

Report Status: Approved as of 06/30/2022

Contributing Organizations

Colorado State University

Executive Summary

Overview

The mission of CSU Extension is to empower Coloradans to address important and emerging community issues using science-based, dynamic educational resources. To this end, we completed 69,390 consultations with 135,492 individuals and made 112,626 contacts through presentations this year. We also engaged Coloradans through publications, media, and a variety of other delivery methods. Our website received over 4 million pageviews (2 million unique pageviews), including 1 million hits to our fact sheets.

Our projects and programs addressed a wide variety of critical issues. Our community development work included improving livestock welfare during emergencies, making livestock markets more resilient during emergencies, ensuring beautification and ecosystem services from tree plantings after a natural disaster, enhancing community ability to respond to wildfire, and helping historically marginalized populations gain access to resources. Work on cropping systems included helping agricultural operations become more profitable. In the realm of environmental horticulture, our sustainable landscape management efforts resulted in healthier plant and animal populations, including pollinators, through reduced consumption of water, fertilizer, and pesticides. In food systems, providing business development skills to new and beginning agricultural producers helped establish profitable agricultural businesses. To further individual, family, and community well-being, we increased use of healthy financial management practices and increased the intake of healthy foods amongst older adults in need. Related to livestock and range, we increased knowledge of and confidence in drought and irrigation management decisions, thereby contributing to resiliency of agricultural producers. In the area of natural resources, we facilitated removal and control of noxious weeds, which leads to healthier ecosystems and associated services like nutrient cycling and support for native plant and animal biodiversity. For nutrition, food safety, and health, we reduced risk related to obesity and chronic disease, increased knowledge of food safety best practices, supported cottage food businesses, helped low-income individuals learn to grow their own fresh food, and provided both donated food and education to community members. Our youth development work included shooting sports and livestock-raising that developed youth life and leadership skills.

The coming transition to faculty status by Extension staff in Colorado will enhance our merit and scientific peer-review process. Stakeholder input we received through an extensive, statewide community needs assessment and series of listening sessions have informed the creation of local program plans and a strategic plan for the Office of Engagement and Extension that are responsive to the priorities of diverse community members. Going forward, stakeholder input from these efforts will continue to shape the projects/programs we develop and the ways in which we partner with communities.

Critical Issue: 4-H Youth Development

Our goal is to contribute to positive youth development by providing opportunities, relationships, projects, and curricula designed according to the best practices of youth development. To this end, we undertook a variety of activities with youth, including organized clubs, school enrichment, school-aged childcare, after school programs, and camping. Extension completed 28,890 consultations with 43,371 individuals and made 46,676 contacts through presentations on this critical issue. We had a total of 10,183 volunteers who contributed an average of 128 hours each over the course of the year, for a total estimated value of \$37 million. Together with our volunteers we worked on specific programs such as youth life and leadership skills, STEM and academic enrichment, and youth diversity/equity/inclusion.

In particular for this fiscal year, we had a number of projects such as shooting sports and livestock raising that developed youth life and leadership skills. These projects may lead to more successful participation in school and career and have been shown to prevent youth substance use.

Critical Issue: Community Development

The goal of our community development work is to develop and conduct educational programs and research that contribute to healthy and vital communities. To this end, Extension completed 1,699 consultations with 3,640 individuals and made 3,171 contacts through presentations on this critical issue. We worked on specific programs such as emergency management, diversity/equity/inclusion, community health, and rural community connectedness.

In particular for this fiscal year, our emergency management efforts improved animal (livestock) welfare during emergencies, made livestock markets more resilient during emergencies, ensured beautification and ecosystem services from tree plantings after a natural disaster (derecho), and enhanced community ability to respond to wildfire, which can save lives. Our work on diversity/equity/inclusion, including a Spanish Aging Mastery project, helped individuals in communities reduce their own personal biases and helped historically marginalized populations gain access to resources.

