Working Lands Service Provider Application

II. Service Provider Investments

Working Lands Enterprise Initiative: Service Provider Grants are available to Agriculture, food systems, forestry & forest products service provider grants are available to Vermont non-profit organizations, associations, educational institutions, private sector or partnership groups, or other entities that provide services to agricultural and/or forestry & forest products enterprises.

Grants are available for service providers to provide the following types of technical assistance: Production training, Process improvements, Needs assessments/studies of baseline data critical to sector development, Professional and organizational development services, Product research services, Marketing assistance/market development, Business development, Financial planning, Access to capital, Regulatory assistance and training, and Addressing workforce development needs.

Applicant proposals should demonstrate capacity for regional and statewide impact, demonstrate financial sustainability of the project beyond the Working Lands Enterprise funding cycle, aggregate or provide services that benefit multiple end users, build on existing programs and partnerships, and/or create innovative models to enhance the viability of agriculture and food systems and/or forestry & forest products based businesses.

Applicants must demonstrate past experience and the ability to provide technical or business assistance to agriculture or forestry & forest products based enterprises (and/or landowners) throughout the supply chain and show how these enterprises will benefit directly from the project outlined in their proposal.

Primary applicant must be headquartered in Vermont.

Request for funds must be between $10,000 and $150,000. Applicants must provide a 50% cash/in kind match (50% of the amount of the Working Lands Enterprise grant requested).

Projects must be completed within a 15 month time frame.

The previous round of grant applications was extremely competitive with nearly 400 applications, and $12 million in requests for funds. Only 10% of applications successfully received grant funding.
All applications must be electronically submitted on Wufoo. It is imperative that you prepare the application and all templates/attachments in full and save to your computer or to an external drive BEFORE entering the Wufoo site. It may be most helpful to create your application as a Word processing document and then cut and paste into Wufoo. The Wufoo site DOES NOT save data so if you leave the site for any reason, all the data that you have entered will be lost. Note that Wufoo will automatically reset after 24 hours so even if you do not leave the site your data will be lost. Be ready to complete your entry in one sitting and submit it.

Project Title
Apple Market Optimization and Expansion through Value-Added Hard Cider Production

Project Category
Specialty crops

If Project Category is "Other", please describe

Applicant Name  First  Last
Terence Bradshaw, MS
David Conner, PhD

Organization(s)
University of Vermont (UVM) Depts. of Plant and Soil Sci (PSS) / Comm Dev & Appl Econ (CDAE). Vermont Tree Fruit Growers Assoc (VTFGA) private cideries (businesses that produce hard cider) and orchards, U.S. Assoc of Cider Makers (USACM)

Applicant Email

County
Chittenden

Working Lands Funds Requested $ Dollars . Cents
$40,000

Where in VT will this project have impact? (Statewide, a specific County, etc)
Statewide

Matching Cash Funds that will be secured upon grant agreement

Please identify the source(s) of cash match
Vermont Hard Cider Company, $10,000

Please specify any in-kind funds that will be used as match ($15,525)
Donated fruit @ $15/bu, 45 bu each:
Champlain Orchards
Sunrise Orchards
Green Mountain Orchards

Cider processing and lab analysis @ $100/lot, 30 lots each:

Vermont Hard Cider Company, LLC
Champlain Orchards
Citizen cider

Please list other grants you are applying to for this project

Planning grant will be submitted to FY 15 USDA Specialty Crops Research Initiative by VT, VA, MI, WA

Please list and explain the purpose of other grants/loans you have secured in the past 2 years

The investigating researchers at UVM are uniquely qualified to conduct this research for maximum impact. As a research institution, resources at UVM include: statistical services; extensive public outreach programs and industry collaborations; horticultural research facilities; research technicians, undergraduate and graduate students; and interdepartmental expertise among colleagues that allows for program impact and completeness far beyond what can be provided by industry organizations such as VTFGA. Project faculty are members of a national team of scientists working on similar cider apple projects who develop consistent protocols and contribute specialized expertise among states.

