



THE UNIVERSITY OF
MAINE
Cooperative Extension

Lily Calderwood, Ph.D.

Assistant Extension Professor and Wild Blueberry Specialist,
University of Maine Cooperative Extension

&

Assistant Professor of Horticulture, School of Food and
Agriculture

Application for Annual Reappointment



March 21, 2022

Promotion Review Committee (PRC)
University of Maine Cooperative Extension
5741 Libby Hall, Orono, ME 04469

Dear Promotion Review Committee,

I am pleased to submit my reappointment packet at the rank of Assistant Professor, which highlights my accomplishments after being in the position of Extension Wild Blueberry Specialist for four years. I have a split appointment between Cooperative Extension (70% Extension) and the School of Food and Agriculture (30% Research).

My current projects and goals fall into two program areas, as described in this packet: 1) Integrated Pest and Crop Management and 2) Wild Blueberry Quality for Value-added Markets. I have consulted with my Peer Committee and have incorporated their changes into my packet.

To date, I have completed seven needs assessment surveys, more than 375 individual consultations, and have built a strong relationship with the Maine Wild Blueberry Commission. I have listened to Maine wild blueberry grower and processor concerns, and involved them directly in my work, throughout the needs assessment to evaluation process, which has helped me to develop my applied research and educational programs. These programs are designed to help educate farmers and processors to make informed decisions on pest and crop management, while opening new economic opportunities for Maine wild blueberry growers and maintaining berry quality. Since 2019, 1,496 people have attended my events (in-person and/or virtually) and online educational materials that I have created and made available on the [UMaine Extension Wild Blueberry Website](#) were viewed 150,068 times in 2021.

In collaboration with colleagues at Cornell and Dalhousie Universities, and the UMaine Schools of Biology and Ecology and Food and Agriculture, we have been awarded 20 grants totaling \$1,378,114. As lead PI, I have been awarded \$1,047,314 in external and \$92,486 in internal grants. I currently have three employees who work on my team, including two full time Extension and research assistants. I have graduated two M.S. students, collaborated to publish 6 peer-reviewed publications, 7 new Extension fact sheets, and multiple webinars to date.

Thank you for your time and consideration regarding my reappointment. I look forward to your suggestions and comments. Feel free to contact me if you have any questions.

Sincerely,



Lily Calderwood, Ph.D.
University of Maine Cooperative Extension
Wild Blueberry Specialist and Assistant Professor of Horticulture



Lily Calderwood
Assistant Professor
Year 4 Reappointment Packet

Table of Contents

I. FACE DATA.....	5
Name: Lily Calderwood.....	5
Current Rank: Assistant Professor.....	5
Address and Contact Information:	5
Professional Experience	5
Educational Background.....	5
II. RECORD OF ACTIONS.....	6
Initial Probationary Appointment.....	6
Reappointments.....	6
Promotion(s).....	6
Continuing Contract Recommendations	6
Exceptions to Board of Trustees Policy	6
Transmittal Letters	6
III. CANDIDATE’S PROFILE	7
Job Description.....	7
Distribution of Efforts by Performance Area.....	9
Professional Development Plan.....	10
IV. PROGRAM SUMMARIES.....	11
PROGRAM SUMMARY I. Integrated Pest and Crop Management.....	11
Background	11
Criterion 1: Conducts issues and needs assessment	11
Criterion 3: Designs, delivers, evaluates, refines, and reports programs.....	11
Criterion 6: Conducts applied research to support program development.....	12
PROGRAM SUMMARY II. Wild Blueberry Quality and Value-added Markets	13
Background	13
Criterion 1: Conducts issues and needs assessment	13
Criterion 2: Sets goals and outcome-based objectives in relation to the State Plan of Work.....	13
Criterion 3: Designs, delivers, evaluates, refines, and reports programs.....	13
Criterion 4: Documents impact with emphasis on economic, environmental, and social conditions for Maine citizens and others.....	14
Criterion 6: Conducts or collaborates on applied research to support program development.....	14
Criterion 7: Seeks and acquires grants, contracts, and special funds in support of educational program development.....	14
V. EXPANDED CURRICULUM VITAE.....	15
Job Description.....	15
Contact Information	15
Academic Background.....	15

Employment Experience.....	15
Licenses and Certifications.....	16
PERFORMANCE AREA I: Educational Program Development.....	16
Criterion 5: Engages in professional development.....	16
Subject Matter Knowledge.....	16
Leadership Development.....	17
Organizational Understanding.....	17
Knowledge Sharing.....	18
Criterion 6: Conducts or collaborates on applied research to support program development.....	19
Criterion 8: Demonstrates educational program leadership.....	21
Table 2. Educational Leadership.....	21
Program Leadership Teams.....	23
Enhances the reputation of UMS and UMaine Cooperative Extension.....	23
PERFORMANCE AREA II. Undergraduate and Graduate Teaching and Advising.....	25
Criterion 4: Courses taught.....	25
Criterion 7: Advising commitments for honors theses, master's theses, and doctoral dissertations.....	25
PERFORMANCE AREA III: Scholarship and Professional Activity.....	25
Criterion 1: Scholarly works completed and in progress.....	25
Criterion 2: Unpublished professional presentations.....	28
Invited Presentations In-State.....	28
Criterion 3: Other scholarly activities.....	28
PERFORMANCE AREA IV: County, Organization, and Campus Service.....	29
Criterion 1: Serves on organizational committees.....	29
Criterion 2: Serves on search and interview teams.....	29
Criterion 3: Enhances skills and knowledge of County Executive Committees and other advisory groups.....	29
Criterion 4: Builds and sustains UMaine Cooperative Extension linkages with county, UM, and UMS.....	30
Criterion 5: Conducts administrative roles and responsibilities including the role of county coordinator.....	31
Administrative Roles.....	31
Criterion 6: Demonstrates commitment to UMaine Cooperative Extension civil rights expectations, and UMaine Extension and UM diversity goals.....	31
Trainings Completed.....	31
PERFORMANCE AREA V: Public Service.....	31
Criterion 1: Presentation and programs that do not require engagement in the full educational program development process.....	31
Presentations.....	31
Events.....	31
PERFORMANCE AREA VI: Awards and Recognition.....	31
Criterion 1: Type of award or recognition.....	31
Recognition.....	31

I. FACE DATA

Name: Lily Calderwood

Current Rank: Assistant Professor

Address and Contact Information:

Campus Mailing Address

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Grove St. Ext.,

Orono, ME 04469

Phone: 207-812-2915

Email: lily.calderwood@maine.edu

Professional Experience

2018 - present	University of Maine , Orono, ME <i>Cooperative Extension Wild Blueberry Specialist and Assistant Professor of Horticulture, School of Food and Agriculture</i>
2016 – 2018	Cornell Cooperative Extension , Albany, NY <i>Senior Resource Educator</i>
2015 – 2016	University of Vermont Extension , Burlington, VT <i>IPM Specialist</i>
2014 – 2015	University of Vermont , Burlington, VT <i>Ph.D. Research Assistant</i>
2011 – 2014	University of Vermont , Burlington, VT <i>Ph.D. Teaching Assistant</i>
2009 – 2011	Earthwatch Institute , Boston, MA <i>Research Coordinator</i>
2009	Massachusetts Audubon Society , Eastham, MA <i>Research Assistant</i>

Educational Background

2011 - 2015	Doctor of Philosophy (Ph.D.) in Plant and Soil Science <i>University of Vermont, Burlington, VT</i>
2006 - 2009	Bachelor of Arts in Biology Minor in Environmental Studies <i>Wheaton College, Norton, MA</i>

II. RECORD OF ACTIONS

Initial Probationary Appointment

Date of Hire: March 12, 2018

Rank: Assistant Professor (split appointment; continuing contract)

-Cooperative Extension (70%)

-School of Food and Agriculture (30% Research)

Credit towards continuing contract: none

Reappointments

Date of 1st year reappointment: March 8, 2019

Date of 2nd year reappointment: September 23, 2019

Date of 3rd year reappointment: June 23, 2021

Promotion(s)

No applications for promotion to date.

