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Cider Apples in Tennessee: Basic Considerations

Brett Wolff[1]

Introduction

Following the surge in popularity of craft beer and microbrewing over the last two decades, hard apple ciders have also seen tremendous growth in popularity. Hard cider can be made from different varieties of apples that will produce different flavor profiles. Cider apple marketing is quite different from fresh fruit apple marketing, and it is important to understand these differences before putting in trees or shifting current production. Cideries can make cider from any kind of apple, but some varieties have more appeal than others. Generally, growers have the option to grow and market cider-specific apples, to sell seconds from their fresh fruit production to cider makers or to grow apple varieties suitable for fresh and processing, including hard cider.

Photo by Brett Wolff, University of Kentucky
Cider-specific varietals like Brushy Mountain Limbertwig can have a harder texture and more tannins than traditional dessert apples.

Market Description

While there have historically been many hard cider-specific varieties of apples grown in the United States, they have represented very little production in recent decades. Cider apples are often divided into the general categories of Sweet, Sharp, Bittersweet and Bittersharp, and apples from these categories are desirable for different kinds of cider. As compared to "dessert" or fresh-eating and baking apples, many cider apple varieties are quite bitter when eaten fresh, but have tannic and flavor characteristics desirable to cider makers. This is similar to the differences between some wine grape varietals and table grapes. In part thanks to Prohibition, and the subsequent lack of consumer interest through most of the 20th century, many older heirloom cider apples have either been lost or relegated to cultivation by botanical historians and hobbyists. Much of the current supply of cider apples comes from European varietals, which command high prices. In recent years, these surviving older cider-specific varieties have seen renewed interest from the craft cider community, but production is still a small fraction of overall apple production and markets. One potential opportunity for growers is to establish a relationship with a ci-

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dery that is able to market premium ciders made from cider-specific varietals. Establishing this relationship, and the production system to support it will likely take considerable time, and given the niche nature of this market it will likely not be viable as a standalone enterprise.

Another option for marketing apples to cideries is to sell cosmetically imperfect and other unmarketable, but sound fresh market apples. Given the long time required to establish an orchard, many growers tend to show more interest in funneling some portion of already established fresh market production into cider markets. It's important to note prices for these dessert apple seconds will be considerably lower than their fresh market price, and will also be lower than the premium paid for cider-specific apples. Breeders and marketers emphasize the potential for "dual purpose" apples that have traits desirable for the fresh and baking market as well as for cider making.

Photo by Brett Wolff, University of Kentucky

Producers will need to decide if they want to market whole apples or juice directly to cideries, and make equipment and pricing decisions accordingly.

Research out of the University of Vermont suggests that based on current prices paid by cideries, orchards should prioritize selling as much product into higher price markets (direct to consumer, other fresh eating markets) before selling product to cideries. This same research suggests that while there are potentially strong marketing opportunities for cider apples, price needs to be discussed early in any conversations to assess potential viability.

Market Channels

There are large-scale national cider makers (frequently a part of a larger beverage or food company) as well as regional and local cideries. In this and other industries, the label of "craft" has been adopted across this spectrum, and is therefore not necessarily an indicator of scale. Large cideries require very high volumes of apples and specific characteristics and specifications for their apples. Growers interested in starting out with cider apples should consider opportunities at the local and state level first. These cideries will likely demand a smaller volume, may be more flexible to adapt to the specifications and varieties a grower is producing, and can represent a good way to test whether growing and selling apples for cider is something to pursue further. In some cases, breweries may have interest in producing small runs of cider and may provide some niche opportunities for growers to market their crop. Eventually these smaller markets will become saturated, and at that point — with more time and experience — a grower can evaluate making the leap to supplying larger regional and national cideries. Given the long establishment times for new orchards and the emergent and changing market for cider, it is difficult to forecast the long-term viability of cider apple production in Tennessee. By utilizing full-dwarfing rootstocks for trees and high-density orchard designs, the time to cropping can be reduced and the yield potential can be increased substantially.

Not all cideries will be able to press apples themselves. In a survey of small cideries in Pennsylvania, only 52% of respondents bought and pressed apples (as opposed to purchasing juice). Growers may need to consider developing pressing facilities in order to capture the majority of the value of their cider apples.

Another marketing option is integrating the orchard and the cidery into one business similar to vineyards with an attached winery. This opens opportunity for additional revenue from agritourism, on-site tastings and sales (with proper permitting), and a variety of other areas of potential expansion. Note that growing cider apples, making cider, and operating an agritourism operation are three distinct skillsets, each requiring a lot of time, so establishing a proper multi-pronged business plan will be crucial to assess potential viability of the business.