The UVM Apple Program conducts research and outreach programs that work to improve environmental, social, and economic sustainability of Vermont fruit growers. Dr. Connor’s research program studies economic effects on sustainable food systems. Grants received by those PIs in the past two years include:

- Apple Research & Outreach activities funded by the VTFGA 2012-2013, $3,837


• Fostering sustainable livestock production in Vermont: prospects for value chain partnerships. Vermont Agricultural Experiment Station, 2012-2014. (Conner, PI). $34,905

• Food system engagement and dietary decisions: quantitative inquiry. Vermont Agricultural Experiment Station, 2012-2013. (Conner, PI). $11,239

• Enhancing the Sustainability of Food Systems through Service-Learning-Based Education and Outreach. USDA NIFA, Agriculture and Food Research Initiative, 2011-2014. (Conner, PI and Williams Howe, co-PI). $300,233.

• Civic Agriculture and the Engaged Consumer: Prospects for Public Health and Community Economic Development. Vermont Agricultural Experiment Station. 2010-2011. $15,000.


• Farm to Institution: Opportunities for Vermont Vegetable Farmers. Vermont Agricultural Experiment Station. 2010-2011. $10,000.

• Farm-to-Institution: Guiding Marketing and Pricing Decision for Small and Medium Sized Farms. USDA AFRI Prosperity for Small and Medium Sized Farms. 2010-2013. (Conner, PI; Matts and Hamm, co-PIs). $331,800.

Where did you learn about this grant opportunity?

Contacted by Will Stevens fall 2011

By checking this box, I self certify that I am in compliance with state regulations and am in good standing with the State of Vermont

Applicant Self Certification

Have you received state or federal funds before? If yes, please list

Yes, listed above

Project and Service Provider Description

Maximum Allowed: 150 words.

We will identify horticulturally and economically feasible market expansion opportunities for Vermont orchards to grow apples for high-value processing by hard cider producers in Vermont. Through this project we will: identify production capacity and needs for market expansion; identify orchard production system and varieties suited for hard cider; and conduct economic analysis to determine price points for cider apples. Collaboration between cideries, fruit growers, and researchers will be facilitated through a Vermont Cider Network. We are seeking an initial investment in a long-term, nationally- and regionally-recognized research program on cider apple and hard cider production in Vermont. Recent
Leadership for the UVM Apple Program was provided by retiring Professor Dr. Lorraine Berkett. In 2014, Terence Bradshaw, a 19-year veteran of the Program and past President of VTFGA (2009-2014), has assumed leadership of the program. The UVM Apple Program has worked closely with VTFGA since the latter’s inception in 1896.

Core Team of individuals involved in this project

Maximun Allowed: 100 words.

Mr. Terence Bradshaw, VTFGA President 2009-2014, UVM Apple Program Research Specialist 1999-2014, UVM Horticulture Research Center Director 2005-, UVM PSS faculty Research Associate 2014-, and owner of Lost Meadow Cider Mill 2006-, has conducted related research projects, including: cultivar performance trials, horticultural and economic assessment of organic and reduced-input orchards, and statewide fruit quality assessment. Dr. David Conner, UVM CDAE Assistant Professor of Agricultural Economics 2008-, has conducted research on economic opportunities and outcomes of sustainable agriculture and food systems including farm-to-school programs, organic tree fruit systems, and low-input dairy production since 1996.

Upload the Goals, Performance Measures, and Outcomes Template and Narrative Here.

Project Need

Maximum Allowed: 100 words.

Nationally and at the state level, the hard cider market has experienced average annual growth of over 15% for the past five years. In 2013, WLEF invested in juice pressing infrastructure at Champlain Orchards to facilitate expansion of the Vermont hard cider industry. That project did not address the key bottleneck in increasing purchases of local apples: availability of a consistent supply of quality fruit priced for processing markets. This proposal addresses industry identified needs, please see letters of support from: Vermont Hard Cider, Citizens Cider, Champlain Orchards, USACM, VTFGA, and orchards interested in growing cider apples.

Project Readiness

Maximum Allowed: 100 words.

Timeline:

May 2014: Survey orchards and processors; identify research sites and available cultivars.

