



ANALYSIS OF VERMONT'S FOOD SYSTEM

Food Production: Hard Cider, Spirits, and Wine

What is needed to expand production of hard cider, distilled spirits, and wine in Vermont?

In the early 19th century, Vermont was home to numerous wineries and distilleries. By mid-19th century, the [*Temperance movement*](#) had swept the Northeast and Vermont banned the consumption and production of alcohol for drinking.¹ Federal Prohibition was established in the early 20th century and then abolished by mid-century when it was recognized that economic activity was suffering, and that those who wanted a drink were still finding one.

"The temperance reform movement in this state, originated less than a year ago, is developing into an agency for well-doing of almost incredible extent and of unspeakable value."

From the Burlington Free Press and Times, published in the New York Times, December 1, 1876.

Today, the alcohol beverage industry in the United States employs millions of people and generates over half a trillion dollars in total economic impact! Even though Vermont produces a relatively small amount of total national alcohol volume, the alcohol beverage industry is a big business here as well. In fact, **despite Vermont's small size, its [breweries](#), [cideries](#), [distilleries](#), and [wineries](#) are demonstrating national leadership in fast growing**

segments of the alcohol beverage industry: craft beer, hard cider, ice cider, craft spirits, and boutique wine.

As the farm-to-glass movement blooms, Vermont's cideries, distilleries, and wineries are using a growing list of local ingredients, including apples, berries, grains, milk whey, vegetables, maple sap and syrup, honey, and grapes. Vermont is well-known for apple production and hard cider is an increasingly important value-added product

GETTING TO 2020

Goals 7, 11, and 13 of the F2P Strategic Plan focus on increasing food production, including hard cider, spirits, and wine production, for local, regional, national, and even international markets.

Goal 7: Local food production—and sales of local food—for all types of markets will increase.

Goal 11: Vermont's food processing and manufacturing capacity will expand to meet the needs of a growing food system.

Goal 13: Local food will be available at all Vermont market outlets and increasingly available at regional, national, and international market outlets.

that is winning awards² and bringing more dollars by volume for the “second-rate” apples being pressed into crisp bubbly drinks. Vermont’s craft distilled spirits are using numerous local ingredients and gaining international recognition for superior quality—including a [gold medal](#) win for [Caledonia Spirits Barr Hill Gin](#) at the 2013 Hong Kong International Wine and Spirit Competition.³ With at least 15 distilleries now operating in Vermont,⁴ the state is experiencing a “modern distilling revival,” leading one Vermont food writer to recently claim, “Within a decade, Vermont may well be known as a craft-distilling epicenter.”⁵

Growing grapes continues to present a challenge for wine production in the Northeast region: cold winters, a short growing season, and disease and other pest pressures throughout the plants’ lifespan are more of a problem here than in places like California, where the majority of U.S. wine grapes are grown. But researchers are establishing varieties that best match northern climes, and the trial-and-error experience of Vermont’s earliest wineries have begun to identify the cold-hardy varieties that grow well here while also producing quality wine.⁶ And climate change spells trouble for many of the world’s traditional grape growing regions—and possible opportunities for northern latitudes.⁷

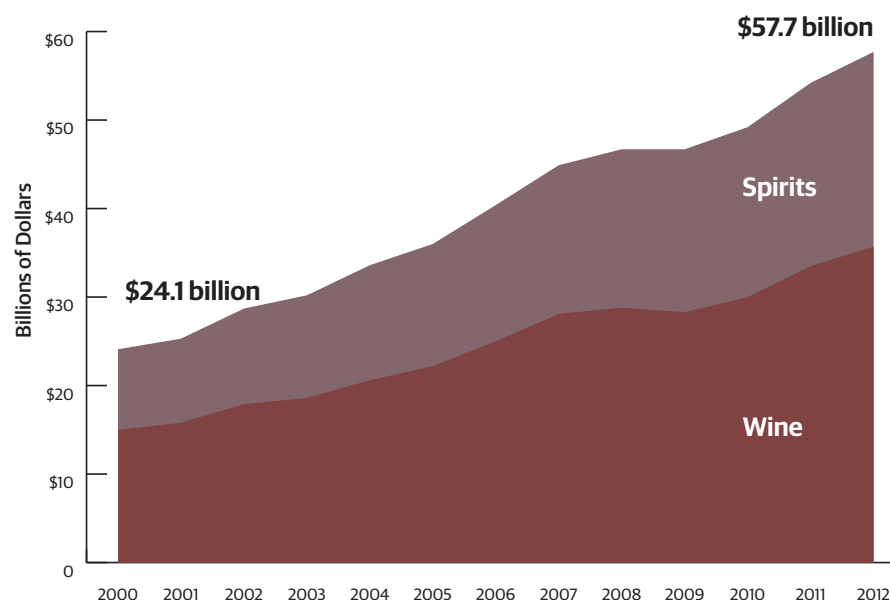
As with the craft brewing movement, sales of craft spirits, boutique wines, hard ciders, and ice ciders are taking off across the country. How can Vermont’s cideries, distilleries, and wineries catch the [craft brewing](#) wave? What is needed to continue to establish and expand production of hard cider, distilled spirits, and wine in Vermont?

CURRENT CONDITIONS

Wine and spirits are huge economic engines throughout the United States:

Wine sales were estimated at \$35.7 billion and sales of spirits were estimated at \$22.0 billion in 2012 (Figure 3.3.1, adjusted for inflation to 2010 dollars). When beer sales are included, alcohol sales were about \$157 billion in 2012. A 2007 analysis of the [economic impact](#) of the U.S. wine, grapes, and grape products industry indicated \$162 billion in total economic impact, including wages, revenue, and taxes collected.⁸ A 2010 economic impact analysis of the U.S. distilled spirits industry identified \$164 billion in total impact.⁹ If we count the total economic impact of the beer industry (estimated at \$246.5 billion in 2012) the total economic impact of the U.S. alcohol beverage industry

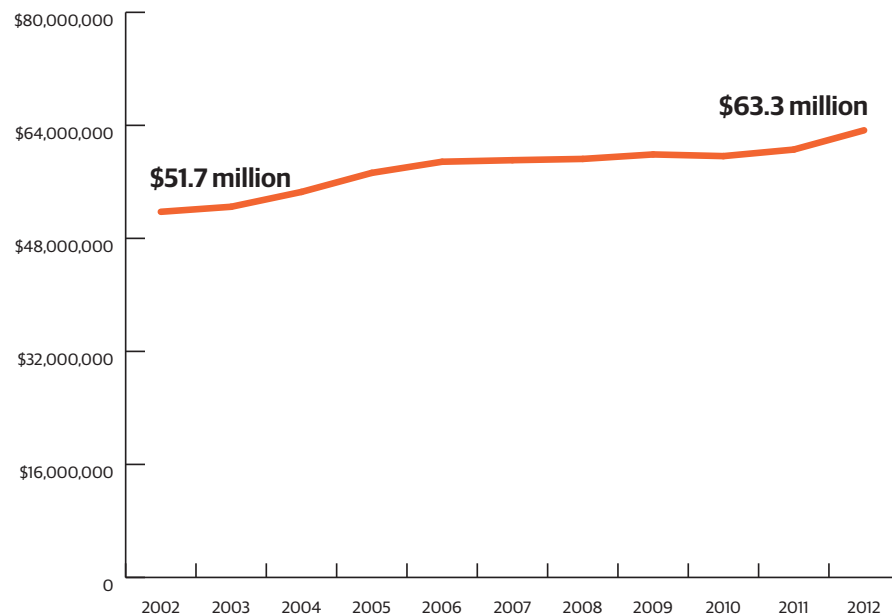
Figure 3.3.1: U.S. Wine and Spirits Sales, 2000-2012



Sources: Wine Institute, www.wineinstitute.org/resources/statistics/article697; Distilled Spirits Council of the United States, www.discus.org/assets/1/7/Distilled_Spirits_Industry_Briefing_Feb_6.pdf.

