

# Cost of Production, Prices, and Economic Performance for the Cider Market in Vermont



THE UNIVERSITY OF VERMONT  
**FRUIT PROGRAM**

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The goal of this fact sheet is to three-fold provide information on: 1. the cost of production of apples, 2. prices paid by cideries and prices received by apple growers, and 3. potential economic returns of selling apples to the cider industry. The information provided in this factsheet is based on data collected from apple growers and cider makers in Vermont.

## Cost of Production

Cost of production data for the 2015 growing season were collected from four Vermont apple growers. The orchards represented were typical for the state, including cultivar composition, rootstock, and medium tree density. Data were collected on orchard activities including cost information for labor, materials, and supplies related to pruning and training, chemicals, fertilization, beehives, maintenance and repairs, harvest activities, maintenance and repairs and other (taxes, insurance, overhead, depreciation). No cost data on irrigation were collected as none of the orchards were irrigated. The data collected were limited to field operations and to traditional dessert cultivars.

To preserve confidentiality of the individual growers we grouped the orchards into two groups with two growers in each group: small scale orchard and large scale orchard. The means size of the small scale orchard is 11.5 productive acres and the average yield in 2015 was 526.0 bushels per acre. The mean size in the large scale orchard is 167.5 productive acres and the average yield in 2015 was 650.7 bushels per acre.

Cost information is available in table 1 and 2. The largest expense for small and large scale orchards is harvest followed by chemicals. The cost per metric ton was higher for the small scale orchard than for the large scale orchard indicating higher efficiencies on the large scale orchard.

Table 1. Cost of production by main categories on small orchards.

Material and Labor	Production Costs (US\$)	Production Costs per Acre (US\$)	Production Costs per Bushel (US\$)	Percent Expenses
Pruning and Training	1,904	166	0.81	5.7
Chemicals	6,303	548	1.53	18.7
Beehive	130	11	0.02	0.4
Maintenance & Repairs	3,417	297	0.71	10.2
Harvest	6,727	585	1.98	20.0
Other <sup>2</sup>	15,136	1,316	3.54	45.0
Total Costs	33,617	2,923	8.59	100.0

<sup>2</sup>Other includes: miscellaneous supplies and labor, overhead expenses, taxes, insurance,

Table 2. Cost of Production by main categories on large orchards.

Material and Labor	Production Costs (US\$)	Production Costs per Acre (US\$)	Production Costs per Bushel (US\$)	Percent Expenses
Pruning and Training	64,365	384	0.59	8.3
Chemicals	123,230	736	1.13	15.9
Beehive	8,720	52	0.08	1.1
Maintenance & Repairs	35,955	215	0.33	4.6
Harvest	192,291	1,148	1.76	24.9
Other <sup>2</sup>	349,098	2,084	3.20	45.1
Total Costs	773,659	4,619	7.10	100.0

<sup>2</sup>Other includes: miscellaneous supplies and labor, overhead expenses, taxes, insurance, and depreciation.

## Prices

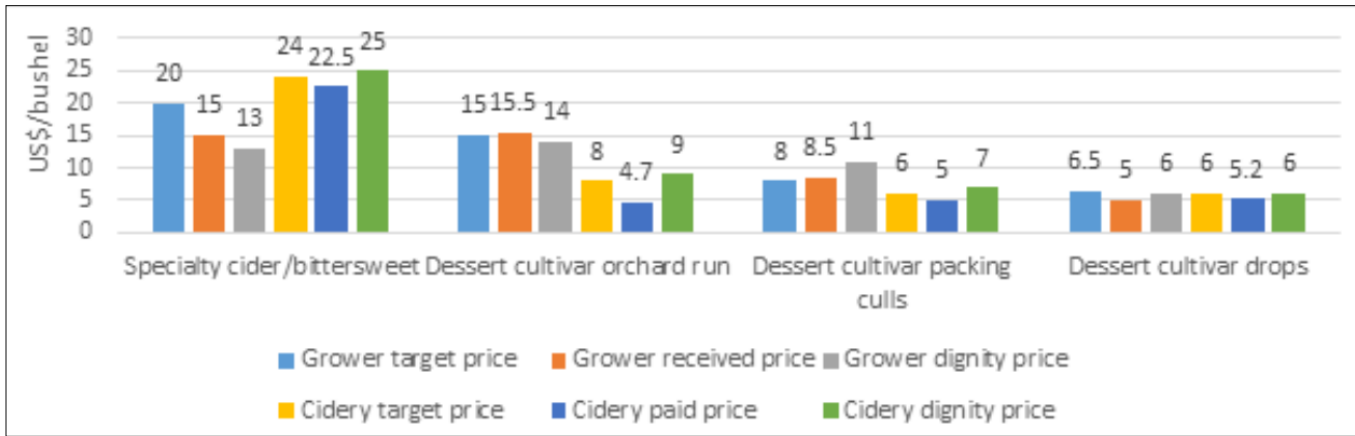
Price data were collected from apple growers and cider makers during a June, 2016 Cider Maker and Grower Meeting held at Woodchuck Cidery. Nine growers and 5 cider makers provided information on their target price, their average price, and their dignity price (price they can pay or receive without losing money) for different types of apple cultivar and marketing niche (figure 1).