Critical Issue: Cropping Systems

The goal of work on cropping systems is to enable farmers to adopt and implement improved production practices that strengthen the economic, social, and environmental condition of farms and local communities. To this end, Extension completed 619 consultations with 1,057 individuals and made 964 contacts through presentations on this critical issue. Extension and AES worked on specific programs such as agricultural business management, cultivar selection for drought and cold tolerance, alternative cropping systems, pest management, soil health, and protecting water quality.

In particular for this fiscal year, our agricultural business sustainability efforts helped agricultural operations become more profitable. This has the effect of allowing farms to continue growing food and fiber and can stimulate rural economies. One example of this involves research and outreach in selecting cold-hardy cultivars in vineyards. Extension and AES efforts have resulted in a 10-fold increase in acreage planted to these varieties. In 2021, 70% of the grape crop in Western Colorado was from acreage planted to these cultivars due to cold damage on other cultivars.

Critical Issue: Energy

Colorado, with nearly 300 days of sunshine a year, is ideal for adoption of agrivoltaic systems. Agrivoltaics combines solar photovoltaic (PV)-based renewable energy generation with agricultural production. The technology shows promise to mitigate climate change impacts on crop and livestock productivity, generate significant clean, renewable energy, increase agricultural water efficiency, diversify and enhance income sources for farmers, and increase the productivity of agricultural land-use. In addition to rural settings, rooftop agrivoltaics can provide fresh food to dense urban communities. These benefits are important for agricultural production in dryland and irrigated systems of the USA, particularly with the challenges imposed by a changing climate. Thus, agrivoltaics is uniquely situated to provide synergies across our nation's food, water, and energy nexus.

We are building research and demonstration programs in agrivoltaics at several locations around the state. At a site in northern Colorado, a partnership between the Specialty Crops Program and a local solar panel provider is studying the use of varying transparency panels on production, soil protection, and water use in cool season vegetables. The panels in the study produce 11.5 kilowatts, enough energy to power two households while benefiting production by modifying the light environment and protecting the crop from extreme heat and weather events like hail.

Critical Issue: Environmental Horticulture

Our goal in environmental horticulture is that professional and lay practitioners will use reasonable inputs of labor, water, fertilizers and pesticides to produce attractive, functional, cost-effective and sustainable ornamental landscapes. To this end, Extension completed 16,668 consultations with 25,772 individuals and made 26,665 contacts through presentations on this critical issue. We worked on specific programs such as sustainable landscape management, urban stormwater, pollinator conservation, and urban agriculture.

In particular for this fiscal year, our sustainable landscape management efforts resulted in healthier plant and animal populations through reduced consumption of water, fertilizer, and pesticides. Similarly, landscape practices that enhanced pollinator habitat preserve vital ecosystem services. We also increased civic engagement by working with a new corps of volunteers for pollinator monitoring. We also worked with partners addressing Individual, Family, and Community Well-Being to address food insecurity in communities and focused on improving aesthetics and developing communities through urban greening efforts.

Critical Issue: Food Systems

Food systems work provides technical assistance for agricultural and food producers and their communities, which improves existing or creates new marketing channels, production practices, and alternative business approaches. To this end, Extension completed 443 consultations with 1,027 individuals and made 2,619 contacts through presentations on this critical issue to

diverse audiences. We worked on specific programs related to strengthening the meat value chain, on-farm produce safety technical assistance, public outreach on the importance of food system investment and development, and business management for new and beginning farmers. Extension staff provided knowledge and technical assistance through written, online and in-person formats, including information booths at farmers markets, workshops, regional convenings, community gardens, and Experiment Station Research Centers.

In particular for this fiscal year, Extension staff focused on providing business development skills to an array of agricultural producers and began building the community infrastructure necessary to support these businesses in the long term.

Critical Issue: Individual, Family, and Community Well-being

By supporting individual and family well-being through financial and relational wellness, we are also strengthening communities. To this end, Extension completed 137 consultations with 276 individuals and made 4,254 contacts through presentations on this critical issue. We worked on specific programs such as family financial stability and healthy aging.

