



2023 ANNUAL REPORT

Waldo County

University of Maine Cooperative Extension

Putting university research to work in Maine homes, businesses, farms, and communities for over 100 years.

extension.umaine.edu

University of Maine Cooperative Extension 2023 Annual Report

Office of the Dean

Welcome to the University of Maine Cooperative Extension! We are located in every corner of the state in 16 county offices, research farms, 4-H camps and learning centers, and online. We are the largest outreach component of the University of Maine and reach more Maine people than any other entity within the seven campus University of Maine System. Our work is focused on helping Maine communities thrive and we do so by connecting people to research-based information, education and services. UMaine Cooperative Extension conducts the state's most successful out-of-school youth education program through 4-H, empowering young people to reach their full potential. Our youth programming also includes our 4-H camps and learning centers which provide opportunities for youth to engage in outdoor experiential learning. Extension also helps support, sustain, and grow the food-based economy across the entire state of Maine. In addition, we provide valuable statewide programming in nutrition education, healthy families and communities. We also partner with other organizations and programs to provide additional educational opportunities to a diversity of audiences across this state.



Extension faculty and staff across the state have also contributed to significant digital outreach this past year. Our Extension website (extension.umaine.edu), which is a combination of 60 interconnected websites, received 3.3 million views in 2023. We have over 700 research-based publications that are available as free downloads at extension.umaine.edu/publications. And in this past year, we had more than 3,200 customers register for workshops, events, webinars and more through our online registration system.

UMaine Cooperative Extension is determined to make a positive difference in our areas of excellence and beyond for the citizens of Maine. Explore our website, visit a county office, and contact our enthusiastic workforce.

— Hannah Carter, Dean

In complying with the letter and spirit of applicable laws and pursuing its own goals of diversity, the University of Maine System does not discriminate on the grounds of race, color, religion, sex, sexual orientation, transgender status, gender, gender identity or expression, ethnicity, national origin, citizenship status, familial status, ancestry, age, disability physical or mental, genetic information, or veterans or military status in employment, education, and all other programs and activities. The University provides reasonable accommodations to qualified individuals with disabilities upon request. The following person has been designated to handle inquiries regarding non-discrimination policies: Director of Equal Opportunity, 5713 Chadbourne Hall, Room 412, University of Maine, Orono, ME 04469-5713, 207.581.1226, TTY 711 (Maine Relay System).

2023 UMaine Cooperative Extension Annual Report

Maine Food System 1

- Integrated Pest Management Saves Millions for Maine Potato Industry
- Wild Blueberry Weed and Blight Management
- Supporting Maple Producers and Encouraging Workforce Development
- Maine Compost Schools Train Respondents for Animal Disease Outbreaks and Disaster Mortalities
- Building Agriculture Literacy Through an Immersive Culinary Experience
- Expanded Food and Nutrition Education Program Increases Food Security and Healthy Behaviors
- Master Gardener Volunteers
- Maine Harvest for Hunger
- Eat Well Volunteers Impact Food Security
- Master Food Preservers Help Support Local Food System
- Veterinary Diagnostic Lab

Positive Youth Development 8

- Summer of Science STEM Enrichment for Children Experiencing Poverty and Immigrant and Refugee Families
- Maine 4-H Community Central
- Advancing STEM Learning Through Connected Learning Ecosystems
- Engaging Maine Youth in Maine's Thriving Aquaculture Industry
- 4-H Ambassadors Mentoring Students Toward STEM Careers
- 4-H Camp and Learning Centers Connecting Youth to the Outdoors and Building Community
- Parent Education Promotes Early Screening and Intervention for Developmental Delays
- Increasing Healthy Behaviors in Youth Through Expanded Food and Nutrition Education Program

Sustainable Economic and Community Development 14

- Micro-credentialing Through University of Maine System Builds Workforce Competence and Confidence
- Extension Homemakers Meet Diverse Community Needs
- Farm and Ranch Stress Assistance Network
- Extension Shares PFAS Resources for Farmers
- Marine Extension Team Supports Community Sustainability/Resilience, Fisheries and Aquaculture, and Ecosystem Health

Financial Support 18

County Highlights 19

- Maine Food System
- Positive Youth Development
- Sustainable Economic and Community Development
- Agriculture and Natural Resources

University of Maine Cooperative Extension's 2023 Digital Presence

Website

University of Maine Cooperative Extension's website at extension.umaine.edu – a combination of over **60 interconnected websites** consisting of nearly **12,000 published pages** – received over **3.3 million pageviews** from visitors in the 12 months between January 1, 2023, and December 31, 2023. Visitors searched for and found information on a wide variety of topics, including plant propagation in Maine, small business management, growing highbush cranberries, Tussock moth caterpillars, and how to tap maple trees and make maple syrup. A wide variety of interactive web forms allowed users to request assistance, presentations, newsletters, and updates; report volunteer hours; make donations; and respond to surveys. Nearly **55,500 web visits were referred from social media**.

Social Media

More than **57,556 followers** followed or subscribed to UMaine Extension's **61 county and program-specific social media accounts** on Facebook, Twitter, YouTube, Pinterest, Instagram, and TikTok. We hosted or co-hosted **118 Facebook Events that reached 243,248 users**. Nearly **750 educational videos** were available to visitors on our 14 YouTube playlists; many were also embedded in our web pages. Extension's YouTube videos were the most watched on the University of Maine Channel, which received nearly **1.15 million views and 47,000+ hours** of watch time. Top videos included Tick Removal, How to Prune a Blueberry Bush, Lobster Cooking and Eating, How Do I Prune Raspberries, and How a Prune a Lilac Bush.

Publications

More than **700 research-based publications** on a broad range of topics were available for free download at extension.umaine.edu/publications. Popular fact sheets, such as *Best Ways to Wash Fruits and Vegetables*, *Storage Conditions: Fruits and Vegetables*, *Facts on Fiddleheads*, *Guide to First-Time Horse Ownership*, *Maple Syrup Quality Control Manual*, *Growing Highbush Blueberries*, and *Recipe to Market: How to Start a Specialty Food Business in Maine* received tens of thousands of pageviews each.

New publications in 2023 included *How to Test Your Own Wild Blueberry Soil pH*, *Getting Geared Up for Maple Sugaring: Supplies and Equipment Needed for 1 to 50 Taps*, *Getting Geared Up for Maple Sugaring: Supplies and Equipment Needed for 50 to 500 Taps*, *Management of Volunteer Potatoes in Maine*, *Irrigation Resources for Maine Farmers*, along with several new publications about forage grasses and legumes (*Kentucky Bluegrass*, *Timothy Grass*, *Orchardgrass*, *Smooth Bromegrass*, *Reed Canary Grass*, and *Tall Fescue*) that will be combined to create the *Maine Forage Handbook*.

Online Registration, CDMS, Salesforce, Brightspace, and MailChimp

Nearly **2,478 customers** registered for workshops, events, webinars, and more through our online Centralized Database Management System (CDMS) registration system.

724 customers registered for in person, on demand and virtual events through our online Salesforce registration system.

620 participants took Extension courses online via Brightspace. Classes included Master Gardener Volunteer training, Maine Gardener Training, Growing Hemp 2023, Boots-2-Bushels, FDA Food Sanitation, Maine Horticulture Apprenticeship, Growing Small Fruit on Your Farm, Business Planning for Producers, AQUEous in Indigenous Aquaculture, Soil Science for Gardeners, Extension Reporting System Training, EFNEP Orientation, Introductory Volunteer Management, Pollinator-Friendly Gardening, and Extension Civil Rights Training.

More than **12,494** subscribers received over **77,000** e-notifications via MailChimp.



Maine Food System



- Integrated Pest Management Saves Millions for Maine Potato Industry
- Wild Blueberry Weed and Blight Management
- Supporting Maple Producers and Encouraging Workforce Development
- Maine Compost Schools Train Respondents for Animal Disease Outbreaks and Disaster Mortalities
- Building Agriculture Literacy Through an Immersive Culinary Experience
- Expanded Food and Nutrition Education Program Increases Food Security and Healthy Behaviors
- Master Gardener Volunteers
- Maine Harvest for Hunger
- Eat Well Volunteers Impact Food Security
- Master Food Preservers Help Support Local Food System
- Veterinary Diagnostic Lab

Integrated Pest Management Saves Millions for Maine Potato Industry

Relevance

The potato industry is the largest agricultural sector in Maine, encompassing more than 530 businesses generating more than \$540 million in sales, 6,100 jobs, over \$230 million in personal income, and over \$32 million in state and local taxes. The Maine potato crop, which averaged 16.8 billion pounds from 2019 to 2023, has its challenges from insects and pathogens alike. Costs to manage these pests can eat up profitability of the crop, and insecticide applications used to manage these pests can pose threats to the applicators, nontarget species, and the environment.

Response

The University of Maine Cooperative Extension Diagnostic Research Laboratory provides pest identification and integrated pest management (IPM) education to commercial and home clients. IPM is a comprehensive approach to solving pest problems with the goal of providing safe, effective, economical, environmentally sound, and socially sensitive outcomes.

Extension's Potato IPM program worked with 270 farms to monitor pest populations in potato fields in northern and central Maine. Using insect traps and field scouting, farms were visited weekly during the growing season to determine pest population status, and growers were given field reports and up-to-date management recommendations. Data collected from the potato farms were shared with potato growers throughout the state, the northeastern states, and eastern Canada through a weekly newsletter with 463 subscribers.

Growers using the information available through the IPM program have been able to successfully manage potato pests using minimal pesticide applications, because sprays were used only when population data indicated a specific need for control. Yields were improved or pesticide sprays reduced, and due to less pest damage, profitability was maintained or improved.

Results

In 2023, Extension's IPM research and identification efforts saved Maine's potato industry more than \$5 million in losses avoided, yields increased, and pesticide uses reduced.

Wild Blueberry Weed and Blight Management

Relevance

Approximately 485 wild blueberry growers in Maine manage 41,000 acres of this culturally and economically important crop. Proper management of weeds and blight is essential to the success of this industry. Broadleaf and grass weeds compete with wild blueberries for light, water, and nutrients, and can reduce wild blueberry yield up to 80%. In Maine's wild blueberry fields, "fine leaf sheep fescue" is resistant to many traditional herbicides and cultural weed management tools. Other challenges to blueberry fields are mummy berry and Botrytis blight diseases that can kill leaves and flowers. Each year weather conditions can affect susceptibility of wild blueberry plants to blight. Blueberry growers need to know when there is a high risk of disease to properly time their use of fungicides to be the most effective and to minimize their number of applications.