Specialty cider/bittersweet cultivars: the prices that cider makers are currently paying or able to pay for these cultivars is higher than what growers are asking or receiving. For instance, cider makers reported a target price of US\$24 per bushel while apple growers reported a target price of US\$20 per bushel. This price difference is likely due to the limited supply of specialty cider/bittersweet cultivars on the market.

Dessert cultivar orchard run and packing culls: the price that growers are receiving or desire to receive is higher than what cider makers are willing to pay or currently paying. For instance, for dessert orchard run, growers report receiving US\$15.5 per bushel while cider makers report paying US\$4.7 per bushel. The higher price received by apple growers is likely from the regional fresh market. The lower price paid by cider makers is likely from the national commodity market. Furthermore, the dignity price needed by growers is higher than the dignity price that cider makers can pay.

Dessert cultivar drops: there is little to no discrepancy for dessert cultivar drops as apple growers and cider makers are reporting similar going and dignity price (US\$5 per bushel for price received, US\$5.2 for price paid and US\$6 per bushel for dignity price).

Figure 1. Median prices paid and received for apples to be used in cider production



## Economic Performance

Potential long-term economic performance assessment of orchards selling dessert apples to the cider industry was conducted with a net present value analysis (NPV). A NPV analysis allows to assess potential long-term economic performance under various scenarios of management, fruit price, and proportions of production going to fresh fruit and cider markets.

Small scale orchards selling 25% of the dessert cultivar orchard run to cideries would incur an opportunity cost ranging from US\$668 to US\$40,628 at the end of 10 years. The lower opportunity cost occurs when the use of chemicals and harvest labor are lowered by 25% and growers receive their dignity price of US\$15.5 per bushel. The larger opportunity cost occurs if growers receive the price paid by cideries of US\$4.7 per bushel (figure 2). Large scale orchards selling 25% of their dessert cultivar orchard would incur an opportunity cost ranging from US\$4,895 to US\$35,248 at the end of 10 years. The lower opportunity cost occurs if growers were to sell 25% of their production to cideries at the dignity price of US\$15.5 per bushel (figure 3)

Figure 2. Net present value for small scale orchard selling 25% of the dessert cultivar orchard run production to cider under various price and management .