In particular, by increasing use of healthy financial management practices, we helped to keep families financial stable. Financially stable families contribute to the overall health of an economy, may be less reliant on public subsidies, and may reduce health care burdens through reduced stress. By increasing the intake of healthy foods amongst older adults in need, we helped to extend lifespans and reduce overall health care burdens related to aging. In addition, our programs that delivered fresh produce to older adults can also support local agricultural producers and local economies.

Critical Issue: Livestock and Range

Livestock and range work strives for rangeland health, improved animal health and production, industry policy and regulation awareness, and economic sustainability using a broad array of methodologies that provides information, skills, and technology to producers and Extension agents. To this end, Extension completed 7,404 consultations with 8,186 individuals and made 6,720 contacts through presentations on this critical issue. We worked on specific programs such as ranch analysis and planning, drought, and soil health. An assessment of drought

In particular for this fiscal year, we increased knowledge of and confidence in drought and irrigation management decisions, thereby contributing to resiliency of agricultural producers. One effort, a survey on 'Understanding Producer Needs for Drought Response and Resilience' informed drought impacts, information needs, and preferred sources and format for outreach from farmers and ranchers across the state. This benefits the broader public by ensuring that those who grow our food and fiber can continue to supply those products. Greater economic success of agricultural producers also benefits the rural economies in which they are typically found.

Critical Issue: Natural Resources

Our goal is to protect and provide management options for our Colorado natural resources including plants, insects, animals, soils, and water, with special emphasis on native species. To this end, Extension completed 6,818 consultations with 12,593 individuals and made 4,818 contacts through presentations on this critical issue. We worked on specific programs such as ecosystem sustainability and emergency management.

In particular for this fiscal year, we facilitated removal and control of noxious weeds, which leads to healthier ecosystems and associated services like nutrient cycling and support for native plant and animal biodiversity. An element of noxious weed control is a research program studying new molecular techniques in functional weed genomics to understand basic weed resistance to herbicides. The current focus is on the weeds kochia and Russian thistle, commonly known as tumbleweeds, which are both a nuisance and a fire hazard, particularly during drought.

Critical Issue: Nutrition, Food Safety & Health

Nutrition, food safety and health promotion programming provides research-based education to a variety of audiences across Colorado in an effort to promote safe and healthful eating habits and a physically active lifestyle. To this end, Extension completed 3,820 consultations with 28,537 individuals and made 11,483 contacts through presentations on this critical issue. We worked on specific programs such as chronic disease, commercial food safety, cottage foods, safe home food preservation, and food insecurity in low-income families.

In particular for this fiscal year, we reduced risk related to obesity as well as to diabetes and other chronic disease in our target audience, which can reduce health care burdens and economic costs at the community and state levels. By providing commercial food safety education and certification programs, we increased knowledge of food safety best practices which contribute to a decrease in foodborne illness by consumers. This helps to prevent illness and death. By supporting cottage food businesses we also support local economic development. By helping low-income individuals learn to grow their own fresh food, we supported self-sufficiency, decreased reliance on public subsidies, and contributed to a lower health care burden. By

providing both donated food and education to community members, we addressed an immediate societal need to relieve hunger and provided opportunities for community service. **Merit and Scientific Peer Review Processes**

Updates

We have received approval to transition to faculty status for our Extension agent and specialist staff. The transition is anticipated to occur on January 1, 2023. Concomitant with this, we have established criteria for promotion of Extension faculty that will strengthen peer review processes. Extension faculty will meet clear standards for their work educating Coloradans, creating works of engaged scholarship, and connecting to internal and community partners. This work will be reviewed through peer review during annual performance appraisals as well as during the promotion process.

Stakeholder Input

Actions to seek stakeholder input that encouraged their participation with a brief explanation

Our year-long, statewide community needs assessment (CNA) was completed at the end of 2021. The CNA was conducted by every Extension office in the state, with results rolling up to inform state priorities and resource decisions. In total, 450 secondary data sources were analyzed, 250 key informant interviews were conducted, and 5,100 responses to community surveys were received. We also conducted seven focus groups with individuals who have limited English proficiency to better understand their needs. Needs assessment results were presented to local and statewide Extension advisory boards and county commissioners to form county program plans and to inform overall strategic directions for Extension. In addition to the needs assessment, a variety of listening sessions were held virtually and across the state with key stakeholders.

