Grape Cultivars for Sparkling Wine Production

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University of Kentucky

Sparkling Wine Production Conference
Wolf Mountain Vineyards in Dahlonega, GA
22 May 2019

Traditional Method Sparkling Wine

- Sparkling Wine Vineyard
  - Production Methods
  - Economics
  - Non-Traditional Wine Styles

Grape Cultivars Used to Produce:

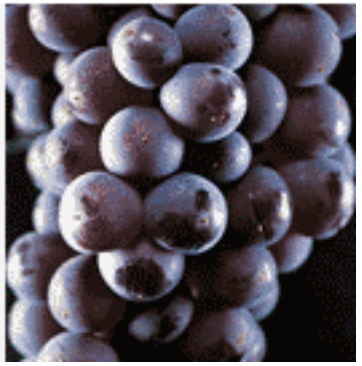
Champagne - Méthode Champenoise - Traditional Method Sparkling Wine

Cool Regions	Warm Regions	Hot Regions
Pinot noir	Chenin blanc	Parallada
Chardonnay	Chardonnay	Chardonnay
Meunier	Gamay	Xarello
Gamay	Pinot noir	Macabeo
Pinot blanc	Meunier	Pinot noir
		Chenin blanc
		Meunier
		Semillon

Source: Dry and Ewart (1985). Regions based on UCD heat summation units.

www.apps.fst.vt.edu/extension/enology/downloads/463-017.pdf

Pinot Noir



Pinot Meunier

Chardonnay

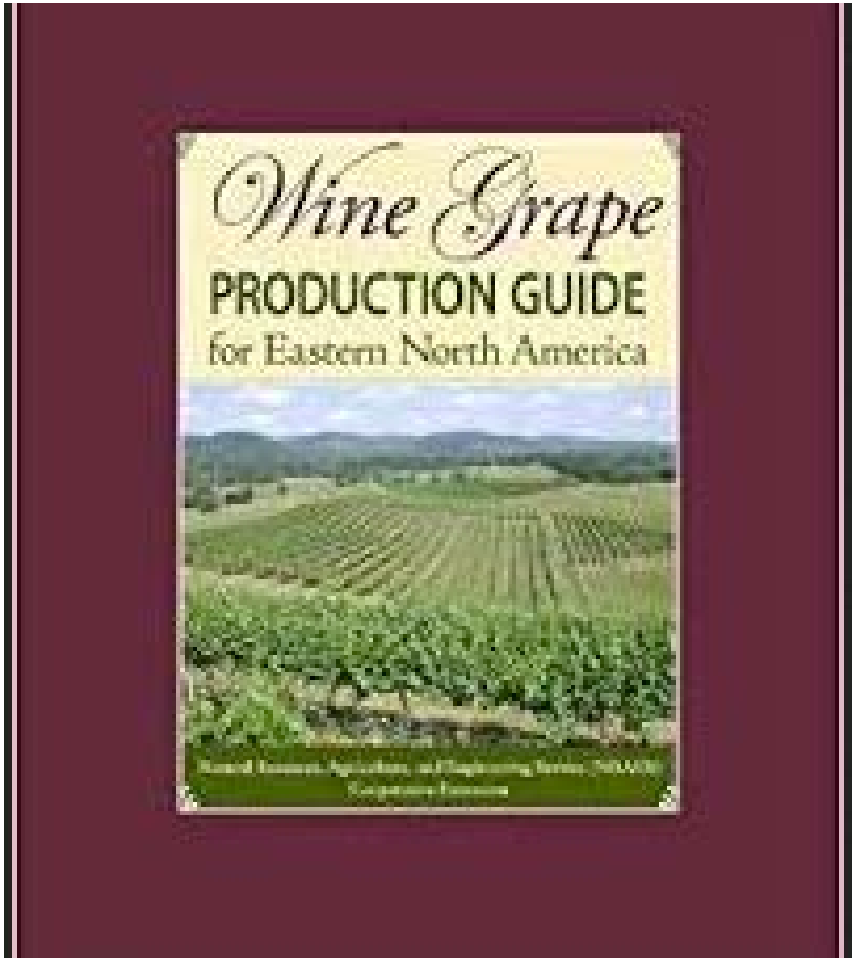
www.champagne.fr/en/from-vine-to-wine/grape-varieties-vineyards/grape-varieties

