

Pinot Noir: The Savage Yet Seductive Grape “The Beauty and the Beast”



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Introduction to Pinot Noir



The Story of the Origin

Quotes taken from “Pinot Noir” by Andrew Barr, Penguin Group, England 1992

“Pinot Noir is the grape of Burgundy. At its best, and only then, red burgundy is the finest wine in the world. If Claret (Bordeaux) appeals to the intellect, Burgundy appeals to the senses. It is the most delicious and sensuous red wine in the world. It is softer, lusher, more exuberant and most exciting.” (Andrew Barr).

- The grape however is a very unreliable variety
- Unless the right clone of Pinot is grown on the right trellising or trainings system in exactly the right climate and picked at precisely the right time, they wines will not be successful

Background on Pinot

- Because of these uncertainties, many wine connoisseurs have stayed away from Burgundy because they believe one would have to spend thousands of dollars to buy a good bottle of burgundy.....only one in 20 is worth the money
- Today, many new world wine regions have adopted this grape variety, but not so many wines have been successful at the beginning
 - California, Oregon, New Zealand, Australia and South Africa (which subsequently developed the Pinotage grape)
- Ontario has been adopting this grape for a while, but on a limited scale
 - I first worked with Pinot in 1987 from the St. Davids region

Climatic Requirements

- Cool Climate Grape
 - One of the failures in new world regions was that it was planted in very warm climates

All Fruit plants produce their best and most complex fruit at their cultivatable limits

- The fruit must attain its physiological maturity
- In a limited climate
 - if the temperature is too hot, the fruit is overripe, gets mushy and tastes like jam
 - if the temperature is too cold, the fruit tastes sour with little flavour
- In the case of grapes, cool climate is defined as one in which wine makers usually have to warm up the grapes to get them fermenting whereas a warm climate allows for instant fermentation
- Ontario seems to swing back and forth between cool and warm climate

Soil

- Much has been argued about climate versus soil
- In Burgundy, the subsoil rests on very old limestone rock
- In Oregon, the soil is young and volcanic, no limestone at all

“What matters in Burgundy is the taste of soil and the growing conditions – the Terroir- of each particular vineyard. Pinot Noir shows terroir more than any other variety because it has no taste of its own. It is a sort of ghost”. Quote from Aubert de Villaine, the co-owner of the Domaine de la Romanee-Conti taken from “Pinot Noir” by Andrew Barr, p9.

- Lalou Bize-Leroy states ***“Pinot Noir does have a taste”*** she says, ***“but I don’t want it. A wine from Burgundy should express the Terroir and should not taste of Pinot Noir such as in Oregon. We have a term for this, called pinotter”***

Terroir

- There is more and more agreement that terroir is a combination of climate, soil, and management such as vine spacing, yields, fertilization, rootstock, clones, **and the actual winemaking.**
 - A great book that summarizes multiple factors creating terroir is called “*Terroir, The Role of Geology, Climate and Culture in the Making of French Wines*”. James E. Wilson, forwarded by Hugh Johnson, University of California Press, 1999
 - Physical elements of the vineyard habitat such as the vine, subsoil, site, drainage, meso and microclimate are all included in Terroir.
- Robert Parker says think of Terroir as you do of salt, pepper and garlic

Clones

- Because of the genetic instability of Pinot noir, over 1000 clones have been identified
- Best known clones available are all originating from the vineyard of Jean-Marie Ponsot in Morey-Saint Denis
 - Clones 113, 114, 115, 667, 777
 - All are allowed for importation into Canada
- Historically in Burgundy, vines were selected and planted from the best performing vines in the vineyard
- This was called “massal” selection and most vineyards had a random set of clones
- This obviously, at least to my conviction, would produce more complex wines since some would bring acidity, others more fruit, others more colour and others more tannin

Vine Spacing

Spacing in Burgundy vs spacing in Canada

Where the wine making starts

- Important for yield i.e yield per individual vine necessary to produce economical yields per acre with higher quality
- Burgundy: 4000 vines/acre or 10,000 vines/ha
 - **1 m²/vine**
- Spacing decision is of ultimate importance in defining potential yield and quality
- See table for vine spacing and tonnage