Methods to identify individuals and groups and brief explanation None.

Methods for collecting stakeholder input and brief explanation None.

A statement of how the input will be considered and brief explanation of what you learned from your stakeholders

The combination of the community needs assessment (CNA) and statewide listening sessions informed the creation of the CSU Office of Engagement and Extension's strategic plan. The OEE strategic plan has informed not only how Extension work will be carried out, but also has informed the overall strategic plan of the university under the banner of Courageous Strategic Transformation. In addition, local CNA results were used to inform the creation of first-ever county program plans for every Extension office in the state. Statewide CNA results have also informed the priorities and work of statewide program teams. To further advance the way CNA results influence our statewide work, we plan to pilot Communities of Practice. In this pilot, CoPs will focus on priority issues from the CNA that have not been formally or strategically addressed by statewide program teams.

Highlighted Results by Project or Program

Critical Issue

Cropping Systems

[Functional Weed Genomics and Sustainable Weed Management for Resilient Colorado Crop Production](#)

Project Director

Philip Westra

Organization

Colorado State University

Accession Number

1026268



In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Functional weed genomics is coming of age as more and more full weed genomes are sequenced and annotated. This information is critical for understanding basic weed resistance to herbicides, and will help identify weediness genes in weeds, and the molecular bases of unique abiotic stress seen in many weeds.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

New basic molecular techniques may be applied to serious weed management issues, and comparative weed genomics should help discovery of key successful weed traits that may help improve crop production.

Briefly describe how your target audience benefited from your project's activities.

We are part of a collaborative weed genomics consortium with my program contributing to sequencing of kochia and Russian thistle genomes.

Briefly describe how the broader public benefited from your project's activities.

Benefits may be more obvious in the future, but we now have successful platforms from which to conduct fundamental molecular, genomic, and biochemical research on these novel plants.

Describe and explain any major changes or problems encountered in approach. Additionally, note opportunities for training and professional development provided, how results have been disseminated to communities of interest, and any new details regarding what the project or program plans to do during the next reporting period to accomplish the goals.

A manuscript on the annotation of the unique genome of kochia is now in review. A Russian thistle manuscript will follow.

Critical Issue

Environmental Horticulture

Pollinator conservation

Project Director

Martha Thomas

Organization

Colorado State University

Accession Number

7002220



Landscape practices that enhance pollinator habitat preserve vital ecosystem services while reducing water and pesticide use

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Healthy bee and pollinator populations are essential for the production of 35% of all high-nutrition crops worldwide. Colorado is home to 946 bee species. As pollinator populations decline due to many factors, increased public awareness via education and citizen science programming can help us understand and quantify bee/pollinator populations and mitigate their population decline.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Our overall goal is to enhance pollinator habitat and increasing pollinator numbers. To this end, Native Bee Watch (NBW) is a community science program that trains and supports volunteers to identify and monitor bees while also generating valuable ecological data. The first objective of NBW is to create a ripple effect of engagement and education when community scientists bring learning back to their communities. This will help others make better informed decisions regarding landscapes such as use of low-water, pollinator-friendly plants. The second objective of NBW is to contribute ecological and social science research.

When the pandemic occurred, we took the opportunity to convert NBW to a virtual community science program. Technology enabled us to reach audiences statewide and provided a unique opportunity for volunteers to get outside and learn more about their backyard ecosystems. We delivered 33 presentations to over 1,100 contacts on pollinator conversation.

Briefly describe how your target audience benefited from your project's activities.

Over 400 people attended the live NBW training or had access to the recorded training. Of those trained, over 95 volunteers monitored bees and submitted data consistently throughout the summer. Volunteers contributed 5,000 plant/bee observations throughout the state.