Wine and Spirits Glossary

- 🍷 **Hard cider:** A fermented alcoholic beverage made from fruit juice. (<http://en.wikipedia.org/wiki/Cider>)
- 🍷 **Spirit:** A distilled beverage that contains no added sugar and has at least 20% alcohol by volume. Alcoholic beverages other than beer and wine are commonly referred to as spirits. (<http://en.wikipedia.org/wiki/Distillation>)
- 🍷 **Distillation:** A distilled beverage, liquor, or spirit is a drinkable liquid containing ethanol that is produced by means of distilling fermented grain, fruit, or vegetables. (<http://en.wikipedia.org/wiki/Distillation>)
- 🍷 **Liqueur:** Distilled beverages that are bottled with added sugar and added flavorings. (<http://en.wikipedia.org/wiki/Distillation>)

Figure 3.3.2: Vermont Gross Liquor Sales, 2002-2012

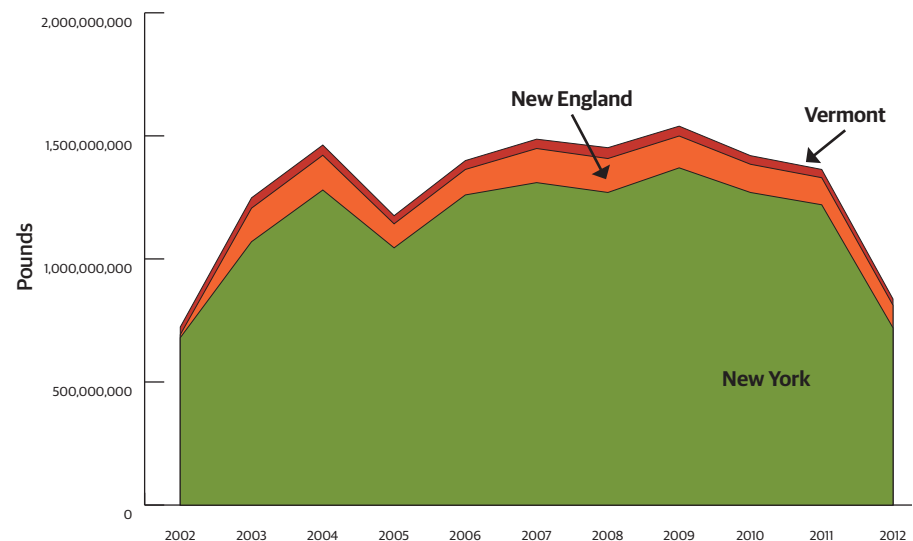
Source: Vermont Department of Liquor Control, 2012 Annual Report, <http://liquorcontrol.vermont.gov/sites/liquorcontrol/files/pdf/annualreports/DLC-AnnualReport-2012.pdf>.

is well over half a trillion dollars.¹⁰ Hard cider sales figures were estimated at about \$130 million from April 2012 through April 2013—the most in the industry's history.¹¹

Gross liquor sales (including taxes collected) for hard cider, wine, and spirits sold at Vermont liquor stores amounted to more than \$63 million at an average case price of \$163 in 2012 (Figure 3.3.2, adjusted for inflation to 2010 dollars). This is equal to only 0.11% of national wine and spirits sales, and includes Vermont and out-of-state products. Total revenue to state and local governments from liquor sales was over \$25 million in fiscal year 2012, and gross liquor sales increased 22% from 2002 to 2012.¹² Of course, the total economic impact of hard cider, spirits, and wine production in Vermont is probably quite a bit higher: A total economic impact assessment for brewing, distributing, and retailing beer in Vermont estimated a \$552 million contribution.¹³ Similar assessments have not been conducted for hard cider, spirits, and wine but it is reasonable to assume that the total economic impact of these products is greater than \$63 million.

🍷 Hard Cider Regains Popularity and Adds Value

The Northeast region (New England plus New York) has over 56,000 acres of apple orchards, down 6% from 59,900 in 2002. New York state accounts for 75% (42,000 acres) of regional apple bearing acreage, while Vermont has only 5% (2,800 acres). Total regional apple production was consistently over 1 billion pounds from 2003 to 2011, but dropped quite a bit in 2012 due to erratic weather. **New York accounted for 86% of total apple production in 2012, while Vermont produced 3% of the regional total** (Figure 3.3.3). **As of the 2007 Census of Agriculture, Vermont had 264 apple farms, while New York had 1,350. Although Vermont apples make up only a small amount of the regional total, apple orchards make up 91% of Vermont's noncitrus fruit orchards. As a practical matter, Vermont's only commodity fruit crop represents a small fraction of the apples produced by our neighbors in New York.** Consequently, Terence Bradshaw, Research Specialist for the [University of Vermont Apple and Grape Team](#), says that Vermont apple producers are exploring ways to diversify the products from their apple harvests for a variety of

Figure 3.3.3: Vermont, New England and New York Apple Production

Source: USDA NASS, www.nass.usda.gov/Statistics_by_State/New_England_includes/Publications/Annual_Statistical_Bulletin/apples2011.pdf, www.nass.usda.gov/Statistics_by_State/New_York/Historical_Data/Fruit/Fruitindex.htm.

markets.¹⁴ Hard cider represents an increasingly important value-added market for apple growers.

While hard cider was popular two hundred years ago, it fell out of fashion as settlement trended towards big cities and fancier cocktails became the norm.¹⁵ Today, hard cider sales are booming again.¹⁶ A recent industry report referred to cider as a “hot spot” riding on the success of craft beer.¹⁷ The top ten bestselling cider brands in the U.S. experienced 62% growth in sales from 2011 to 2012,¹⁸ and total sales were nearly \$90 million from November 2011 to November 2012.¹⁹ Data from April 2012 through April 2013 shows sales of \$127.8 million for the top ten hard cider brands in the U.S.²⁰ In a recent *Seven Days* article, Vermont Secretary of Agriculture Chuck Ross compared the benefit of hard cider to orchards to that of cheese to dairy farms.²¹

Bradshaw says that hard cider represents an important value-added market for apple growers to utilize dropped fruit, which presently has little or no value to growers because of foods safety concerns. For example, blemished apples typically bring in \$5 per bushel, compared to \$28 to \$52 per bushel for blemish-free eating apples.