Continuing Contract Recommendations

1. Promotion Review Committee's Recommendation:		
Positive _____	Negative ____	Date:
2. Program Administrator's Recommendation:		
Positive ____	Negative ____	Date:
3. Director's Recommendation:		
Positive ____	Negative ____	Date:
4. Chief Academic Officer's Recommendation:		
Positive ____	Negative ____	Date:
5. President's Recommendation:		
Positive ____	Negative ____	Date:

Exceptions to Board of Trustees Policy

Not applicable – Majority Extension appointment.

Transmittal Letters

1. President
2. Chief Academic Officer
3. Director
4. Program Administrator

III. CANDIDATE'S PROFILE

Job Description

Title: Extension Wild Blueberry Specialist & Assistant Extension Professor and Assistant Professor of Horticulture (ID #41985)

Department: Cooperative Extension

Bargaining Unit: AFUM

Purpose:

The University of Maine Cooperative Extension and School of Food and Agriculture invite applications for a joint full-time, fiscal-year, continuing contract eligible faculty appointment as Extension Wild Blueberry Specialist & Assistant Extension Professor and Assistant Professor of Horticulture, effective January 1, 2018. This 70% Cooperative Extension and 30% research appointment in the School of Food and Agriculture has a primary responsibility to conduct research on the management of weeds and pests that limit wild blueberry production in Maine. The specialist is expected to be a project leader on State and federal grants on Wild Blueberry Research. Collaboration is required with Extension faculty, as well as faculty in the School of Food and Agriculture including those specializing in crop and soil science, food analytical chemistry, food processing, human nutrition, plant pathology, and other disciplines. The wild blueberry specialist may become a member of the graduate faculty and may serve as an advisor on graduate committees.

This Assistant Extension Professor will work from an office at the University of Maine in Orono with state-wide responsibilities.

Essential Duties & Responsibilities:

- Conducts an educational program that supports The University of Maine Cooperative Extension's Plan of Work and stresses the use of best management practices (BMPs) in an integrated crop management (ICM) program for wild blueberries. Improves the efficiency and profitability of wild blueberry culture, to minimize the use of unnecessary pesticides and fertilizers, and to develop organic production practices.
- Conducts grower meetings, pesticide training and re-certification sessions, and field days to introduce and reinforce the use of BMPs, ICM, and sound business management principles.
- Provides information management through Wild Blueberry Newsletters and fact sheets in the Wild Blueberry Growers Guide, available in printed form and on the web at www.wildblueberries.maine.edu, as well as via Internet publications, telephone, email and other written correspondence, and by conducting individual field visits as appropriate.
- Conducts research related to wild blueberry cropping systems in Maine, particularly on the management of weeds and other pests that limit wild blueberry production and reports results in peer-reviewed journals and other outlets.

- Cooperates with county faculty to provide support for wild blueberry initiatives and provides weed identification as requested by the Pest Management staff and County faculty.
- Actively consults with the Wild Blueberry Research Advisory Committee, the Wild Blueberry Commission of Maine on wild blueberry related matters and also cooperates with county (Soil and Water Conservation Districts), state (Maine Department of Agriculture, Conservation & Forestry, the Board of Pesticides Control) and federal agencies (United States Department of Agriculture, National Agricultural Statistics Service and the Environmental Protection Agency) on wild blueberry related matters. Cooperates with Canadian counterparts to facilitate the sharing of knowledge of wild blueberry research.
- Serves as the liaison from Maine for the IR-4 program, which provides support for minor-use pest management registrations.
- Conducts IR-4 residue and efficacy trials to support minor use registrations.
- Serves as supervisor for a clerical staff position and a research professional who assists with research.
- Develops and delivers educational programs that align with the UMaine Cooperative Extension mission and plan of work.
- Secures external grants and contracts for research and educational programming.
- Assesses needs as an essential part of program planning, program implementation and grant development.
- Reports program impacts on Plugged-In and other venues upon request.
- Develops and sustains a professional development plan in support of one's professional, organizational and plan of work priorities.
- Develops and maintains professional relationships that reflect courtesy, civility, and mutual respect.
- Builds productive relationships with internal and external constituencies.
- Utilizes coaching and mentoring methods, which provide an environment that is anticipatory, supportive, and encourages constructive feedback on performance.
- Commits to organizational improvement by identifying opportunities to improve and recommending possible alternatives for a situation.
- Ensures compliance with civil rights, affirmative action and equal opportunity requirements.
- Participates in Extension & School of Food and Agriculture staff meetings as appropriate.
- Participates in organizational program meetings to support program development that affects the wild blueberry programs.
- Performs other reasonably related duties, as assigned.

Knowledge, Skills & Qualifications:

Required:

- Ph.D. in horticulture, weed science, or closely-related field.
- Demonstrated skill in developing and delivering educational programs.
- Demonstrated excellent oral and written communication skills.


- Documented ability to conduct high-quality scientific research, as evidenced by publications in peer-reviewed journals.
- Computer and mobile device proficiency.
- Independent and team work skills.
- Self-motivation and direction.
- Demonstrated success in working collaboratively with other agencies and organizations, including private industry.

Preferred:

- Knowledge and experience in agricultural economics or business management.
- Demonstrated success in obtaining research funding.
- Post-doctoral or equivalent experience.
- Experience and skills in supervising others.
- Experience seeking participation from and working with diverse audiences.
- Experience successfully conducting applied research in response to industry needs.

Distribution of Efforts by Performance Area

Performance Area	Weight (%)	Days
I – Educational Program Development Issue 1 – Wild Blueberry	49	113
II – No Teaching Appointment		
III - Scholarship and professional activity	10	23
IV – Organizational Service	6	14
V – Public Service	5	11
Research Appointment (30%)	30	69
Total	100	230

Program Administrator: 

Date: March 18, 2022

Professional Development Plan

Development Need	Specific Development Need	Relevant Activities to Reach Development Goals
<i>Subject Matter Knowledge</i>	Expand knowledge into herbicides, mechanical weed management, and farm succession.	Develop Herbicide Mode of Action factsheet. Conduct an herbicide trial. Collaborate with Land for Good to deliver farm succession assistance to growers.
	Increase knowledge of pesticide chemistry	Continue working with the Maine Board of Pesticide Control on 24C approvals/denials to the WBB industry.
	Continually seek to understand blueberry industry and grower needs.	Develop Winter 2023 survey to evaluate my program impacts. Receive feedback from conversations with growers and at Wild Blueberry Commission of Maine Advisory Committee meetings every 6 months.
<i>Program Development Abilities</i>	Improve my ability to evaluate and measure the impact of my work and programs.	Read Journal of Extension articles on measuring impact such as “Reporting Program Impacts.”
	Improve my program’s ability to reach all wild blueberry growers and styles of learning.	Distribute Annual Wild Blueberry Report to public libraries and develop a condensed, digestible version of research results for growers. Continue updating the Wild Blueberry Website and other materials to improve visitor access to research-based knowledge. Continue to update grower contact information.
<i>Scholarship and Professional Activity</i>	Become an expert in blueberry IPM.	Continue to publish scientific publications, connect with new colleagues and review scientific articles for experts in my field.
	Improve my leadership and facilitation skills to become better at addressing DEI.	Join the Office for Diversity and Inclusion Newsletter for ideas on how to incorporate DEI into my programs.
<i>Interpersonal Skills</i>	Improve my supervisory skills of technicians.	Continue holding weekly meetings and annual reviews with my employees, including an opportunity for feedback on my leadership approach.
<i>Organizational Understanding</i>	Improve my understanding of the University of Maine system and departments on UMaine campus.	Attend UMCE and SFA Faculty Meetings. Represent UMaine Extension on the Grad Board, PACE, and when requested for information from the Maine State Legislature. Extend my research collaborations across UMaine campus and beyond.
	Improve my understanding of Ethics and Civil Rights	Continue to complete Ethics and Civil Rights Trainings. Join the Office for Diversity and Inclusion Newsletter for ideas on how to incorporate DEI into my programs.