Of the 52 respondents to our evaluation, 100% increased knowledge of bee identification, the types of plants that may attract bees, why pollinators are important to the ecosystems, and challenges facing pollinators. Ninety eight percent increased knowledge of the differing roles of native bees and honey bees in ecosystems and the importance of insects and arthropods in gardens. Ninety six percent increased knowledge of actions they can take to help pollinators in their communities.

Ninety six percent also indicated that they have or will share information they've learned with others, advocate for pollinator conservation, and pay more attention to the biodiversity on their property and/or in public spaces. One hundred percent have or will provide pollinator habitat on their property.

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Briefly describe how the broader public benefited from your project's activities.

In conserving pollinators through best landscape practices, our efforts reduce water use, reduce the use of pesticides, and ensure that critical ecosystem services such as plant, fruit, and vegetable growth are sustained or enhanced.

Critical Issue

Individual, Family, and Community Well-being

Family financial stability

Project Director

Martha Thomas

Organization

Colorado State University

Accession Number

7002217



Adoption of good financial management practices leads to more stable, healthy families and communities

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

In the American Psychological Association's Stress in America 2020 Survey, 64% of Americans said money was a significant source of stress. The COVID-19 pandemic has not only highlighted but also worsened family financial instability, with 29.3% of Coloradans losing hours or income at a job, 17.2% struggling to afford basic necessities, 11.9% losing their job, and many facing a heavy debt burden. In addition, although numerous financial institutions offer financial literacy education, some community members and groups would prefer information from an unbiased source.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Our goal is for people to adopt good financial management practices, including but not limited to: living within their means; making good decisions with their money; managing their debt; and planning for the future. With 21 Extension agents having attended a two-day training on the evidence-based financial education curriculum called All My Money, we were ready to deliver the curriculum to the public. Lessons include getting to know yourself with money, tracking spending, savings, spending plans, money services, choosing credit, and credit history.

Public education began during Money Smart Week (April 10 - 17, 2021) and consisted of a wide variety of activities for both adults and youth. With COVID restrictions still limiting or prohibiting in-person classes/programs, we published educational content in English and Spanish on our LiveSmart Colorado blog and through a new social media account called MoneySmart Colorado. The blog content traced the lessons from the All My Money curriculum and was supplemented with 3-5 minute videos for each post. In addition, Extension professionals made themselves available for live chats with Coloradans when each video was posted. From February 18 to December 8, 2021 the social media posts reached almost 8,000 people with over 3,000 engagements and 127 shares. In the same time period the videos were viewed 634 times. In person workshops were also held in select counties. Efforts to reach youth included the development and dissemination of 200 kits with savings boxes and calculators as well as delivery of a virtual youth finance program.

Other work on the issue of family financial stability included online financial literacy workshops in English and Spanish for residents in suburban counties near Denver. In total, 89 presentations were made on this issue, reaching almost 1,500 Coloradans.

Briefly describe how your target audience benefited from your project's activities.

Of the 54 individuals who returned evaluations related to the All My Money workshops, 50 indicated that they increased their knowledge, skill, confidence, attitudes, and behavioral intent about financial management practices to improve their financial stability. Of the 20 participants in suburban Denver who returned evaluations for the financial literacy workshops, 19 reported increased knowledge and confidence around financial management practices. Nineteen also indicated that they increased their knowledge, skill, confidence, attitudes, and behavioral intent about financial management practices to improve their financial stability.

For the issue of family financial stability overall, 305 out of 316 evaluated participants indicated that they increased their knowledge, skill, confidence, attitudes, and behavioral intent about financial management practices to improve their financial stability.

Briefly describe how the broader public benefited from your project's activities.

By increasing use of healthy financial management practices, we are helping to keep families financial stable. Financially stable families contribute to the overall health of an economy, may be less reliant on public subsidies, and may reduce health care burdens through reduced stress.

