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## Fiscal Year 2024 Description of Funded Projects

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**Number of Grants Awarded:** 11  
**Amount of Funds Awarded:** \$5,133,246.87

For more information, please visit the grant program's website: <https://www.ams.usda.gov/acer>

**NOTE:** The below project descriptions were provided by the grant recipients.

### Illinois

**Recipient:** Northwestern University  
**Project Type:** Producer and Landowner Education  
**Award Amount:** \$226,014.13

#### *Sap to Survivors: Identifying Microbiological Hazards and Optimal Shelf Life of Potable Maple Water for Cancer Survivor Consumers*

This producer/landowner education-focused project will leverage multiple, long-standing university/community-based partnerships to: 1) increase understanding of microbiological hazards for safe consumption of potable maple water; 2) increase understanding of optimal hydration assessment methods following maple water consumption with cancer survivor sample; and 3) advance producer knowledge of cancer survivor perceptions of hydration satisfaction of consuming maple water during and following light intensity physical activity. This proposed project involves a multidisciplinary scientific team of maple/forestry research experts from Michigan State University (MSU), microbiology and immunology researchers at Montana State University (MoSU), cancer survivorship outcomes researchers from Northwestern University (NU), and young adult cancer support non-profit partners from True North Treks (TNT). In partnership with MSU, MoSU, and TNT, Year 1 activities will focus on maple water collection, pasteurization, bagging, and microbiological hazard analysis to determine optimal shelf stable consumption period. In partnership with MSU, TNT, and NU, Year 1-3 activities will focus on evaluating multiple hydration assessment methods with cancer survivors following consumption of maple water in context of light physical activity. Finally, in partnership with TNT and NU, Year 1-3 activities will focus on gathering information on cancer survivor perceptions of hydration satisfaction following consumption of maple water. This multi-level, stakeholder-centered initiative holds great promise to advance our understanding and knowledge of microbiological hazards present in maple water for safe consumption, optimal hydration assessment methods for maple water research with cancer survivors, and perceptions of hydration satisfaction following consumption of maple water among cancer survivors.

## Maine

**Recipient:** University of ME System /University of Southern Me

**Project Type:** Producer and Landowner Education

**Award Amount:** \$481,691.00

*Resilient Maple Sugarbushes and Businesses: Climate Adaptation and Mitigation Training for Sugarbush Managers and Consultants.*

This 3-year project will develop resources to educate maple sugarbush managers, consulting foresters, and other professionals on climate adaptation and mitigation practices to enhance the resilience of the maple industry. Project goals include development of a micro-credentialed course, two conferences, and six field tours. An advisory committee of extension specialists, producers, researchers, and foresters will provide guidance. M.S. students at University of Maine and University of Vermont will conduct a survey about climate change effects observed by maple producers, as well as establish permanent sugarbush monitoring plots to assess climate adaptation and mitigation strategies. As a result of this project, producers will learn about climate adaptation practices, develop climate resilience action plans, implement adaptation practices, and develop a forest management plan. Summaries of this work will be presented at four conferences. Survey and monitoring plot results will lead to peer-reviewed publications.

## Montana

**Recipient:** Montana State University

**Project Type:** Producer and Landowner Education

**Award Amount:** \$498,945.00

*Early prediction of maple syrup quality using carbon dynamics spectroscopy*

The goal of this Producer and Landowner Education project is to develop protocols for mapping maple sap quantity and quality from leaf spectra collected during the growing season. The amount and chemical composition of sap available for harvest in the spring varies among trees depending on environmental conditions and physiology. This project plans to predict sap production potential by following the carbon dynamics of 50 maple trees growing at Michigan State University's (MSU) Forestry Innovation Center (FIC). The chemical composition of leaves and phloem sap collected throughout the growing season will be combined with environmental data, including soil properties, temperature, and precipitation to determine the factors contributing most to sap quantity and quality in the spring. In addition, leaf spectroscopy will be used to predict leaf chemistry from spectra allowing frequent and non-destructive sampling of the same trees. Further this project will train machine learning methods for predicting sap quantity and quality from foliar spectra directly. Once calibrated the predictive models will be applied to spectral images collected by an unpiloted aerial system (UAS) to map production potential across the entire sugar bush. The project team will host workshops with landowners and producers and co-create avenues for implementing the results from this study, which could benefit sustainable harvesting practices across Eastern North America. The team consists of experts in plant physiology, forestry, spectroscopy, remote sensing, microbiology, and engineering from Montana State University (MTSU), Minnesota State University Mankato (MNSU, sub-awardee), and MSU (sub-awardee).