Response

Since 1945 when Blueberry Hill Farm was established, UMaine Extension has been conducting research and working with Maine farmers to understand the severity and distribution of fine leaf sheep fescue and how to reduce its spread. In 2023, we continued direct outreach with blueberry farmers individually and through agricultural trade shows and in-season field days. We designed and implemented a pruning and herbicide control demonstration at Blueberry Hill Farm to showcase different combinations of chemical and cultural ways to reduce the spread of this weed. To address mummy berry and Botrytis blight diseases, we use wild blueberry weather stations in wild blueberry fields around the state to monitor weather conditions and fungal development. Extension staff gather information from the blueberry growers and the weather station to provide wild blueberry disease reports on the risk of disease occurring in blueberry growing areas.

Results

Most growers can now identify fine leaf sheep fescue and have two herbicides and two cultural control options available to them. By suppressing this weed in wild blueberry fields, growers realize substantial savings on herbicides and increase wild blueberry yield and quality. More than 70% of blueberry growers who use fungicides to control mummy berry and Botrytis blight use Extension disease reports to determine the timing of fungicide applications. Mummy berry disease levels have dropped in most fields in Maine where growers use the blueberry disease reports. In recent years, levels of mummy berry disease have been 5% to 25% of stems infected, when in the past the levels were always 25% and higher.

Supporting Maple Producers and Encouraging Workforce Development

Relevance

Maine is the third largest producer of maple syrup nationwide, behind Vermont and New York. Our state produced 470,000 gallons of maple syrup in 2023. Annually, maple syrup contributes an estimated \$49 million in production value, more than 800 full- and part-time jobs, and more than \$25 million in labor income to Maine's economy. Maple sugaring has a remarkable connection to the culture, history, and economy of Maine. To thrive, the industry needs research and educational support for 1) existing maple producers, 2) the general public, 3) sugarbush management and climate resilience, and 4) developing a trained workforce for the future.

Response

Extension's maple education programs provide producers with resources about international grade standards, maple grading techniques, quality control, and food safety in the production process. For 18 years, Extension's International Maple Grading School (IMGS) has been training maple producers, packers, and inspectors on best practices when grading syrup. In 2023, we offered programming on sugarbush management and climate resilience, including site visits, timely alerts and resources on weather events, and a full day sugarbush management conference and workshops. We provided public outreach and education through Maple Sugarmaking 101 courses and facilitated a new 4-H club through which youth learned about tree ages,

identification, versatility of commercial and ecosystem benefits, the diversity of forest-related careers, and tapping maple trees.

Results

The continued success of the school and its participants helps promote the exceptional image of both the maple industry and its producers who create high-quality products. In 2023, the IMGS provided a platform for industry discussion and education about maple products, grading, and quality issues concerning pure maple syrup. Through Extension's maple programming, 288 individuals learned about the maple industry, syrup grades, and diverse uses of syrup; more than 60 beginning or backyard sugarmakers participated in two Maple Sugarmaking 101 courses led by our team; and 93 producers participated in our new hybrid model for the IMGS. In addition, 62 producers participated in full-day maple grading programs, helping meet our goal of increasing the amount of marketed syrup that is food-safe, the proper density, free of flavor defects, and graded accurately to ensure consumers purchase syrup with flavor profiles that they expect. Through our 4-H club maple programming, Maine youth were exposed to the diversity of forest-related careers.

Maine Compost Schools Train Respondents for Animal Disease Outbreaks and Disaster Mortalities

Relevance

Composting is a management tool that can be utilized in a variety of sectors to reduce the amount of waste through decomposition and stabilization. Composting can be carried out to reduce food waste, manage animal mortalities, stop the spread of disease, and create a valuable and safe product that can be used in the agricultural, horticultural, and environmental engineering sectors. There is a national need for compost education as we move toward a more environmentally sustainable society.

Response

The University of Maine has identified the need to train members of the workforce on the composting process, uses, and applications, and has met that need by offering weeklong trainings multiple times a year focused on comprehensive composting training and composting to manage animal mortalities through general agricultural production or in the incidence of disease outbreaks or disaster mortalities. Participants in these trainings are tested on their composting knowledge and receive recognized certification.

Results

In 2023, 40 participants completed the Compost School and 30 participants completed the Carcass Management School. Participants in the Compost School have used the training as professional development and to bring a more robust and rounded set of composting skills back to various businesses to improve understanding, efficiency, and profitability. The majority of participants in our classes this year rated the course as excellent. Participants who have completed the Carcass Management School have passed the initial requirements to become a Composting Subject Matter Expert and will deploy in animal mortality outbreaks due to diseases such as highly pathogenic avian influenza during disaster events.

Building Agriculture Literacy Through an Immersive Culinary Experience

Relevance

Maine's local food system is a collaborative network that integrates sustainable food production, processing, distribution, consumption, and waste management to enhance the state's environmental, economic, and social health. Consumers and the culinary arts (CA) workforce play vital roles in supporting a local food system through their daily food choices. Educational efforts targeted toward current and future consumers and the CA workforce will increase their agricultural literacy and positively impact the Maine Food System.

Response

UMaine Extension and Maine Ag in the Classroom collaborated to create the Building Agriculture Literacy through an Immersive Culinary Experience project to help career and technical education (CTE) CA instructors increase their agricultural literacy and enhance the connectedness between agriculture and food service. Funded and initiated in 2021, this four-year project is seeking to create a skilled and educated workforce that will increase the usage of Maine-grown, -processed, and -produced foods in their programs and careers. Project activities have included a weeklong Immersive Culinary Arts Summer Institute for CTE CA instructors, hands-on experience in local food procurement practices, demonstrations of food system lessons, educational field trips, financial support for experiential activities through their existing school restaurants, participation in a University of Maine Local Foods Competition, and coaching during the school year.

Results

In 2023, Maine Food System lessons and experiential food-based activities were delivered to 70% of Maine's CTE CA programs (650 students and 26 CA Instructors), and 86% (21) of Maine's CTE CA programs participated in the experiential learning events of the program. The purchasing power of consumers and the CA workforce matter. Maine is home to 1.3 million consumers who have an average annual expenditure on food of \$4,576, representing a total value of over \$5.9 billion. A consumer shift of 10% of their purchases to Maine-grown and -produced foods creates an influx of more than \$594 million toward supporting Maine's food-based economy. Maine's restaurants generated \$3.3 billion in 2021 and encompass 50,100 jobs in Maine—8% of the state's employment. Shifting the local foods value system of the future CA workforce will positively impact the use of Maine-grown foods within this multibillion-dollar industry.

Expanded Food and Nutrition Education Program Increases Food Security and Healthy Behaviors

Relevance

In 2022, 10.9% of Maine people lived in poverty and 10.1% of Maine households experienced food insecurity. In 2022, 33% of Maine adults were obese—an increase from 31% in 2020. The combination of high rates of food insecurity and the complexity of the causes of obesity increases the risk of developing chronic diseases and reducing the quality of life for Maine people. Recent estimates of the cost of adult obesity on health care expenditures amounted to an increase of \$1,861 in excess annual medical cost per adult, resulting in an annual rise in health care costs in Maine by more than \$172 billion. Severe obesity was associated with excess costs of \$3,097 per adult.

Response

To improve the food and nutrition security of Maine's parents, caregivers, and young adults who are experiencing limited income, UMaine Extension delivers education through the Expanded Food and Nutrition Education Program (EFNEP) to improve behaviors related to diet quality, physical activity, and using food resources management practices to learn how to plan and shop for healthy meals and snacks. Program outcomes are measured for all adults using validated pre/post program questionnaires and 24-hour food recalls.

Results

In 2023, 258 adults participated in Maine EFNEP, and the education program reached a total of 1,269 individuals in program families. Fifty percent of adult participants completed pre- and post-surveys showing these results:

- 92% showed improvement in dietary intake.
- 90% showed improvement in food resource management practices.
- 69% showed improvement in physical activity behaviors.
- 73% showed improvement in food safety practices.

Specifically:

- 40% report eating fruit more often each day.
- 36% report eating vegetables more often each day.
- 31% report drinking soda less often.
- 43% report planning meals before shopping more often.
- 40% report making a list before shopping more often.
- 44% exercise for at least 30 minutes most days of the week.

Master Gardener Volunteers

Relevance

Public and private gardens are important tools for enhancing physical and mental health, and they play a key role in sustaining the health and vitality of our natural communities. Since the beginning of the pandemic, gardening has been on the rise in Maine, with our offices experiencing a tremendous influx of gardening questions. As it becomes more and more challenging to sort through information online, Maine gardeners need access to reliable research-based information, now more than ever. Extension trains and supports Master Gardener Volunteers (MGV), who help extend university knowledge to local communities through the teaching of sustainable gardening practices.

Response

The MGV program provides participants with a minimum of 64 hours of in-depth training in the art and science of horticulture. Trainees receive current, research-based information from our educators and industry experts and are connected with service projects that match their interests, skill sets, and availability. MGV coordinators facilitate relationships between MGVs and community partners, assisting with needs assessment, program planning, risk management, and problem solving. In 2023, MGV played a vital role in connecting communities with educational resources through community events, social media, and programming.

Results

The MGV program provides opportunities for gardeners with all levels of experience to connect with meaningful service projects in their community. In 2023, 733 volunteers donated 30,932 hours to a variety of educational and food security projects throughout the state, including school gardens, demonstration gardens, horticulture therapy gardens, pollinator and native gardens, and Maine Harvest for Hunger projects. Their efforts amounted to the direct reach of 932 youth and 3,106 adults through programming and the indirect reach of 3,500 Maine residents through outreach, news articles, TV features, and more. Many volunteers enter the MGV program intending to improve their gardening skills for their personal benefit and leave surprised by how deeply involved and passionate they become about community projects. As they become more involved with the program, they help establish meaningful connections in the communities where they live, and serve as educational resources for their neighbors, schools, towns, and community organizations. These relationships help grow our educational outreach efforts and facilitate positive change in communities across the State of Maine.