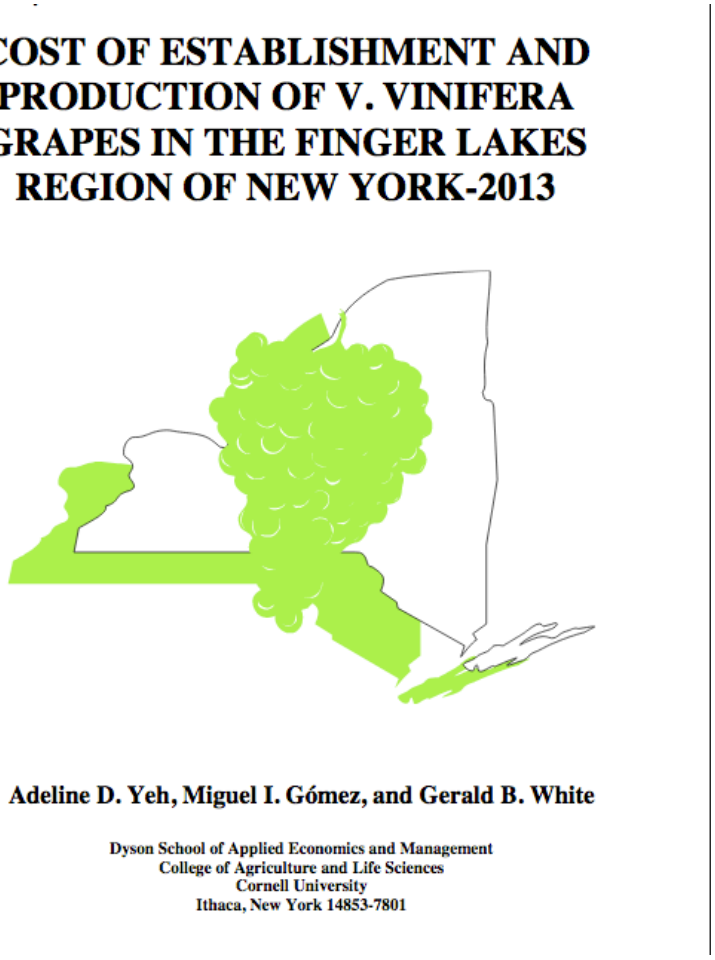
Champagne
48.9169° N

Issues w/ Chardonnay and Pinot Noir in KY

- Mid-Winter Cold Hardiness
- Spring Frost -> Early Budbreak
- Early Harvest
- High Vigor
- Disease Susceptibility
- Cluster rot
- Small Cluster

Grape production and Rate of Return on Investment





COST OF ESTABLISHMENT AND PRODUCTION OF V. VINIFERA GRAPES IN THE FINGER LAKES REGION OF NEW YORK-2013

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Alternatives to Pinot and Chardonnay?

Ideal Fruit Chemistry

Traditional Method Sparkling Wine

°Brix (17-20) --> Base Wine = 9-11% alc.

pH (2.8-3.2) --> Reduce Need for SO_2

T.A. (10-14 g/L) --> Structure + Freshness

Low “Varietal” Character + Minimal Cluster Rot = Imperative to Quality

Fruit Chemistry and Harvest Date -

UKHRF - Lexington KY

2010-2018	Harvest Date	Brix	pH	T.A.
Chambourcin	19-Aug	16.3	3.02	12.6
Villard Blanc	22-Aug	16.4	2.92	12.1
Vidal Blanc	25-Aug	17.5	3.10	10.2

Vidal Blanc

Chambourcin

Villard Blanc

Chambourcin - Villard Blanc - Vidal Blanc

UKHRF (2010-2018)

- Yield = 5-8 tons per Acre
- 100% vine survival in spite of cold 2014-15
- Growth habit = low cost to maintain open canopy
- Large cluster = less labor to harvest

- Early harvest for sparkling =
  - less bird damage
  - no cluster rot
  - long post-harvest canopy

Disease Susceptibility

- Chambourcin
  - Susceptible to Powdery mildew and Black rot
  - Resistant to Phomopsis and Downey mildew
- Villard Blanc
  - Susceptible to Black rot
  - Resistant to Phomopsis, Powdery mildew, and Downey mildew
- Vidal Blanc
  - Susceptible to Powdery mildew, Black rot, Anthracnose, Phomopsis

Villard Blanc

Vine Growth Habit

Villard Blanc

- Semi upright
- Moderate to low vigor
- Highly fruitful
- No Summer laterals
- Non aggressive tendrils
- Best on SHW
- Late bud break
- Later season harvest

Vine Growth Habit

Chambourcin

- Semi upright
- Moderate to Mod/high vigor
- Highly fruitful
- High vigor + SHW = Summer laterals
- Non aggressive tendrils
- Either VSP or SHW
- Mid-early bud break
- Later season harvest

Villard Blanc

Norton

VSP or Single High Wire

Chambourcin

How much crop? When to pick?

