing after taking the course compared to 50% who could do so before the course. Among participants 92% feel confident that they can help clients keep that housing once acquired compared to 50% before the course.</p> | |
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| | | <p>In 2020, a total of 156 participants joined the learner-focused courses. Evaluations show that 100% of respondents report feeling confident that they can communicate their rental needs to their landlords after completing the course, compared to only 63% before the course. 89% feel that they have tools and ways to manage their monthly expenses compared to just 50% before the course. 100% report that they understand their responsibilities as a tenant and the responsibilities of their landlord, compared to 66% prior to the course. 94% of participants say that the course will help them obtain housing in the future and 88% believe that the course will help them keep that housing.</p> <p>In 2020, the Wisconsin Rent Smart program received the national Dean Don Felker Award for Financial Management from the National Extension Association for Family and Consumer Sciences.</p> <p>Program Website: https://fyi.extension.wisc.edu/rentsma</p> | |
| <p>9</p> | <p>Improving the Capacity of Nonprofits to Address Complex Community Issues</p> | <p>Nonprofits play an important role in addressing complex community issues ranging from homelessness and social justice to water quality and mental health. Local governments rely on nonprofits to deliver programs and services to residents at low cost. Nonprofits also contribute to the economy, employing 11.9% of Wisconsin’s workforce with an annual average wage of \$50,243 per employee. According to the National Council on Charitable Statistics there were over 36,000 registered Wisconsin nonprofits in 2018. Nonprofit organizational development needs typically fall within five broad capacity building categories: (1) organization policy, systems, and structures, (2) leadership, (3) fiscal resources, (4) programs and services, and (5) stakeholder and community engagement.</p> <p>In 2020, Wisconsin’s nonprofits were impacted by the COVID-19 pandemic. Early impacts included reduction in volunteerism, funding, programs and services; changes in programs and services to address increased demand for basic needs and mental health support; and concerns about long-term sustainability. During this tumultuous time, nonprofits continued to look to Extension for support and resources.</p> | <p>Rural Prosperity</p> |

2020 Annual Report of Accomplishments and Results (AREERA)

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| | | <p>In response, Extension’ Organizational & Leadership Development Program supported nonprofits through a variety of activities, including facilitation of group processes (41% of documented activities), trainings and workshops (25%), coaching and consultation (14%), and research and data collection (11%). In 2020, we worked with 171 nonprofits in 33 counties in Wisconsin, totaling over 10,000 direct educational contacts in safe in-person settings or virtual settings. The nonprofits we supported deliver programs and services that touch 20 different sectors, including human services, community improvement, environment, youth development, and food, agriculture, and nutrition.</p> <p>In 2020, Extension facilitated strategic planning processes for 29 nonprofits through the Organizational & Leadership Development Program. As a direct outcome of Extension’s work, leadership of these nonprofits adopted and updated mission and vision statements, and strategic priorities. These actions provided directors and their boards with clear direction for organization decisions, programs, and services. Our educators worked with six community groups interested in forming a 501c3 nonprofit. The groups learned how to write organization bylaws and the steps to apply for incorporation. As a result, each group has taken action toward filing for incorporation. In response to COVID-19, Extension educators taught nonprofit leaders how to use scenario planning. These nonprofit leaders then created flexible plans for different “COVID-19 realities” that might impact their organization.</p> <p>In addition to facilitating group processes, and delivering training, Extension educators met with individual nonprofits assisting them with finding solutions to their most pressing needs. This type of coaching and consultation included providing information about nonprofit incorporation, organization bylaws, fund development, and board governance. Using virtual platforms and live interpretation assistance from Extension’s Office of Access, Inclusion and Compliance, educators worked with Spanish-speaking members of the Latinx community to help them learn about the requirements and options for incorporating their organization. Educators also assisted executive directors and nonprofit board presidents with diagnosing reasons for a large number of board of director resignations, using bylaws as a tool for board engagement, and navigating the SBA Economic Injury Disaster Loan process. As a result of</p> | |
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2020 Annual Report of Accomplishments and Results (AREERA)