Maine Harvest for Hunger

Relevance

Maine continues to face significant challenges regarding food insecurity, with the highest rate in New England and ranked 20th nationwide. According to the latest data from the United States Department of Agriculture (USDA), 10.1% of Maine households are food insecure. Nationally, 17.3% of households with children under the age of 18 and 11.4% of households where an older adult was living alone experienced food insecurity in 2022. Given the pervasive nature of this problem, it remains imperative to implement comprehensive measures to ensure that all communities can adequately support their neighbors in times of need.

Response

Since 2000, UMaine Extension's Maine Harvest for Hunger (MHH) program has mobilized gardeners, farmers, businesses, schools, and civic groups to grow, glean, and donate fresh produce to food security agencies. Our work involves training volunteers, developing partnerships with farms and organizations, organizing and leading volunteer opportunities, maintaining databases of sites accepting produce donations, and building awareness of the extent, causes, and impacts of food insecurity.

Results

In 2023, 262 MHH volunteers grew, gleaned, and distributed 203,991 pounds of produce, valued at \$391,663, to 173 food security agencies throughout the state. We partnered with 112 farms and community gardens on these efforts. One shining example of the many creative ways we connect people with food is the Waldo County Give & Take program. These sites enable gardeners, homesteaders, and farmers to drop off excess produce, and people can obtain free produce anonymously and accessibly. This program began in 2020 with 10 sites; this year there were 19 sites. This project is part of Waldo County Bounty with coordination from Cooperative Extension. About 1,600 donations were recorded this year, which represents some but not all of the donated produce, seedlings, and seeds, and is equivalent to approximately 10,500 pounds of local, nutritious produce. From backyards to

farms to school gardens, MHH is enhancing access to healthy food and offering volunteers a truly meaningful way to engage with their community.

Eat Well Volunteers Impact Food Security

Relevance

Food insecurity challenges 10.5% of Maine's population (Map the Meal Gap, 2023). Although Hancock and Washington Counties house more than 19 food pantries dedicated to alleviating hunger, there exists a critical gap in educating pantry visitors about making healthy food choices and embracing nutrition education. Conventional food security initiatives primarily focus on distributing food, and many pantry patrons are constrained by availability and often find unfamiliar produce intimidating.

Response

The Eat Well Volunteer Program responds to this education gap by empowering families with tools to confidently prepare nutritious meals at home. Our trained volunteers guide pantry visitors through recipes, introduce them to unfamiliar produce, and foster a welcoming environment where they can openly learn about food safety and nutrition. This Extension program trains volunteers in essential skills, including sensitivity and inclusion training, food safety, knife skills and food preparation tips, nutrition standards, lesson plan reading, and cooking demonstrations. Through partnerships with pantries, the Eat Well Volunteer Program conducts regular, volunteer-led programming aligned with the growing season. Participants receive recipe packets related to featured monthly produce, tip sheets on food safety, fresh produce, and engaging and informative demonstrations at the pantries.

Results

Through this Extension and food pantry collaboration, more than 400 limited-income patrons have directly benefited from nutrition education, food safety training, and recipe preparation advice. Collaborating with UMaine Extension Master Gardener Volunteers, the program also contributes more than 500 pounds of fresh produce to food pantries annually, further enriching its nutritional programming. The impact extends beyond tangible benefits, as volunteers themselves report positive experiences and personal growth. Through the program, volunteers forge meaningful connections within their communities, experience the fulfillment of giving back, and enhance their knowledge about food education. Through education, collaboration, and hands-on involvement, the program is transforming lives and fostering a healthier, more resilient community.

Master Food Preservers Help Support Local Food System

Relevance

Over the past decade, interest and demand for local food and food preservation have continued to grow, due in part to economics and the public's interest in supporting a local food system. UMaine Extension efforts seek to create a social shift toward a more educated and skilled public that will revitalize our local food system and positively impact the local agricultural economy through an increase in safely preserving local Maine foods at home to eat year-round.

Response

In 2023, 49 Master Food Preserver volunteers completed more than 350 hours of food preservation education, community projects, and administrative tasks. Volunteers taught preserving workshops through Adult Education, Cooperative Extension offices, and community centers. Volunteers staffed educational displays and demonstrated at farmers' markets, harvest festivals, agricultural fairs, and local food events. In all, their community impact in volunteer time was valued at more than \$11,000.

Results

These volunteer efforts reached more than 880 people in nine Maine counties. When surveyed, program participants report:

- 88% plan to do something differently when preserving.
- 100% understand how to preserve foods better.
- 96% feel more confident about their food preservation skills.
- plans to can jam and jelly, pickles, and tomato sauces, while freezing vegetables, fruits, and tomato sauces.

Veterinary Diagnostic Lab

Relevance

The vitality of Maine agricultural and aquacultural producers depends on many factors, including their success in identifying animal health–related problems.

Response

UMaine Extension’s Veterinary Diagnostic Laboratory (VDL) performs rigorous diagnostic testing of biological samples from domestic and wild animals. Services provided by the VDL support Maine livestock producers, companion animal owners, and animal health regulatory agencies. This includes disease surveillance with the state’s Department of Inland Fisheries and Wildlife; the Department of Agriculture, Conservation, and Forestry (DACF); USDA Animal and Plant Health Inspection Service; and forensic pathology for animal abuse and neglect cases through DACF’s Animal Welfare Program. We conduct and collaborate on applied and basic research within Cooperative Extension, UMaine, and with state and federal agencies.

In 2023, the VDL responded to more than 100 client inquiries, reported on more than 250 case submissions, and received and processed more than 900 physical samples, including mastitis submissions (52% of samples), environmental surveillance samples for *Salmonella enteritidis* regulatory testing (29% of samples), necropsy + ancillary postmortem testing (20% of samples), and parasitology samples (9% of samples). Our veterinary anatomic pathologist conducted more than 80 necropsies on 17 different species, most commonly avian (46%) and small ruminants (14% goat, 8% sheep), with fewer dogs (10%), cats (3%), cattle (4%), and horses (3%) during this time. Twelve percent of necropsy cases are the result of collaborations with the Maine Department of Inland Fisheries & Wildlife; these included red fox, raccoons, corvids (crows, ravens), raptors (red-tailed hawk), and cervids (deer, caribou).

Results

We were able to identify eight necropsy cases over the last eight months as reportable animal or zoonotic diseases, including rabies virus, eastern equine encephalitis virus, West Nile virus, *Avibacterium paragallinarum* (infectious coryza), avipoxvirus (fowl pox), and *Mycobacterium avium* ssp. paratuberculosis (Johne’s disease). This information will assist in guiding future applied research and educational outreach efforts. Our lab hires a small number of student workers of diverse backgrounds, who benefit the lab by providing energetic, curious, and detail-oriented efforts. These students help us adapt our methods to develop better teaching and outreach materials for farmers, at the same time as they receive mentoring and develop skills and knowledge that will help them in their veterinary careers. The VDL combines service, research, and education to improve agriculture, the food system, and the quality of life in Maine.



Positive Youth Development

- Summer of Science STEM Enrichment for Children Experiencing Poverty and Immigrant and Refugee Families
- Maine 4-H Community Central
- Advancing STEM Learning Through Connected Learning Ecosystems
- Engaging Maine Youth in Maine’s Thriving Aquaculture Industry
- 4-H Ambassadors Mentoring Students Toward STEM Careers
- 4-H Camp and Learning Centers Connecting Youth to the Outdoors and Building Community
- Parent Education Promotes Early Screening and Intervention for Developmental Delays
- Increasing Healthy Behaviors in Youth Through Expanded Food and Nutrition Education Program

Summer of Science STEM Enrichment for Children Experiencing Poverty and Immigrant and Refugee Families

Relevance

Children experiencing poverty have less access to enrichment activities, contributing to an achievement gap between them and their more affluent classmates. This gap accelerates during summer months, when children from low resource backgrounds tend to fall behind in grade equivalency compared to their peers. This condition can be especially acute for children living in public housing neighborhoods, including many of Maine’s immigrant and refugee families in the metro areas of Portland and Lewiston. Access to STEM enrichment activities leads to improved academic success, more educational attainment, and better employment opportunities.

Response

UMaine Extension created the 4-H Summer of Science (SOS) in 2012 to: 1) improve youth aspirations in STEM, 2) introduce STEM careers to youth, and 3) mitigate summer learning loss and the achievement gap. Over time, the SOS program has developed to include teens as teachers and college interns as teacher mentors. The SOS program focuses on programming where youth already are (in neighborhoods, libraries, and community sites) and uses positive 4-H youth development practices to reduce barriers to STEM activities. By engaging in Summer of Science activities, the 4-H youth are well poised to return to their academic school year with reduced summer learning loss and an increased interest in science. In 2023, UMaine 4-H faculty and staff designed four STEM lessons that were taught in seven southern Maine communities at 19 sites, including Boys & Girls Clubs, the YMCA, summer lunch programs, public housing centers, and libraries. There were 269 adult volunteers and summer staff who taught 822 youth in the field of environmental DNA (eDNA). Fifty-seven percent of youth participants were nonwhite (404 of them of black or African American origin).

Results

Research by UMaine faculty shows that well-designed STEM lessons delivered by near peers (teens and college students) support STEM career aspirations and lead to better content knowledge. Research also shows that youth involved in 4-H are more likely to pursue future courses or a career in science, engineering, or computer technology, which can lead to improved employment opportunities. For Maine elementary school youth, SOS supports narrowing their STEM achievement gap during summer months, and for the teens trained to deliver programming, it fosters their career development, leadership abilities, and sense of responsibility. Teen teachers in the SOS program report improved socio-emotional skills and applicable workforce skills, as well as increased resiliency.

Maine 4-H Community Central

Relevance

Youth need skills and experiences to help them be successful adults in a complex and ever-changing world. As they move toward adulthood Maine youth need to understand their career and education possibilities and to build skills necessary for their personal and professional development as the future of the Maine workforce.