- Higher cropload values tend to:
  - increase variability in ripening between clusters
  - Increase Titratable acidity
  - Lower Brix

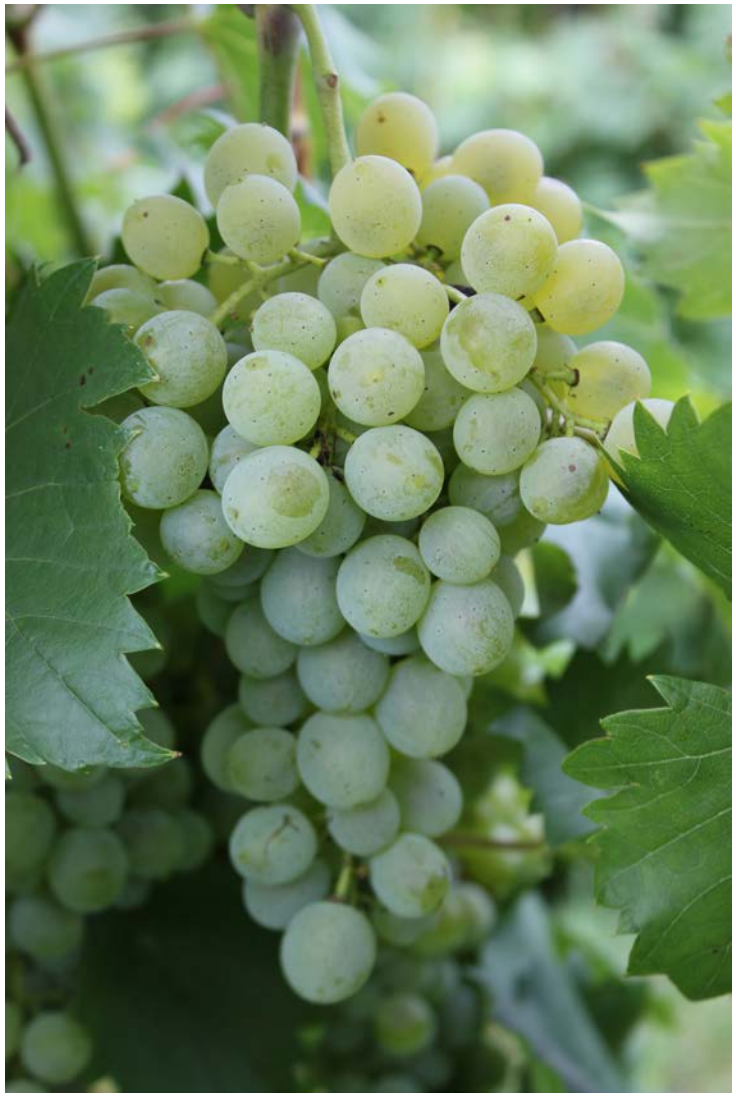
Chambourcin

August 1

August 15

Villard Blanc

August 15



August 22

Villard Blanc

- Early Harvest = more neutral flavor
- Late harvest = more fruity + herbal/medicinal
- Useful for blending down alcohol and up acid if buying high maturity Vinifera

Large Cluster and Open Canopy = Efficient Hand Harvest

Mechanization

Hand Harvesting is required to reduce skin contact & prevent extraction --> aroma, color, tannins, and bitterness.