Blemished apples made into non-alcoholic cider bring the value up to \$9 per bushel, and a whopping \$135 per bushel when made into hard cider.²² From



Woodchuck Hard Cider comes off the line and is ready for packaging.

PHOTO CREDIT: Vermont Hard Cider Company, LLC

Table 3.3.1: Vermont Hard Cider Producers

	www.champlainorchards.com (802) 897-2777 3597 Route 74 West Shoreham, VT 05770		www.harpoonbrewery.com (802) 674-5491 336 Ruth Carney Drive Windsor, VT 05089		http://stowecider.com (802) 254-5306 1815 Pucker Street Stowe, VT 05672
	www.citizencider.com (802) 448-3278 6 Laurette Drive Essex, VT 05452		www.shacksbury.com (802) 458-0530 128 Bates Rd Shoreham, VT 05770		www.windfallorchardvt.com (802) 462-3158 1491 Route 30 Cornwall, VT 05753
	www.flaghillfarm.com (802) 685-7724 135 Ewing Road Vernon, VT 05079		www.whetstoneciderworks.com (802) 254-5306 P.O. Box 512 Marlboro, VT 05344		www.woodchuck.com (802) 388-700 153 Pond Lane Middlebury, VT 05753

2002 to 2012 Vermont averaged over 36 million pounds (864,000 bushels) of apples. In some years, upwards of 20% of that crop may be lower-grade due to hail, pests, or other reasons, and thus would be destined for processing markets. This represents a potential for over 500,000 gallons of juice that could be converted into hard cider annually.²³

Vermont's contribution to the hard cider resurgence is significant: *Woodchuck Hard Cider*, Vermont's largest and most well-known cidery, makes up roughly half of the U.S. hard cider market.²⁴ While cider sales make up 0.2% of the total U.S. beer market, they make up 15-20% of the beer market in England and Ireland. *Woodchuck's* owner, Bret Williams, thinks there is significant potential for growth. If England and Ireland are any indication: "...[T]here is so much upward traction for the category, it's almost mind numbing."²⁵ In fact, *Woodchuck Hard Cider* was recently bought by Ireland's C&C Group for \$305 million.²⁶

In addition to *Woodchuck Hard Cider*, there are at least 8 other Vermont cideries (Table 3.3.1) like *Whetstone Ciderworks* and the brand new cidery, *Stowe Cider*. *Flag Hill Farm* makes two types of hard cider, *Still Cyder* and *Sparkling Cyder*, plus *Pomme-de-Vie*, a French-style apple brandy.

Most cideries, like *Champlain Orchards*, source their apples locally from their own orchards or by working with other orchards to augment supply, and can use this growing market to plan for orchard expansions. *Champlain Orchards* got into the hard cider business because the product is shelf-stable and ensures year-round cash flow, and it allows the company to expand and diversify their orchard as they move into new markets.²⁷ *Citizen Cider* in Essex has partnered with *Happy Valley Orchard* in Middlebury, a relationship that has allowed both companies to take growth risks as they coordinate on supply volume and apple varieties.²⁸ Larger operations like *Woodchuck Hard Cider* import apples from other states, although its *Farmhouse Select* is made from Addison County apples.²⁹ Some cider companies also



Bill Suhr at Champlain Orchards.

produce flavor blends that include other Vermont fruit like raspberries, cranberries, or blueberries.

Cider apple growers in the U.S. are increasingly looking to Europe for examples of low-input, high-yield orchards (i.e., high-value 'cider apples', often of European origin, but also including regionally-developed varieties, that contribute unique flavor profiles to finished ciders) that are specifically designed for cider production, and may include *mechanized harvesting* and other management techniques.³⁰

At least 6 Vermont companies now produce ice cider (Table 3.3.2), a sweet wine that is made by allowing apple juice to freeze outdoors for 6 to 8 weeks during winter. A resulting concentrate high in sugar is then fermented.

Table 3.3.2: Vermont Ice Cider Producers

 <p>www.boydenvalley.com (802) 644-8151 64 Vermont Route 104 Cambridge, VT 05444</p>	 <p>hallhomeplace.com (802) 928-3091 4445 Main St Isle La Motte, VT 05463</p>
 <p>www.champlainorchards.com (802) 897-2777 3597 Route 74 West Shoreham, VT 05770</p>	 <p>www.whetstoneciderworks.com (802) 254-5306 P.O. Box 512 Marlboro, VT 05344</p>
 <p>www.edenicider.com (802) 895-2838 1023 Sanderson Hill Road Charleston, VT 05872</p>	 <p>www.windfallorchardvt.com (802) 462-3158 1491 Route 30 Cornwall, VT 05753</p>

Source: Vermont Ice Cider Association, www.vermonticecider.com.

🍷 Vermont's Distilling Revival Draws on Local Farms

Total U.S. liquor sales were \$22.0 billion in 2012, up 4.4% from the previous year,³¹ with over 475 billion gallons of liquor sold in the country. Sales of craft spirits still represent less than one percent of total U.S. sales of spirits, but [American Distilling Institute](#) (ADI) founder and president, Bill Owens, sees a booming industry: "Pioneering entrepreneurs are breathing new life and high quality into the spirits industry," he said in a recent article. "They reflect the same renaissance that we've seen with bread, cheese, and other foods."³²

A recent industry white paper described this trend: "The number of identifiable Craft Distilleries in production has gone from 24 in 2000, to 52 in 2005, to 234 at year end 2011, and new entrants are showing up with regularity."³³ In Vermont, the number

of distilling licenses has grown from 5 in 2000, to 16 today (but not all are currently producing)³⁴ and the quality is gaining attention.³⁵