Response

Community Central offers 4-H Positive Youth Development for high school students in Lewiston and Portland with a focus on workforce skill development and career/college exploration while increasing social capital. Most participants are black, indigenous, and other people of color (BIPOC) teens, and many are from immigrant/refugee families. In 2023, two 4-H professionals provided programming for youth in Lewiston and Portland, offered in partnership with the public schools and housing authorities. Short-term SPIN clubs offered connections with local professionals, and long-term weekly programming offered hands-on skill development. All sessions were designed based on youth interest in real-time.

Results

In 2023, 4-H Community Central engaged 141 youth, of whom 87% were nonwhite, with 44 identifying as black or African American. As a result of participation, participants were able to build their social capital and connect with professionals in their communities who are part of the areas of the workforce they are interested in pursuing. Participants were able to access 4-H in a variety of methods, thus broadening their life skill, leadership, and personal development: weekly school year skill development programming, SPIN clubs based on specific sectors of the workforce, National 4-H conferences (Ignite Summit and True Leaders in Equity), Maine teen conferences (Maine Youth Council Teen Conference and MYAN Youth Leadership Conference), and through community service-learning projects with several community partners. Two participants also joined the Maine 4-H Youth Council and four enrolled in the CMMC Junior Volunteer Program after meeting the volunteer coordinator during a Medical/STEM SPIN session. Community Central, in partnership with numerous community partner organizations, allows teens to explore various career and education possibilities and builds skills necessary for their personal and professional development as the future of the Maine workforce.

Advancing STEM Learning Through Connected Learning Ecosystems

Relevance

Research indicates that youth are influenced by various factors, including family, school, work, and extracurricular activities, all of which significantly contribute to shaping their confidence, interest, and agency in science. Recognizing the importance of these diverse learning contexts is essential for fostering authentic STEM learning. There has been a shift to approaching STEM education from an "ecosystem" perspective, creating multiple entry points and pathways both within and outside of traditional educational settings to provide youth with engaging, locally relevant experiences. To facilitate meaningful connections within a local "ecosystem," educators and practitioners in diverse spaces need a platform to engage with one another, share initiatives, articulate goals, and discuss the experiences of the youth they serve.

Response

Learning Ecosystems Northeast (LENE), a NASA-funded network of Connected Learning Ecosystems (CLEs), led by the Gulf of Maine Research Institute, recruits and supports regional peer communities of teachers, librarians, and informal educators with a shared goal to create multiple pathways for youth to find their interest and passion for STEM learning. Focused on climate science and data literacy, these CLE communities are designed to permeate the boundary between in and out of school, ensuring youth experience connected learning in diverse environments and experience various layers of positive influence on their science identity. Maine 4-H staff are

integral to this initiative and actively participate in local CLEs, collaboratively supporting place-based investigations of climate change that bridge formal and informal learning spaces. The overarching vision is to build a climate-literate generation with the skills necessary to thrive in a changing world.

Results

The impact of Maine LENE's CLEs has been transformative in connecting the educators who deliver STEM learning experiences to youth in their communities. Collaboration between 4-H staff and other educators in their communities has expanded, fostering a vibrant exchange of educational resources and experiences. In 2023, 114 youth educators participated in these CLEs, which have resulted in new climate- and data-focused Maine 4-H programs, including the 4-H Tick Project, Vernal Pools Club, Virtual Algae Club, Pollinator workshops, Eclipse Investigations, and more, collectively reaching 2,095 Maine youth. The development of these programs and engagement in CLE activities has led to increased 4-H staff confidence and skills in facilitating climate and data science learning experiences. This initiative is not merely cultivating knowledge; it's sowing the seeds of a climate-literate generation and forging enduring connections between educators and the youth they inspire.

Engaging Maine Youth in Maine's Thriving Aquaculture Industry

Relevance

Maine communities have a long tradition of harvesting healthy seafood and taking care of the environment. As part of the Blue Economy, which seeks to use ocean environments in a sustainable way to support jobs and economic growth, aquaculture is one of the fastest-growing sectors in Maine and includes more than 200 farms and 700 farmers producing premium seafood (finfish, shellfish, and sea vegetables) and realizing \$110M in annual sales. In-state total employment is expected to increase by 33% by 2030. Although aquaculture and its technologies are a growing part of the Blue Economy, widespread support for aquaculture products is lacking. Creating opportunities for youth to engage in aquaculture programs can have positive implications for consumer education and awareness, and lower barriers that rural youth experience, such as low wages, job security, aspirations, and the need for higher education in STEM fields.

Response

Maine 4-H, in partnership with the UMaine Center for Cooperative Aquaculture Research and the Aquaculture Research Institute, has continued to expand the 4-H Aquaponics Project, an innovative workforce development program designed to harness youth interests in fish and gardening to cultivate real-world skills applicable to the fast-growing aquaculture industry. It is a nationally recognized, youth-centered, innovative program that honors 4-H roots in agriculture and animal and plant science, and a viable model to extend Extension's programs and cultivate youth interests in aquaculture careers and technologies. The curriculum is aligned with Maine's Aquaculture Occupational Standards, which specify the current workforce skills and training needs of Maine's aquaculture sector. The project is supported by a team that includes formal and informal educators, youth leaders, industry partners, scientists, and collaborating partners.

Results

In 2023, the project has reached nearly 400 youth participants, who are participating from their classrooms, homeschool, or out-of-school programs (such as summer camps). The 4-H Aquaponics Project outcomes include gains among youth in their knowledge of aquaculture principles, practices, and technologies, as well as aquaculture career readiness. Through 4-H Aquaponics, youth participants gain a deep understanding of novel, complex systems, while practicing important life skills such as resiliency and troubleshooting. They also develop skills that are sought after by the aquaculture industry (for example, basic knowledge of fish biology, understanding water quality issues, project management, teamwork, and more). The project has increased access to aquaculture education opportunities for Maine youth and generated an increase in 1) awareness and understanding of the aquaculture industry and related technologies; 2) knowledge about aquaculture careers; 3) aquaculture career aspirations; 4) knowledge about innovative aquaculture systems; and 5) capacity for high-quality aquaculture education.

The 4-H Aquaponics Project is being lauded as a viable workforce development program for the aquaculture sector in Maine and nationally. The project is investing in the future of Maine youth and a vital and growing aquaculture industry in the state. The project is giving youth participants exposure to and training in the industry, and it is developing a potential labor pool to meet the projected workforce demands in the years ahead.

4-H Ambassadors Mentoring Students Toward STEM Careers

Relevance

Developing Maine youth STEM literacy is vital to ensuring that our state continues to thrive economically and socially. Given the remote and diverse communities where Maine youth live, informal education can help minimize inequities in rural youth STEM education and career pipelines. Future career opportunities in Maine will depend heavily on STEM skills, whether in the growing fields of healthcare and engineering, or in positions requiring technical skills, such as construction, and maintenance of transportation and energy systems.

Response

4-H STEM Ambassadors are trained University of Maine System students enrolled as 4-H volunteers who facilitate hands-on STEM activities with youth 8–14 years old throughout Maine. Since 2014, our 4-H STEM Ambassadors program has enrolled and trained nearly 600 University of Maine System students who have facilitated in-person, hands-on learning experiences fostering youth STEM enjoyment, literacy, and identity, reaching more than 6,000 Maine youth in classrooms, libraries, and after-school clubs across the state. In fall 2020, Extension redesigned the program to be virtual, including a training, mentoring, and experiential STEM programming. The shift to a virtual program allowed for multicampus student teams and increased access for more distant community partners regardless of local program model (remote, in-person, hybrid).

Results

In 2023, the program reached more than 200 students, grades 3–8, with the help of 63 volunteer Ambassadors and staff. Through this program, youth ages 8–14 come to view these Ambassadors as mentors and leaders in their community while also developing skills in STEM through hands-on activities and becoming connected to research, resources, and scientists at Maine's public universities.

4-H Camp and Learning Centers Connecting Youth to the Outdoors and Building Community

Relevance

Research has shown that positive social and emotional learning experiences can significantly impact youth development and that connecting youth to a positive adult role model decreases the risk for making unhealthy choices or engaging in risky behaviors. Especially since the pandemic, youth are spending more time connected to social media and other digital platforms, resulting in isolation and sedentary indoor time. Many youth suffer from obesity and/or attention-deficit/hyperactivity disorder (ADHD). Many lack opportunities to develop positive interpersonal communication skills.

Response

UMaine Extension 4-H Camp and Learning Centers provide programs for youth ages 4–17, many from underserved populations. Using evidence-based practices and program design principles, these transformational experiences develop a sense of place and belonging, and confidence in the outdoors. Our programs include both day and residential summer camps, on-site Outdoor School programs, in-school enrichment, as well as adult programming and workshops. We have a well-developed virtual component to our programs that gives them added depth and maximizes accessibility. Our Learning Centers typically attract more than 2,500 youth each summer, and provide school programming for more than 6,000 students from 60+ Maine school groups.

Results

In 2023, our 4-H Camp and Learning Centers:

- Delivered year-round programming at the UMaine 4-H Learning Centers at Blueberry Cove, Bryant Pond, and Tanglewood, including programs in water ecology, forest ecology, wilderness survival, and conservation education.
- Continued to support Telstar Freshman Academy at Bryant Pond, offering daily, yearlong, experiential learning designed to engage students in an outdoor setting.
- Continued to deliver the NorthStar Youth 4-H Mentoring program that connects young people with caring adults through community engagement, cultural exchange, and adventure challenge and leadership. The program is grounded in in-person contact, and also uses virtual contact for family and other activities.
- At Greenland Point in Washington County, one of Maine's most impoverished counties, we offered hands-on, ecology-focused education. We provided significant scholarship funding, ensuring cost is not an obstacle to anyone who wants to come to camp.

- At summer camps and open-air classroom programs, Tanglewood and Blueberry Cove offered programs tailored to community needs, including youth development programs for schools.

Our 4-H Camp and Learning Centers provided life-changing outdoor learning programs for youth ages 4-17, many from underserved populations. In addition, we worked with dozens of classroom teachers, and engaged more than 50 volunteers in supporting our work. In three out of four counties in which we operate, Cooperative Extension and 4-H are the only connection to a four-year institution of higher education. Through innovative, evidence-based youth development programs that utilize outdoor and community-connected learning, we provide pathways for youth to achieve post-secondary success in college or meaningful careers.