## New Jersey

**Recipient:** Stockton University

**Project Type:** Market Development and Promotion

**Award Amount:** \$499,947.00

*Made in Vermont; Sold in New Jersey: Marketing Vermont Maple Syrup to the New Jersey Consumer.*

Recognizing that low consumption of maple products among New Jersey's 9.3 million consumers is largely owing to lack of maple industry knowledge, this project will increase NJ demand for maple products by improving consumer knowledge and understanding of the maple industry. Currently, NJ ranks third in the nation for per-farm income from agritourism; at the same time, the ability of agritourism to drive consumption of local, naturally derived foods is well documented. Therefore, this project entails educating NJ consumers about the maple industry and cross-marketing Vermont maple products during tours of NJ land devoted to maple-sugaring and farming. The project also entails exploiting growing NJ consumer demand for locally produced foods by developing and marketing maple syrup and value-added maple products blending Stockton University and Vermont maple syrups. Other consumer promotion activities under this project include promoting NJ retail sales of Vermont maple-sap products, developing marketing materials to promote direct-to-consumer sales of Vermont maple syrup, launching an annual Maple Syrup Festival in the spirit of other popular agricultural festivals in the State, and addressing consumer concerns through research on the ecological impact of sap harvesting on tree health. This project intends to benefit the domestic maple industry at large as newly developed preferences for maple products are expected to accompany NJ consumers into markets and grocery stores; it also intends to benefit Vermont maple syrup producers through direct collaboration as well as NJ consumers who are increasingly demanding less-processed sweeteners and naturally derived food products.

## New York

**Recipient:** Cornell University

**Project Type:** Producer and Landowner Education

**Award Amount:** \$426,657.00

*Providing Food Quality and Safety Resources for the Maple Industry*

Maple syrup and traditional maple confections are exempt from many regulations, which is a benefit intended to promote maple syrup production. However, the lack of a strict regulatory structure leaves the industry vulnerable to quality loss and safety concerns caused by non-rigorous approaches to food safety in the sugarhouse. Ultimately this will harm the industry through reputational damage among consumers. This project addresses the problem by establishing an industry benchmark for quality and safety through two primary objectives. This project will evaluate five FDA approved disinfectants to reduce bacteria and biofilm development on sugarhouse equipment. These procedures will be applicable for all food contact and non-food contact surfaces in the sugarhouse. Second, we will create an online course on Good Manufacturing Practices (GMP) for Quality, Safety, and Sanitation of Maple Sugarhouses, which will be accessible to maple producers nationwide. With these resources, producers

will improve safety in maple sugarhouses and uphold the high-quality standard needed for continued growth in sales.

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**Recipient:** Paul Smith’s College of Arts and Sciences

**Project Type:** Producer and Landowner Education

**Award Amount:** \$499,993.00

*Developing and Disseminating a Handbook of Sugarbush Silviculture*

Well-developed silvicultural prescriptions increase sugarbush productivity and profitability, generating significant value for maple producers, the rural communities they are a part of, and society at large. Sugarbush silviculture also has a critical role to play in ensuring the long-term sustainability of the nation’s maple resource and of the industry it underpins. However, there is currently no consolidated source of technical silvicultural guidance targeted to an audience of professional sugarbush managers. This project brings together an exceptional team of leading young silviculturists and maple researchers, supported by an Advisory Board of experienced academics and industry experts, to fill that need. Through a series of linked activities, this project will strengthen the scientific underpinnings of sugarbush management in the United States and drive the continued professionalization of the maple industry. Specifically, the project will: (1) synthesize existing scientific literature on sugarbush silviculture and consolidate informal producer and manager knowledge; (2) design and execute original model-based analytical research to address identified knowledge gaps; (3) produce an accessible, authoritative Handbook of Sugarbush Silviculture; and (4) plan and deliver an extensive outreach and training campaign for maple producers, sugarbush managers, and professional foresters so that the benefits of this project are equitably and impactfully distributed across the maple industry. By strengthening the connections between maple producers and professional foresters and repositioning silviculture as an essential component of modern sugarbush management, this project will deliver substantial and lasting value to maple producers of all sizes and across the entire geography of the industry