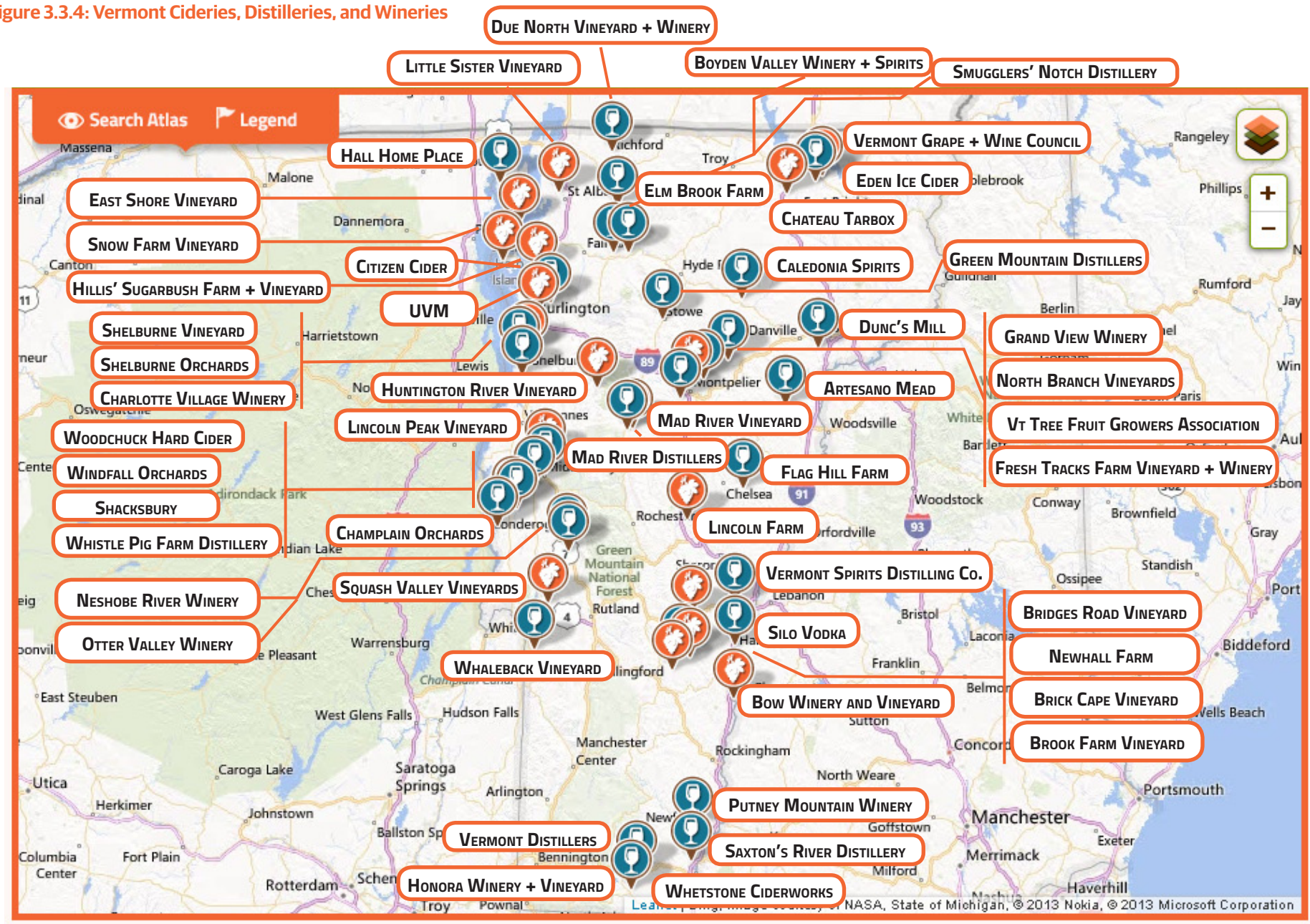
Vermont has at least 15 distillers in active operation, many of which draw ingredients from their neighbors. [Caledonia Spirits](#) uses local honey, corn, and sugar beets;³⁶ Vermont maple syrup is featured in numerous craft spirits, like Vermont Gold, vodka distilled from maple sap by [Vermont Spirits Distilling Company](#) in Quechee, while their Vermont White vodka is distilled from whey, a byproduct of cheesemaking.³⁷ [Saxtons River Distillery](#), maker of Sapling Vermont Maple Liqueur, buys 40-gallon drums of maple syrup from [Black Bear Sugar Works](#) in Guilford.³⁸ Others grow their own ingredients, or aim to, like [WhistlePig Farm](#), which produces about 4,000 cases of rye whiskey each year and is currently planting 90 acres of rye.³⁹

Table 3.3.3: Vermont Distillers

 <p>Maple crème liqueur www.boydenvalley.com (802) 644-8151 64 Vermont Route 104 Cambridge, VT 05444</p>	 <p>Apple brandy www.flaghillfarm.com (802) 685-7724 135 Ewing Road Vershire, VT 05079</p>	 <p>Maple liqueur saplingliqueur.com (802) 246-1128 485 West River Road Brattleboro, VT 05301</p>	 <p>Maple crème liqueur www.vermontdistillers.com (802) 464-2003 7755 Vermont 9 East West Marlboro, VT 05363</p>
 <p>Gin, vodka, cordials caledoniaspirits.com (802) 472-8000 46 Buffalo Mountain Commons Drive Hardwick, VT 05843</p>	 <p>Gin, vodka, maple liqueur greendistillers.com (802) 253-0064 192 Thomas Lane Stowe, VT 05672</p>	 <p>Apple brandy www.shelburneorchards.com (802) 985-2753 216 Orchard Road Shelburne, VT 05482</p>	 <p>Vodka, whiskey, gin vermontspirits.com (866) 998-6352 5573 Woodstock Rd Hartford, VT 05059</p>
 <p>Rum www.duncsmill.com (802) 745-9486 622 Keyser Hill Road St. Johnsbury, VT 05819</p>	 <p>Rum, bourbon, whiskey, apple brandy www.madriverdistillers.com (802) 496-6973 156 Cold Spring Farm Rd Warren, VT 05674</p>	 <p>Vodka www.silovodka.com (802) 674-4220 3 Artisans Way Windsor, VT 05089</p>	 <p>Whiskey www.whistlepigwhiskey.com (802) 897-7700 1030 Palmer Road Shoreham, VT 05770</p>
 <p>Vodka, maple liqueur www.elmbrookfarm.com (802) 782-5999 250 Elm Brook Road Fairfield, VT 05448</p>	 <p>Apple brandy/wine www.putneywine.com (802) 387-4610 71 Holland Hill Road Putney, VT 05346</p>	 <p>Vodka, gin, rum, bourbon www.smugglersnotchdistillery.com (802) 309-3077 276 Main Street Jeffersonville, VT 05464</p>	

Source: Distilled Spirits Council of Vermont, <http://distilledvermont.org>.

Figure 3.3.4: Vermont Cideries, Distilleries, and Wineries



Source: Vermont Food System Atlas, www.vtfoodatlas.com/atlas?categories%5B0%5D=34&categories%5B1%5D=46&categories%5B2%5D=48.

🍷 Vermont's Grape Wines Get Established

Total U.S. wine sales in 2012 were \$35.7 billion including wine from all U.S. states and imports. California alone accounted for \$22 billion (63.5%) of that total. As the leading U.S. grape and wine producer, California produced 207.7 million cases of wine⁴⁰ from 546,000 acres⁴¹ of wine grapes in 2012. In comparison, total sales of liquor (i.e., wine, cider, and spirits) in Vermont were 387,256 cases (equal to 0.18% of California wine cases) and sales of \$63 million (equal to 0.28% of California wine sales) in 2012.⁴²

According to the 2007 Census of Agriculture, apple orchards accounted for 91% of noncitrus fruits orchards in Vermont. Perhaps surprisingly, grapes were the second largest category at 167 acres, or 5% of total fruit orchards. The number of Vermont farms growing grapes increased 73% from 2002 ($n = 26$) to 2007 ($n = 45$), while grape orchard acreage increased by over 400%, from 33 acres in 2002 to 167 acres in 2007. Grape orchard acreage in Vermont is equal to 0.03% of grape acreage in California.⁴³ Vermont grape production is equal to 0.4% of [New York grape production](#)—our neighbors to the west grew grapes on over 42,000 acres in 2007.