Parent Education Program Promotes Early Screening and Intervention for Developmental Delays

Relevance

The first three years of a child's life are a critical time for growth and development. Maine Families Home Visiting program provides services at a minimum of one time per month. Parent Educators support early identification of developmental delays by offering developmental screenings to families during home visits and providing additional activities in areas where a child may need extra support for growth. If needed subsequent referrals are offered as appropriate early intervention services are essential to reduce the long-term impacts and school readiness.

Response

UMaine Extension's Parent Educators are part of a statewide network of Maine Families Home Visiting Programs that provides services at a minimum of one time per month. Using the parents as teachers model, certified Parent Educators meet with families in their homes and 1) provide them with current information on child development and parenting, 2) share activity ideas and ways to engage and nurture their child's optimal development, and 3) provide connections and linkages to community resources. During each home visit Parent Educators offer book sharing opportunities and information about early literacy, including the importance of reading aloud. Parent Educators provide free children's books to all enrolled families, including books in French, Lingala, and Spanish for families who are non-English-speaking.

At each visit, developmental information, anticipatory guidance, and an activity to promote growth are provided. Certified Parent Educators encourage parents to continue learning beyond the visit. Parent Educators support early identification of developmental delays by offering developmental screenings to families during home visits and providing additional activities in areas where a child may need extra support for growth. If needed, subsequent referrals are offered, as appropriate early intervention services are essential to reduce the long-term impacts and improve school readiness.

Results

In 2023, 10 certified Parent Educators provided 2,143 home visits to 215 children living in five counties, with 98% receiving timely and complete developmental screenings.

Increasing Healthy Behaviors in Youth Through the Expanded Food and Nutrition Education Program

Relevance

Obesity is a chronic disease. Nationally 17% of youth ages 10–17 are experiencing obesity. In Maine, 13.8% of youth ages 10–17 and 14.9% of high school students have obesity. Recent estimates of the cost of childhood obesity on health care expenditures found that obesity was associated with an increase of \$116 per child in annual health care expenditures, resulting nationally in \$1.32 billion of medical spending. Severe obesity was associated with annual excess health care costs of \$310 per child. Nutrition insecurity, or lack of consistent and equitable access to healthy, safe, and affordable foods that promote optimal health and well-being, increases the risk of poor health of Maine's children in the short- and long-term. In Maine, 1 in 7 children (14.6%) under the ages of 18 years are experiencing food insecurity. Of those 36,490 children, 42% of households do not qualify for federal food assistance programs and need to rely on charitable organizations for supplemental food.

Response

To help lower childhood obesity rates, UMaine Extension Expanded Food and Nutrition Education Program (EFNEP) delivers education to Maine's low-income children to improve their knowledge, behaviors, and attitudes related to improving diet quality, increasing daily physical activity, and using food resource management practices

to learn how to plan and shop for healthy meals and snacks. Program outcomes are measured for all youth ages 5–18 using validated pre/post program surveys.

Results

In fiscal year 2023, 1,774 youth participated in Maine EFNEP. Youth participated in an average of six educational lessons over three months. Seventy-seven percent of youth participants completed a pre- and post-survey. As a result of participating in EFNEP:

- 82% improved their abilities to choose foods according to current dietary guidelines or improved nutrition knowledge.
- 44% improved their daily physical activity practices.
- 47% used safe food handling practices more often.
- 56% improved their ability to prepare simple, nutritious, affordable food.



Sustainable Economic and Community Development

- Micro-credentialing Through University of Maine System Builds Workforce Competence and Confidence
- Extension Homemakers Meet Diverse Community Needs
- Farm and Ranch Stress Assistance Network
- Extension Shares PFAS Resources for Farmers
- Marine Extension Team Supports Community Sustainability/Resilience, Fisheries and Aquaculture, and Ecosystem Health

Micro-credentialing Through University of Maine System Builds Workforce Competence and Confidence

Relevance

Extension provides valuable skills to both youth and adult learners. There is a need to provide employer-recognized evidence of training and skills for agricultural and other workers.

Response

In 2020 we began developing and issuing micro-credentials through the University of Maine System. In 2022, these included micro-credentials and badges in Meat Cutting, Horticulture Apprenticeship, Seafood HACCP (hazard analysis and critical control points), Meat and Poultry HACCP, Food Processing Sanitation, Food Safety Systems, and Facilitation. Youth in the 4-H Communication Science program are now eligible to receive the nationally normed and recognized "Oral Communication" badge from the Education Design Lab. In 2023, we worked on expanding Extension micro-credentials, including developing guidelines for UMaine, networking at the UMaine and University of Maine System level, creating teams, and writing metadata with subject matter experts. Micro-credential participants were in 4-H STEM Ambassadors, food safety, aquaculture and 4-H aquaculture, facilitation, collaboration, food processing, horticulture, meat cutting, resilience, collaboration, and oral communication. We worked on updating badges in volunteer management, climate resilience, aquaculture, and outdoor leadership.

Results

In 2023, 482 badges were issued to UMaine Extension participants. Earners ranged from current University of Maine System students to adults in the general public. These credentials can be used to showcase skills earned through Extension and are verified by UMaine. Micro-credentials help earners make competencies visible, beyond what is seen on a transcript or résumé; demonstrate skills in real-world settings; gain work experience and receive valuable performance feedback; stand out to employers; better articulate the skills developed to potential employers; enhance digital identity; share badges; and be recognized. All micro-credentials/badges can be shared on social media and professional sites, such as LinkedIn and the holder's personal website, e-portfolio, or résumé.

Extension Homemakers Meet Diverse Community Needs

Relevance

Many communities throughout Maine face poverty, and many families are considered food insecure. Budget cuts and inflation mean that every sector of community living is affected when resources are reduced. Janet was a helper. When Janet passed away from complications resulting from a heart transplant, her family wanted her legacy as a helper to live on. They created Janet's Jammies, through which volunteers sew pajamas to send to children in need in the State of Maine. There are hundreds of young children throughout our state who live at or below the poverty level, including homeless children, foster children, and refugees. Providing warm pajamas for Maine's vulnerable children helps them to stay warm and feel loved.

Response

The Maine Extension Homemakers Council has clubs with more than 250 members statewide. In 2023, this volunteer group identified community needs and worked to contribute both financial and volunteer hours to community partners to meet the needs of Maine's most vulnerable citizens. They heard of Janet's Jammies and decided to set a goal of making 300 pairs of pajamas in honor of Janet. Several branches of the United Way of Maine agreed to distribute the pajamas.

Results

In 2023, Maine Extension Homemakers raised and donated \$26,437 to civic organizations, nonprofits, and individuals throughout Maine. They also provided 4,986 hours of volunteerism within their counties and communities. In all, their community impact was valued at \$175,768. The fingerprints of the efforts of the Maine Extension Homemakers can be seen in school libraries, at food pantries, in local town offices, with the Newborns in Need program, at the Home for Little Wanderers, at Hope and Justice Project shelters, in the back seats of state police cars, in hospitals and nursing homes, and in assisted living facilities. Their community efforts have been visible at animal shelters, historical societies, and on the faces of people protecting themselves from COVID-19 and the flu. Homemakers made more than 300 pairs of Janet's Jammies, each sporting a red heart as a symbol of Janet's love of helping, and of her heart transplant. Janet's family provided cotton shirts to accompany each pair of jammies, and each set of pajamas was wrapped and tied with a ribbon and distributed by United Way chapters throughout Maine. Extension is in our communities, thanks to the Maine Extension Homemakers.

Farm and Ranch Stress Assistance Network

Relevance

Mental health is an overlooked challenge farmers face nationwide. Farmland loss and land access issues, rising production costs, plummeting farm incomes, climate change, and most recently, the pandemic are contributing to a mental health crisis within the farming community. The taxing nature of agricultural work makes it one of the most hazardous jobs, with risk of injury, disability, and death higher than most other professions. Daily decision-making in the context of long-term planning to ensure crop and livestock yields and profits can prove extremely difficult. Even the most proactive planning can be short circuited by factors beyond an individual's control, such as natural disasters. Suicide rates among farmers and ranchers are well above the national average, while mental health services are less available and accessible in rural areas.

Response

In the 2018 Farm Bill, the Farm and Ranch Stress Assistance Network was established to support farmers, ranchers, and other agricultural workers with stress management and offer a pathway for improving mental health awareness and access for farmers and their families. USDA NIFA awarded funds to four regional entities to help launch the network. The Northeast funds (\$4.8 million dollars) were granted to the National Young Farmers Coalition, with subcontracts to UMaine Cooperative Extension, Farm Aid, Vermont Farm First, Northeast Farmers of Color Land Trust, and Migrant Clinicians Network, to assist with advising the direction of the project and bring together network members. Extension produced a Farm Wellness brochure and website, and they offered wellness grants for farmers, small grants for organizations, and training for service providers (secondary trauma, de-escalation techniques). Partnerships with 10 collaborators helped to expand reach to Latinx, other non-English-speaking audiences, Black/African American, Indigenous/Native American, other people of color, disabled/veterans, and LGBTQ+.

Results

As a result of these actions and general education about mental health, service providers/Extension professionals are now a stronger source of referral. They offer opportunities to have conversations with farmers and then make referrals for mental health services. Well over 500 farmers benefited from the funding. There is more awareness of Extension and ag service providers as being part of mental health conversations with farmers.

Extension Shares PFAS Resources for Farmers

Relevance

Per- and polyfluoroalkyl substances (PFAS) contamination from historical applications of sewage sludge is an emerging crisis in agriculture worldwide, and Maine is at the forefront of this crisis. Crops may be grown on soil containing these PFAS, but how much of these chemicals is in the crop depends on the type of crop, what part of the crop is edible, soil properties, and PFAS levels in the soil. These chemicals may end up in the milk and meat of animals fed crops such as hay containing PFAS. These chemicals can also move from the soil into the groundwater and into well water. Consuming contaminated milk, meat, plants, or water are potential ways people can be exposed to these chemicals. In 2021, the ME Department of Environmental Protection launched a statewide investigation of the presence of PFAS in soil and groundwater at historically licensed sludge and septage land application sites. As of November 2023, 54 farms have been identified that have at least one soil or water sample that exceeds current screening levels. Farmers and gardeners need reliable and timely information to assess the risks that PFAS contamination may pose to them and their operations, and to access available resources and support.