## Oregon

**Recipient:** Oregon State University

**Project Type:** Producer and Landowner Education

**Award Amount:** \$500,000.00

*Increasing Regional Maple Syrup Production in Oregon through Landowner, Community, and Tribal Partnerships, Improved Program Capacity, and Expanded Geographic Reach*

Commercial maple sugaring to produce syrup and other sap-based products is rapidly gaining traction as an industry in Oregon and the broader Pacific Northwest. The sector is in a pivotal period, with the demand for locally sourced maple syrup outpacing the current supply from existing production. The Maple Sugaring Program at Oregon State University (OSU) is helping new producers get established, but it needs to improve program capacity to assist existing and future producers with making informed decisions on how to scale up production to more advanced procurement and processing systems. Demand is growing for OSU's assistance from areas across the state where the program has yet to establish a presence, but where stakeholders seek support through in-person workshops and equipment demonstrations. Furthermore, OSU aims to extend its outreach to underserved populations in both

established and emerging regions, including tribal natural resource programs and Hispanic communities and organizations. In collaboration with a newly established statewide maple syrup producer's association, OSU endeavors to empower producers to take a leading role in shaping their industry's trajectory. By actively engaging with organizations such as the North American Maple Syrup Council, the International Maple Syrup Institute, and the Oregon Farm Bureau, OSU can help producers access resources and networks essential for their success.

## Rhode Island

**Recipient:** University of Rhode Island

**Project Type:** Producer and Landowner Education

**Award Amount:** \$499,999.74

### *Developing Maple Value-Added Products (MVPs) from Industry By-Products for Increased Producer Profitability*

The United States maple syrup industry could significantly increase profitability and economic return by upcycling and valorization of maple by-products that are not palatable or suitable for table consumption. These by-products commonly include late-season, off-flavored, lower-valued syrup, declassified, fermented or spoiled syrup, and sugar sand/nitre, a concentrated sugar mineral sediment that builds up on the floors of evaporator pans. University of Rhode Island (URI) researchers have published extensive studies on the chemical composition and health benefits of maple products and these findings have been disseminated on an existing publicly accessible mobile-friendly URI web portal designed to communicate maple benefits ([www.uri.edu/maple](http://www.uri.edu/maple)). Leveraging these strengths, in this Producer and Landowner Education project, URI will identify and collect a variety of by-product samples from maple syrup producers in the northeast region, generate research-sized batches to conduct chemical compositional and biological studies, and validate and conduct feasibility studies to generate maple value-added products (MVPs) for commercial nutraceutical and cosmeceutical applications. The dissemination of results will include using a variety of platforms including the URI maple website, print and social media, and peer-reviewed publications, to stimulate future research on MVPs centered on the valorization of maple by-products. Intended beneficiaries are United States maple syrup producers and landowners who will benefit from new market opportunities created by innovative applications of MVPs thereby diversifying the maple product portfolio and stimulating sustainable growth in the industry.