Program Administrator:  Date: March 18, 2022

IV. PROGRAM SUMMARIES

PROGRAM SUMMARY I. Integrated Pest and Crop Management

Background

As the Wild Blueberry (WBB) Specialist, I provide research-based knowledge to help growers adapt their IPM (integrated pest management) and crop management practices to current and emerging needs. Based on their needs, I design and implement applied research and create educational opportunities.

Criterion 1: Conducts issues and needs assessment

In 2018 and 2019 I conducted grower surveys (total 124 responses) that indicated weed (72 out of 124, 58%), nutrient (35 out of 124, 28%), and soil (35 out of 124, 28%) management were the top three management topics of interest. In an organic specific survey in 2018, 23 of the 28 respondents (82%) indicated organic nutrient management, and 26 (92%) indicated organic weed management were priority research and education needs.

Tools, Methods, and Sources Used: 1. Surveys conducted before and after events on paper and online (Qualtrics), 2. One-on-one and group consultations with growers and processors through farm visits, emails, phone calls, field meetings, and Wild Blueberry Commission of Maine Advisory Committee, 3. Continual use of national USDA survey data, literature reviews, and Wild Blueberry Commission of Maine Research Priorities.

Criterion 2: Sets goals and outcome-based objectives

Goal: Develop a pest and crop management research and education program for WBB growers with the following objectives to achieve by 2023.

1) Short-term objectives:

- a. Pest and crop management resources will be publicly available and accessed at least 1,500 times.
- b. 50 WBB growers will document increasing their knowledge of a weed, nutrient, or soil management strategy from materials available and/or participation in programing.

2) Long-term objective:

- a. 30 WBB blueberry growers will implement a weed, nutrient, or soil management strategy as a result of materials available and/or participation in programing.

This program meets the UMaine Extension Priority Issue Area to "adopt and maintain integrated pest management strategies," and "adopt techniques to improve soil quality."

Criterion 3: Designs, delivers, evaluates, refines, and reports programs

To meet these objectives, I offer the following educational materials and events. I evaluate and refine them as needed based on post-event feedback and suggestions from farmers and colleagues. More detail on meetings held and grants awarded for this research and extension program is located in my Expanded CV., P.A. I and III.

WBB Website and Newsletter: I write and distribute a bi-monthly newsletter via both email and mail to 750 contacts. In 2020 I conducted a Newsletter Evaluation and refined it by adding more crop updates and research findings according to feedback.

UMaine WBB Conference: I organize, present, and facilitate this event held annually. Material is delivered through invited oral presentations, paper handouts, facilitated panels, and now Zoom. Based on feedback in 2019, I moved the date of this event to a weekend in 2020. The WBB research team (plant pathologist, entomologist, and plant physiologist) collaborate to bring the most relevant information to growers for this event.

Field Days and Workshops: I organize and deliver meetings held on wild blueberry farms in 9 counties with an average of 12 meetings/year. Topics covered at field days are determined through needs assessment (see above). In 2020, I lead an effort to create an online Sprayer Calibration Review course.

Research and Extension Annual Report: I annually compile all research and Extension efforts completed for the wild blueberry industry by multiple researchers including myself in the form of a farmer friendly research report book. Although published for decades, I have made this report available to all WBB growers to access.

System Reporting: I submit reports to USDA, MPRS, School of Food and Agriculture, and the Maine Agriculture and Forestry Experiment Station (MAFES).

Criterion 4: Documenting impacts (corresponds with Criterion 2)

In order to refine my program and document the impact of research and outreach activities, I include evaluation and impact questions in each post-event survey.

1) *Short Term Program Impacts:*

- a. Thus far, I reach an average of 387 people at my events/year, which have been held in 9 different counties, compared to the 310 that my predecessor reached in 4 counties in 2018.
- b. I have added 7 factsheets and updated the UMaine WBB website that I manage. This has resulted in an increased number of total page visits from 98,399 in 2018 to 150,068 in 2021 (+53%). Based on website feedback, I have refined 8 pages.

2) *Medium Term Program Impacts:*

- a. 34 of 55 participants (81%) who completed the 2020 WBB Conference survey indicated that they increased their knowledge of WBB pest or crop management.
- b. Of those who completed the 2021 WBB Conference survey, participants indicated that they increased their knowledge about weed management tactics (17 of 29, 58%), nutrient management (17 of 29, 58%), and mulching (15 of 29, 52%).

3) *Long Term Program Impacts:*

- a. 20 of 40 participants (50%) who completed the 2021 BHF Field Day survey indicated that they planned to implement a weed management practice as a result of attending. 16 of 29 (55%) who completed the 2021 WBB Conference survey indicated they would implement a cultural weed management tool and 13 of 29 (45%) a nutrient management practice as a result of attending.
- b. Due to my research and education on mulching in collaboration with NRCS, just in Hancock county, the number of WBB acres mulched increased from 15.5 in 2019 to 29.3 in 2020 with continued growth expected. Source: Hancock County NRCS.

Criterion 6: Conducts applied research to support program development

I have been collaborating with growers through both on-farm research at private farms, and at Blueberry Hill Farm Agricultural and Forest Experiment Station since 2018. Please see grants awarded in Expanded CV., P.A. I Table 1 and collaborators in Table 2 for more detail.

Criterion 7: Seeks and acquires grants, contracts, and special funds in support of educational program development

Collaborators and I have been awarded 16 grants (\$892,398 total) for applied pest and crop research and this Extension program from 2018-2022. Please see my expanded CV for completed and current grants in P.A. I Table 1.

PROGRAM SUMMARY II. Wild Blueberry Quality and Value-added Markets

Background

The price of frozen conventional wild blueberries (WBB) hardly justifies the cost of production. The goal of this program is to increase the quality of fresh, value-added, and frozen WBB to improve market opportunities.

Criterion 1: Conducts issues and needs assessment

According to my 2018 survey, 30 of 63 (47%) respondents indicated that value-added products were in their top 4 interests. In the same survey, 47 of 63 (75%) respondents indicated that their farm was not profitable in 2017. The WBB Commission of Maine created a new Fresh Pack and Value-added Committee of growers interested in pursuing diversification in 2018 for which the objectives for this program align closely.

Tools, Methods, and Sources Used: 1. Surveys conducted before and after events on paper and online (Qualtrics), 2. One-on-one and group consultations with growers and processors through farm visits, emails, phone calls, field meetings, and Wild Blueberry Commission of Maine Advisory Committee, 3. Continual use of national USDA survey data and literature reviews.

Criterion 2: Sets goals and outcome-based objectives in relation to the State Plan of Work

I have developed a berry quality research and education program for WBB growers and processors with the following objectives to achieve by 2023.

1) Short-term objectives:

- a. 30 WBB farmers and value-added food processors will indicate that they have made a new connection with either a buyer or source of WBB.
- b. 30 WBB growers will add at least one new market avenue to their operation.

2) Long-term objective:

- c. 10 WBB growers will increase their revenue due to market diversification.

This program meets three of UMaine's Extension Priority Issue Areas including "New crops and markets developed," establish new farm enterprises," and "increase consumption and preservation of healthful, locally-grown and produced food."

Criterion 3: Designs, delivers, evaluates, refines, and reports programs

WBB Website and Newsletter: [Three new factsheets](#) (3,813 total views in 2021) were developed and placed onto a new berry quality webpage to provide WBB specific quality and food safety information in 2020. Newsletter feedback in 2021 indicated that recipients would like to hear more about blueberry markets and marketing in the future, which I suggested and is now covered by the WBB Commission of Maine newsletter.