Vine spacing and crop load

	Old spacing	New Ontario spacing	Burgundy Spacing
Row spacing	3m X 1.5m	2.5m X 1m	1.2m X 0.8m 1.0m X 1.0m
Area/vine	4.5 m ² /vine	2.5 m ² /vine	1 m ² /vine
Vines/acre	888 vines/acre	1600 vines/acre	4000 vines/acre
Vines/ha	2222 vines/ha	4000 vines/ha	10,000 vines/ha
Desired hL/ha	30 hL/ha	30 hL/ha	30 hL/ha
Required kg/ha	5000 kg/ha	5000 kg/ha	5000 kg/ha
Required kg/acre	2000 kg/acre	2000 kg/acre	2000 kg/acre
Required kg/vine	2.25 kg/vine	1.25 kg/vine	0.5 kg/vine

Desired Crop Load for Quality Pinot Noir Production

- The legal limit for a grand Cru in Coton is 35 hl/ha
- The Burgundian experience vs our Ontario experience shows that the maximum yield for any kind of quality in Burgundy is 40-45 hl/ha and in Ontario it is **30 hl/ha** at 1,600 vines/acre (4000 vines/ha) which amounts to 1.25 kg/vine
 - In our best Pinot Noirs, we had only 15-20 hl/ha which corresponds to 2.5-3 tonnes/ha or 1-1.2 tonnes/acre



Summary of Important Viticultural Aspects of Growing Pinot noir

- The number of vines/acre is of utmost importance in any soil and climate to produce quality Pinot Noir
- Wide spacing is futile and totally uneconomical for producing good Pinot Noir
- Pinot Noir is made in the vineyard
- Since it ripens unevenly, it is a “lying grape” because the top of the bunch ripens before the berries in the middle