Response

In response to the PFAS contamination crisis in Maine, UMaine Extension has led and collaborated on several initiatives to provide farmers and gardeners with critical information and support. We created a FAQ for Extension staff and developed fact sheets for farmers and gardeners, hosted on the new “Extension PFAS and the Maine Food System” website extension.umaine.edu/agriculture/guide-to-investigating-pfas-risk-on-your-farm/, and created a [Guide to Investigating PFAS Risk on Your Farm](#) as a comprehensive collection of resources about PFAS contamination in Maine. To facilitate statewide communication, Extension initiated and coordinates the Maine PFAS network. This coalition of Maine agencies, organizations, and individuals holds monthly update meetings and hosts a listserv to ensure that agricultural service providers are providing consistent, timely, and comprehensive information and support to impacted farmers and others in the agricultural community. Finally, Extension faculty are leading and collaborating on several research and Extension teams (within Maine as well as with Michigan and New Mexico) that have applied for funding to engage with impacted farmers and to research practical PFAS mitigation strategies for farmers.

Results

Farmers and gardeners in Maine now have access to timely information and direct support related to PFAS contamination. In 2023, Extension’s PFAS-related website content received 10,910 views. Using the dedicated Extension email address, 48 clients requested and received information and assistance. Most commonly, clients ask for guidance on how to assess PFAS contamination risks on their farm or in their garden, and how to access testing.

Marine Extension Team Supports Community Sustainability/Resilience, Fisheries and Aquaculture, and Ecosystem Health

Relevance

Climate change is requiring Maine communities to build the capacity to make informed decisions on the management of coastal and marine resources that promote ecological and economic sustainability.

Response

Maine’s Marine Extension Team (MET), a collaboration of UMaine Extension and Maine Sea Grant, continued to help communities gain the capacity to make informed decisions on ecologically and economically sustainable management of coastal and marine resources. MET members worked with communities to address problems and respond to opportunities in four major areas: ecosystem health; sustainable coastal communities; fisheries and aquaculture; and coastal community resilience.

Results

Our research and outreach collaboration benefits Maine broadly by marrying Extension's outreach and programming experience with Sea Grant's marine research and knowledge of coastal communities and issues. In 2023, our projects included:

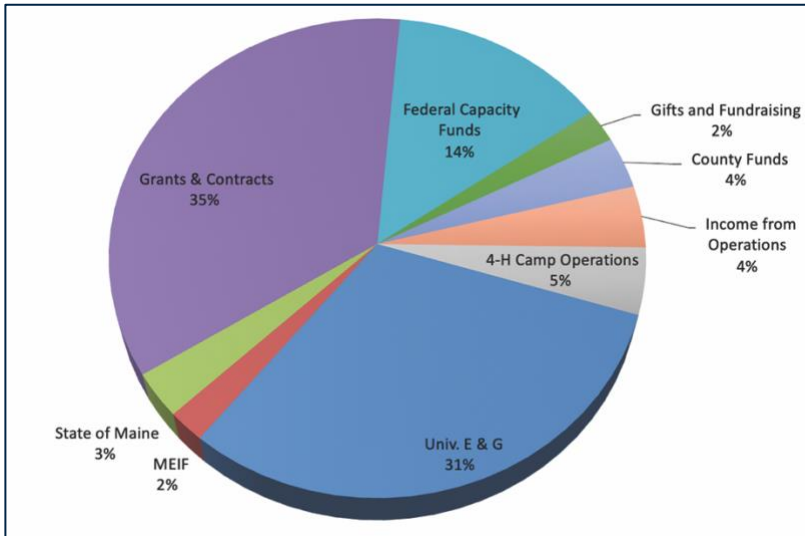
- *Maine Community Resilience Workbook*, an inventory of best practices, useful tools, available resources, technical experts, and all current climate adaptation activities across the state. It was compiled to allow municipalities and community groups to engage more effectively in climate change.
- *Building Your Virtual Facilitation Skills*, a training series in partnership with Extension educators in four states, last year training 65 professionals and community members in Maine.
- *Recirculating Aquaculture Salmon Network (RAS-N)* with Maryland Sea Grant, Wisconsin Sea Grant, and academic and industry partners to address barriers in land-based salmon aquaculture, and hosting online and in-person events on topics that industry partners identified as top priorities.
- Through the *Maine Aquaculture Hub*, investing \$471,000 in 14 projects designed to address industry-identified barriers to aquaculture development in the State of Maine, such as reducing costs of biotoxin testing of raw scallops, to providing educational experiences for undergraduates centered around traditional ecological knowledge in aquaculture.
- With the *Maine Oyster Trail*, continuing to support Maine's oyster farmers with the first digital and interactive oyster trail in the US; partnering with 85 Maine oyster farms and businesses to drive coordinated tourism to Maine's working waterfronts; and piloting an advanced Aquaculture in Shared Waters program, which engaged more than 80 seaweed and shellfish farms and businesses in new hands-on curriculum and professional development opportunities.
- Addressing the challenges to *sustainable growth of the threatened green sea urchin industry*, through a research collaboration with University of Rhode Island, the Maine Department of Marine Resources, and the Maine Urchin Zone Council.
- Through the *Southern Maine Volunteer Beach Profile Monitoring Program* developed and coordinated by the MET, successfully collaborating with Maine Geological Survey to launch a new data management portal. Data provided by the program is being used by Maine Geological Survey, National Weather Service, Army Corps of Engineers, and participating municipalities to guide beach management.
- Leading efforts in Maine to *recapture retired plastic equipment from the aquaculture and fishing industries*, including mechanisms to prototype useful items from recovered plastics, and contributing to network-building in the state to build capacity to reduce plastics pollution in the marine and terrestrial environments.
- Hosting the *National Aquaculture Extension Conference* in virtual format in 2021 and an in-person Portland event in 2022, providing education, networking, technology transfer, and mentoring opportunities for Extension professionals from across the nation. Our programming supports both Cooperative and Sea Grant Extension professionals, allowing Extension professionals to support Maine communities and industry more effectively.

FINANCIAL SUPPORT

Statewide Funding for University of Maine Cooperative Extension

As a unique partnership among federal, state and county governments, UMaine Extension uses funding from Maine counties and the University to match and leverage support from the United States Department of Agriculture, other federal grantors, state agencies and private foundations. Each county UMaine Extension office is also part of a statewide organization and the national Extension system.

Statewide Funding Levels by Source - 2023



| | | |
|------------------------|--------------|-------|
| Univ. E & G | \$ 7,070,124 | 31.2% |
| MEIF | \$ 485,020 | 2.1% |
| State of Maine | \$ 700,000 | 3.1% |
| Grants & Contracts | \$ 8,012,297 | 35.3% |
| Federal Capacity Funds | \$ 3,158,946 | 13.9% |
| Gifts and Fundraising | \$ 506,692 | 2.2% |
| County Funds | \$ 788,885 | 3.5% |
| Income from Operations | \$ 944,554 | 4.2% |
| 4-H Camp Operations | \$ 1,019,672 | 4.5% |
| | \$22,686,190 | |

| Waldo County | 2023 |
|---------------------------------------|--------------------|
| Local Salaries and Benefits | \$504,763 |
| Prorated Support from UMaine* | \$534,364 |
| Computer Equipment and Networking | \$4,799 |
| Statewide Animal Diagnostic Lab | \$19,727 |
| Marketing, Publications, Video | \$1342 |
| Local Programming Supplies & Expenses | \$298 |
| Postage | \$1,034 |
| Telephone | \$206 |
| Travel | \$13,582 |
| TOTAL | \$1,080,116 |

* Prorated support from UMaine reflects travel, postage, telephone, computer equipment & networking, salaries & benefits for administrative and state-wide staff.

University of Maine Cooperative Extension Support for Waldo County

Without statewide support, UMaine Extension would not be present in your county. Funds for projects are provided through the University of Maine, Federal Formula Funds, grants, contracts, and fees. Dollars from other sources support salaries and benefits for Extension specialists, county educators, Extension administration, computer equipment and networking, publications, postage, telephone, and travel.

Each year, **Waldo County** tax dollars support the UMaine extension with physical office space, support staff salaries, office supplies, equipment, and some programming expenses.

WALDO COUNTY HIGHLIGHTS -

Maine Food System

Food Preservation & Food Safety Programming

Waldo county staff offered programming, free pressure gauge testing, and research-based information to the public related to food preservation and food safety. In 2023 workshops were offered through adult education and the Maine State prison, 25 adults participated in workshops related to water bath canning, atmospheric steam canning, pressure canning, lacto-fermentation, drying, freezing & root cellaring.

Waldo County Bounty

Waldo County Bounty is a hunger relief organization working to improve access to locally-grown foods for people experiencing food insecurity in Waldo County. With initiatives such as purchasing local foods from farms and distributing it to pantries in Waldo County (known as “farm-to-pantry”), gleaning food waste and providing support to home gardeners who share their excess produce at Give and Take Tables. University of Maine Cooperative Extension staff serve on the board of directors and oversee the Give & Take Table program which provided sites where gardeners can drop home-grown produce 24/7 for people in need to pick up. 2023 was a busy year for the Give & Take program, three new sites were added including Freedom, Stockton Springs & Winterport and an additional three sites were moved to new *and improved* locations, (Thorndike, Liberty & Monroe). We worked with area builders and volunteers to build 8 share sheds for Montville, Liberty, Searsport, Thorndike, Freedom, Waldo, Stockton Springs & Monroe.

In total, 19 sites were supported with help from approximately 65 volunteers. We transitioned to new reporting system in 2023 year, which has given us a great deal more data to help shed light on how much produce moves through the Give and Take sites. There were 1600 donations tracked and an estimated 10,500 pounds of produce moved through the Give & Take sites this year, as well as about 1800 seedlings. Some of the most frequently recorded produce donations were tomatoes, peppers and squash but there is a huge variety of fresh produce moving through the sites including pears, eggplant, collards, rhubarb and garlic scapes and more. According to the USDA Food program, the 2023 per pound value of donated produce was .30/lb which means that this program provided at least \$3,150 worth of food to people in Waldo County as well as countless seedlings which provide people a means to build their own self-sufficiency.