June-Oct 2014: Select sites, begin horticulture and economic data collection, coordinate fruit needs between growers and cideries; conduct financial analysis of orchard systems.

Sep-Dec 2014: Collect horticultural (yield) and economic data. Coordinate fruit processing and cidermaking.

Jan-Sep 2015: Summarize economic, horticulture, and cider trials data. Prepare final report and present results at VTFGA meetings as well USACM Cider Conference 2015. Meet with stakeholders to continue
to meet producer needs identified and informed by WLEF project. Submit, with national collaborators, competitive proposal to continue and expand program.

**Sustainability**

*Maximum Allowed: 100 words.*

This project provides initial investment in a long-term research focus of the applicant. A research team of scientists from Michigan, Vermont, Virginia, and Washington has recently convened to address research needs addressed by USACM and local grower organizations and will be submitting a multi-year USDA proposal to coordinate similar efforts in their states and to increase faculty expertise and program impact. Because of the long-term nature of apple production, cideries and fruit growers will develop lasting relationships as a result of this research that will improve the sustainability of each industry.

**Innovation**

*Maximum Allowed: 100 words. Currently Used: 0 words.*

Little research on cider apple production is presently conducted nationally. Growing cider apples is novel; New England’s (sweet) cider processing market relies on crop failures from hail or pest damage to provide fruit, and those fruit are purchased at below cost-of-production prices. Cideries require consistent supplies of hard cider apple varieties, i.e. traditional commodity varieties (McIntosh, Cortland), dual-purpose varieties (Idared, Northern Spy), and specific cider apples with unique flavor, acid, and tannin characteristics (Dabinett, Golden Russet). Farms will commit acreage to support this new and growing market, which will increase economic opportunities for orchards and cideries statewide.

**Beneficiaries**

*Maximum Allowed: 100 words. Currently Used: 0 words.*

Beneficiaries of this project will include apple growers, cideries, consumers, and rural communities statewide. Fresh market Vermont apple growers presently have few outlets for blemished fruit because markets are largely dominated by fresh juice processors that pay low prices for apples. Increased production of hard cider in the region represents an opportunity to increase prices to growers for cider fruit. This will allow for expansion of cider and orchard business, increased employment and profitability for both industries, and expansion and enhancement of the Vermont brand by increasing supply of high-quality ciders made from Vermont fruit.
**Working Lands Service Provider Grants**  
Apple Market Optimization and Expansion through Value-Added Hard Cider Production  
CoPIs: Terence Bradshaw & David Conner

### A) Goals, Performance Measures, and Outcomes Template

<table>
<thead>
<tr>
<th>Goals</th>
<th>Performance Measures</th>
<th>Expected Outcomes</th>
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| Develop a specialty network supporting multiple parties on the value chain to facilitate coordination between ciders and apple growers to improve fruit availability and quality. *(F2P goals 11,12,16,19, & 25)* | • Form VT Cider Network comprised of ciders and cider apple growers using UVM Apple Program outreach platform (mailing lists, interactive grower forum) to facilitate collaboration | • 40 fruit growers and commercial ciders join the network  
• At least one meeting held annually to identify industry priorities |
| Develop understanding of production capacity for ciders and apple growers interested in growing cider apples via survey of 40 stakeholders *(F2P goals 1,13,16,19, & 25)* | • Total quantity of fruit required by ciders  
• Quantity of VT fruit currently purchased by ciders  
• Quantity of fruit ciders willing to purchase from VT orchards  
• Acreage of fruit grown for cider processors  
• Available acreage for expansion by VT apple growers  
• Prices paid for different grades of cider fruit | • Increase quantity of VT fruit purchased by ciders by 15%  
• Increase % of all VT cidery fruit that is VT-grown by 15%  
• Increase acreage of cider apples by 15%  
• Reduce cost of production of cider apples by 15% |
| Conduct economic analysis of orchards to determine price points and overall feasibility of growing processing apples for three orchard production systems (high density specialty variety, low density specialty variety, commodity dessert variety (i.e. ‘McIntosh’) culls for cidermatters *(F2P goals 4,6,7,9,11 and 16)* | • Input costs per acre/bushel  
• Labor costs per acre/bushel  
• Gross returns per acre | • Reduce input and labor costs (pesticides, fertilizers, pruning, harvest, etc.) in cider apple orchards by 15% over fresh-market orchards  
• Cider apple production systems will generate at least equal revenue per acre as industry standard for fresh market fruit in Vermont *(NASS economic data)* |
Identify presently-growing or unique apple cultivars that meet the needs of orchards and cideries via horticultural testing, juice quality assessment, and coordinated fermentation trials at commercial cideries (F2P goals 4,6,7,9,11 and 16)