Summary of Important Viticultural Aspects of Growing Pinot noir

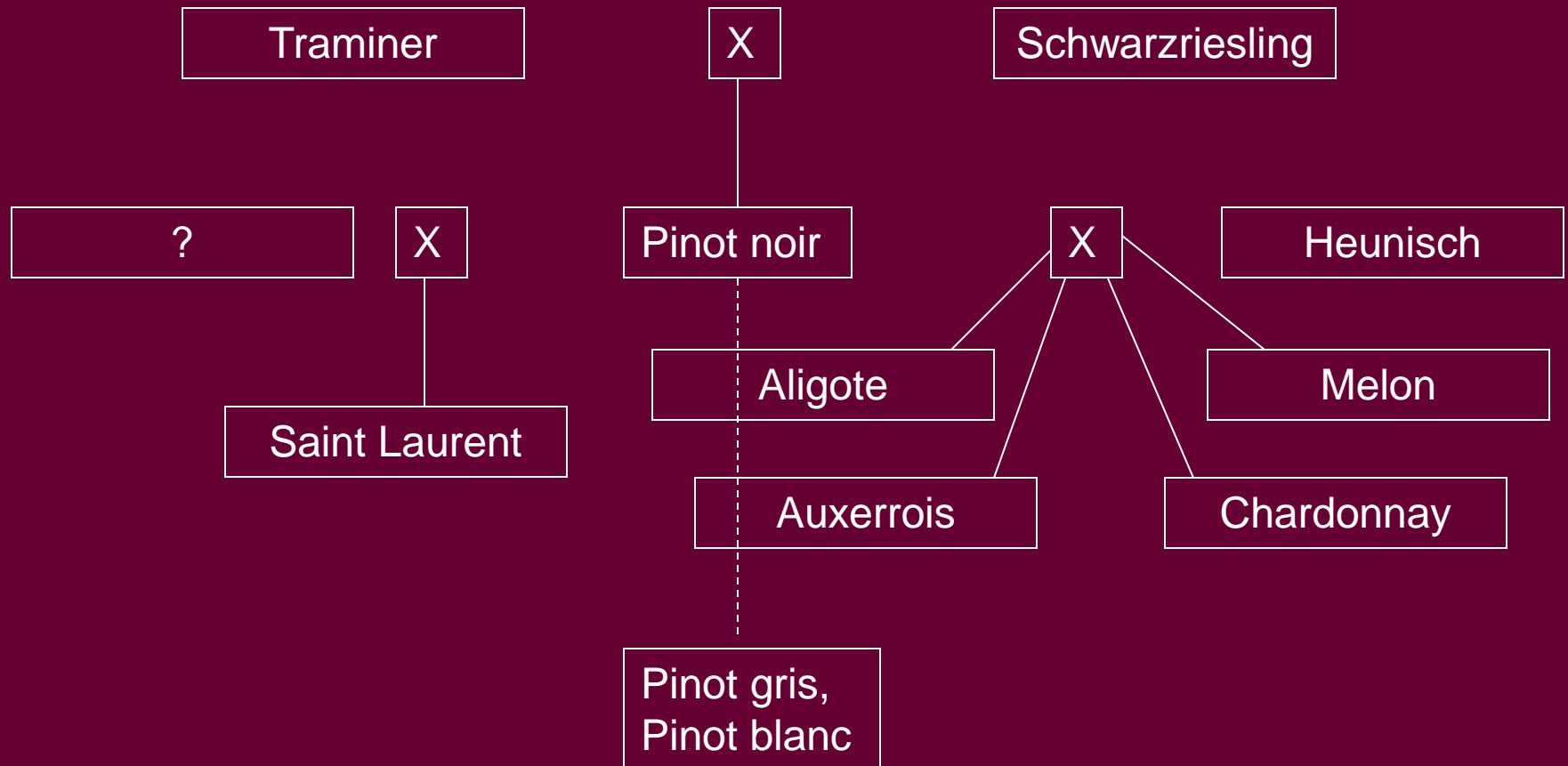
- *“One should not wait until all the grapes have reached the same degree of maturity”, wrote Abbe Tainturier in the eighteenth century. “Cooked, roasted and green grapes are all necessary- the green ones bring liveliness to the wine. Experience has taught us that complete maturity produces fat, heavy wines that ooze like oil”*
- *“It may well be in fact that Pinot Noir produces the best flavours before they are fully ripe. They may well produce the best wines if they are picked at 11.5-12% potential alcohol-the level they normally achieve in Burgundy – rather than the 13% in which they are generally picked in warmer climates”* from Pinot Noir by Andrew Barr p 19
- **My preference is harvesting grapes at 12.5% potential alcohol (22 Brix) and then chaptalize if need be**

Pinot Noir Historical Synonyms

France	Pineau, Franc Pineau, Noirien, Savagnin Noir, Savagnin (ur), Morillon, Auvergnat, Plant Dore, Vert Dore (champagne), Pinot, Franc Norien, Bourgignon Noir, Plant de Cumieres
Switzerland	Pinot Noir, Cortaillod, Blauer Spatburgunder Klevner
Italy	Pinot Nero, Pignol, Pignola
Austria	Blauer Spatburgunder, Blauer Nurnberger
Yugoslavia	Burgundac Crni, Modraklevanyka
Czechoslovakia	Rouci, Roucimodre
Hungary	Nagy Burgundi, Kisburgundikek, Pinot Noir
Germany	Blauer Spatburgunder, Spatburgunder, Blauburgunder, Blauer Klevner, Klavner, Clavner, Klebrot Old names: Schwarzer Burgunder, Schwarzer Riesling, Sussling, Sussedel, Sussrot, Mohrchen, Malterdinger

Origin of Pinot and related varieties

Pinot pedigree



The Vine, the Grape, the Wine

The Plant

- A variety for cooler climates
- Relatively vigorous vine, with dark green leaves which are relatively rough
- Its canes are of moderate thickness but can grow into bullwood if grown on too light a soil or if it had too much nitrogen fertilization
- Budding is relatively late, ripening is “middle early to middle”
 - in Ontario, it ripens in most years from middle to end of September and in Burgundy, it is said that it takes 100 days from the flowering of the roses to the harvest of Pinot Noir – the flowering of roses – early June – is also the flowering of the vines
- Yields are moderately low, wood maturity is moderately good, therefore cold hardiness is moderately good but it can have bud damage at -17°C particularly after overcropping or a very late harvest in a cold autumn
- Professor Galet recommends calcerous soils (lime content) which should be well drained - Pinot Noir needs warm soils