UMaine WBB Conference: Based on 2019 event feedback, I refined the 2020-2022 conferences to include presentations and producer panels on starting value-added businesses, specialty food trends, fresh pack line improvements, shelf life extension, and producing wild blueberry wine.

Field Days: Five of sixteen field days that I organized, presented, and facilitated were held on farms where diversified markets were discussed and showcased.

One-on-one consultation: Thus far, I have provided at least 55 individual consultations specifically on value-added topics with farmers, blueberry processors, and value-added businesses. In 2020, I helped coordinate a tour for John Belding (Director of the Advanced Manufacturing Center) where he visited WBB farms to provide technical assistance on fresh pack line efficiency.

Criterion 4: Documents impact with emphasis on economic, environmental, and social conditions for Maine citizens and others

1) Short Term Impacts:

- a. From one-on-one consultations, I have connected 9 different WBB growers to 10 different WBB buyers for successful business partnerships.
- b. “In 2021 we hope to have lowered the percent of berries that we sell to a freezer to 40% from 100% in 2017 and so much of our gain has been realized by connections shared by Lily Calderwood our Extension Wild Blueberry Specialist. We have developed strong sales agreements with a winery, a vinegar maker and had one with an ice cream manufacturer until the Pandemic changed their business model. All these partnerships were developed because of Lily’s work as a conduit between potential new markets and growers throughout Maine.” – WBB Grower and Value-added Producer, Hope ME

2) Medium Term Impacts:

- a. 21 of 40 respondents (53%) to a zoom poll at the 2022 WBB Conference indicated that they had expanded their fresh-pack operation in the last 5 years.
- b. 5 of 11 respondents (45%) to a zoom poll at the 2022 WBB Conference indicated that they had expanded into value-added products in the last 5 years.

3) Long Term Impacts:

- a. 34 of 40 respondents (87%) to a zoom poll at the 2022 WBB Conference indicated that the expansion of their fresh-pack operation increased their revenue and 6 of 11 respondents (54%) indicated that their expansion into value-added products increased their revenue in the last 5 years.

Criterion 6: Conducts or collaborates on applied research to support program development

I have collaborated with SFA and Extension faculty, colleagues at other universities (Dalhousie, Cornell) and external agencies (MOFGA) and industry to obtain funding for my education and research programs. Please see grants awarded in Expanded CV., P.A. 1 Table 1 and collaborators in Table 2 for more detail.

Criterion 7: Seeks and acquires grants, contracts, and special funds in support of educational program development

I am the lead PI on a USDA CARE grant to study WBB ripening and development in the field to meet quality standards for value-added markets. I am also the lead PI on a SARE partnership grant to identify the appropriate temperatures and humidity required to maintain WBB quality with only one cooling step along their distribution journey from farm to market.

- **Calderwood, L.**, B. Calder, J. Perry, B. Perkins, J. Meyers, and T. Esau. Improving Northeast Berry Quality for Value-added Markets. Critical Agriculture Research and Extension (CARE) USDA NIFA (\$292,715) 2020-2023.
- **Calderwood, L.** and M. Peronto. Improving Shelf Life of Fresh Pack Maine Wild Blueberries. Northeast Sustainable Agriculture Research and Education (NE SARE) Partnership Grant USDA (\$28,270) 2021-2023.

V. EXPANDED CURRICULUM VITAE

LILY CALDERWOOD

**Extension Wild Blueberry Specialist
Assistant Professor of Horticulture**

Job Description

As the Extension Wild Blueberry Specialist (70%) and Assistant Professor of Horticulture (30%), it is my responsibility to conduct applied research and disseminate research-based knowledge to the wild blueberry farmers and processors of Maine. I am responsible for the development and delivery of crop and pest management educational material and for acquiring external funding that strengthens those educational efforts. I work collaboratively with growers, the Wild Blueberry Advisory Committees, and state agencies to identify research and education needs.

Contact Information

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Office: 207-581-2321
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Academic Background

2011 - 2015

Doctor of Philosophy (Ph.D.) in Plant and Soil Science

University of Vermont, Burlington, VT

Dissertation Title: Top-Down and Bottom Up-Tools for Integrated Pest Management in Northeastern Hop Production

2006 - 2009

Bachelor of Arts in Biology

Minor in Environmental Studies
Wheaton College, Norton, MA

Employment Experience

Assistant Professor, University of Maine Cooperative Extension (70%) and School of Food and Agriculture (30%), Orono, Maine. (March 2018-present)

Commercial Horticulture Senior Resource Educator, Cornell Cooperative Extension, Capital Area Agriculture and Horticulture Program, Albany, New York. (January 2016 – March 2018)

IPM Specialist, University of Vermont Extension, Northwest Crops and Soils Team, St. Albans, Vermont. (April 2015 – January 2016)

Research Assistant, University of Vermont, Department of Plant and Soil Science, Burlington, Vermont. (2014-2015)

Teaching Assistant, University of Vermont, Department of Plant and Soil Science, Burlington, Vermont. (2011-2014)

Research and Fellowship Program Coordinator, Earthwatch Institute, Boston, Massachusetts. (December 2009 - August 2011)

Research Assistant, Massachusetts Audubon Society, Wellfleet, Massachusetts. (May 2009 - November 2009)

Licenses and Certifications

- Maine Commercial Pesticide Applicator- Master (2020)
- Maine Commercial Pesticide Applicator (2019 Core, Blueberry, Research)
- UMaine Tractor Safety Course, Roger's Farm (2018)

PERFORMANCE AREA I: Educational Program Development

Criterion 5: Engages in professional development

The following activities that I attended between March 2018 and March 2021 have helped to increase my knowledge and improve my effectiveness in wild blueberry production and Maine agriculture.

Subject Matter Knowledge

The wild blueberry production system is unique. Attending crop specific events in 2018 with Dr. Yarborough and Dr. Drummond taught me more about the biology of this crop, identified gaps in knowledge, and helped me learn more about completed, current, and up-coming research and extension efforts. To date, I have attended the following events that contribute to my expanding subject matter knowledge:

- ISHS 12th International Vaccinium Symposium (August 30-September 1, 2021, Virtual)
- North American Blueberry Researchers and Extension Workers Conference (NABREW) (August 13-15, 2018, Orono, ME)
- Eating on the Wild Side; Blueberry Marketing (July 10, 2018, Dresden ME)
- Nova Scotia Wild Blueberry Field Day (July 21, 2018, Amherst, NS)
- Wild Blueberry Producers Association of Nova Scotia Conference (April 2019, Truro NS)
- IR4 Priorities Meeting, University of Maryland, MD (April 2019)
- Maine Wild Blueberry Legislative Tour (August 2019)

Certifications Gained

- Acquired Private Pesticide Applicator License, March 2019
- Acquired Master Pesticide Applicator License, July 2020

Leadership Development

As a new agricultural leader for a large commodity, it is important that I continue to develop my ability to supervise/manage employees and students/projects, represent my programs, and represent UMaine Extension.

- University of Maine 2019 Faculty Fellow, Margaret Chase Smith Policy Center
- Handling Difficult Conversations, June 2019, Augusta, ME (Attendee)
- Maine Climate and Agriculture Network (MECAN) (Member)
- University Research Council (URC) (Extension Representative)
- Provost's Advisory Council on Equality (PACE) (Extension Representative)
- STEM Workforce Development in Maine, Maine Chamber of Commerce
 - I gave a presentation on how Extension fits in to our future STEM workforce
- Legislative Check-In with Chancellor Malloy (December 17, 2020)
 - I gave a summary of Wild Blueberry Climate Research and Extension

Educational Development

Due to Covid-19, I learned and executed the following new online educational delivery methods.

- Developed video editing skills to post the 2020 Virtual Field Days, 2021 and 2022 UMaine Wild Blueberry Conference recordings online.
- Collaborated with Mark Hutchinson and Caragh Fitzgerald to create an online [Sprayer Calibration Review](#) course for pesticide credit.
- Created the [Real Time Phenology Tracker](#) during the 2020 season. Data collected in the field was entered weekly for growers to watch the wild blueberry crop develop across the state of Maine.

