

Annual Report 2007

Evaluation of Apple Cultivars for Hard Cider Production

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Summary

A small variety trial of cider apples conducted at Mount Vernon from 1979–1994 provided preliminary observations on the potential of cider apple production. In recent years, with the encouragement of local hard cider makers, WSU – Northwest Washington Research & Extension Center at Mount Vernon (NWREC) has expanded research on apple varieties specifically bred for the characteristics needed in producing market quality hard cider. In 2002 the first cider was pressed at Mount Vernon, under the direction of cider cooperator Drew Zimmerman.

In November 2003, May 2004, November 2004, December 2005, December 2006, June 2007 and December 2007, a week-long series of Cider School classes, taught by Peter Mitchell, were conducted at NWREC. Mitchell is a professional cider maker and trainer in hard cider production techniques from Worcestershire, England. In his courses the emphasis is on hands-on experience of cider production, laboratory techniques, and post production quality analysis. Two sessions of the Cider School were held in 2007: Principles and Practice of Cider Making on June 25–29 and Commercial Cider and Drinks Production on December 10–14. Participants from the Pacific Northwest (eastern and western Washington, Oregon, Idaho and B.C., Canada) as well as from states as distant as Indiana, New Hampshire, Michigan, Montana and Virginia have attended these courses.

In 2007 most of the younger trees and all the mature trees produced sufficient fruit for making cider. Due to budget considerations, only 4 varieties were pressed for cider, coordinated with the cooperating cider maker to handle post harvest fruit in a manner characteristic of standard cider production. Two rows of the cultivar Brown Snout grafted on very dwarfing rootstocks M27 and M9 were experimentally harvested using a mechanical raspberry picker. Results of this preliminary trial indicated that with some attention to suitable pruning and training techniques, the mechanical picker is well worth further trial.

A row of single-tree specimens, including some early American hard cider varieties, was planted in 2003 for evaluation and possible inclusion in future trials. Bloom data was recorded and sample fruit from most of these trees examined in 2007. In cooperation with the cider consultant, fermentation of ciders from the 2007 crop is in process and samples for evaluation will be set aside for 2008. Evaluation of ciders and perries produced in 2005–2006 was conducted by participant panels.

Methods

The cider apple trial plot consists of five single-tree replications of each cultivar to provide for sufficient fruit to make single-varietal cider as well as for blending. All trees are free-standing, with row spacing 18' between rows, 12' between trees. Trees planted in 1994 were grafted on MM 106 rootstock, with additions in 1999. Acquisitions in 2001–02 are grafted on MM 106 and M26 rootstock. Specific cultivars being evaluated are listed below (see **Appendix, Table 1.**) A screening trial collection of 40 single trees was planted in 2003 for preliminary evaluation, from which replications can be made and added to the main trial if they show promise. Some new acquisitions were planted out in spring 2005 (see **Appendix, Tables 2 and 3.**) In 2004 a collection of perry pears was also added (see **Appendix, Table 4.**)

The acquisitions include specimen trees of old American varieties used for farm cider in the 1800s and earlier not yet tested here, to rediscover and evaluate their unique cider heritage in this country. In addition, cultivars that have been selected for cider production in France and England are included that may be well adapted to our climate conditions.

In 2003–04 new trees were established and grafted on strongly dwarfing rootstocks M27 and M9, grafted to the cultivars Foxwhelp, Muscadet de Dieppe and Yarlinton Mill (M27), Vilberie (M9) and Brown Snout (M27 and M9.) Planted at close spacing, the trees are designated for use in a cultural trial for mechanized harvest methods, conditional on the amount of grant funding available.

Data collected includes bloom and harvest dates, productivity (yield), harvest fruit analysis (Brix and titratable acid), and observations relative to ease of culture such as disease susceptibility, vigor and growth habit.

Results

In 2007 most mature trees produced a full crop of fruit. Fruit from the cider test plot was harvested and pressed for juice in a manner consistent with commercial cider production, in cooperation . Notes were kept on the characteristics of the juice, the blends produced, and the fermentation methods used.

Table 1. Juice pressed at Mount Vernon in 2006(* indicates dessert apple cultivar)

Cultivar	Press Date	Net Fruit (lbs)	Yield (gal)	Lbs/gal
Conference pear	Oct 20	139.3	8.5	16.4
Concorde pear	Oct 20	147.9	10.5	14.1
Comice pear	Oct 20	131.7	9.0	14.6
Tom Putt apple	Oct 20	173.3	12.0	14.4
Gravenstein apple*	Oct 20	158.0	11.0	14.4
Muscadet de Dieppe apple	Oct 20	223.6	13.0	17.2
Bulmer's Norman apple	Oct 20	115.9	9.0	12.9

Table 2. Juice characteristics for ciders and perries bottled at Mount Vernon in 2006