- Collect yield and tree growth data from three representative orchards
- Analyze juice from ten apple varieties for characteristics important to cidemaking (sugars, acids, tannins)
- Evaluate ciders for standard organoleptic characteristics: color, aroma, bitterness, sweetness, astringency, body, flavor profile
- Conduct hedonic analysis of ciders to determine commercial acceptability of assessed apple varieties
- Five varieties selected as suitable for cidery needs for increased production in Vermont orchards

**B) Goals, Performance Measures, and Outcomes Narrative Questions**

1. **Why is your project being proposed?**

   Vermont cideries have expanded production several-fold in recent years, which mimics national trends, and new cideries continue to open. Cideries indicate that their greatest challenge to maintaining growth and product supply is accessing an adequate supply of fruit.

   At the 2014 U.S. Cider Makers Association Conference, over 400 participants, including representatives from several Vermont companies, outlined research and education needs essential to their continued business growth. Common research needs expressed include: economic analysis of cider apple production systems; regional evaluation of apple varieties for hard cider makers; horticultural education programs for cider apple growers; and access to fermentation scientists who may address unique challenges in cider processing. Five University faculty representing the major production regions (Dr. Nikki Rothwell (pest management & horticulture, MI); Mr. Terence Bradshaw (horticulture, pest management, & economics, VT); Dr. Greg Peck (horticulture and economics, VA); Dr. Amanda Stewart (fermentation science, VA); and Dr. Carol Miles (horticulture, WA)) formed a collaborative multidisciplinary team to address cider makers’ and apple growers’ research priorities.

   *This WLEF project is intended to be an initial investment for Vermont’s hard cider and apple industries in a long-term, nationally-coordinated program that will address grower and cider maker needs through multidisciplinary research and outreach.*

2. **What do you wish to accomplish using measurable targets that will be met through your project?**

   This project will provide important industry data, horticultural and economic analysis of cider apple production, and facilitation of grower and cidery networking to improve feasibility and profitability of growing fruit for Vermont cideries. Performance measures, detailed in the above table, will include:
• Development of the Vermont Cider Network for orchards, cideries, and researchers to form partnerships that will enhance sustainability of their industries and address grower and cidery needs.
• A survey of Vermont apple growers and cideries to quantify production capacity.
• Collection and analysis of production costs and returns for cider apple orchards in three Vermont orchards using diverse production systems (i.e. low vs high tree density, commodity vs heirloom varieties, low-input vs conventional management).
• Identification of ten varieties of interest to Vermont cideries and collection of horticultural and juice quality data to identify varieties suited to grower and cidery needs.
• Coordination of fermentation trials of ten apple varieties in commercial cideries and evaluate finished ciders for organoleptic characteristics and hedonic preference to identify varieties suited to grower and cidery needs.

3. **What are the impacts and changes you anticipate will occur due to project work?**

We expect that program results will:

• Develop and support working relationships between orchards, cideries, and consumers.
• Increase acreage devoted to cider apple production as a complement to fresh fruit production.
• Increase cidery businesses that purchase Vermont-grown apples.
• Reduce input expenses (i.e. labor, pesticides) in cider apple orchards.
• Increase Vermont-grown apple sales (percentage and dollar) to cideries.
• Improve revenue and profitability of cideries and orchards that grow cider apples.

Beyond the short-term impacts listed previously, this research and outreach effort will improve both the hard cider and apple industries’ sustainability in the mid- to long-term.