(photo credit Mattie Bamman, Northport Give & Take site)

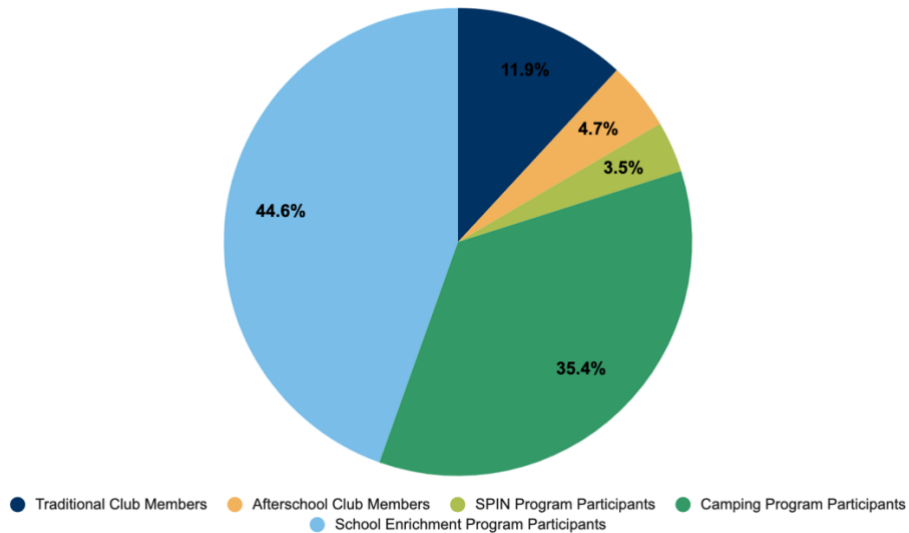
Positive Youth Development

4-H POSITIVE Youth Development

4-H is the positive youth development program of the University of Maine Cooperative Extension. In 4-H, youth partner with caring adults to explore areas of interest where youth acquire knowledge and skills that will build their confidence and give them the tools to be civic leaders. 4-H provides the flexibility for volunteers to plan activities and projects for youth throughout the county.

There are several ways youth ages 5-18 can participate in 4-H: in school, afterschool programs, traditional clubs, and camps. In 2023 the Maine 4-H program served over 10,000 youth through a variety of program offerings. Over 3000 youth participated in Maine 4-H camp programs, 1700 youth were members of 4-H clubs or afterschool programs, and nearly 5000 youth participated in Maine 4-H's school enrichment programs. In 2023, Maine 4-H had 611 enrolled volunteers who worked to provide learning opportunities to Maine youth.

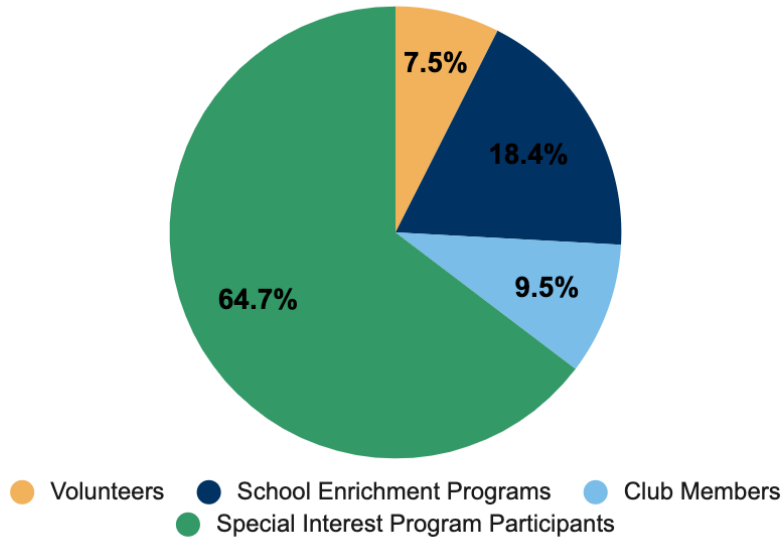
2023 Maine 4-H Members by Program Area



4-H In Waldo County

In the 2023 4-H year Waldo County 4-H served over 1500 youth with the help of many adult volunteers. Youth participated in school enrichment program, traditional 4-H clubs, special interest clubs, and camping programs. Tanglewood 4-H camp housed over 400 overnight campers and served nearly 1000 youth in their in-school programs. Over 200 youth participated in 4-H through programs offered through the Waldo County Cooperative Extension office.

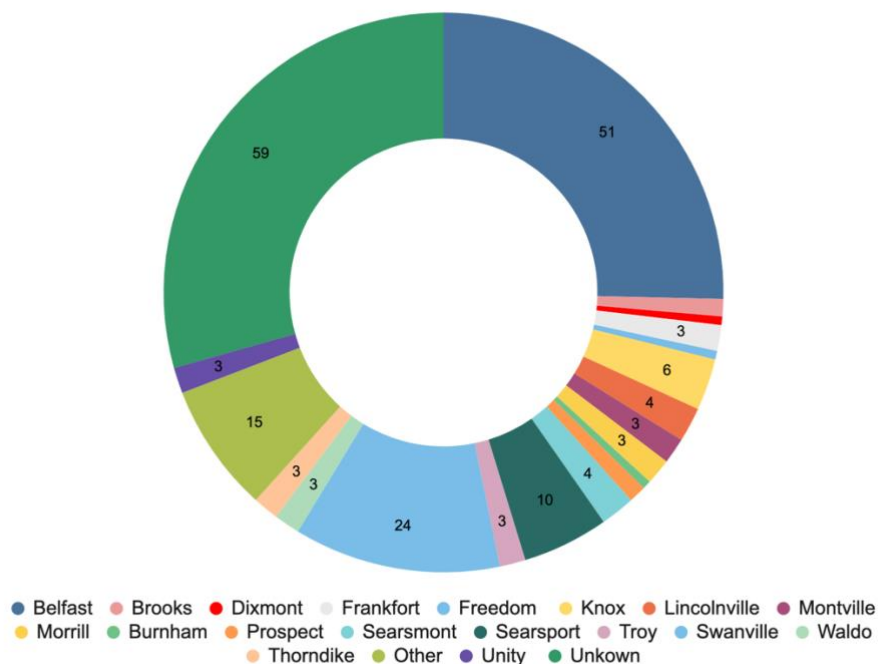
Avenue of Engagement of 2023 Waldo County 4-H Participants



Of the more than 200 youth served by Waldo County 4-H in 2023, 64.7% engaged with 4-H through a special interest program such as the 4-H Ocean Xplorers program or 4-H offerings at the United Farmers Market. 18.4% of Waldo County 4-H participants were served through a school enrichment offering such as the Community Food for Children Summer Meals program, and nearly 10% of Waldo County 4-H members were enrolled in a traditional 4-H Club. During the 2023 program year Waldo County 4-H saw an increased amount of youth interested in traditional club programming but lacked the volunteer base to create additional clubs. In the coming 4-H year 4-H staff intend to focus on volunteer recruiting to increase program capacity.

The 200 plus youth engaged in Waldo County 4-H in 2023, represented 18 out of the 25 Waldo County towns.

2023 Waldo County 4-H Participants by Town



4-H Ocean Xplorers

The 4-H Ocean Xplorers program was offered through a partnership with the UMaine MARINE Initiative, Waldo County 4-H, and the Belfast Free Library. Over 70 youth participated in the program and explored mid-coast Maine's coastline through a series of activities. Topics covered by the monthly program included aquaculture, marine mammals research, aquatic animal biology, ocean colors, and more! Presenters included numerous researchers from the University of Maine's MARINE Initiative, University Students, Maine 4-H staff, and staff from Maine's Bigelow Laboratory.

Through the Ocean Xplorers program youth were able to connect with Waldo County's coastline, discover new career paths, and learn about the research projects at the University of Maine.



Community Food for Children Summer Meals Enrichment

To bring 4-H programming to youth in with limited access to transportation, Waldo County 4-H partnered with Community Food for Children, a program that delivers meals to school-aged youth during summer break. When the meals were delivered 4-H staff were able to engage youth in a variety of STEM (Science Technology, Engineering and Technology) activities that sparked their interest. Staff provided the youth and their guardians an opportunity to practice experiential learning and provided the families with a connection to their local 4-H program. 4-H activities were conducted at four sites per day for three different days in July 2023.

As a result of the Waldo County 4-H Community Food for Children 4-H Enrichment Activities, 37 from Waldo County were able to participate in 4-H activities on topics such as physical health, tick education, and engineering. During the 4-H activities, the youth explored new STEM topics, engaged in building relationships with their peers, and made connections to their local 4-H staff.

4-H Livestock Projects

Every summer Maine 4-H members have the opportunity to show off their livestock projects at Maine agricultural fairs. Waldo County 4-H members participate in events such as horse shows, dairy shows, and market lamb auctions. Waldo County 4-H staff also support numerous animal science educational opportunities for 4-H youth statewide. In 2023 Waldo County saw an increase in interest in 4-H livestock projects and hopes to expand on offerings in that area in the coming year.

Many 4-H members, including those from Waldo County, strive to represent Maine 4-H at Eastern States Exposition (ESE). Each fall teams Maine 4-H members and volunteers travel to Eastern States Exposition

In Springfield, MA to compete in animal science related contests including livestock show, knowledge tests, public presentations, cooking challenges, and more. For these 4-H'ers, their experience at ESE is more than just another livestock show. ESE 4-H teams are a place to build lifelong connections with teammates, expand their knowledge, and become part of a Maine 4-H legacy. In speaking of their experience at ESE, 4-H member's remark that participation "helped me be more independent and confident." When asked about their experience, other 4-H'ers indicate that participating in a 4-H ESE team helped them learn how to work with a team, build connections with others, and develop many more life skills.



Each Maine 4-H team is supported by a committee of volunteers and staff who dedicate their time year-round to making these trips possible. From planning practice events to transporting kids and fundraising for the team, 4-H volunteers make dreams a reality. As transportation costs begin to rise and children's access to livestock declines, the Maine 4-H program is in a unique position to continue providing life changing experiences to Maine youth. Through the support of the Maine 4-H Foundation, caring community members, and local businesses Maine 4-H was able to send 5 teams totaling more than 50 youth, 45 animals, and 30 volunteers to ESE last fall.