Organizational Understanding

By attending and participating in UMaine trainings and events, I gain an understanding of expectations (including civil rights and inclusivity) and the internal functions of the University of Maine System.

- Civil Rights Diversity Training (completed 2019, 2020)
- Social & Behavioral Human Subject Research Training (completed 2018)
- FERPA Training (completed 2020)
- Information Security Training (completed 2020)
- Sexual Harassment Prevention Training (completed 2020)
- Title IX Training (completed 2021)
- Conflicts of Interest Training (completed 2019, 2021)
- New Faculty Orientation (attended 2019)
- Search Committee Hiring & Recruitment Equal Opportunity Training (completed)
- Attend Cooperative Extension and School of Food and Agriculture faculty meetings
- Attended University of Maine Cooperative Extension Events from other programs (2018 and 2019)

- Attended University Research Council Meetings as the Extension representative (2020-2021)

Scholarly Activity

- Entomological Society of America Annual Meeting, Governing Council Treasurer (November 2018, Vancouver, BC)
 - Networked with the BC Blueberry Research Council and Washington State University Blueberry Extension Program
- New England Vegetable and Berry Extension Team Meeting (December 18, 2018, Fairlee, VT)
 - Collaborated with other Small Fruit Extension Specialists in New England
- Northeast Berry Calls (seasonal weekly Zoom calls 2018-2021)
 - Led by Cornell Cooperative Extension. Extension Small Fruit Specialists and farmers throughout the Northeast region call in once weekly during the critical spring and summer berry season to report on pest and crop management status.
- Submitted and revised several manuscripts for scientific journals (See Performance Area III, Criterion 1).

Knowledge Sharing

- Shared steps that the WBB industry took to orchestrate a safe Covid-19 season and our new protocols. (Summer 2020)
- Shared updated Pesticide and Fertilizer Company Reps Serving Maine Farmers Contact List with the Maine Vegetable and Fruit Extension Specialists and Professionals through the listserv. (January 2022)
- As the new co-coordinator of [NEWA](#) (pest and crop weather tool system) I shared information on how to link current weather stations to the system and where farmers can find tutorials on how to use NEWA pest and crop models with several groups including: Pest Management Office, Maine Veg and Berry List Serve, MOFGA, and Wild Blueberry Growers. (February 2022)

Criterion 6: Conducts or collaborates on applied research to support program development

As lead PI, I have been awarded \$1,047,314 in external grants and \$92,486 in internal grants. In collaboration with colleagues at Cornell University, Dalhousie University, and the University of Maine Schools of Biology and Ecology and Food and Agriculture, we have been awarded a total of 20 grants totaling \$1,378,114. Below are two tables outlining completed grants in Table 1A and current grants in 1B. All of these projects contribute to my applied research and education program.

Table 1A. Completed Grant and Gift Activity

Fund Type	Grantor	Award	Title	Dates	My Role*
Completed, External	Wild Blueberry Commission of Maine 2019	\$35,155	Program Support: outreach material printing, 2-4 months of technician, mileage	2019	Lead PI.
Completed, External	Wild Blueberry Commission of Maine 2020	\$47,693	Program Support: outreach material printing, 3 pilot projects, mileage	2020	Lead PI.
Completed, External	Wild Blueberry Commission of Maine 2021	\$18,828	Program Support: Gap funding for SARE RE grant, outreach material printing, and mileage	2021	Lead PI.
Completed, External	State of Maine Specialty Crop Block	\$99,880	Improving Wild Blueberry Production with IPM for Weeds and Diseases	2018-2021	Co-PI. S. Annis is Lead PI (SBE).
Completed, External	State of Maine Specialty Crop Block	\$43,851	Effects of Phenology and Fertilizer Applications on Wild Blueberry Production and Pests	2020-2021	Co-PI. Y. Zhang is Lead PI (SBE).
Completed, External	BlueWave Solar	\$29,876	Exploration of Dual-Use Solar in Wild Blueberry	2021	Lead PI.
Completed, Internal	Maine Food and Agriculture Center	\$4,999	Developing Precision Weed Management for Maine Wild Blueberry Production	2018-2019	Lead PI.
Completed, Internal	UMaine Research Reinvestment Fund	\$44,000	A Platform Using a Cyber Physical System and UAV to Detect Temporal and Spatial Variation for Precision Agriculture. UMaine Research Reinvestment Fund.	2019-2020	Co-PI. Y. Zhang is Lead PI (SBE).
Completed, Internal	Mitchell Center for Sustainable Solutions	\$26,582	Increasing Maine Farmer Capacity to Succeed in a Changing Environment: Needs Assessment	2019-2020	Lead PI

*My role as “Lead PI” includes management, project design, execution, analysis, and dissemination. My role as “Co-PI” includes work on a specific research or Extension aspect of the project. My role as “Collaborator” is the least involved and includes work on specific events or efforts.

Table 1B. Current Grant and Gift Activity

Fund Type	Grantor	Award	Title	Dates	My Role*
External	USDA NE SARE Novel Approach	\$134,509	Investigating Dual-use Solar for Wild Blueberry Farms in Maine	2022- 2025	Lead PI.
External	USDA NRCS Conservation Innovation Grant	\$74,960	Whole Field Mulching for Wild Blueberry Drought Management	2021- 2024	Lead PI.
External	State of Maine Specialty Crop Block	\$99,894	Exploring Fertilizers, Soil Amendments, and Pollination as Tools to Improve Wild Blueberry Resilience to Warming	2022- 2023	Lead PI. Co-PIs are Y. Zhang and P. Fanning (SBE).
External	USDA NE SARE Partnership	\$28, 270	Improving Shelf Life of Fresh Pack Maine Wild Blueberries	2020- 2023	Lead PI. Co-PI is M. Peronto (Hancock Cty).
External	USDA CARE	\$292,716	Improving Northeast Berry Quality for Value-Added Markets	2020- 2023	Lead PI. Co-PIs T. Esau (Dal), J. Meyers (Cornell), and the UMaine Food Science Team (SFA).
External	Wild Blueberry Commission of Maine 2022	26, 957	Program Support: Gap funding for undergraduate support, outreach material printing, and mileage	2022	Lead PI.
External	USDA NE SARE Research and Education	\$199,828	Nutrient and Weed Management for Organic Wild Blueberry Growers	2019- 2022	Lead PI.
External	State of Maine Specialty Crop Block	\$89,314	Effects of Fertilizer and Temperature on Wild Blueberry Pests, Yield, and Quality	2021- 2022	Co-PI. Y. Zhang is Lead PI (SBE).
External	USDA SARE Professional Development	\$149,000	The Northeast Climate Adaptation Fellowship to Support Fruit and Vegetable Producers	2020- 2023	Collaborator. R. Schattman Lead PI (SFA).
Internal	HATCH MAFES	\$10,605	Integrated Nutrient and Pest Management for Wild Blueberry Growers in Maine	2020- 2025	Lead PI.
Internal	Maine Food and Agriculture Center	\$6,300	Wild Blueberry Nutrient Sampling for Crop and Pest Management	2021- 2022	Lead PI. Co-PI is R. Gumbrewicz

*My role as “Lead PI” includes management, project design, execution, analysis, and dissemination. My role as “Co-PI” includes work on a specific research or Extension aspect of the project. My role as “Collaborator” is the least involved and includes work on specific events or efforts.