Terence Bradshaw estimates 175 acres currently in grape production in Vermont based on his experience talking with growers, including about 15-20 larger growers as well as some smaller growers, some who may be just starting out, or that may have only an acre or two. With a production rate of 4.5 tons of grapes per commercial acre in Vermont, and factoring for variances in production rates due to age of establishment (e.g., younger vines are not as productive) and variable management quality, Bradshaw estimates that Vermont produces about 300 tons of wine grapes commercially, plus about another 50 tons from hobby growers, translating to about 22,000 cases of grape wine produced commercially annually.

The [Northern Grapes Project](#), a partnership between 12 universities and 19 regional and/or state winery and grape grower associations, is working to enhance and support development in cold-climate grape and wine production through coordinated research and outreach across the region. Research topics include estimating the economic impact of cold-climate grapes and wine; evaluating varietal performance and resulting fruit and wine flavors; producing distinctive high-quality wines from cold-climate grapes; and understanding consumer behavior and preferences to create marketing strategies that will increase sales of cold-climate grape wines. Research indicates that



White grapes at Boyden Valley Winery, Cambridge.

PHOTO CREDIT: Boyden Valley Winery














the emerging cold-climate grape industry currently generates \$342 million annually across 12 northern states from growing grapes, making wine, and tourist spending at wineries. Since 2007, there has been a 43% increase in wineries producing with cold-hardy grapes, and 45% of the current cold-hardy grape acreage has been planted in that past four years.⁴⁴

One of Vermont's earliest commercial vineyards and grape wineries, [Snow Farm Vineyard](#), opened in 1992 with a mission "to preserve Vermont's agricultural land in the face of rapid development by providing an alternative for farmers."⁴⁵ The Lane family left the dairy business, sought work off the farm, and sold 20 acres to a couple looking to start a commercial vineyard—a new concept for Vermont at the time—with the stipulation that this

"The big difference in operating a vineyard and winery over milking cows is the relationship you need to build with consumers. A high percentage of revenue for all Vermont wineries comes from direct sales to consumers. Marketing is critical. That has been challenging and exceptionally rewarding."

—David Lane, Snow Farm Vineyard

Table 3.3.4: Vermont Vineyards and Wineries

 <p>www.artesanomead.com (802) 584-9000 1334 Scott Highway Groton, VT 05046</p>	<p>DUE NORTH</p>  <p>duenorthvineyard.com (802) 285-2053 206 Skunks Misery Road Franklin, Vermont 05457</p>	 <p>www.lincolnpeakvineyard.com (802) 388-7368 142 River Road New Haven, VT 05472</p>	 <p>www.putneywine.com (802) 387-4610 71 Holland Hill Road Putney, VT 05346</p>
 <p>www.bowvineyard.com (802) 546-4330 21 Ferry Road Springfield, VT 05156</p>	 <p>www.eastshorevineyard.com (877) 378-8466 69 East Shore Grand Isle, VT 05458</p>	 <p>littlesistervineyard.com (802) 355-0013 140 Brigham Road St. Albans, Vermont 05478</p>	 <p>shelburnevineyard.com (802) 985-8222 6308 Shelburne Road Shelburne, VT 05482</p>
 <p>www.boydenvalley.com (802) 644-8151 64 Vermont Route 104 Cambridge, VT 05444</p>	 <p>www.freshtracksfarm.com (802) 223-1151 4373 VT Route 12 Berlin, VT 05602</p>	 <p>Mad River Vineyard (802) 583-1118 3354 East Warren Road Waitsfield, VT 05673</p>	<p>SNOW FARM</p>  <p>www.snowfarm.com (802) 372-9463 190 West Shore Road South Hero, VT 05486</p>
 <p>Brick Cape Vineyard (802) 484-9133 299 Malagash Road S. Reading, VT 05062</p>	 <p>www.grandviewwinery.com (802) 456-7012 2113 Max Gray Road Plainfield, VT 05667</p>	 <p>Monroe Hill Vineyard (802) 728-4273 4884 East Bethel Road Randolph, VT 05061</p>	 <p>Town Farm Vineyard Cavendish, VT 05142</p>
 <p>Brook Farm Vineyards (802) 226-7142 4203 Twenty Mile Stream Rd Proctorsville, VT 05153</p>	 <p>www.hillisfarm.com (802) 893-2928 206 Sugarbush Farm Rd Colchester, VT 05446</p>	 <p>www.neshoberiverwinery.com (802) 247-8002 79 Stone Mill Dam Road Brandon, VT 05733</p>	 <p>www.whalebackvineyard.com (802) 287-0730 202 Old Lake Road Poultney, Vermont 05764</p>
 <p>Charlotte Village Winery (802) 425-4599 3968 Greenbush Road Charlotte, VT 05445</p>	<p>HONORA</p>  <p>www.honorawinery.com (802) 368-2233 201 VT Route 112 Whitingham, VT 05342</p>	 <p>www.northbranchvineyards.com (802) 229-6169 82 Trillium Hill Montpelier, VT 05602</p>	 <p>Northeastern Vine Supply (802) 287-9311 1428 River Road W. Pawlet, VT 05775</p>
 <p>Chateau Tarbox (802) 754-9506 168 Tarbox Hill Road Orleans, VT 05860</p>	 <p>www.huntingtonrivervineyard.com (802) 434-3332 344 Moody Road Huntington, VT 05462</p>	 <p>www.ottervalleywinery.com (802) 247-6644 1246 Franklin Street Brandon, VT 05733</p>	

Source: Vermont Grape and Wine Council, www.vermontgrapeandwinecouncil.com.

Thinking Outside the Bourdeaux

As skills are wont to do, the production of fermented drinks fell away with the growth of cities and electricity, but the process is now making a comeback. The high sugar content of grapes, and their suitability for European growing conditions, made them de rigueur for wines around the world, but just about anything with enough sugar and water can be fermented and preserved. While grapes are finally being grown with success in Vermont, our lush soils and short growing season have long been better suited to fruits like apples, blueberries, rhubarb and raspberries, so it is no surprise that Vermont wineries started out with fruit.



Charles Dodge of Putney Mountain Winery pours a sample for tasting.

[Boyden Valley Winery](#) in Cambridge launched using apples grown on their farm, but have since branched out to create a wide variety of grape, maple, and fruit wines. They continue to use their own apples—and blend in other Vermont apples—to make wines like their Vermont Maple (a light apple and maple wine), Gold Leaf (a barrel-aged dessert apple and maple wine), Vermont Ice Cider (a barrel-aged apple dessert wine), and Vermont Ice Apple Crème (a blend of Vermont Ice Apple Cider, apple brandy, and Vermont cream). They use Vermont-grown cranberries for their light, semi-dry Cranberry Wine, Boyden Farm rhubarb for their medium-body Rhubarb Wine, Vermont blueberries for port-like Blueberry Wine, and Vermont currants for their sweet Cassis dessert wine.