Critical Issue

Livestock and Range

[Drought management](#)

Project Director

Martha Thomas

Organization Colorado

State University



Informed drought and irrigation management decisions result in more resilient agricultural operations and benefit rural communities

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

With the severe drought experienced in Colorado in recent years, agricultural producers need actionable drought information synthesized in accessible ways. This will help them respond in the short-term while also initiating actions for longer-term resilience. Junior water rights holders are particularly vulnerable to water shortages during drought years, with water availability impacting productivity and weed pressures.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Our overall goal with respect to drought is to increase the number of agricultural producers who create or implement a drought plan. One of our key objectives is to help producers gain knowledge and confidence in decisions regarding drought.

In addition, we believe that rangeland resources can be managed well through drought if plans are in place.

To this end, we delivered a series of three webinars on different aspects of drought management for agricultural producers. In addition, by building on previously developed low-cost, soil moisture testing procedures that can be implemented in the field, our Garfield County Extension office was able to work with four pilot producers to better manage irrigation delivery on their fields. Results from soil moisture tests were delivered in a moisture map, which was easy to interpret and gives producers a tool that can assist in water management decisions. In total, we delivered 27 presentations and 93 consultations on drought management to over 2,400 contacts in the state.

Briefly describe how your target audience benefited from your project's activities.

One hundred percent of our 48 drought management webinar attendees said that the webinar held their interest. When asked to rate the usefulness of the webinar, 62% rated it as 'very useful', 15% as 'extremely useful', and 19% as 'moderately useful'. Eighty one percent of participants said they were "extremely likely" to recommend a future CSU program to a friend or relative. Thirty four of 48 webinar participants indicated that they feel more confident in their knowledge of drought and ability to effectively plan and manage in drought.

In the Garfield County soil moisture project, all four pilot producers (three forage, one vegetable producer) gained knowledge of their land from the before and after irrigation comparisons displayed on maps. Management alterations ranged from irrigation scheduling to field management (adding corrugations for more uniform delivery).

Briefly describe how the broader public benefited from your project's activities.

By increasing knowledge of and confidence in drought and irrigation management decisions, agricultural producers become more resilient to drought. This benefits the broader public by ensuring that those who grow our food and fiber can continue to supply those products. Greater economic success of agricultural producers also benefits the rural economies in which they are typically found.

Critical Issue

Nutrition, Food Safety & Health

Chronic disease

Project Director

Martha Thomas

Organization

Colorado State University



Weight loss and diabetes education fills local resource gaps, improves health, and reduces overall health care burdens

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

In recent years, the percent of people who are overweight and obese has continued to rise across Colorado, with all eastern Colorado counties between 51 and 65 percent. Overweight and obese people have an increased risk of developing several diseases and conditions, including high blood pressure, type 2 diabetes, cardiovascular disease, gallbladder disease, osteoarthritis, stroke, depression, anxiety, sleep apnea, and several cancers. Chronic diseases carry large individual and societal health and economic burdens.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

To help achieve our goal of increasing behaviors that will result in chronic disease prevention and/or management, we ran a Healthier Weigh Health and Fitness Challenge and also held a number of Dining with Diabetes classes across the state.

CSU Extension in northeast Colorado developed a 12-week health and fitness challenge to serve as an educational and motivational method to encourage adults to make healthy lifestyle changes. The primary goal for participants is weight loss. However, the program is promoted to focus on holistic health, not just on body weight. Lesson topics for 2021 included: Basics of Nutrition & Exercise, Basal Metabolic Rate & Eating Plan, Love Your Body, At Home Exercise, Tracking and Self-

Accountability, Low Stress Meal Planning, Portion Distortion & Hydration, Self-Care and Mindfulness, Diets Backed by Science,

Live More Stress Less, Inflammation Affects Health and Weight, and Fitness Trends Revisited.

In Fremont County, the 2019-2023 county Public Health Improvement Plan identified diabetes as one of the leading causes of a shortened lifespan, and there were no local resources available to educate the public on diabetes control and prevention. Two separate Dining with Diabetes class series were held there. Daytime classes served one target audience, while evening classes made the resources accessible to a different audience. We had 37 class participants in Fremont County.

In total, 23 presentations for 366 contacts were made on the issue of chronic disease in Colorado.

Briefly describe how your target audience benefited from your project's activities.