Criterion 8: Demonstrates educational program leadership

Table 2. Educational Leadership

Educational Program and My Role	Collaborator's Name	Institution/Agency/Organization
Wild Blueberry Extension Program <i>My Role: Lead PI</i>	Dr. Phil Fanning	Univ. of Maine (SBE)
	Dr. Seanna Annis	Univ. of Maine (SBE)
	Dr. Yongjaing Zhang	Univ. of Maine (SBE)
Weed and Nutrient Management <i>My role: Lead PI</i>	Dr. Yongjaing Zhang	Univ. of Maine (SBE)
	Bruce Hall	Wyman's of Maine
Berry Quality <i>My Role: Lead PI</i>	Dr. James Meyer	Cornell Cooperative Extension
	Dr. Travis Esau	Dalhousie University
	Dr. Beth Calder	UMCE, Orono
	Dr. Jennifer Perry	Univ. of Maine (SFA)
	Dr. Brian Perkins	Univ. of Maine (SFA)
	Marjorie Peronto	UMCE, Hancock/Washington Counties
Updating Whole Field Mulch Guidelines <i>My role: Lead PI</i>	Eric Venturini	Wild Blueberry Commission of Maine
	Chris Phinney	NRCS Ellsworth
Pollinator Protection Program Development <i>My role: Co-PI</i>	Dr. Frank Drummond	Univ. of Maine (SBE)
	Eric Venturini	Wild Blueberry Commission of Maine
	Alice Begin	NRCS Bangor
Business Management & Farm Succession <i>My role: Co-PI</i>	Alex Fouliard	Maine Farmland Trust
	Abby Sadauckas	Land for Good
	Eric Venturini	Wild Blueberry Commission of Maine
Food Safety for Wild Blueberry Industry <i>My Role: Collaborator</i>	Dr. Robson Machado	UMCE, Orono
	Food Safety Committee	Wild Blueberry Commission of Maine
Downeast Agriculture Conference <i>My role: Lead PI</i>	Marjorie Peronto	UMCE, Hancock/Washington Counties
	Tara Wood	UMCE Washington County
	Elizabeth Sprague	Maine Farmland Trust
	Crystal Hitchings	Sunrise County Economic Council

*My role as “Lead PI” includes management, project design, execution, analysis, and dissemination. My role as “Co-PI” includes work on a specific research or Extension aspect of the project. My role as “Collaborator” is the least involved and includes work on specific events or efforts.

Table 3. Educational Programs from 2019 - 2022 that I personally organized and was a speaker.

Year	Date	Event	County	Attendees
2019	28-Feb	UMaine Wild Blueberry Conference	Penobscot	160
	24-Apr	Safe Burning, Value-added and Food Safety Field Day	Washington	12
	22-May	Pollinator Identification/Behavior and Disease IPM Field Day	Knox	13
	3-Jun	Pollinator Identification/Behavior and IPM Field Day	Washington	13
	17-Jun	Sprayer Calibration and Disease IPM Field Day	Washington	13
	26-Jun	Fresh Pack Storage and Insect IPM Field Walk Field Day	Hancock	10
	10-Jul	Food Safety on the Farm + Value-added Products Field Day	Piscataquis	6
	8-Jul	Organic Wild Blueberry Field Day	Lincoln	20
	17-Jul	Annual Jonesboro Wild Blueberry Field Day	Washington	91
	24-Sep	Western ME Wild Blueberry Growers Meeting	Oxford	14
2020	18-Jan	Downeast Ag Conference	Washington	60
	29-Feb	UMaine WBB Conference	Penobscot	110
	6-Apr	Covid-19 Grant Programs for Farms	Virtual	41
	13-May	Fresh Pack Covid Harvest Discussion	Virtual	22
	14-May	Large Processor Covid Harvest Discussion	Virtual	9
	14-Jul	All Growers Covid Harvest Webinar	Virtual	6
	Jul	Virtual Field Day Series (4 sessions)	Virtual	61
	Apr-Jun	Friday Weekly Coffee Hours (10 sessions)	Virtual	34
	6-Oct	Downeast IPM Field Meeting, Wesley	Washington	6
	7-Oct	Mid-coast IPM Field Meeting, Hope	Knox	18
2021	21-Jan	Agricultural Trade Show: WBB Weed Management	Virtual	105
	Jan-Mar	UMaine WBB Conference (17 sessions)	Virtual	250
	25-May	IPM Field Day, Ellsworth	Hancock	17
	15-Jun	IPM Field Day, Cherryfield	Washington	22
	16-Jun	Organic IPM Field Day, Brunswick	Cumberland	9
	22-Jun	Dual-use Solar Field Day, Rockport	Knox	17
	23-Jun	Mulching Field Day, Stockton Springs	Waldo	4
	8-Jul	Blueberry Hill Farm Field Day, Jonesboro	Washington	100
2022	13-Jan	Agricultural Trade Show: WBB Weed Management	Virtual	98
	Feb-Mar	UMaine WBB Conference (14 sessions)	Virtual	155
Totals		30 Events	9 Counties	1496 Attendees

Program Leadership Teams

UMaine Leadership Teams where I provide a leadership role for others (2019-2022).

- Wild Blueberry Extension and Research Team, which includes the following members: Myself, Dr. Yongjiang Zhang (SBE), Dr. Seanna Annis (SBE), Dr. Phil Fanning (SBE), Dr. Robson Machado (SFA), Dr. Jennifer Perry (SFA), Dr. Rachel Schattman (SFA). And Dr. Jonathan Malacarne (SE)
- University Research Council (URC) (Extension Representative)
- Provost's Advisory Council on Equality (PACE) (Extension Representative)

Industry Leadership Teams where I provide a leadership role for others (2019-2022).

- Wild Blueberry Commission of Maine Research Advisory Committee
- Wild Blueberry Commission of Maine Fresh Pack and Value-added Committee
- Wild Blueberry Commission of Maine Food Safety Focus Group
- Wild Blueberry Wine Trade Group

Enhances the reputation of UMS and UMaine Cooperative Extension

- Liaison between the Maine Board of Pesticide Control and Wild Blueberry Commission of Maine for 24C pesticide product approval/denial (2019-2022).
- Treasurer for the Plant-Insect Ecosystems section of the Entomological Society of America (2016-2019).
- Public Presentations. See Table 3 above and additional below.
- Invited Speaker Presentations:
 - STEM Workforce Development in Maine, Maine Chamber of Commerce (November 13, 2020), Panelist
 - Legislative Check-In with Chancellor Malloy (December 17, 2020), Title: Wild Blueberry Climate Change Research and Extension
 - Maine Academy of Nutrition and Dietetics Conference (April 7, 2022), Panel Member to discuss Wild Blueberry Farmers and Production
 - New England Fruit and Vegetable Conference (December 15, 2022), Title: Promotional Success in the Maine Wild Blueberry Industry
- Newspaper, TV, and other reporter interviews. See Table 4 below.

Table 4. Newspaper, TV, and other Reporter Interviews that I was personally interviewed for.

News Outlet	Type	Title	Date
Scientific American	Podcast	This Maine Farm is Harvesting the Sun's Power While it Picks Blueberries	2/22/2022
The Maine Organic Farmer and Gardener	Article	Can Agriculture and Solar Farming Coexist?	Spring 2022
NPR, Science Friday	Video	Maine's Downeast Blueberry Blues	11/17/2021
News Center Maine	Video	Maine's Wild Blueberries Feeling the Heat from Climate Change	11/16/2021
Ellsworth American	Article	Better Blueberry Harvest Predicted	7/22/2021
Morning Ag Clips	Article	UMaine Extension Wild Blueberry Field Days open May 25	5/23/2021
Knox County Village Soup	Article	Local Solar Farm Will Produce Energy, Blueberries	11/12/2021
Yankee Magazine	Article	Bluet: Maine's Wild Blueberry Wine	6/21/2021
Scientific American	Article	The Effects of Covid-19 will Ripple through Food Systems	3/26/2020
Associated Press	Article	Maine Wild Blueberry Industry Reels from Drought, Frost, Virus	9/19/2020
The Maine Question	Podcast	What does the future look like for Maine's Wild Blueberries?	9/24/2020
Country Folks Grower	Article	Building Tools for Tech Savvy Farmers	12/22/2020
Ellsworth American	Article	Blueberry Crop Takes a Beating	10/8/2020
NPR, Maine Calling	Radio	Blueberries: From highbush to Wild, Blueberries are a Sweet Symbol of Maine	7/9/2019
The New York Times	Article	From Apples to Popcorn, Climate Change is Altering the Foods America Grows	4/30/2019

PERFORMANCE AREA II. Undergraduate and Graduate Teaching and Advising

Without a teaching appointment, I do not teach formal courses. However, I have advised undergraduate workers and two graduate students in addition to being an occasional guest lecturer. In collaboration with my School of Biology and Ecology wild blueberry colleagues, I am planning a short course on wild blueberry production for both farmers and undergraduates to take.

