Maine Climate Resilience Training Program

Progress report for ONE19-334

Project Type: Partnership
Funds awarded in 2019: $29,787.00
Projected End Date: 07/31/2022
Grant Recipient: MOFGA
Region: Northeast
State: Maine
Project Leader:

Ryan Dennett
Maine Organic Farmers and Gardeners Association

Project Information

Project Objectives:

This project seeks to demonstrate that when farmers are informed and properly prepared for the exigencies of climate changes, they will be able to adapt and even thrive. With funding from SARE, we will develop and deliver this innovative and replicable training series to 960 farmers, utilizing MOFGA's education models and building on existing research and resources concerning climate strategies that farmers in Maine need to be aware of.

The benefits to farmers are as follows:

- Increased knowledge of production practices and strategies to counteract various climate scenarios
- On-farm guidance and consultation addressing the unique needs of each farm in preparing for and dealing with unusual weather events and climate changes
- Access to low-interest funding for investment in farm adaptations
- Increased well-being and stress-management in the face of worrying change
- Networking opportunities designed to facilitate farmers supporting and collaborating with each other in these uncertain times

Introduction:

Maine farmers, like others in the Northeast, have now experienced drought conditions for three years in a row The impact of increasingly extreme and unpredictable weather patterns directly affects farmers' production and income, and consequently their well-being.

The Maine's Climate Future: An Initial Assessment, a compendium of "information Maine needs to mitigate, adapt, and capitalize on new opportunities in a changing climate," underscores the need for more farmer education about climate resilience. "This industry...faces substantial effects from projected increases temperature and

shifts in the amount and distribution of precipitation. In addition to factors like soil texture and management inputs, temperature and precipitation are two of the driving forces controlling the productivity and, ultimately, the viability of agriculture in Maine. This includes both direct effects (like the effect of higher temperature on current or potential crops) and indirect effects (changing pest pressure, for example). Farmers can expect a greater need for irrigation, particularly for high value crops, to offset increased soil moisture loss through evaporation and transpiration. Increasing temperatures will also negatively affect confined livestock in the state. New pests, invasive plants, and pathogens will increasingly encroach into Maine, threatening plants, animals, and humans, and making management more difficult." The report goes on to say, "however, with adequate preparation, farmers will also have access to a new and broader range of crops to serve a population increasingly interested in locally produced food."

As our farmers here in Maine contemplate the years to come, the drought and predicted climate concerns have also prompted requests - on our Journeyperson listserv, in Farmer to Farmer Conference evaluations, and through MOFGA's program application questionnaires - for climate change adaptation programming as well as information on irrigation, strategic land planning, crop management, well-being resources such as counselling, and peer networking events in order to share innovations and social support. There has been a keen interest in agricultural conservation strategies to reduce the need for irrigation, such as low tillage, diverse cover crops, and mulch.

MOFGA's comprehensive Climate Change Resilience Training Program will address resilience and production adaptations by developing, in collaboration with agricultural climate resilience experts, a series of workshops, on- farm trainings, presentations, individual technical assistance, enhanced pest reports, a resilience planning workbook, and fact sheets. Topics will include Crop Sensitivities, Livestock Sensitivities, Weeds, Insects and Disease, Soil and Water Strategies, Animal Health, Local Marketing (to reduce our carbon footprint), Risk Assessment, and Decision Making. Our Ag services staff, all pre-trained and educated in climate change issues, will initiate 60 farm visits providing individual consultation salient to the needs of each farmer. We will also open access to our Organic Farmer Loan Fund.

All of the above strategies will be designed to ensure farmers have the resources they need to navigate the complex uncertainties of farming in a changing climate.

Cooperators

- Dr. Sonja Birthisel (Educator)

  Postdoctoral Research Associate University of ME

  University of Maine (1862 Land Grant)

- Abby Lydon - Producer

  Dharma Farm

- BrennaMae Thomas-Googins - Producer

  Patch Farm

- James Gagne - Producer

  Dickey Hill Farm

- Richard Lee - Producer

  Tender Soles Farm

- Kate Delvecchio - Producer

  Tender Soles Farm

Research

Materials and methods:

We provided 10 technical assistance farm visits addressing irrigation, pest management, cover cropping, water drainage, pasture management, compost management, and season extension in 2019. We provided 20 technical assistance farm visits in 2020 addressing soil health (18), irrigation (10), converting to no till production (2), site planning for climate resiliency (3), water management to avoid erosion (1), pest and disease management (17).

In 2019, We held educational farm tours on the following topics: legume-based cover cropping strategies, on-farm composting, transition to wholesale, irrigation strategies, land access, animal health, and breeding fine sheep and wool to optimize regenerative agriculture. We taught the following workshops: cover cropping and crop rotation on low acreage, compost and soil health, nuts and bolts of irrigation infrastructure - irrigation tools and strategies, good pasture management, extending the grazing season - harvesting tree fodder and other methods, managing soil fertility with organic and natural fertilizers, legislative action and laws which affect Maine farms and how to propose legislative bills, climate change and carbon sequestration, climate adaptation, compostable packaging, and whole farm planning. We published 3 seasonal pest reports in August, September and October 2019.