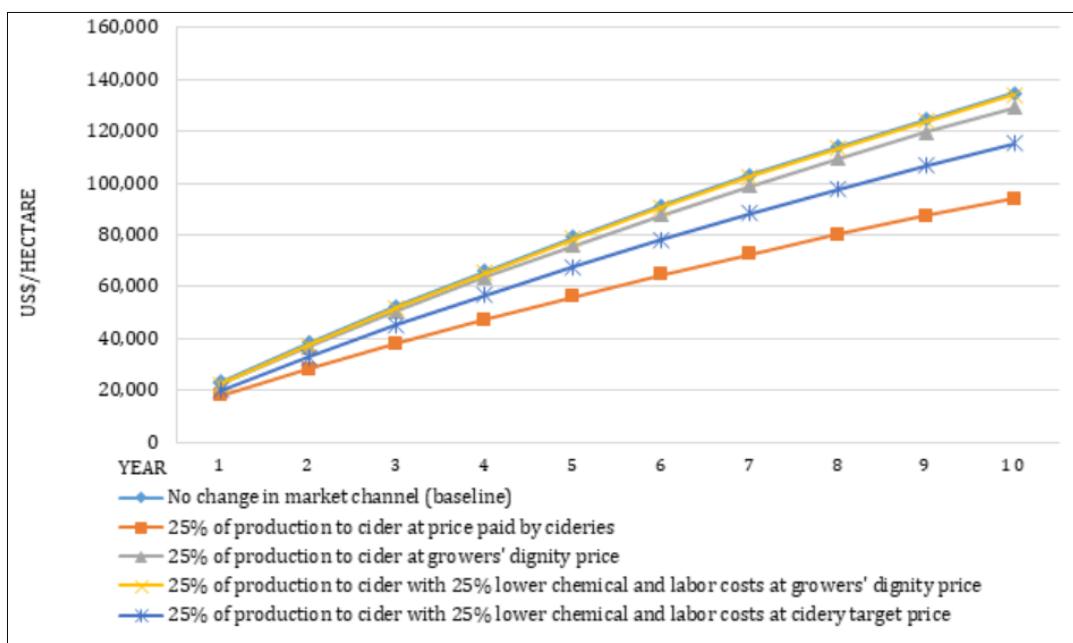
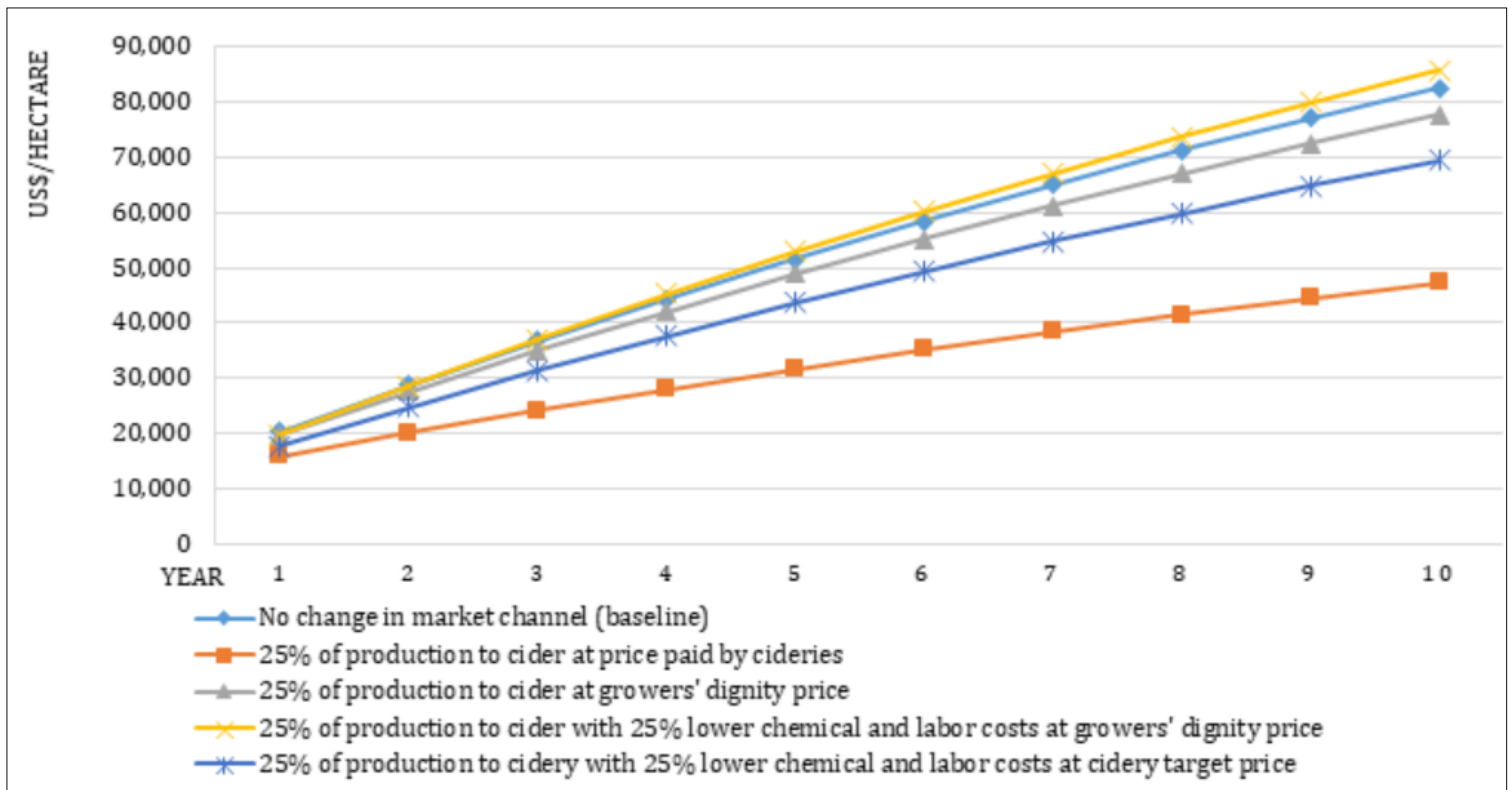


Figure 3. Net present value for large scale orchard selling 25% of the dessert cultivar orchard run production to cider under various price and management



**Acknowledgments:** We thank the growers and cider makers who have participated in the study.

This research project is funded by Vermont Working Lands Enterprise Initiative #02200-WLEB-77USDA “Apple Market Optimization and Expansion through Value-Added Hard Cider Production” and USDA Federal-State Marketing Improvement Program (FSMIP) Grant #11677750 “Orchard Economic Assessment to Support Vermont Hard Cider Production”.

**Additional Information:** Detailed information about the methods used to conduct the study and results is available in the following research article: Becot, F. A., T. L. Bradshaw and D. S. Conner (2018). "Growing apples for the cider industry in the U.S. Northern Climate of Vermont: Does the math add up?" Acta Hort 1205: 461-468.

For more information about this fact sheet, contact Terence Bradshaw at tbradsha@uvm.edu.

Information on the UVM Apple Program may be found at: <http://www.uvm.edu/~fruit/>

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