Criterion 4: Courses taught

Guest Lecturer

- BIO 327 Introductory Applied Entomology (Fall 2018)
 - I gave one lecture on plant-insect interactions
- PSE 215 Crop Production (Fall 2019, 2021)
 - I gave the Wild Blueberry Production lecture
- Wild Blueberry Course PSE 270. *In Progress, Fall 2022*. A [UMaine School of Food and Agriculture one-credit course](#) available to UMaine students and farmers.

Criterion 7: Advising commitments for honors theses, master's theses, and doctoral dissertations

Student	Degree	Program	Dates	My Role
Oluwafemi Alaba	PhD Student	SBE	2021-present	Committee Member
Carly Frank	MS Student	CCI	2021-present	Committee Member
Rafa Tasnim	PhD Student	SBE	2019- present	Committee Member
Rebecca Gumbrewicz	MS Graduated	PSE	2019-2021	Major Advisor
Yu-Ying Chen	MS Graduated	SBE	2019-2021	Committee Member
Anthony Ayers	MS Graduated	PSE	2019-2020	Major Advisor

PERFORMANCE AREA III: Scholarship and Professional Activity

Criterion 1: Scholarly works completed and in progress

Peer-reviewed Journal Articles Published Since 2018

*I was the primary advisor to these graduate students.

- Tasnim, R.; Birkel, S.; Calderwood, L.; Roberts, S.; Zhang, Y.-J. Seasonal Climate Trends across the Wild Blueberry Barrens of Maine, USA. *Atmosphere* **2022**, *13*, 690. <https://doi.org/10.3390/atmos13050690>

- **Calderwood, L.**, Koehler, G., Birkel, S., Roche, E. 2022. Weather Information and Decision Support Tool Needs Assessment. Journal of Extension. *In Press*.
- Gumbrewicz, B. * and **Calderwood, L.** 2022. Fertility Effects on Blueberry Gall Midge (Diptera: Cecidomyiidae) in Wild Blueberry (*Vaccinium angustifolium*; Ericales: Ericaceae). Journal of Economic Entomology. 115:3. <https://doi.org/10.1093/jee/toac043>

Gumbrewicz, B. * and **Calderwood, L.** 2022. Comparison of Wood Mulch Particle Sizes for Wild Blueberry Management in a Changing Climate. International Journal of Fruit Science, 22:1 <https://doi.org/10.1080/15538362.2022.2070577>

- Barai, K., **Calderwood, L.**, Wallhead, M., Vanhanen, H., Hall, B., Drummond, F., Zhang, Y.-J. 2022. High Variation in Yield among Wild Blueberry Genotypes: Can Yield Be Predicted by Leaf and Stem Functional Traits? Agronomy, 12, 617. <https://doi.org/10.3390/agronomy12030617>
- Tasnim, R., **Calderwood, L.**, Tooley, B., Wang, L., Zhang, Y.-L. 2022. Are Foliar Fertilizers Beneficial to Growth and Yield of Wild Lowbush Blueberries? Agronomy 2022, 12, 470. <https://doi.org/10.3390/agronomy12020470>
- Chen, Y., Pahadi, P., **Calderwood, L.**, Annis, S., Drummond, F., and Zhang, Y. 2022. Will Climate Warming Alter Biotic Stresses in Wild Lowbush Blueberries? Agronomy. 12:371 <https://doi.org/10.3390/agronomy12020371>
- Tasmin, R., **Calderwood, L.**, Annis, S., Drummond, F., and Zhang, Y.-L. 2020. The Future of Wild Blueberries: Testing Warming Impacts Using Open-top Chambers. Spire; The Maine Journal of Conservation and Sustainability. 4th Issue.

Peer-reviewed Journal Articles Submitted

- **Calderwood, L.**, Tooley, B., Ayers, A*. *TBD*. Evaluation of the Current Weed Community in Maine Lowbush Blueberry. Weed Technology. *In Revision*.

Extension Factsheets

*= *peer reviewed*

- Drummond, F. and **L. Calderwood**. 2018. [IPM Tactics to Reduce Pesticide Exposure to Honey Bees and Native Bees](#). * University of Maine Wild Blueberry Program for NRCS Collaboration.

- **Calderwood, L., R. Machado, C. Howard.** 2019. [Food Safety Best Management Practices for Wild Blueberry Producers in Maine.](#)*
- **Calderwood, L and B. Tooley.** 2020. [Postharvest Handling of Wild Blueberry.](#)*
- **Calderwood, L and B. Tooley.** 2020. [Wild Blueberry Concentrations: Antioxidants, Vitamins, and Minerals.](#)*
- **Calderwood, L. and B. Tooley.** 2021. [Wild Blueberry Production Schedule and Management Recommendations.](#)*
- **Calderwood, L. and B. Tooley.** 2021. [Maine Wild Blueberry Phenology Guide.](#)
- **Calderwood, L. and M. Scallon.** 2021. [Growing Wild Blueberries for Homeowners.](#)

Annual Wild Blueberry Research and Extension Report

- I am the primary editor of the [Wild Blueberry Annual Research and Extension Report](#). This document is used to communicate the details of all research conducted on wild blueberry to the Wild Blueberry Commission of Maine and the public. From 2000 to 2018 this report was only available to the Commission, yet since 2019 I have made the report available to all wild blueberry growers in print and online formats.

Website

- <https://extension.umaine.edu/blueberries/>
I manage the Wild Blueberry Website, which holds more than 200 factsheets, annually updated pesticide guides, videos, equipment for sale, crop management tools, and more. Total website page views have grown over time. In 2018 there were a total of 98,399 views, in 2019 113,658 views, in 2020 136,892 views, and in 2021 150,068 views.

Newsletter

- I compile and write the [Wild Blueberry Newsletter](#), which is sent out to 250 people by mail and 500 people by email. The target audience is both growers and industry stakeholders. There are approximately 8 issues per year with more frequent issues during the growing season. In 2020, I conducted a Newsletter Evaluation that had a low response rate (n= 15). Of those 15 respondents, 100% find the newsletter worth reading. Respondents find the crop updates and event notices to be the most valuable content and suggested including information about drought resistance tactics, weed management, and blueberry markets in future newsletters.

Extension Videos/Webinars

- Calderwood, L. and several guest speakers. [2022 UMaine Wild Blueberry Conference Series](#). Recorded Sessions in Progress. February-March 2022.

- **Calderwood, L.** and several guest speakers. [2021 UMaine Wild Blueberry Conference Series](#). Recorded Sessions in Progress. January-March 2021.
- **Calderwood, L.**, M. Hutchinson, C. Fitzgerald, J. Lilley, and J. Dill. [Sprayer Calibration Review](#) for pesticide credit. 2020.
- Calderwood, L., Fanning, P, Annis, S., Zhang, Y.-L. [Virtual 2020 Field Days](#). 2020.