Production

Variety and site selection

While ongoing research about cider apple varieties is happening across the U.S., current production in-

formation for cider-specific apples is lacking due to the lag time in establishing trees. This dearth of information is even greater in the Southeastern U.S. than in other traditional apple growing regions like the Northeast, Midwest and Northwest. Many cider specific varieties are susceptible to disease, vigor issues and other problems that will require further research. Since different regions of the country will likely have unique challenges, investigations should be conducted at multiple sites. Yields may be lower per acre for some of these varieties, which can offset the potentially higher prices per bushel, and some cider-specific varietals may also not yet be adapted to the intensive planting systems developed for dessert apples. Both these variables (yield and density) are currently being evaluated and in some contexts early cropping and higher yields do seem possible. Growers should also consider that many cider varietals bear fruit biennially (every other year), though it is possible to eliminate or greatly reduce this alternate bearing through management.

The climate in Tennessee provides a number of disease, pest and physical challenges (heat and sun) to apple production. Cultivar and site selection are two of the most important decisions in establishing a successful orchard. Washington State University assembled a helpful list of cider apple varieties commonly grown in the U.S., available in the "Additional Resources" section below. Michigan State University put together a list of potential cider varieties based on a curated selection of the USDA's U.S. National Plant Germplasm System, also available in the resource section at the end of this publication. It again should be pointed out that a given apple variety is apt to be better suited

Photo by Brett Wolff, University of Kentucky

One method for trellising cider apples.

Photo by Brett Wolff, University of Kentucky

Apples for cider will still need be sorted for soundness, but there is a much higher tolerance for imperfection in the fruit.

to certain areas of the country than others and that the characteristics of ciders made may also vary depending on the area in which the apples were grown. The general provisions for site selection for cider apples are the same as those for fresh market apples. An ideal site is higher than the surrounding land, and has deep friable, fertile soil. There are multiple production systems for dessert apples including standard, semi-dwarf, and high-density dwarf and spindle plantings. There are more extensive apple production resources linked in the "Additional Resources" section below.

Cultivars

Several cider apple cultivars recommended by N.C. State Extension include: Grimes Golden, Magnum Bonum, Virginia Beauty, Stayman, Royal Limbertwig, American Golden Russet, Blacktwig and Winesap. The University of Kentucky is currently evaluating King David, GoldRush, Grimes Golden, Arkansas Black, Golden Russet, Black Twig, Brushy Mountain, Imperial Red Delicious, Redfield, Roxberry Russet and Ashmead's Kernel for their potential as cider apples. Note that some of these varieties fall into the category of "dual-purpose" in the sense that they can be marketed as dessert or cider apples.

Pest Management

Like other specialty crops in Tennessee, apples are susceptible to damage from insects, diseases, weed competition and other pests, such as birds and wildlife. Apples are particularly challenging to grow in the Southeast due to disease and pest pressures, and having a good pest management strategy in place is crucial. An IPM program will be the main strategy for preventative pest management. State and regional

Harvesting apples in the cider varietal evaluation orchard at the University of Kentucky.

Photo by Brett Wolff, University of Kentucky

IPM resources may be accessed at the Southern Integrated Pest Management Center website, https://southernipm.org/. Another resource for apple growers in Tennessee and other Southeastern states is AG-472, "Integrated Orchard Management Guide for Commercial Apples in the Southeast," found online at content.ces.ncsu.edu/integrated-orchard-management-guide-for-commercial-apples-in-the-southeast.

While there are products and management plans available for both conventional and organic cider apple production, it's very important to establish whether the potential price premium for certified organic products is likely and whether the higher input costs and potentially higher cull rates are worth that premium. Proper site selection, pest management, pruning and fertility management will help increase the odds of higher yields, better quality and overall profitability.

One potential major advantage for cider production is that cider makers can tolerate cosmetic imperfections typically not accepted by fresh market buyers and end consumers. This means that seconds from fresh market apple production deemed otherwise unacceptable from a cosmetic standpoint may be utilized by cideries. Depending on prices and volume, this could be an opportunity to recoup costs or even to generate some profit. It also means that any cider apple specific production may be able to adopt less intense pest and disease control, though the apples must still be sound, free of rot, and of otherwise high quality. Experienced and efficient commercial growers may not produce enough seconds to be viable, and so the cider market may represent an occasional overflow for their products rather than a stable market they depend on.