Charles and Kate Dodge of [Putney Mountain Winery](#) in Putney opened their winery in 1998. Their focus is entirely on fruit wines made from fruits grown in Vermont; the only fruit they buy from out of state are cranberries grown on a small family farm on Cape Cod. They have a sparkling apple wine—Heirloom Cuvee—an Apple Maple wine, and Vermont Cassis, all of which are available year round. Their seasonally available wines include two other sparkling apple wines, their Rhubarb wine, Cranberry wine, and Pear wine, as well as a Strawberry Rhubarb wine and a Blueberry Apple wine. All of their wines can be sampled in their tasting room at the Basketville store in Putney.

Excerpted from "Thinking Outside the Bourdeaux" by Claire Fitts, [Vermont Local Banquet](#), Fall 2011.

acreage be kept in agricultural use. After a series of economic and personal events, the Lanes now hold a majority ownership of *Snow Farm Vineyard* and are back to working the land. The vineyard has become a major tourist destination in the islands region of Vermont with a retail store and tasting room, concert series, and on-site art, cheese, and other special events.⁴⁶ Since the start of *Snow Farm Vineyard*, other Vermonters have realized the potential value in local grape and wine production. There are now at least 26 vineyards or wineries (Table 3.3.4) in the state.

Some of these wineries also produce fruit wines with ingredients that are more readily and easily available in Vermont other than grapes, like [Grand View Winery](#) in Calais. In addition to producing grape wines with out-of-state grapes, Grand View sources local dandelions, blueberries, apples, pears, cranberries, raspberries, rhubarb, and other fruits on-site and from neighbors.⁴⁷ [Boyden Valley Winery Cranberry Wine](#), in addition to grape wines made with their own grapes, that is made with cranberries grown by [Vermont Cranberry Company](#). In addition to grape and fruit wines, mead, which is a honey wine, is also gaining attention in Vermont, with companies like [Artesano Mead](#) and [Caledonia Spirits & Winery](#) making award winning recipes.

☀ Climate Change Impacts on Apple and Grape Production

Two new reports from the [U.S. Department of Agriculture \(USDA\)](#) and a draft report from the [U.S. Global Change Research Program](#) indicate detrimental effects from climate change on most crops, livestock, and ecosystems that will vary somewhat by region:⁴⁸

- 🍏 Rising temperatures and altered precipitation patterns will affect agricultural productivity. Crop sector impacts from weather are likely to be greatest in the Midwest, and these impacts will likely expand due to damage from crop pests.
- 🍏 Climate change will exacerbate current stresses from weeds, diseases, and insect pests on plants and animals; it will also alter pollinator life cycles, which will impact all types of crop and livestock production in Vermont.

- 🍏 Ecosystem services (e.g., maintenance of soil and water quality, flood control) that food systems depend on will be damaged.
- 🍏 Increased incidences of extreme weather events will impact food production around the world. Tropical Storm Irene—viewed as a harbinger of things to come—flooded 20,000 acres of farmland and impact 463 Vermont producers when it struck in 2011.

Evidence already suggests that Vermont's growing season for frost-sensitive plants has increased by about two weeks over the past forty years, although there is large variability from year to year.⁴⁹ A longer growing season may present new opportunities for food production in Vermont, but gains in the length of the growing season must be counterbalanced with other changes. Climate change has shifted plant hardiness zones northward across the United States over the past 40 years. Plant hardiness zones reflect the average annual extreme minimum temperature during a period of time. The most recent plant hardiness zones map reflects averages from 1976 to 2005 and show the creep of zones 5 and 6 into more parts of New England. Some research indicates that the 2012 plant hardiness zone maps already underestimate total warming by 0.7 to 1.7 degrees.⁵⁰

According to the USDA, each crop and animal species has a "given set of temperature thresholds that define the upper and lower boundaries for growth and reproduction, along with optimum temperatures for each developmental phase." For example, vegetables exposed to temperatures that are 1 to 4 degrees Celsius above optimal for biomass growth may have reduced yields, while exposure to temperatures above 5 to 7 degrees Celsius can result in total crop loss. Or, for example, increases in winter temperatures can effect the chilling requirements (i.e., a minimum period of cold temperatures that trigger blossoms) of perennial crop systems. **The USDA says that perennial crops in the Northeast that have a lower than 400-hour chilling requirement should be safe for the rest of the century, but plants with prolonged cold requirements (e.g., apples and grapes) may experience reduced yields.**⁵¹

In the case of apples, the USDA report explains that the value of an apple is determined and limited at many points before and during the growing season. For example, high temperatures in June and July can reduce the number and vigor of the floral buds,

while extreme cold can kill the buds, and warming periods can de-acclimate the buds. Frost periods in the spring can kill flowers, while high spring temperatures can result in smaller fruit. Finally, high summer temperatures can cause sunburn, leading to reduced harvests and decreased fruit quality.⁵² Broadly speaking, then, while the implications of climate change for apple production—and consequently hard cider production—are not entirely clear, the expectation is that a longer growing season will be counterbalanced by hotter summer temperatures that reduce yields.

Wine grapes are sensitive to climate changes and *conservative* computer models suggest that the suitability of wine grape production is projected to decline in many famous wine-producing regions (e.g., the Bordeaux and Rhône valley regions in France and Tuscany in Italy) and increase in more northern regions in western North America and Europe. In particular, extreme hot days during the growing season are predicted to significantly decrease wine grape production in traditional areas like Napa Valley. A modest warming trend may benefit wine grape production in the Northeast, but many climate scientists are already saying that a high emissions scenario—with warmer temperatures—is likely.⁵³

Consequently, Vermont's apple and wine grape growers, cideries, distilleries, and wineries, and the technical support system for these sectors need to seriously investigate mitigation and adaptation strategies.

ANALYSIS

Vermont's hard cider, spirits, and wine producers are on the leading edge of a trend that emphasizes quality, craftsmanship, and support for local farmers over mass production. There are several strategies that could support further establishment and expansion of these sectors in Vermont.