• Contribute and provide leadership to national research and education effort supporting cider making and cider apple production.
• Increase private capital (orchard plantings, juice processing, cidery startup and expansion, cider distribution) and competitive grant (federal, state, foundation) investments in the working landscape through development of a nationally-recognized research and outreach program focused on cider apple production.

4. **How will your project enhance your ability to provide services to businesses? Please refer to examples of measurable outcomes as identified by the Working Lands Enterprise Board on the Applicant Guide. Please quantify your response, and briefly state how you think this will take place.**

Orchards and cideries have indicated that expansion of cider apple production and markets for those fruit would positively affect their businesses. When converted into hard cider, blemished fruit may see an effective increase in value from $5 to $135 per bushel (Farm to Plate Sec 3.3, p. 4). However, costs for growing, labor, storage, transport, processing, packaging, bottling, and marketing cider have not been studied to assess the overall viability of growing apples in Vermont specifically for sale to
cideries. This project will identify orchard management systems and variety selection that are critical in making long-term (20 years-plus) business decisions for both farms and cideries. Orchards are making initial investments in new, cider apple-specific orchards (see LOS from Champlain, Shelburne Orchards) or are allowing potentially useful cider apples go unharvested (LOS from Green Mountain Orchards) because important linkages in the value chain between orchards and cideries have not been made or cider prices are based on the lower fresh juice market. Comprehensive cider apple research and outreach funded are by WLEF will identify grower needs and begin to develop a body of science-based knowledge to guide them in making business decisions.

5. For food system businesses and organizations, please review the 25 goals contained in Chapter 2 of the Farm to Plate Strategic Plan. What goals will your project impact?

This project *directly addresses* the research strategies section of the VT Farm to Plate Strategic Plan Chapter 3.3 (Hard Cider, Spirits, and Wine, page 12) to conduct applied horticultural and economic research programs that enhance production of hard cider apples. It also *directly addresses* research needs identified by apple growers in 2013 (“Strategic Planning for the Vermont Apple Industry: Planning for Success in the 21st Century”, http://www.uvm.edu/~orchard/VT_AppleStratPlan_131111.pdf).

This multidisciplinary proposal impacts sections 3.1-3.6 and 4.1, 4.3, 4.5, 4.6, and 4.8 of the Farm to Plate plan (goals referenced in above table) by: increasing production of local food available to local, regional, and national consumers; identifying strategies to reduce farm inputs while maintaining profitability through high-value processing (hard cider) markets; maintaining and/or increasing acreage in sustainable orchard production and numbers of Vermont cideries; encouraging postharvest processing by unique businesses to increase demand for the crop; developing coordinated curricula and research programs for varied scales of farms and processors; and leveraging private support through project buy-in from growers and processors.
2014 Working Lands Enterprise Fund Grants Program

Apple Market Optimization and Expansion through Value-Added Hard Cider Production

CoPIs: Terence Bradshaw & David Conner

Outreach Plan

Please describe the project’s outreach plan. How will proposed services be marketed to potential clients? How will the project reach out to farm and forest based businesses that are new to receiving business and technical assistance?

The primary investigators are well-experienced in stakeholder education, with over 100 stakeholder presentations, 40 outreach publications, and 80 scientific publications combined (see CVs in supporting documents). Mr. Bradshaw has worked with the Vermont apple industry since 1995, and served as President of the VTFGA 2009-2013. He is also nationally known as an authority on small-scale hard cider production through his Lost Meadow Cider Mill operation. In 2013, he assumed leadership of the UVM Apple Program and its outreach platform. Dr. Conner contributes food systems and agricultural economics-related content to many outlets across UVM and the state’s food system. Existing outreach platforms that will be used for this project include:

1. UVM Apple program outreach (orchard.uvm.edu, email newsletters, UVM Fruit blog, social media);
2. VTFGA grower communications (monthly newsletter, email list);
3. UVM Food Systems outreach (Food Feed blog, Food Systems Research Collaborative listserv, social media);
4. Vermont Food Atlas;