Economic Considerations

Costs

As with most specialty crops, labor is the single largest cost in producing cider apples. Some collaborative research with cider apple growers in Washington and Virginia estimated that labor could account for as much as 70% of overall costs. There is also considerably higher investment while establishing an orchard (the first three to five years). Researchers estimated that in Virginia, first-year establishment costs would be $14,421/acre. Another study from Western Washington estimated just under $11,000 first-year establishment costs and just over $27,000 total establishment costs over the first four years. Since apples are perennials that take time to establish and mature, the decision of whether to invest in starting an orchard should be weighed carefully. When considering these budgets, please be sure to note tree population per acre and which costs are included in each figure.

After establishment, costs decrease but are still considerable. In the study of Virginia orchards, annual variable costs at maturity were estimated at $3,270/acre, and the total variable costs over 25 years were $87,788/acre. The study out of Washington State University estimated higher variable costs per acre for cider apple production: just over $8,000 per acre annually.

The full enterprise budgets referenced here are linked in the "Additional Resources" section below.

Pricing

Since this market is relatively young, and particularly so in Tennessee, pricing information remains somewhat sparse and mostly comes from outside the region. High-end craft cideries may be willing to pay considerably more for local cider-specific apples, but it is important to have those conversations before establishing a planting. As a rule, unmarketable dessert apples diverted to cider command significantly lower prices than cider-specific apples and than those dessert apples command in direct-to-consumer and wholesale markets. Various studies and surveys have estimated prices for cider-specific varieties at $15-$25 per bushel and prices for cull or second dessert apples for cider production at $4-$15.50 per bushel.

Conclusion

Ultimately, cider-specific apple production pairs an expensive, slow-developing production system with a fast-moving, sometimes unpredictable, and (in Tennessee especially) undeveloped market. Cider has grown in popularity with American consumers in the last decade, but that trend is not assured to continue nor do all national-level trends translate well to local markets. There is less risk in marketing dessert apple seconds to cideries in order to establish a relationship and assess potential. There may also be opportunities to establish agritourism and farm-to-glass markets by pairing an orchard with an on-site taproom and other kinds of agritourism offerings, but this is a considerably more complex approach.

Additional Resources

- Commonly Grown Cider Apple Cultivars in the U.S., Cider Report 202 (Washington State University, 2015) https://s3.wp.wsu.edu/uploads/sites/2167/2017/04/CiderRegionalVarieties2015B1.pdf
- "Growers seek best way to supply fruit to cidery market" (Fruit Growers News, 2017) https://fruitgrowersnews.com/article/growers-seek-best-way-supply-fruit-cidery-market/
- Apple Cultivars for Production of Hard Cider in Michigan, Extension Bulletin E3364 (Michigan State University, 2017) https://www.canr.msu.edu/uploads/resources/pdfs/e3364.(1).pdf
- Assessing the Economic Feasibility of Growing Specialized Apple Cultivars for Sale to Commercial Hard Cider Producers (Virginia Cooperative Extension, 2013) https://vtechworks.lib.vt.edu/handle/10919/47428
- The Economics of Growing Cider Apples (Washington State University and Cornell University, 2016) https://cpb-us-e1.wpmucdn.com/blogs.cornell.edu/dist/c/7021/files/2016/06/Cider_Apple_Prod_Econ_Galinato_and_Peck-1e44sqk.pdf
- "Growing Apples for Craft Ciders" (New York Fruit Quarterly, Vol. 23, No. 1. Spring 2015) https://nyshs.org/wp-content/uploads/2015/03/5-10-Merwin-Pages-NYFQ-Book-Spring-2015.pdf
- Cost Estimation of Establishing a Cider Apple Orchard in Western Washington (2014). Acta Horticulturae. 10.17660/ActaHortic.2015.1085.70. https://www.researchgate.net/publication/267353730_Cost_Estimation_of_Establishing_a_Cider_Apple_Orchard_in_Western_Washington#:~:text=For%20a%20fully%20established%20cider,be%20recovered%20after%2014%20years.
- Cost of Production, Prices, and Economic Performance for the Cider Market in Vermont (University of Vermont, 2017) https://www.uvm.edu/~orchard/fruit/pubs/Factsheets/UVMFRT002_ciderAppleProductionCosts.pdf
- Hard Cider Business Benchmark Survey (Penn State University, 2018) https://extension.psu.edu/hard-cider-business-benchmark-survey
- Heirloom Apple Production (N.C. State University Extension, 2017) https://growingsmallfarms.ces.ncsu.edu/growingsmallfarms-heirloom-apples/

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Photos courtesy of Brett Wolff

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