## Utah

**Recipient:** Utah State University

**Project Type:** Producer and Landowner Education

**Award Amount:** \$500,000.00

### *Sustaining maple syrup industry under a changing climate through expanding research and Extension (Phase II)*

Maple syrup is one of important agricultural commodities in Canada and the northeastern United States. Since 2021, with support from the Acer Access and Development Program, maple sugaring activities

have been expanded to the Intermountain West and Great Plains regions. Many maple syrup products have been developed in these regions. However, there is limited knowledge about the nutritional content and unique chemical composition of maple products developed from different maple species. Knowing the trace elements in maple sap and syrup is critical for developing safe products for consumption. Additionally, there is an urgent need to understand customer preferences for marketing these maple products. To this end, the purpose of this project is to collaborate with food scientists to develop maple syrup and maple syrup-based products, discover the chemical composition of maple syrup and maple syrup-based products, and conduct consumer sensory evaluations of products created from various maple species; and expand maple sugaring activities through a multi-faceted approach to educate existing maple syrup producers and landowners who wish to utilize their woodlots for maple syrup production and increase the public awareness of maple syrup products and their nutritional facts and healthy benefits. These findings will be disseminated to maple producers and the public through a wide range of outreach materials and publications. This project is essential for the marketing and commercialization of maple syrup products developed from various maple species, as well as for sustaining the maple syrup industry under a changing climate

## Vermont

**Recipient:** Smokey House Center

**Project Type:** Producer and Landowner Education

**Award Amount:** \$500,000.00

### *Climate Adaptive Maple Program at Smokey House Center*

There is an increasing need for syrup producers to actively manage their sugarbushes to withstand the impacts of climate change, including drought and pest outbreaks. However, many producers are resistant to implementing adaptive management strategies due to concerns about short-term reductions in syrup production and logistical complications. This project proposes the creation of a Climate Adaptive Maple Research and Education Program at the Smokey House Center in Danby, VT that will help to address these issues. It aims to investigate two key questions: how do different climate-adaptive forest management strategies impact long-term production and resilience in sugarbushes and how do different sap extraction strategies affect the long-term ability of sugarbushes to respond to climate disturbances while maintaining production? To conduct this research, two sugarbushes of roughly four thousand taps will be established across Smokey House Center's property. Three distinct silvicultural treatments, representing different approaches to sugarbush forest management, will be conducted with three replications in each sugarbush. Additionally, four different sap extraction techniques (high, medium, low and no extraction) will be set up in each sugarbush. Monitoring sites will track annual fluctuations in starch levels of individual trees, sap production, annual tree growth, long-term stand health, amongst other measurements. This project will result in specific recommendations for forest management methods and sap extraction practices that allow for more productive and resilient sugarbush management in the face of climate change. Project leaders, in collaboration with partners, will host field-based workshops and learning opportunities, as well as carry out an online education campaign, that promotes the adoption of adaptive management strategies amongst regional producers, enhancing sugarbush health and production into the future. Additionally, the program will support an annual field internship for interested youth that trains the next generation of maple

professionals in these innovative adaptive strategies. The Climate Adaptive Maple Research and Education Program at Smokey House Center will continue to act as a valuable regional resource for applied research and education that assists the evolution of the maple industry long into the future. IG.

## West Virginia

**Recipient:** Future Generations University Corporation

**Project Type:** Producer and Landowner Education

**Award Amount:** \$500,000.00

### *Sweet Economic Futures: Inspiring and Supporting the Next Generation of Maple Syrup Producers and Service Providers*

This project will utilize existing resources to design, test, and implement an integrated maple sap and syrup training program for PreK-12 students and educators. It will create the resources needed to support the growth of the next generation of syrup producers and forestry service professionals. Initial activities will be implemented and tested across West Virginia, Maryland, Kentucky, and Virginia. A standardized maple curriculum for PreK-12 students will be created. The project team will then work with educators across Appalachia to test and refine the curriculum. In parallel, a syrup in school resource guidebook for existing maple producers and landowners to engage their local schools and communities will also be created. Finalized curricula and educational resources will then be disseminated across syrup producing states. Sweet Economic Futures will directly address the fact that the U.S. maple industry currently lacks a comprehensive curriculum for PreK-12 aged students. Many localized efforts to engage kids with maple have been started. These have been developed outside of state or national learning standards. Sweet Economic Futures will therefore build upon these existing efforts and resources. It will do so by utilizing existing best practices, while also adding increased academic rigor and technical assistance to educators and maple producers. This project will bring together State Departments of Agriculture, Education, and Forestry into direct collaboration with local schools and non-profit organizations to advance the next generation of syrup producers across the United States.