Criterion 2: Unpublished professional presentations

Invited Presentations In-State

- **Calderwood, L.** G. Koehler, S. Birkel, E. Roche. Weather Tools for Tech Savvy Farmers; Decision Support Tool Needs Assessment. 2020 Mitchel Center Seminar Series.
- **Calderwood, L.** facilitated Covid-19 Harvest Logistics Virtual Discussions. April-July 2020.
- **Calderwood, L.** Weed Management and Research Update. July 2020. Virtual Field Days, Online and Recorded.
- **Calderwood L.** Blueberry Production and Biology. Falmouth Garden Club. April 2020. Virtual Talk.
- **Calderwood, L.** Observations from the Field. 2018. Annual Summer Blueberry Hill Farm Field Day. Jonesboro, ME.
- **Calderwood, L.** Sustainable Weed Management. 2018. Maine Farm Day
- **Calderwood, L.** Wild Blueberries! 2018. Downeast Tourism Symposium; Balsam, Blueberries, and Bicycles. Machias, ME.
- **Calderwood, L.** Wild Blueberry Soils and Nutrients. UMaine Wild Blueberry Conference, 2019. Orono ME.
- Drummond, F. and **Calderwood, L.** IPM Tactics to Minimize Pesticide Exposure to Bees. Agricultural Trade Show. 2019. Augusta, ME.
- **Calderwood, L.** Bees and Wild Blueberries. Schoodic Institute Brown Bag Lunch Series. 2019. Winter Harbor, ME.
- **Calderwood, L.** Wild Blueberry Production and Value-added Options. MOFGA Common Ground Fair. 2019. Unity, ME.

Criterion 3: Other scholarly activities

Articles Reviewed

- Journal of Extension (1)
- Journal of Economic Entomology (1)
- 2018 National Assoc. for Blueberry Research and Extension Workers Conference Proceedings (2)
- Ecological Applications (1)
- Crop Protection (1)
- National Association of County Agricultural Agents (NACAA) Journal (2)

- Canadian Journal of Plant Science (4)
- Environmental Entomology (2)
- Horticultural Technology (1)
- International Society for Horticultural Science (1)

Professional Memberships

- International Society for Horticultural Science (ISHS), 2019-present
- National Association of Agricultural Extension Agents, 2020-present
- Weed Science Society of America, 2021-present

PERFORMANCE AREA IV: County, Organization, and Campus Service

Criterion 1: Serves on organizational committees

University Committees

- Provost's Advisory Council on Equality (PACE) 2020-2022 (Extension Representative)
- University Research Council, 2020-2022 (Extension representative)
- Grad Board, 2022-2024 (Extension representative)

Extension Committees

- Programming for the Future Committee, February 2021
- COVID-19 Taskforce, June 2020
- Jen Loble's Peer Review Committee, 2018-2020
- Robson Machado's Peer Review Committee, 2021
- UMaine Extension Ag Leadership Committee, 2019
- UMaine Soil Health Vegetable Team 2018-2020 (fruit representative)
- Downeast Agriculture Network 2018-present (founder)

Inter-departmental Committees

- Maine Climate and Agriculture Network (MECAN), 2018-present

Criterion 2: Serves on search and interview teams

- CL2 Administrative Assistant Hiring Committee. March 2018 (60% General Extension, 40% Wild Blueberry Program)
- CL2 Administrative Assistant Hiring Committee. December 2018 (60% General Extension, 40% Wild Blueberry Program)
- Crop Entomologist Extension Faculty Hiring Committee, Presque Isle. December 2018. (90% Extension, 10% Teaching)
- Agricultural Entomologist, School of Biology and Ecology Hiring Committee. March 2019. (80% Research, 20% Teaching)
- Crop Entomologist Extension Faculty Hiring Committee, Presque Isle. November 2019. (90% Extension, 10% Teaching)
- Extension Research Assistant, Wild Blueberry Team Hiring Committee. February 2021. (Chair)

Criterion 3: Enhances skills and knowledge of County Executive Committees and other advisory groups

- Wild Blueberry Commission of Maine

This group is a state of Maine legislative statute that collects the wild blueberry tax and distributes funds based on grower and processor needs. By attending bi-annual meetings, I am present to provide research-based knowledge that helps to guide their decision making.

- Wild Blueberry Advisory Committee
This is a committee under the Wild Blueberry Commission of Maine that serves to give feedback to myself and other wild blueberry researchers at UMaine. I attend two additional meetings/year with this group to report on current research and education ideas and receive their feedback.
- Fresh-pack and Value-added Wild Blueberry Committee.
This is a newly formed committee of the Wild Blueberry Commission of Maine. I served as a facilitator of this group as they organized their mission and will continue to provide facilitation as requested.
- Food Safety Focus Group for Wild Blueberry
Also under the Wild Blueberry Commission of Maine, this is a group of wild blueberry farmers and processors who work with myself, Dr. Machado, the Maine Department of Agriculture, Conservation, and Forestry (DCAF), and the FDA to understand the new Food Safety Modernization Act (FSMA) regulations.

Criterion 4: Builds and sustains UMaine Cooperative Extension linkages with county, UM, and UMS

Formed the Downeast Agriculture Network

- I organized this group in 2018 to build relationships within the agricultural community in Washington and Hancock Counties where 60-70% of wild blueberry acreage is located. At this time, I organize a biennial Downeast Agriculture Conference with the following groups to communicate programs and goals: Washington County Council of Governments, Sunrise County Economic Council, Maine Farmland Trust, The Greenhorns, Washington County Cooperative Extension, and other UMaine Faculty.

UMaine Teams

- Wild Blueberry Extension and Research Team which includes the following members: Myself, Dr. Yongjiang Zhang (SBE), Dr. Seanna Annis (SBE), Dr. Phil Fanning (SBE), Dr. Robson Machado (SFA), Dr. Jennifer Perry (SFA), Dr. Rachel Schattman (SFA)
- Maine Climate and Agriculture Network (MECAN)
- University Research Council (URC) (Extension Representative)
- Provost's Advisory Council on Equality (PACE) (Extension Representative)
- Attend Faculty Meetings for Extension and SFA

Industry Teams

- Wild Blueberry Commission of Maine Research Advisory Committee
- Wild Blueberry Commission of Maine Fresh Pack and Value-added Committee
- Wild Blueberry Commission of Maine Food Safety Focus Group
- Wild Blueberry Wine Trade Group

Criterion 5: Conducts administrative roles and responsibilities including the role of county coordinator

Administrative Roles

- I currently manage 6 employees: two full-time extension/research assistants, one part time administrative assistant, and three seasonal undergraduates.
- I currently manage 11 grant accounts and 2 gift accounts with help from a part-time administrative assistant.

Criterion 6: Demonstrates commitment to UMaine Cooperative Extension civil rights expectations, and UMaine Extension and UM diversity goals

Trainings Completed

- Civil Rights (July 2021)
- Civil Rights (November 2020)
- Participated in book discussion “How to be an Antiracist” (October 2020)
- Handling Difficult Conversations (September 2019)
- Search committee training (April 2019)
- Conflicts of Interest (April 2019)
- General Research CR (April 2019)
- Social and Behavioral Research/IRB (October 2018)
- Civil Rights (April 2018)

PERFORMANCE AREA V: Public Service

Criterion 1: Presentation and programs that do not require engagement in the full educational program development process

Presentations

- Blueberry Production and Biology. Falmouth Garden Club, Virtual. (Spring 2020)
- Bees and Wild Blueberries. Schoodic Institute Brown Bag Lunch Series. Winter Harbor (Summer 2019)
- Wild Blueberries in Maine, Tourism Lecture. Bar Harbor (Fall 2019)
- Wild Blueberry Production. Silvia Ross Home, Bangor ME (Fall 2018)

Events

- Kids Farm Day Wild Blueberry Booth. Windsor Fairgrounds, ME (Summer 2019)
- Wild Blueberry Weekend Booth. Brodis Blueberries Hope, ME (Summer 2021)

PERFORMANCE AREA VI: Awards and Recognition

Criterion 1: Type of award or recognition

Recognition

- 2019 UMaine Faculty Fellow, Margaret Chase Smith Policy Center
- 2020 UMaine Extension Research Award