🔑 Research Strategies

The most pressing need for research into grape wines in Vermont is establishing the varieties that grow well here while also producing good-tasting wine. Early researchers like [Elmer Swenson](#) and the University of Minnesota led the way in identifying grape varieties that perform well in colder northern climates, and Vermont vineyards like [Lincoln Peak](#) have benefitted from this. And the [Northern Grape Project](#) is a multi-state,

multi-institutional effort to address:

- 🍷 Varietal performance and resulting fruit and wine flavor attributes in different climates.
- 🍷 Applying appropriate viticultural practices to achieve consistent fruit characteristics for winemaking.
- 🍷 Applying winemaking practices to the unique fruit composition of cold-climate cultivars to produce distinctive, high quality wines that consumers will like and purchase.
- 🍷 Understanding consumer preferences and individual/regional marketing strategies that will increase sales and growth of wines made from cold-climate cultivars and result in sustained profitability of wineries and vineyards.⁵⁴

Still, there has been a learning curve in identifying the varieties specifically grow well in Vermont, and identifying best horticultural and pest management strategies for these varieties to Vermont. The [University of Vermont](#) contributes to the Northern Grapes Project by evaluating cultivar performance in Vermont, establishing best-practices for vineyard management, and developing outreach strategies for the state,⁵⁵ but there is currently not a full-time faculty focused solely on grape and wine production and the leading researcher contributing to this work is phasing into retirement.

Vermont wine industry members need a statewide expert on grape and wine production to conduct research to address Vermont's specific needs and work one-on-one with grape growers to get their plants established and productive.⁵⁶ This horticultural expert should also have strong knowledge of and experience with the wine industry to be fully effective at identifying grape varieties for Vermont that grow well here and make quality wine. In addition, regional experts could be brought to Vermont at regular intervals and at critical timing to offer technical assistance to Vermont's grape growers and wine producers.

Hard cider research needs include:

- 🍷 Identification of cultivars best-suited to multiple hard/ice cider styles and quantify their present production capacity in Vermont.

- 🍷 Assessment of integrated pest management (IPM) strategies that reduce orchard inputs, decrease costs, minimize environmental impact, and increase availability of cider fruit to processors.
- 🍷 Study of horticultural strategies geared specifically toward high-value processing apples: dwarf vs. semi-dwarf trees; trellis systems; groundcover management; orchard/tree nutrition; annual cropland management; harvest timing.
- 🍷 Conduct economic analysis of cider apple production and procurement for multiple orchard types (e.g. high-value specialty fruit; low-input, high quantity 'base' fruit' preharvest dropped and hail or otherwise damaged fruit from present orchards managed for fresh fruit markets). Develop enterprise budgets for cider fruit options.⁵⁷

🍷 Sales and Distribution Strategies

Cideries, distilleries, and wineries can obtain permits to sell their products at farmers' markets, manufacturing sites and tasting rooms, special events, and other tasting events.⁵⁸ Bill Owens, president of *American Distilling Institute*, is quoted in a [Seven Days](#) article as saying "That's a progressive state. Most states aren't nearly that helpful," when informed about the Vermont law.⁵⁹

Wineries and cideries have also been allowed, since 2006, to ship their products, including grape wines, mead, and hard cider, directly to consumers and retailers, thereby allowing online and out-of-state sales to grow their customer base.⁶⁰ In 2013, Vermont brewers began to enjoy this same benefit.⁶¹ Distillers, however, cannot ship their product. Customers can special order products to be shipped to the Vermont liquor store of their choice, but this option is often not helpful to out-of-state customers.⁶² **Distillers would benefit from the same access to a broader market that is currently enjoyed by wineries, cideries, and breweries through online sale and shipment of their products.** Legislation will be required to allow shipping of spirits, but it can be modeled after similar successful efforts by Vermont's wine and beer sectors. The [Distilled Spirits Council of Vermont](#) could initiate this legislation as part of their role to represent their constituents at the State House.

Marketing and Public Outreach

[Pennsylvania](#) and [New York](#) have successfully attracted tourists to their beverage-makers using online resources. The Pennsylvania site collects wine trails by region, allowing users to select their destination area and see a full list of possible stops in that part of the state. The New York site deepens the regional approach by also including acreages, flavor influences, and leading varieties for each region.

[Iowa](#) offers one of the most comprehensive programs and websites supporting a statewide beverage-based tourism industry that serves as a robust marketing program for wineries, cideries, distilleries, and breweries. The [Iowa Wine and Beer Promotion Board](#) operates the website as a user-friendly one-stop resource for lodging, food, and other amenities in addition to information on the beverage makers, and is searchable by region or city.

Vermont could look to the Iowa Wine and Beer Promotion Board as a model for a new comprehensive marketing approach to expand tourism to Vermont. The Promotion Board was created by the Iowa legislature and is comprised of three members representing the interests of breweries, wineries, and the statewide Iowa Economic Development Authority (IEDA). The Promotion Board advises the IEDA on all things related to winery and brewery tourism and is funded by a tax on in-state sales of wine and beer. The majority of the funds generated go to the Midwest Grape and Wine Institute at Iowa State University to expand research into grape varieties and wine production, to develop quality assurance programs, and to develop job training at community colleges specific to growing grapes and making wine. The remaining money generated by the in-state sales tax funds the marketing efforts of the Promotion Board.⁶³ **A similar approach in Vermont could simultaneously support the research, technical assistance, and marketing needs of distilleries, wineries, cideries, and breweries.**

Technical Assistance and Business Planning Strategies

Vermont's apple and grape growers have adapted to new market opportunities in an environment of declining research, marketing, and outreach support from the [Vermont Agency of Agriculture, Food and Markets](#) (VAAFAM) and [UVM Extension](#). A [2013 Strategic Plan](#) for Vermont's apple industry reports that "Since 2011, there has been

no base-funded Extension or outreach specialist at UVM devoted to the needs of the fruit industry, and in 2013, remaining support for apple research and outreach projects was eliminated from the UVM Extension and Agriculture Experiment Station Plan of Work."⁶⁴

The implication, this plan states, is that technical assistance is missing for "Critical management decisions during orchard establishment, including: selection of appropriate cultivars and rootstocks, trellis construction; layout and design of the orchard and its infrastructure; and proper tree training to encourage early fruit production." UVM Extension, VAAFAM, the broader Farm to Plate Network, and each of these industries need to examine opportunities for rectifying this situation, including funding opportunities, partnerships with other states, and other online resources that can provide information. Continued support for orchard/cider and vineyard/winery development is critical for helping growers adapt to new production strategies and varieties that are best suited for the Northeast region.

Financing Strategies

Grape growers in cold climates have benefitted from the [USDA's Specialty Crop Research Initiative](#) (SCRI), which funds the [Northern Grapes Project's](#) research and outreach. Supporting Federal investment in specialty crop research is smart, particularly when signs point to a growing market opportunity. Specialty crops comprise more than half of the total value of U.S. agriculture, and grapes comprise the largest portion of the nation's specialty crops, generating \$162 billion in annual revenue, \$33 billion in wages, and \$17 billion in state and local taxes. A recent University of California study showed a 32-to-1 return on investment in agriculture research,⁶⁵ suggesting a continued investment here could have a large payout. The SCRI program and the Northern Grapes Project depend on the passage of the [Farm Bill](#) for funding.⁶⁶

Network Development Strategies

Informal networks are critical to the evolution of these sectors. For example, some Vermont wine producers meet regularly for blind taste tests and honest feedback. These types of gatherings provide opportunities to connect personally and learn from each other, and are also drivers for continually improving the quality of Vermont wines

overall, thereby improving Vermont's statewide image as a producer of high-quality wine.