The Vine, the Grape, the Wine

The Bunches

- Compact and small, usually pine-cone (Pinot) shaped being only approximately 7-10 cm long for the better clones
- The lesser clones have frequently larger bunches



The Berries

- Relatively thin-skinned and because of this, and the tightness of the bunches, it is quite susceptible to grey rot also called bunch rot or more scientifically “botrytis”
- The fungus not only damages the fruit but destroys the red wine colouring matter in the skins

The Vine, the Grape, the Wine

The Juice

- There is virtually no colour in the juice and for this reason, if the grapes are cold pressed (such as in Champagne), the juice is often vinified into white wine
- Unlike Chardonnay, Pinot Noir does not reach high sugar levels with ease
- Its acid content is relatively low and most often, the pH is high (3.3-3.4) inviting microbial problems
 - In Ontario, often the pH is 3.5 and higher
 - Due to young vines and fertile soils lending to vines not always in balance
 - Over application of potash may also compound the problem (the Burgundians blame their higher pHs on the potash mines in the Alsace)

The Vine, the Grape, the Wine

The Colour

- Pinot Noir looks almost black (noir) when ripe, but most often, this is only on the sun-exposed outside of the bunch
 - Particularly when the vine had too much yield, the bunch's colour on the portion hidden from the sun, remains pink or even greenish
 - This uneven appearance often misleads one to assume that Pinot Noir is ripe
- Since the berries are thin-skinned, not much red wine colouring matter (anthocyanin) is embedded and colour extraction is often poor
- However, the late Andre Noblet who was almost as well known for his sexist comments as for having been manager of the Domaine de la Romanee-Conti, once declared “***colour in a beautiful wine is no more important than clothes on a beautiful woman***” taken from “Pinot Noir” by Andrew Barr



The Vine, the Grape, the Wine

Other Characteristics

- Probably the most sensitive variety to overcropping
 - The wine will not forgive if too many bunches are left, hence bunch thinning is of utmost importance
- Vines should be pruned to only 8-10 buds/m² which will give 1 kg/m² of fruit at one bunch per shoot.
 - Maximum yield affordable in order to obtain ripe fruit
- **Overcropping will produce low sugar, poor colour and easy bunchrot and poor cold hardness**



The Vine, the Grape, the Wine

The wine

- The wine should have one or more of the following aroma characteristics depending on the year, location, vinification techniques and age of the wine
 - Tree fruit: plum, cherry
 - Berry: raspberry, strawberry
 - Vine: cassis, blackberry
 - Floral: violets, etc.
 - Rustic: animal, compost, farmyard when old
- In reality, Pinot Noir vines whether young or old have an aroma (and bouquet when old) which is hard to describe but is wholly their own
 - Single, straight forward terms as above do not do justice and their colour is often not as impressive when compared to other famous wines
- Relatively lower tannin levels in comparison to other great red wines requires Pinot Noir to have a good degree of acidity to provide the mouth-watering freshness and delicacy it needs to be a great wine

The Making of Pinot Noir Wine

- As mentioned already, low yields in the vineyard are **COMPULSORY**
- In Burgundy, pH is lower than in Ontario and TAs are higher
- In the Table on the next slide, across five different vintages, compare how parameters vary in the juice
- The Mean values of 143 samples are recorded based on data from Pierre Dupuy, INRA Dijon France 1985

Pinot Noir Harvest Parameters in Burgundy

Year	Sugar (g/L)	Potential Alcohol (%)	TA (g/L tartaric acid)	pH	Rainfall (mm) July-Sept
1965	169	9.95	12.6	3.14	401
1966	213	12.53	9.6	3.34	112
1967	201	11.82	9.3	3.13	209
1968	175	10.30	9.3	3.30	285
1969	202	11.88	11.9	3.06	107