We are planning educational tours on weed management in a changing climate, emotional resilience in a changing climate, no-till and reduced tillage, on-farm composting and animal health for early 2020.

In 2020, we had to radically change our plans for educational workshops and tour topics and formats. We held one in-person day-long workshop on “Moving Water on the Farm,” but shortly after that, due to the pandemic, we pivoted to online farm tours and workshops to date. We shifted the focus of several of the early Climate Change workshops in order to provide COVID-19 information, strategies, and support. For example, we offered “Emotional Resilience during COVID-19” rather than “Emotional Resilience in a Changing Climate,” although the content is relevant regardless of the title. We held online workshops on the following climate resilience and adaptation topics: Pasture-based livestock profitability, Voice of Organic in Augusta and Washington D.C., Climate Adaptation Options with Dr. Laura Legnick and Dr. Rachel Schattman, Soil and Carbon Sequestration, A Novel Shallow Well Technology to Provide Safe, Sustainable Drinking & Irrigation Water, and a keynote presentation on Climate Resilience along with an advanced intensive workshop with

Dr. Laura Legnick. We utilized our long practiced peer-learning format by lining up a block of farmer and service provider presentations followed by a block of farmer-to-farmer discussions on the topics presented.

We held 10 online farm tours and discussions on the following topics: Seed Saving, Organic Farming Practices and Principles for Crops, Organic Farming Practices and Principles for Livestock, Grazing & Forage Season Extension, Farming & Marketing Cooperatively, Soil Health & Diversified Vegetables, Modern Dairy and Agricultural Policy, Farming & Climate Change, A Novel Shallow Well Design, and A Tour of Habit Farm. We published 3 pest reports in June, July and August 2020. We prerecorded farm visits for participant viewing and held 1 hour discussions with the host farms and relevant service providers.

Research results and discussion:

In 2019, 56 Farmers (86% of evaluations completed) reported changes in knowledge, attitudes, skills and/or awareness in the following key areas: nutrient management using cover crops, incorporating cover crops into no till vegetable systems using solarization or occultation (tarping), soil health, pasture management, carbon sequestration strategies and how common agricultural stewardship practices such as plowing, cultivating, plasticulture and timber harvesting affect the carbon footprint of their farm, strategies for optimizing irrigation and how soil moisture monitoring may help save time and money while improving crop health and yield, understanding whether any compostable packaging options are actually better for the environment, emotional coping strategies for stress related to climate change, and production-related adaptation strategies.

In 2020, 137 farmers (83% of evaluations completed) reported increases in knowledge, skills, awareness, and/or changed attitudes in the following key areas: pasture management and season extension strategies, how to engage in legislative policy at the state and national level, how to utilize a decision making framework pertaining to climate resilience practices, carbon sequestration strategies and soil management, irrigation adaptations, seed saving, organic crop and livestock management practices, no till and cover cropping practices, and pest and disease identification and management. The 17% of farmers who reported no change in knowledge as a result of the programming all ranked themselves as having considerable knowledge on the subject to begin with. We did use two types of evaluation to report these changes. Referring to 33 evaluations asking farmers to indicate the level of knowledge increase as a result of the farm tour or workshop, 55% of farmers reported experiencing a significant increase in knowledge and 45% of farmers reported experiencing a minimal increase in knowledge. We also used an evaluation approach that asked farmers to rank their knowledge prior to the educational event and as a result of the educational event. In these 132 evaluations, most participants (27.5%) started with minimal knowledge and increased to a moderate level of knowledge, followed closely by 26.5% of farmers who started with a moderate level of knowledge and increased to a considerable amount of knowledge. 10.6% of farmers started with a non-existent knowledge base and increased to a minimal level of knowledge, while 14.4% of farmers jumped from having non-existent knowledge to a moderate level of knowledge.

Farmers were much more engaged in programming this year because of our pivot to online education formats. Although we received regular feedback from farmers about email, resource, survey, and even funding opportunity fatigue during the pandemic, we saw much higher numbers of attendees overall, with the added benefit of more diversity from out of state participants enriching the experience for

our Maine growers.

Of the 20 farm visits conducted, farmers reported the following increases in knowledge:

- Soil health (17)
- Crop production (20)
- Irrigation (1)
- New invasive pest (1)

As a result of the farm visits, the following practices were reported to have been adopted:

- Record keeping (12)
- Irrigation (10)
- Mulching (8)
- Cover Cropping (12)
- Infrastructure change (1)

Gained skills were reported as:

- Soil analysis (12)
- Insect or pest ID (5)
- Weed ID (9)
- Disease ID (8)
- Insect ID (8)
- Soil fertility planning (1)
- Irrigation (1)
- Nutrient deficiency symptoms in crop (1)

In March of 2021 we will measure participants' implementation of behavioral change and adoption of skills and climate related practices as a result of participating in educational workshops and farm tours. Plans to do so in 2020 were delayed by the pandemic and replaced by related efforts and surveys.