Outreach activities will include:

1. Project announcement and call for participation (July 2014)
2. Monthly updates on research priorities
4. Presentations of project findings at winter meetings (winter 2015)
5. Publication of industry survey results, research protocols (Spring-Summer 2015)

Program material will follow guidelines from a similar project which the PI participates in supporting cold-climate winegrape production, the Northern Grapes Project (USDA Specialty Crops Research Initiative Coordinated Agricultural Project (CAP) #2011-51181-30850). Given the scope of WLEF, program material will focus on in-state (VT) needs, but will be tailored so as to fit into regional and national collaborations on cider apple research and outreach for which funding is currently being sought.
Working Lands - Service Provider Grant Budget Template and Narrative

Apple Market Optimization and Expansion through Value-Added Hard Cider Production

CoPIs: Terence Bradshaw & David Conner

A) Budget Template

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B) Budget Narrative

Personnel:
PI effort for Terence Bradshaw, horticultural evaluator (9.25% FTE) will be paid as a cash match from Vermont Hard Cider, LLC (see letter of support). Remaining personnel will be paid with WLEF funds: Co-PI Dr. David Conner, economic evaluation (8.33% FTE); Florence Becot, research specialist (20% FTE); and Sarah Kingsley-Richards, research technician (7.5% FTE).

Fringe:
Fringe rates for all personnel are 43.9% for FY 15 and 45.3% for FY 16 (the project will carry over for two months into FY 16). Fringe for PI Terence Bradshaw will be paid with a cash match from Vermont Hard Cider, LLC. Remaining personnel fringe will be paid with WLEF funds.

Travel:
WLEF funds will be used for two travel purposes. Travel to orchards and cideries to collect data, fruit, and to distribute pressed juice will be billed at the Federal rate of $0.57 per mile ($1,232). Two project personnel will attend the U.S. Association of Cider Makers annual Cider Conference in 2015 to present project results, collaborate with national experts on industry goals and research protocols, and collect data from cideries to guide continued efforts ($2,160).

Supplies:
Three participating orchards (Champlain Orchards, Green Mountain Orchards, Sunrise Orchards) will donate 45 bushels of cider fruit each (valued at $15 per bushel, $2,025 total in-kind matching support).
to the project for juice characteristic data collection and experimental fermentation at commercial cideries. WLEF funds are requested for supplies including juice transport containers, lab supplies for juice analysis conducted by UVM personnel, and maintenance of digital equipment including data storage, digital cameras, and computers ($1,200).

Services:
Commercial cideries (Champlain Orchards, Citizen Cider, and Vermont Hard Cider Company) will donate in-kind services inclusive of equipment and supplies to ferment 90 lots of experimental cider for analysis and organoleptic evaluation (valued at $150 per lot, $13,500 total in-kind matching support). WLEF funds are requested for juice pressing services at a commercial facility (405 gallons at $3 per gallon, $1,215 total).

The PIs were unsuccessful in receiving WLEF funding for a similar proposal in 2013. WLEF funds in the cider industry were awarded to Champlain Orchards in 2013 to address infrastructure needs for juice pressing facilities in Vermont, and this project builds upon that one. For this proposal, commercial cideries and orchard (see above) have committed in-kind or cash funding to support project goals. Commercial orchards have begun to invest in cider-apple specific orchards on a limited scale, but future investment will depend on results of variety, orchard systems, and economic evaluation of cider apple production. Orchards are ready to invest in cider apple production, but need the information that this project will generate to do so successfully.

Vermont Hard Cider has committed to invest in match funding for this and similar projects, and other commercial cideries and the U.S. Cider Makers Association are expected to follow suit in the future. Most importantly, the PIs for this proposal are involved in a national effort to develop long-term, competitively-funded programs that will extend the usefulness of this WLEF project. PI Terence Bradshaw will begin a Vermont Agriculture Experiment Station appointment in 2014 that provides base funding for applied research projects on tree fruit, with expectations that continued grant funding and industry support will be attained. This new field of research on cider apple production is expected to be a primary focus of his research program.