Ontario Pinot Harvest Parameters

- Ontario: since most vines are young, and vigourous, they store high potassium content in the berries
- pHs are quite high due to the buffering capacity from the potassium and the TAs are low
- In most years, “for potassium fining”, ie adding tartaric acid (ca 1-1.5 g/L) to lower the pH and reduce the potassium content might be appropriate
 - ie add tartaric acid right into the crushed grapes to raise acidity and lower the pH before sulfiting
 - **Optimal pH to target in the juice is pH 3.2-3.3**

Challenges in Ontario

- Although there are as many opinions in Burgundy as there are domains, really no secrets exist
- I have undertaken to categorize three distinct philosophies in making Pinot Noir
 - The Traditional Way
 - Current, modern practices
 - Guy Accad's Way (cold soaking, cold maceration)

A. The Traditional Burgundian Way

This is the way by which I have produced almost all Pinot Noir I have made

1. Hand pick and sort the grapes in the vineyard
 - May require harvesting twice
 - Eliminate everything you don't want ie unripe fruit, botrytis, etc (we had no sorting tables, so sorting while the grapes were being harvested was the only way)
2. Destem and Crush almost all of the grapes and transfer to the fermenting vats (ie be very frugal and prudent with the number of full clusters to avoid excess carbonic maceration and to avoid excess unripe stems that will add green and tannic bitterness)
 - Wines made with a large portion of whole clusters taste like Beaujolais in their youth, aromas of bubble gum and bananas

A. The Traditional Burgundian Way

3. Determine Brix, pH and TA

- If pH high and TA low, add tartaric acid to achieve a TA of at least 8.5 g/L
- Optimal 22-22.5Brix (if sugar is needed, wait to chaptalize until fermentation is about half-way through)

4. Evaluate soundness of fruit and determine how much sulfur dioxide to add

Very Important to adjust acidity if necessary prior to adding SO_2 to ensure maximal effectiveness

- Very sound fruit, add 35 ppm SO_2
- Sound fruit, add 50 ppm
- Troubled fruit, add 75 ppm
- No higher than 100 ppm added

A. The Traditional Burgundian Way

5. Fermentation Vats

Four commonly used types in Ontario

Square bins

- Used for hand punchdown
- Most wineries already have them available

Shallow round wooden vats

- Used for hand punchdown

(In Burgundy, concrete tanks are still used)

Larger stainless steel vats

- For pumping over

Classical burgundy vats

- For pumping over
- Conical in shape
- Produces thick cap that allows for good extraction when pumped over
- provides for easy emptying

A. The Traditional Burgundian Way

6. Yeasting

- After sulfiting, give the must a rest before adding the yeast i.e. overnight
- Might have to warm up must to 15°C to start fermentation
- My favourite yeasts are Lalvin RA17 and Lalvin RC212

7. Fermentation

- Punch down two to three times daily
- Around 26°C, you might chaptalize if necessary to prolong the fermentation to assist in extraction from the skins (usually around day 4-5 of the fermentation)
- Try to reach, at least once, 30°C for maximal colour extraction, normally around the 6th day
- Stop punch down after 8-9 days when the wine gets dry
- Press off skins on day 12-14 (**my favorite day was 13**)
- In a “green year”, do not leave for an extended maceration after 8-9 days to avoid green tannin extraction

A. The Traditional Burgundian Way

8. Colour Stabilization

- Since Pinot noir has only four types of colour pigments (vs seven in Cabernet Sauvignon), we need to preserve every ounce of colour
- Colour stabilization requires tannins for polymerization

B. Present Day Techniques for Producing Pinot Noir

- More recent techniques in wine making include
 - Extended maceration
 - If you intend to do an extended maceration, to as long as 30 days or more, do not punch down or pump over too frequently (ie not more than twice a day) or after 6-7 days to avoid over extraction of tannin
 - Particularly, do not press off the skins around 18-20 day mark because you will obtain overextracted, tannic, bitter wines
 - In the extended maceration process, **you must wait for 25-30 days by which time the tannin-shift has already occurred**
 - The tannin shift means polymerization of tannin complexes which can then precipitate out
 - Tannin polymerization can also stabilize the colour by complexing with the anthocyanins
 - The tannin shift can easily be detected organoleptically by tasting the wine
 - One draw back, this procedure ties up tank space for an extended period of time
 - This is not a technique I routinely used due to limited tank space and room