In northeastern Colorado, the 2021 A Healthier Weigh Program had positive impacts on participants. Eighty-nine people out of

103 enrolled completed the 12-week challenge for an 86.4% completion rate. People completing the program logged between 100 to 900 miles of steps/physical activity, with most participants averaging over 350 miles in the 12 weeks. They lost a collective 423.9 pounds of body weight and lost 141 inches from their waist measurements. Based on pre- and post-program assessments, participants who indicated that they engaged in at least 30 minutes of dedicated physical activity 5 days per week went from 25% to 65%. Those who indicated that half of their daily beverage consumption is water went from 15% to 81%. Eating from all food groups daily went from 19% to 57%. Using mindfulness as tool for health and weight management went from 18% to 35%. Getting 8 hours of sleep every night went from 17% to 38%.

In Fremont County, 25 of 37 Dining with Diabetes participants completed a post-program evaluation. All 25 showed improvement in knowledge regarding diabetes and a healthy lifestyle. All 25 also implemented at least one healthy lifestyle behavior change. Statewide, all 115 participants who returned evaluations indicated improved behaviors related to diabetes prevention and control. Twenty four out of 42 participants also indicated reduced A1C levels.

Briefly describe how the broader public benefited from your project's activities.

By reducing risk related to obesity as well as to diabetes and other chronic disease in our target audience, communities and the state benefit from reduced health care burdens and economic costs.

Cottage foods

Project Director

Martha Thomas

Organization

Colorado State University

Accession Number

7002203



Cottage food programs support small businesses, contribute to local economies, and ensure consumer food safety

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Workers who have been disrupted by Covid have joined others in growing a booming cottage food industry. Cottage food producers have a variety of needs to establish a profitable business, including access to new markets, developing business plans, establishment of networks, and access to support resources. They are also legally required to go through food safety training in order to sell products because widespread and serious food-borne illness can result from improper food safety practices.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Our goal is to help cottage food business owners succeed by using financial tools, supply chain analysis, food safety training, other risk management resources, and the knowledge associated with a network of peer producers. We conducted a wide variety of activities to this end.

Thirty-three cottage food safety classes were offered by 11 CSU trainers. These classes provide small food production businesses with a required food safety certificate and resources to become successful entrepreneurs. To address the desire of burgeoning cottage food businesses to establish peer networks, we have established a "Colorado Cottage Food Peeps" Facebook group. To address an expressed need by many cottage food producers, we facilitated testing of a non-refrigerated cream cheese frosting recipe by the CSU Food Laboratory. The lab was able to verify the recipe as shelf stable, making it a viable option as a cottage food product. Subsequently, the Colorado Department of Public Health and Environment accepted the test results and has approved the recipe.

We developed a new section on our website, Food Smart Colorado, to address cottage food. These webpages include product guides, food safety issues, product labeling, class schedules, and links to other cottage food resources. We have provided training for Small Business Development Center staff on the needs of producers, which resulted in the creation of an SBDC business class specifically for cottage food producers. We also provided training to the Colorado Farmers Market Managers Association about cottage foods. This training helps them to understand cottage foods that are eligible for sale at farmer's markets in order to facilitate appropriate opportunities for cottage food producers. In total, we delivered 40 presentations to 870 contacts and consulted with 1,476 individuals on cottage foods.

Briefly describe how your target audience benefited from your project's activities.

Statewide, over 800 individuals attended a food safety training, passed a food safety test, and received a food safety certificate from Colorado State University Extension. Participants came from 55 of Colorado's 64 counties. Post-program evaluations and test scores show that CSU Extension program participants understand food safety principles and practices, can recognize multiple food safety risks, and can apply these principles to the unique challenges of operating a home-based food business.

Eight hundred ninety seven out of 899 cottage foods program participants reported increased knowledge and confidence that they can make informed decisions and that their businesses will comply with food safety best practices and existing Colorado cottage food laws. Many graduates report having been successful in creating cottage food businesses. Some participants have been so successful that they have gone on to become commercial food production businesses, providing employment to others in their communities.