Formal networks, like producer and processor associations, are membership-based organizations that may provide peer-to-peer learning opportunities, policy advocacy, technical assistance, industry education, and marketing support. Vermont has several associations for apples/cider, grapes/wine, spirits (and associations for many of the raw ingredients used in spirits): the [Vermont Tree Fruit Growers Association](#), the [Vermont Grape and Wine Council](#), the [Vermont Ice Cider Association](#), and the [Distilled Spirits Council of Vermont](#). Additionally, national associations (e.g., [U.S. Association of Cider Makers](#), [American Craft Distillers Association](#)) promote their sectors with marketing efforts and support their members with movement on key legislation.

A recent Farm to Plate Network report, [At a Turning Point: Strengthening Vermont's Producer Associations](#), evaluating the needs, interests, administrative and leadership capacities, challenges, and opportunities facing Vermont's producer and processor associations. The challenge for many associations, the report found, is converting the passion and knowledge of its membership into sustained organizational stability, with the added challenge of doing so with constrained budgets and administrative capacity.⁶⁷

It is very likely that the associations that support Vermont's apple/hard cider, spirits, and grapes/wine sectors would benefit with shared service models for assistance on the following:

- 🍷 Organization development (including leadership and succession development; membership development)
- 🍷 Financial sustainability (including revenue diversification and membership rates, grant information, and shared administrative support)
- 🍷 Lobbying / Policy
- 🍷 Website development and branding

🍷 Regulation and Public Policy

Permitting for wineries and distilleries include the same basic steps: obtaining a Federal permit from the Federal Tax and Trade Bureau and applying to the [Vermont Department of Liquor Control](#) (DLC) for a manufacturing license. DLC offers clear and easy to understand sets of instructions, plus links to all forms, for the manufacture and sale of spirits and wine in Vermont. Following the State permit application, a DLC representative will obtain proof of the Federal permit, trade name registration, and other important documentation. (See a full list on the [DLC website](#)). Once the Federal and State permits are in-hand, further permits can be obtained to sell at farmers' markets and tasting rooms, to offer in-store tastings, and, for hard cider and wine, to ship to customers.

With permits in-hand, production and sales can begin, thus triggering the next political challenge: taxation. While no one likes paying taxes, hard cider producers have the most difficult time navigating the alcohol taxation structure, a system created with beer, wine, and liquor in mind.⁶⁸ Depending on sugar, alcohol, and carbonation levels, which vary by batch, hard cider bounces around taxation categories from being taxed as beer to wine to champagne—the latter a product that includes a steep “luxury tax.” A recent convening of the national hard cider industry, [CiderCon](#) led to proposed legislation from New York: **The CIDER (Cider, Investment & Development through Excise Tax Reduction) Act would “modernize the definition of hard cider” to make taxation more straight-forward and predictable.** The Act appears to be co-authored and supported by Vermont Senator Leahy,⁶⁹ but expanded support and passage of this act into law will greatly benefit Vermont's cideries.

Small distillers in Vermont (or anywhere in the U.S.) do not enjoy the same reduced tax rate allowed for small wine and beer producers.⁷⁰ [H.R. 777 Small Distillery Excise Tax Act of 2011](#), **aims to reduce the rate of federal excise tax on distilled spirits produced by small producers.** It was introduced February 17, 2011 and referred to the House Ways and Means committee, but as of yet has not been enacted. According to one legislative tracking website, this law “will allow small American craft distillers the opportunity to grow, supporting local farms and communities through the purchase of goods and services, hiring of local employees, increasing economic development and tourism dollars.”⁷¹

GETTING TO 2020

The Vermont label on hard cider, spirits, and wine designates craftsmanship and Vermonters and tourists have poured into tasting rooms, tap rooms, farmers' markets, and festivals to celebrate and drink the taste of Vermont. There are several ways to support growth of this sector of Vermont's alcohol beverage industry, particularly in the case of technical assistance, marketing, distribution, and regulation. Unlike Vermont's craft beer industry, which must largely rely on external sources of hops and malt, Vermont's cideries, distilleries, and wineries can source from small, but local supplies

of ingredients. Dedicated financial support for apple and grape technical assistance historically offered by UVM Extension and the Vermont Agency of Agriculture, Food and Markets needs to be re-examined given the potential for growth in this sector.

Table 3.3.5: Objectives and Strategies for Expanding Hard Cider, Spirits, and Wine Production

OBJECTIVE	STRATEGY
Research Strategies	
To help Vermont apple and grape growers and technical assistance providers adapt to climate change.	Climate change is expected to impact plants with prolonged cold growing requirements. Vermont researchers should work with regional partners to understand the implications of climate change for apple and grape production, including opportunities for mitigation and adaptation.
To establish best practices for growing wine grapes in Vermont and support grape growers with technical assistance.	Add a faculty member within the UVM Plant and Soil Science Department in the College of Agriculture and Life Sciences with horticultural expertise in wine grapes and a research appointment with the Vermont Agricultural Experiment Station to conduct research into growing wine grapes in Vermont.
Sales and Distribution Strategies	
To allow distillers to ship their products so that they can access online markets.	Encourage the Vermont legislature to enact legislation that allows shipment of spirits via online sales.
Marketing and Public Outreach Strategies	
To promote tourism to Vermont cideries, distilleries, wineries, and breweries.	Explore Iowa's model for funding marketing activities for Vermont's alcoholic beverage industry through a small tax on alcohol sales.
Technical Assistance Strategies	
To provide clear guidance on starting and expanding an alcoholic beverage business in Vermont.	Identify online locations (e.g., association websites, Department of Liquor Control, Vermont Food System Atlas) for guidance, explanations, and instructions for market assessments, business plans, permitting and regulations, taxation, and timelines for all alcoholic beverage sectors.

OBJECTIVE	STRATEGY
<i>Financing Strategies</i>	
To ensure continued funding for northern grape growing.	Encourage Vermont's federal delegation to support funding for specialty crop research in the Northeast.
<i>Network Development Strategies</i>	
To explore shared service models for Vermont's alcohol beverage industry associations.	Encourage the Vermont Brewers Association , Vermont Grape and Wine Council , Vermont Ice Cider Association , and the Distilled Spirits Council of Vermont to explore shared service models for organization development, financial sustainability, branding and marketing, and policy development.
<i>Regulation and Public Policy Strategies</i>	
To create a more clear and fair taxation structure for hard cider at the national level.	Encourage Vermont's federal delegation to champion and support the passage of the Federal CIDER Act to update the definition of hard cider and improve the taxation structure for this beverage.
To allow small distillers to be taxed at lower rates similar to the tax relief already enjoyed by small wineries and breweries.	Encourage Vermont's federal delegation to champion and support the passage of H.R. 777, the Small Distillery Excise Tax Act of 2011, to reduce the tax rate for small distilleries.

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ANALYSIS OF VERMONT'S FOOD SYSTEM

Food Production: Hard Cider, Spirits, and Wine

Credits

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