Research conclusions:

Our project offers a comprehensive approach to increasing farmer knowledge and adoption of climate resilience practices. Early results show consistently that in 2019, 86% of farmer participants increased their knowledge about these practices, as did 84.86% of the farmers reporting on technical assistance, workshop and farm tour experiences in 2020.

We were unable to increase our evaluation completion rate in 2020, and in fact it decreased to 31%. We attribute this to our learning curve in quickly transitioning to online learning. Early on, some poll evaluations were neglected, incorrectly administered, or administered at the very end of the workshop or farm tour when most participants had already left the program. We have learned to tighten our practices to make sure that there are multiple facilitators and that short evaluation polls are administered throughout the duration of the online program. We were able

to reach more farmers from across the state by making hotspots, tablets and keyboards available to interested participants to reduce the barriers of rural internet access.

Participation Summary

4 Farmers participating in research

Education & Outreach Activities and Participation Summary

20 Consultations

6 Published press articles, newsletters

5 Tours

29 Webinars / talks / presentations

PARTICIPATION SUMMARY:

700 Farmers

29 Number of agricultural educator or service providers reached through education and outreach activities

Learning Outcomes

213 Farmers reported changes in knowledge, attitudes, skills and/or awareness as a result of their participation

Key areas in which farmers reported changes in knowledge, attitude, skills and/or awareness:

Farmers reported increased production knowledge in the following areas: how to engage in legislative policy at the state and national level, nutrient management using cover crops and incorporating them into no till vegetable systems using solarization or occultation (tarping), soil health, pasture management and season extension, carbon sequestration strategies and how common agricultural stewardship practices such as plowing, cultivating, plasticulture and timber harvesting affect the carbon footprint of their farm, strategies for optimizing irrigation and how soil moisture monitoring may help save time and money while improving crop health and yield, understanding whether any compostable packaging options are actually better for the environment, emotional coping strategies for stress related to climate change and production-related adaptation strategies.

Project Outcomes

20 Farmers changed or adopted a practice

Project outcomes:

We do not yet have evidence of changes in practices or behavior of the farmers who received education because most of the farm tours and workshops as we will be surveying participating farms in March 2021 to share their intentions of changing practices and behaviors for the 2021 growing season and any outcomes from 2020. We will reach out to them during the growing season to confirm implementation and results of any changes made.

Quotes that indicate the benefit of the project thus far include:

"I learned so much and left really inspired."

"It was informative and well-run."

"Such a great blend of ag scientists and farmers for every subject."

“I think info on on-site water management and low tech well technology is very timely and helpful.”

Regarding Dr. Laura Legnick’s workshop: “This was terrific! I loved her multidisciplinary approach to climate change, blending life science with sociology and psychology, to help farmers approach resiliency. While a rather disheartening topic, I found her address to be uplifting.”

Regarding Voices of Organic workshop: “Networking with policy initiators and supporters was very exciting! I want more!”

Regarding Soil & Carbon Sequestration: “I'll be expanding my no-till growing space and using James from Dickey Hill Farm's method of opening new plots. Going to try and work in more cover cropping.”

Regarding a Novel Well Design: “Really fascinating, lots of potential.”

Assessment of Project Approach and Areas of Further Study:

Our pairing of a peer-education approach combined with University research is tangible and effective for farmer participants. Offering a wide array of climate-related topics in a variety of formats and locations, in both the classroom and the field, while only titling some events explicitly as such, allows us to engage a broad audience and make climate adaptation strategies more widely accepted than if all workshops and tours were promoted as specific to climate change. We have begun to increase farmer knowledge around climate resilience practices but have additional topics and farmers to reach.

We will continue to provide educational workshops and farm tours on additional climate resilience topics relevant to different geographic areas of the state, with a focus on reaching northern, downeast and western Maine with online content. We will highlight numerous farms and farmers as all climate challenges and adaptations are unique.

It is sometimes difficult to collect evaluations from the large number of attendees at our tours and workshops. Last year we planned to pair the paper evaluations with interactive evaluation activities to wrap up each educational event. We have realized better results when we send participants an online evaluation after the event at which time we solicit their increase in knowledge on relevant topics. We will also solicit the changes to practices and behaviors they intend to make this season as a result of the education.

In 2020, our pivot to online learning increased participation and drew in more individual farmers. We observed more engaged dialog, with opportunities for vocal and written discussion. As mentioned above, there was a learning curve where we

struggled to have surveys completed before participants dropped off toward the end of the webinars. Facilitators adapting to new online formats occasionally neglected to use the evaluation polls and follow up survey tools were not effective. By the end of the year we had improved our techniques in this area by requiring 2 facilitators for each online workshop, with the secondary staff member taking responsibility for tech support and implementation of evaluation polls. We also shifted from doing evaluations at the end of a session to spreading them throughout the session to increase completion rates.

New England farmer educators will directly benefit from the results of this project, and farmers in this geographic region, particularly those on diversified and organic farms, will benefit from the lessons we learn from offering a range of climate resilience programs in various formats and any additional programming that stems from it.