C. Guy Accad Way: Cold Soaking

- Guy Accad, a french Burgundian consulting enologist, proposed to cold macerate the crushed grapes for a long time with high SO₂ dosages
- This implies that the fermentation even by indigenous yeast is postponed by adding high SO₂ dosages (150-250 ppm), and storing the must at cold temperatures (4-7°C) for 7-10 days
- The high SO₂ addition causes several problems
 - Blocks the links between tannin since they do not precipitate out during the fermentation and the wines are harsher and more tannic
 - Enhances Beaujolais aromas of bubblegum and bananas
- The Accadian technology will not go much above 25°C
- The bubble gum and banana aromas are caused by the slow and low temp fermentation rather than by the prefermentation cold maceration

Use of Whole bunches

- In Burgundy, usually the stocks/stems are brown and mature, lignified, they do not give off green tannins
- However, historically, before crushing machines were invented, all grapes were put into the vat as whole bunches
- The grapes were stomped by people
- This was called *pigeage*
- Consequently, we can assume some berries were not crushed and were intact, and subject to some carbonic maceration
- Maybe this was the reason why very old burgundys were said to have tasted different

Or was the unique taste due to something else?

- According to a story told by Edward Ott in “*A Tread of Grapes*”, the monks who used to make the wine at Clos de Vougeot climbed naked into the vats on three occasions during vinification. ***“It was the only occasion in the year when the monks had a bath, and for many years after this unhygienic stirring was abandoned, it was said that a real burgundy expert could declare by taste whether a wine was pre- or post –pigeage.”***

What is Barnyard Aroma all about in Pinot Noir

- This is what the Burgundians call “le gout de terroir”
- “there is something animal, often something erotic about great Burgundy” wrote Anthony Hansen in his book on the region.
- He added a phrase that will live forever
“Great Burgundy smells of shit”
- More recent Burgundys and New World Pinot Noirs do not have this descriptor
- We do know that some of this character might have come from old barrels infected with *Brettanomyces* yeast

Making Pinot Noir in lesser years

Le Saignee (bleeding)

- In years where the grapes are not fully ripe and one fears there is not going to be enough colour extraction, there is an effective way for colour improvement, but reduces red wine volume
- It is a judgement call by the winemaker how much free run juice he would draw off from the fermenting vat to increase the solids to liquid ratio
 - It could be 5, 10 or 15% of the original volume
- As already stated, we are dealing with grapes in a lesser year so one should be cautious of the total time frame for fermentation and maceration
- **I have used this technique almost every other year to some small extent**

Oak Aging

- Since Pinot Noir is a fragile red wine, too many new world winemakers have overpowered their Pinot Noir wines with too many new oak barrels
- Too much new oak will make the wine too tannic and the wood flavours will overpower the delicate wine aromas and flavours
- Our experience was as follows:

As a good approach, I would recommend to use

- 1/3 new (first fill) oak barrels
- 1/3 second fill oak barrels
- 1/3 third fill oak barrels

(these percentages are not fixed)

- American oak is too perfumey for Pinot Noir
- A tight grain French oak is recommended with a medium to medium+ toast level

Summary

- In closing, Pinot Noir is a viticulturalist's and winemaker's challenge
- In winemaking, if it ferments too cool, there will be little colour and if it ferments too hot, it loses its delicate fruit
- Making it even more difficult are the vast differences within the numerous clones and the various degrees of ripeness from bunch to bunch
- For many, Pinot Noir, at its best, has no other match. On the other hand, it can also be terribly poor, when at its worst

Closing

“The thought, I must admit, delights me, for there is something untamed and ferocious about the smell and taste of top Pinot Noir wines, particularly when they are young or still maturing”

From “Burgundy” by Anthony Hanson, Faber and Faber, London, 1982 p76

Hence, “The Beauty and the Beast”

Dr. Karl J. Kaiser and David Sheppard