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| | | <p>Extension’s work, nonprofits are more effective at responding to local needs, providing services and programs, and addressing complex community issues ranging from homelessness and social justice, to water quality and mental health.</p> | |
| <p>9</p> | <p>Youth In Governance builds Civic Capacity, Social Capital and Long-Term Sustainability in Communities</p> | <p>Youth leadership development is critical in building civic capacity, social capital, and long-term community sustainability in local communities. Programs that teach useful skills and build the self-confidence of young people ensure capable, effective leaders for the next generation. In addition, recent national trends including an increase in youth civic service and a new emphasis on civic education in schools indicate a growing need for leadership training to ensure young people are prepared to participate in political and civic life.</p> <p>In response to the lack of leadership opportunities for youth in local communities, several counties in Wisconsin developed and implemented the Youth in Governance program. The purpose of Extension’s Youth in Governance programs is to create a model of youth empowerment through direct participation in local government. Youth participating in Youth in Governance sit on county boards or on county board committees and receive mentoring from elected officials. The overall goal is to bring youth voice to community issues and concerns while fostering the development of confident, independent, and motivated youth leaders. Extension uses its expertise in facilitating strong working relationships with adults and youth to lead training, orientation, and ongoing development for local government partners and youth participants. In 2020, Extension has worked with 121 youth participants in 12 locally based Youth in Governance Programs that were located in 11 Wisconsin counties. While each locally implemented Youth In Governance program operates differently, most include all or some of the following components: An elected official serves as mentor to youth participant; youth sit on broader council/board as well as a committee/ subcommittee; a youth cohort meets regularly as a learning community; each youth member has a capstone project; and youth present/publicly speak. In some cases, youth craft or assist with crafting policy.</p> | <p>Rural Prosperity</p> |

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| | | <p>Extension is continuously evaluating program outcomes via retrospective pre-post surveys, semi-structured interviews and other sources. In a 2020 retrospective pre-post survey of Youth in Governance programming (n=32), youth participants attributed their participation in the program with improvements in a variety of areas, for example: 80% of participants improved confidence speaking in front of groups; 80% increased their ability to work with others to make change; 85% improved knowledge and understanding of community issues.</p> <p>Additionally, past participants in the Youth in Governance program report that they are more likely to be involved in a government-related career in the future or pursue a public office. For example, Abby Korb served as a Racine County Youth in Governance (YIG) representative in 2015-2016: “At the time, I had no clue how impactful YIG would be on my future career. I always said that I did not want to go into government or any form of public service, but rather took part in YIG as a learning experience. However, when I got to college, my whole outlook changed. I ended up earning my BA in politics and government and held various other political and governmental internships and jobs, including an internship in the U.S. Senate.”</p> | |
| <p>10</p> | <p>Demographic Consequences of Attenuating Winters: Cryptic Declines of Ruffed Grouse throughout the Upper Midwest</p> | <p>Issue:</p> <p>Like many wild animals adapted to cold environments, ruffed grouse depend on snow cover for winter roosting and for avoiding predators and bad weather. Past surveys show that winters with low snow cover have led to large declines in grouse populations in subsequent springs; however, no studies have identified the specific reasons behind this persistent pattern.</p> <p>What has been done:</p> <p>Researchers at the University of Wisconsin–Madison carried out a three-year radio-tracking study of grouse in Wisconsin’s Sandhill State Wildlife Area to identify how snow cover, weather, and forest cover impact winter deaths of the game birds. According to their data, snow and temperature conditions are important predictors of where grouse choose to live. Grouse are very likely to</p> | <p>Wisconsin Competitive Program</p> |

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| | | <p>select areas with no snow cover, and the likelihood of that selection decreases as snow depths increase — but only up to 15-20 cm (about 6-8 in) in depth. When snow is deeper than that, grouse are able to create snow burrows, which protect them from cold and predators. Grouse in areas of very shallow or no snow, and those in areas of deeper snow, were more likely to survive the winter than grouse in areas of moderate snow (7-15 cm). The finding that moderate snow depths are the worst conditions for grouse survival is critical because snow depths currently peak at about 15 cm on average in Wisconsin and are projected to decline with climate change. Researchers also investigated stress levels in grouse by measuring stress hormone levels in collected fecal samples. Chronic elevated stress can reduce reproductive output in grouse. The researchers found that, as temperatures dropped, grouse stress increased. However, when grouse were able to use snow burrows, temperature no longer affected grouse stress levels.</p> <p>Impacts:</p> <p>Findings from this study demonstrate that deep snow cover is vital for grouse survival, and its loss will ultimately affect grouse populations. The data collected were used to create an overwinter survival model (based on individual grouse-level habitat selection in terms of land cover, snow conditions, and temperature) and a regional population projection model linking nest success and winter survival to temperature and precipitation anomalies. The models have been incorporated into grouse management plans used by the Wisconsin Department of Natural Resources.</p> <p>The researchers shared findings with a wide variety of groups by delivering nine academic conference presentations. They published two peer-reviewed journal articles (a third is in preparation) and one trade journal article.</p> | |
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