With the value of a volunteer hour coming in above \$30/hour, the value of the 4-H volunteers in the Maine 4-H livestock program well exceeds \$25,000.

National 4-H Trips

In 2023 Maine 4-H hosted four national trips for 4-H youth. These trips included Citizenship Washington Focus, National 4-H Congress, National 4-H Conference, and the Ignite Summits. Maine 4-H sent more than 20 youth on out of state trips to learn citizenship skills, connect with peers, and discover new career pathways. The largest of the four trips, the 4-H Ignite Summit included 18 youth, two of which were chosen to host workshops at the event. These opportunities to travel the country, learn new skills, and share passions with others are what make the 4-H program unique. For many members these trips mark the pinnacle of their 4-H career. 4-H staff in Waldo County partner with other county staff to make these trips possible.



Sustainable Economic and Community Development

Maine Families

The University of Maine Cooperative Extension Parent Educators are part of a, no-cost to families, statewide network known as Maine Families Home Visiting Programs that serves all prenatal families and families of newborns. Sing an evidenced based model at each "visit", developmental, health, safety, and nutrition information is shared with anticipatory guidance and an activity to promote growth. Parents are encouraged to continue learning beyond the visit by certified Parent Educators.

Maine Families believes that parents are their children's first and most important teachers. Parent/child interaction and experiences in the early years determine how the baby's brain develops and sets the stage for the child's future. Family Visiting professionals provide individualized parent education and support throughout Waldo County to expectant parents and parents of babies and toddlers to support safe home environments, promote healthy growth and development, and provide key connections for families to available services in their communities.



Enrolled families receive a program that is tailored to meet their needs. Visits can happen in-person at a mutually agreed upon location or virtually, continuing to receive services, and we are able to enroll eligible families. Family visitors are connecting with parents and caregivers virtually through Zoom, through phone visits and in-person visits. Through these virtual visits, family visitors can still do developmental screenings, provide information on children's developmental milestones and early learning, provide linkages to community resources, provide referrals for maternal depression and intimate partner violence, and reduce social isolation for parents. If an in-person visit is not possible then visitors will drop off materials for an activity and educational materials.



Visitors support early identification of developmental delays by offering developmental screenings to families during home visits and providing additional activities in areas where a child may need extra support for growth. If needed subsequent referrals are offered as appropriate early intervention services are essential to reduce the long-term impacts and school readiness. With federal funding from, the Maternal, Infant, and Early Childhood Home Visiting Program (MIECHV), parent educators conduct developmental screenings starting at 2 months of age using the evidenced based Ages and Stages Questionnaire (ASQ). Offering a screening is a way to help parents learn what to expect as their child grows, celebrate their child's milestones, and identify any concerns or delays during this critical time of development. When results of these screenings indicate a possible delay our parent educators' partner with families to make the appropriate referrals for additional evaluation and services long before a child enters Kindergarten. Home Visiting services conclude at the age of 3. During the final visits a transition plan is discussed, and families are connected to additional resources in the community to support further learning.

A group connection is a facilitated opportunity for families to build social connections, increase knowledge of parenting/family topics, interact with their child and learn about community resources. The group connections focus on parent-child interaction, development-centered parenting, and family well-being. Group connections encourage families to share common experiences, gain new insights, and to foster peer relationships in such a way that they build a health community. In 2022 Maine Families in Waldo County offered a combination on in-person and virtual group connections for enrolled families and residents in Maine. Each group includes free play, a healthy snack when in-person, information related to nutrition, an opportunity to develop literacy skills, social development, motor skill development, brain development and the value of learning through play. In addition, group connection materials were dropped off or mailed to every family.



Every 5 years The University of Maine Cooperative Extension Maine Families Waldo County goes through the Parents as Teachers Quality Endorsement and Improvement Process (QEIP).

In 2022, they earned endorsement as a Parents as Teachers Blue Ribbon Affiliate. To achieve this endorsement an affiliate must meet all the Parents as Teachers Essential Requirements. Blue Ribbon Affiliates are nationally recognized as high-achieving, exemplary affiliates, delivering high-quality services to children and families.

In the 2023 program year in Waldo County:

- 52 families were served
- 54 children were served
- 620 home visits
- 19 group connections
- 100% of families received a family assessment
- 100% of families completed at least 1 goal
- 100% of enrolled children received a complete health screen
- 100% of children received a complete developmental screening
- 89% of families that enrolled were connected to resources in the community
- 67% of prenatally enrolled families received lactation support for at least 3 months

www.extension.umaine.edu/parenting/maine-families-waldo/

Agriculture and Natural Resources

Welcome Brett Johnson

Meet our new Sustainable Agriculture and Farm Business Management Educator, Brett Johnson. Brett joined UMaine Extension in July of 2022 and comes to this region after serving the people of Somerset County as their Sustainable Agriculture and Horticulture Professional. In this new role, Brett provides technical assistance to commercial agricultural producers in Waldo, Knox, and Lincoln Counties, and develops educational programs in a wide range of topics including integrated pest management (IPM), marketing of farm products, and farm business planning.

Brett was born and raised in Stillwater, Oklahoma, and is a two-time graduate of Oklahoma State University, holding a Bachelor of Science in Agricultural Sciences and Natural Resources, and a Master of Science in Entomology and Plant Pathology. Brett looks forward to working with producers to address challenges in production and identify new market opportunities with the goal of improving the sustainability of farm businesses in the Midcoast region.

2023 / 2024 Sustainable Agriculture Programming Highlights

Introducing Integrated Pest Management (IPM) Practices to Maine Christmas Tree Producers

Brett Johnson has initiated research and education efforts working to improve the economic and environmental sustainability of Christmas tree production in Maine through adoption of IPM practices. Integrated Pest Management (IPM) is a knowledge-based approach to pest management that employs cultural, biological, and chemical practices to maintain pest populations below a damaging level. In 2023 and 2024, Johnson has delivered presentations covering various topics including the fundamentals of IPM in Christmas tree production, management of balsam gall midge, weed management in Christmas tree production, and offered backpack sprayer calibration demonstrations. These programs help to ensure the safe and efficient use of crop protectants on farms, as well as inform producers of the numerous preventative management options available to help maintain pest and disease agents below crop damaging levels.

Current on-farm research involves the investigation of the needle-gall producing midge, balsam gall midge (BGM) in Balsam fir plantations. Current objectives of the study include documenting time of spring emergence and egg laying on Balsam fir in Maine, effectiveness of contact and systemic insecticides on management of BGM, relative occurrence of biological control agents and their effectiveness in regulating populations of BGM below economically damaging levels. Research and educational efforts are focused on providing Christmas tree producers with the information necessary to develop IPM plans for their farms. Intended program outcomes include increased income for Christmas tree producers, increased quality of Maine grown Christmas trees, and decreased reliance on pesticides.

Growing and Marketing Specialty Potato Varieties

In 2024, Brett Johnson is conducting specialty potato variety trials at the Rogers Farm Forage and Crop Research Facility in Stillwater. This year we are trialing 15 varieties, which represent 8 unique skin and flesh color combinations identified as important to potato producers in Maine. In early 2024 a series of program events were held across Maine covering best practices in growing specialty potato varieties followed by a roundtable discussion of visual and culinary traits of importance to potato producers in Maine. Prior research points to skin color and quality as important factors in purchasing decisions among potato consumers in Maine. During the fall and winter potato consumers across Mid-Coast Maine will have the opportunity to participate in preference surveys that will help to rank potato varieties by visual appearance. Research and educational efforts are focused on providing agronomic performance and consumer preference data to specialty potato producers to decrease the risk of adopting new potato varieties. Intended program outcomes include adoption of new specialty potato varieties, increased knowledge of consumer preferences in specialty potato products among producers, and increased income for Maine's specialty potato producers.

Business Planning for Producers

In 2023, Brett Johnson served as a member of the facilitation team for Business Planning for Producers. This 10-session web-based course was offered to new and beginning farmers and those considering starting a land or sea-based natural resource business in Maine within the next year. Weekly sessions included presentations and guest speakers covering a broad range of business management topics such as financing, marketing, enterprise budgeting, estate planning, financial planning and record keeping, and much more.

The 2023 cohort included 3 participants from Waldo County who completed the course and qualified for USDA Farm Service Agency Borrowers Training Credit. Johnson is the lead coordinator for the course in 2024. He is focused on increasing the level of participation in the course within the county through the one-on-one business consultation he conducts with new producers. Commercial producers or those interested in starting a farm business in Maine can contact Johnson by phone or email at 207.342.5971 or brett.w.johnson@maine.edu.

The County Extension Act

The County Extension Act explains the role of county government in funding local Extension offices.

Cooperative Extension work shall consist of the giving of practical demonstrations in agriculture and natural resources, youth development, and home economics and community life and imparting information on those subjects through field demonstrations, publications and otherwise. For the purpose of carrying out this chapter, there may be created in each county or combination of two counties within the State an organization known as a "county extension association," and its services available to all residents of a county. The county extension is viewed as a unique and important educational program of county government. The executive committee of each county extension association shall prepare an annual budget as requested, showing in detail its estimate of the amount of money to be expended under this chapter within the county of counties for the fiscal year. The executive committee shall submit to the board of county commissioners on a date requested by the county commissioners, and the county commissioners may, if they deem it justifiable, adopt an appropriate budget for the county extension program and levy a tax therefore. The amount thus raised by direct taxation within any county or combination of counties for the purposes of this chapter shall be used for the salaries of clerks, provision of office space, supplies, equipment, postage, telephone, a contribution toward the salaries of county educators and such other expenses as necessary to maintain an effective county extension program.¹

¹Excerpted from Title 7, Chapter 7 of the Maine Revised Statutes, §191–§195.

For more information contact:

University of Maine Cooperative Extension Waldo County
992 Waterville Rd.
Waldo, ME 04915

Phone: 207.342.5971 or 800.287.1426 (in Maine)
Email: extension.waldo@maine.edu



extension.umaine.edu