The Colorado Cottage Food Peeps Facebook group grew from 848 to 1,262 members in 2021. This group provides mentorship and guidance from seasoned producers and others to the new producers. For example, a small business development specialist provides members with guidance to grow their businesses and guides them through the

process of moving into retail/wholesale space. An employee of the Colorado Department of Revenue assists members with sales tax collection questions.

Cottage food producers and others have made increasing use of our Food Smart Colorado website for educational purposes. Over 12,000 visitors to the site spent a total of 393 hours there, including significantly increases in traffic to our specific cottage foods pages.

Briefly describe how the broader public benefited from your project's activities.

Our cottage food work directly supports the NIFA goal of ensuring the development of human capital, communities, and a diverse workforce. Cottage food businesses provide income to families, foster connections to local producers, and support local economic development. They also ensure that consumers of cottage foods will be protected against food borne illness.

Type	Projects / Programs
Projects / Programs without a Critical Issue	1

[Multi-state Coordinated Evaluation of Winegrape Cultivars and Clones](#)

Project Director
Horst Caspari
Organization
Colorado State University
Accession Number
1014339



Multi-state Coordinated Evaluation of Winegrape Cultivars and Clones

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Cold temperature damage to grape vines occurs frequently in Colorado and is the main reason for low yields. The reason for the frequent cold damage is the industry's reliance on growing cold-tender European grape cultivars that are poorly adapted to Colorado's climate. This program aims to reduce cold temperature damage and increase grape yields by identifying grape cultivars and clones that are better suited to Colorado's growing conditions.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

About a dozen cultivars among the large number of grape cultivars being evaluated in our cultivar trials have been identified as being better adapted to Colorado's growing conditions. Following repeated severe yield reductions in 2010, 2013, and 2014 due to cold damages to European grape cultivars there was a substantial change in the cultivar mix in Colorado. Prior to 2010 only about 2 % of Colorado's vineyard area was planted with cold-hardy cultivars. Today, nearly 20 % of the vineyard area is planted with cold-hardy cultivars. Annual survey data show that cold-hardy cultivars evaluated in this and earlier projects account for more than 50 % of this area.

Record-breaking, extreme cold temperature events occurred in late October 2019, and again in late October 2020. The October 2020 event caused nearly 100 % crop loss on European cultivars, but moderate to no loss on cold-hardy cultivars. As a result, cold-hardy cultivars accounted for 70 % of the crop produced in 2021. These extreme low temperature events in late October were unprecedented. A general warming trend in fall will delay cold acclimation and make grapes more susceptible to cold injury from sudden temperature drops. This then represents a new type of risk requiring more information about cold acclimation in fall, which is currently missing. Through controlled freezing tests we have identified several cultivars, including two European ones, with very early cold acclimation that had no or minor bud damage in October 2020, and full crops in 2021. This information has been shared with Colorado's grape and wine industry, and a few growers have ordered vines of some of those cultivars for planting in 2022.

Briefly describe how your target audience benefited from your project's activities.

Over the past ten years the percentage of vineyard area planted with cold-hardy cultivars has increased ten-fold. While coldhardy cultivars represent only 20 % of vineyard area they accounted for 70 % of the crop in 2021, due to cold damage to coldtender European grapes in late October 2020. The majority of growers who have adopted cold-hardy cultivars tested in this program had full or nearly full crops on those cultivars in 2021.

Briefly describe how the broader public benefited from your project's activities.

The grape and wine industry is an important economic driver in Western Colorado, both through direct employment in the industry and its impact on agritourism. A reliable, steady supply of grapes is a requirement for a thriving wine industry. Wine tourists come to sample local wines, not wines made from out-of-state fruit. Many Colorado wineries exclusively produce wines from Colorado fruit, so every time there is a shortage of grapes those wineries are forced to reduce their wine production and ultimately wine sales. Some wineries reduce their business hours which directly impacts the employees and reduces the attractiveness of the area enlarge as an agritourist destination. Higher sale taxes, wages, and employment in the grape and wine industry as well as associated industries are some of the potential benefits of our research project.