Cultivar	pH	S.G.	Brix	T. Acid %	Tannin %
Conference pear	3.39	1.051	12.7	0.15	0.03
Concorde pear	3.38	1.055	13.9	0.13	0.03
Comice pear	3.47	1.051	12.8	0.17	0.02
Tom Putt apple	3.49	1.048	12.0	0.40	0.06
Gravenstein apple*	3.38	1.051	12.6	0.43	0.02
Muscadet de Dieppe apple	3.88	1.055	13.6	0.30	0.13
Bulmer's Norman apple	3.25	1.047	12.1	0.27	0.16

Table 3. Ciders analyzed for tannin in 2007 (*dessert apple cultivar)

Cultivar	% tannin	Cultivar	% tannin
Amere de Berthcourt	2.0	Chisel Jersey	1.6
Reine des Pommes	2.0	Muscadet de Dieppe	1.6
Kermerrien	1.9	Golden Russet	1.5
Frequin Rouge	1.8	Brown Snout	1.4
Cap of Liberty	1.8	MacIntosh*	1.4
Finkenwerder Herbstprinz	1.7	Harry Masters' Jersey	1.4
Gravenstein*	1.6	Dabinett	1.3

Discussion and Recommendations

At this point in the trials, several cider apple varieties have shown themselves to be well adapted to coastal maritime climate conditions, consistently productive, yielding sufficient crops of fruit capable of producing high quality commercial market cider. Some of these varieties combine well with commercial dessert apples (e.g. Jonagold, Gravenstein) in producing blended ciders.

Various styles and methods of cider making have been used to explore the techniques that are most suitable in making high quality cider, both varietal and blended. Further work in this trial will be focused on the following areas:

1. Publishing a new Extension Bulletin summarizing the work done since the initiation of the project and presenting the results of the trial in a readable, easily understood format useful to anyone considering the commercial production of hard cider.
2. Continuing to conduct an annual Cider School, in cooperation with Peter Mitchell, cider expert from Worcestershire, England, to offer intensive hands-on training for all those seriously interested in making commercial quality cider to a high standard. The sequence of course offerings includes a basic understanding of fermentation methods and techniques, the science and technology involved, quality control of the product, and product development, marketing and sales. These classes are of direct practical assistance to anyone establishing a small to medium size cider business, in either western or eastern Washington. Past courses, as mentioned above, have drawn participants from Washington, Oregon, Idaho and British Columbia, and also from as far away as New Hampshire, Michigan and Virginia.
3. Evaluating the cultivars planted since 2003, including cider varieties from England, France and Germany, but with particular emphasis on early American cider varieties. Some of these, if they prove to be early season bloomers, may be better suited to growing in eastern Washington orchards. Most of the cider varieties tested so far are late season bloomers and thus potentially more susceptible to fireblight [*Erwinia amylovora*] which is a serious problem in eastern Washington orchards.
4. Conditional on the available funding, conducting a trial of mechanical harvesting of fruit. The test plot for this trial has already been established, including 5 proven cider varieties grafted on strongly dwarfing rootstocks (M27 and M9) and planted at dense in-row spacing.

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APPENDIX

Table 1. Cider apple cultivar trial (5 trees)

<i>Bittersweet:</i>		<i>Bittersharp:</i>	<i>Sharp:</i>
Brown Snout	Redstreak	Cap of Liberty	Bramley's Seedling
Chisel Jersey	Reine des Hatives	Foxwhelp	Tom Putt
Dabinette	Tremlett's Bitter	Kermerrien	<i>Other:</i>
Harry Masters' Jersey	Vilberie Yarlinton Mill	Kingston Black	Golden Russet
Muscadet de Dieppe		Breakwell's Seedling	Harrison
Michelin		<i>Bitter:</i>	Granniwinkle
		Frequin Rouge	Campfield
			Finkenwerder Herbsprinz

Table 2. New acquisitions 2003 (single trees)

Amere de Berthcourt	Frequin Tardif	Nehoe
American Forestier	Granniwinkle	Peau de Vache
Blanc Mollet	Grindstone	Red Jersey
Brown Thorn	Harrison	Royal Jersey
Bouteville	Harrison SS	Roxbury Russet
Cap O'Liberty	Jouveaux	Sweet Alford
Cimitiere	Lambrook Pippin	Sweet Coppin
Coat Jersey	Major	Taliaferro (Colaw)
Court Pendu Plat	Metais	Taylor's

Court Pendu Rose	Muscadet de Dieppe	Whidbey
Crow Egg	Muscat de Bernay	Zabergau Reinette
Frequin Audievre		

Table 3. New acquisitions 2004 (planted spring 2005)

Bedan de Parts	Grimes Golden	Stembridge Jersey
Bramtot	Maude	Stoke Red
Doux Normandie	Pethyre	Vagner Ascher
Fillbarrel	Ross Nonpareil	

Table 4. Perry pears (single trees, planted fall 2004, source NCGR Corvallis OR)

Barland	Gin	Schweizer Wasserbirne
Barnet	Huffcap, Hendre	Taynton Squash
Blakeney Red	Huffcap, Yellow	Thielersbirne
Butt	Normannischen Ciderbirne	Thorn
Gelbmostler	Romania Perry Pear	Winnals Longdon