Chambourcin, Villard Blanc, & Vidal Blanc

- Pressing Issues

- Chambourcin & Villard Blanc --> Low tannin + Low bitterness
- Villard Blanc --> slightly *Labrusca*-like gummy flesh
- Vidal Blanc --> high tannin + moderate bitterness

Chambourcin

Villard Blanc

Vidal Blanc

Alternative Sparkling Wines From UKHRF Cultivar Trials

Light, fruity, refreshing => different

UKHRC -Organic Grape Cultivar Trial

- White Wine
  - Villard Blanc
  - Traminette
  - Valvin Muscat
  - Edelweiss
  - Brianna
  - Cayuga White
- Table
  - Mars
  - Vanessa
- Red Wine
  - Corot Noir
  - Noiret
  - Villard Noir

Red Color = Susceptible to Black rot

Cayuga White

Villard Noir

Jupiter

- Thin, non slip-skin
- Excellent flavor (grapefruit, floral)
- Highly susceptible to late season Downey Mildew
- Some Cluster thinning required
- May benefit from rootstock to maintain long-term vine vigor

August 1

Brix	pH	T.A.
17.5	3.25	7.0

Marquis

- Cold Hardy
- High yields
- Cluster thinning required
- Large berries + Clusters
- Excellent pineapple flavor when fully mature
- May need multiple harvests
- Thin skins (slipskin)
- Slightly gummy flesh

August 10

Brix	pH	T.A.
17.0	3.15	6.0

Cayuga White

- Labrusca = Gummy flesh
- Early Harvest = more neutral flavor
- Late Harvest = more Labrusca-like “foxy”
- Skin Contact
  - Orange Wine??
  - Add tannin to Cider??

August 10

Brix	pH	T.A.
18.5	3.20	8.1

Vignoles

- High sugar + mod. high acid
- Excellent Wine Quality
- Intense aromatics = peach, tropical + floral
- Susceptible to berry splitting and fruit rot at harvest

August 24

Brix	pH	T.A.
23.2	3.25	10.1

Traminette

- Lower than average T.A.
- Very aromatic - floral/spice
- What is ideal amount of fruit exposure???
- Harvest Date???
- Later harvest increases sugar, juice pH, aroma, and bitterness

September 1

Brix	pH	T.A.
18.9	3.15	7.2

Traminette

A2574

- Gewurtztraminer x Melody
- Harvest date similar to Traminette
- Higher Brix + lower pH

September 1

Brix	pH	T.A.
22.5	3.21	6.5

St. Vincent

- Ripens Late
- Mod. Sugar + Mod. high acid
- Low tannin + high color
- Makes Excellent Rose and Soft Red Wine

September 20

Brix	pH	T.A.
19.7	3.26	9.7

Norton

- Ripens Late
- High color + mod. tannin
- High pH + high T.A.
- High sugar

September 25

Brix	pH	T.A.
23.2	3.62	9.5

Risk vs. Reward of Bubbles

Upside

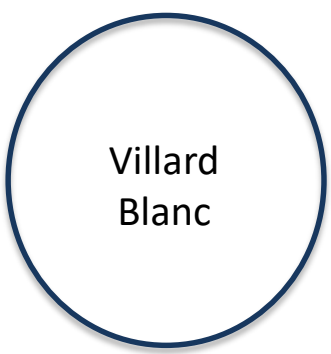
- Vineyard Profitability
- Higher Bottle Price
- Product Diversification
- The Champagne Process is Highly Marketable
- Bubbles are More Fun

Downside

- Expensive Equipment
- Higher Packaging Cost
- Longer Aging Process
- Higher Labor Cost to Produce Wine
- Bubbles Expose Flaws

Sparkling Wine Tasting

KFVC Wine Short Course – January 7, 2019



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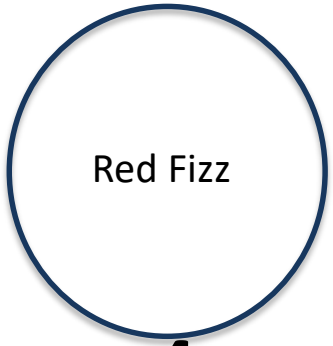

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Wine Chemistry

Chambourcin
(2016-2017)

- pH = 2.95
- alc. = 10.5%
- TA = 11.5
- R.S. = 4.0 g/L

Villard Blanc
(2015-2016)

- pH = 3.00
- alc. = 10.5%
- TA = 9.5
- R.S. = 2.5 g/L

Wine Chemistry

Jupiter

(2017)

- pH = 3.33
- alc. = 9.9%
- TA = 5.0
- R.S. = 0 g/L

Red Fizz

(2015-2016)

- pH = 3.50
- alc. = 13.7%
- TA = 5.2
- R.S. = 0 g/L

Cultivar	% of blend
Villard Noir 2016	50%
Norton 2015	20%
St. Vincent 2015	15%
Chambourcin 2015	15%
Blend	100%