



Comparative study of the storage of quality wine by means of crystallisation pictures and tasting

Question

What effects does the concrete admixture Pneumatit® (Pneumatit AG, 8462 Rheinau CH) have on the quality of wines stored in rooms made of Pneumatit® concrete?

Samples

Pinot Noir, organic cultivation

Producer (and client of this study): **Domaine Laurant Bannwarth** in Obermorschwhir / Alsace FR.

Harvest 2015, same bottling:

- Pinot Noir 1, ageing: from October 2015 to May 2018 (= 30 months) in an environment of conventional concrete.
- Pinot Noir 2, storage: from October 2015 to February 2017 (= 16 months) in a conventional concrete environment / from March 2017 to June 2018 (= 14 months) in a Pneumatit® concrete environment.

Analyses

Test (in triple blinding), crystallisation images and report from Oenocrystal / Chapelle Margarethe, July 2018 [Translation: Rudolf Tille, Mouret FR].

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PINOT 1

After opening the bottle

Figure The copper chloride crystallization shows a balanced wine with all its inherent components.

Behaviour The moment immediately after uncorking the bottle does not seem to be the best time for this wine. The multiple axis formation indicates a slightly in-stable metabolic character. This results in phases of closure, even austerity, which make it rather inaccessible. Wines with this behaviour develop in their own cycles. Interventions before bottling must therefore be followed by a rest period so that the desired information can be absorbed (oxygen, for example). Too many interventions would shorten their life.

Signature fruit type with flower traces Expresses a harvest maturity of only 90%. The wine recalls a precarious state of health: if the harvest date has not been brought forward, it is a slow ripening of the vines due to the climatic conditions in 2015.

Slightly malformed centers The wine does not yet allow access to its full aromatic profile when the bottle is opened. The essential notes of the grape variety unfold without the desired complexity.

Structure Fractures related to climatic attacks on the vines. The relatively dense but uneven, yet silky and well chiselled texture still lacks some volume without aeration. The wine is still volatile at this stage, not yet finding access to the potential crispness of its tannins, which are, however, fully developed. No hard, fibrous or coarse zones: the winemaker has understood the nature of these grapes and fully preserved the desired elegance. Fractures and cracks due to fungal attack at the end of the ripening process indicate sensitivity to oxygen and a high propensity to oxidize. In the second phase, attention must be paid to whether this sensitivity continues or whether it is only related to the two and a half years of air exclusion in the bottle. It is quite possible that this wine cannot cope with the oxygen supply when the bottle is opened. Moreover, if it has been in a phase of closing during bottling, it cannot stabilize.

Acid-alkaline balance Good. Supports the wine. No particular sensitivity. Some unstable colloids are detectable and a slight sediment may form in the bottle.

Sulphur dosage Well done. No influence on the ray bundles, indicating good uptake with no tendency to oxidation.

No inclusions There is no risk from Brettanomyces.

No stains in the fabric The temperature control during pressing was in harmony with the nature of the grapes.

Cracks on the right side Sensitivity at the beginning of fermentation, but which did not cause a delicate oxidation phase: the winemaker's control of the start of fermentation was impeccable.



Intact luminosity energy reserves, no wear. This confirms that this wine can be stored for a long time.

Visible fragility of the tissue Can be compensated for by an existing natural immune system, which will become apparent in the second stage. Overall, one is faced with a somewhat flat but chiselled tissue when opened. To avoid a certain disappointment, it is essential to let the volume unfold when tasting.

Edge strips Well filled, the terroir meets the vine's requirements. The root zone still needs to be optimised so that it strengthens the immune system.

Edge stains Indicate that periods of soil overheating have been experienced by the vine roots, but these have no influence on the development of terroir memories. Generally good exchange between plant and terroir, despite some small areas where moisture remains, which may be solely due to the harvest year. Some qualitative criteria are not yet fulfilled in the first phase. However, the behaviour and functionality of the wine are beyond question and make it clear that the grape variety is well adapted to its terroir.

Pinot 1 - Summary after opening the bottle: *Study base is a wine with a balanced composition. After opening the bottle is not the best time to taste the essential aromatic notes of this wine. Its volume must be allowed to develop. In fact, it tends to re-close periodically. It is advisable to wait until this tendency has passed. With this type of wine, any intervention before bottling also requires a subsequent resting period in which all the information is fully integrated. The signature "fruit on flower traces" expresses a harvest maturity of only 90%, which is certainly due to the climatic stress of 2015. The fungal attack at the end of the ripening, together with the bottling in a period of closing, may have caused an affinity for oxygen, which becomes apparent when the bottle is opened. This is to be checked in stage 2. No oxidation tendency: the sulphur is not overdosed, there is no danger of brettanomyces. Good start to fermentation. Luminosity confirms long life. Stage 2 will show whether there is a natural immune system - which is already present thanks to good rooting, but still needs to be improved. The grape variety is in harmony with its terroir.*

After 24 hours of air contact

Center Fruit profile with slight traces of blossom. If not harvested too early, the growth slowdown of the vines could not be compensated. Nevertheless, the wine develops strength and a volume it did not have at the beginning. The fruit signature over light floral aromas is accompanied by rather full-bodied red notes of the cherry type, which are related to the aroma profile of the grape variety.

Structure No weaknesses. This thanks to the acidity, which provides good cohesion. Slightly heterogeneous texture. One part with a lot of body and one part with a little less body. It is possible that one can also taste this disparity.

Volume Accompanies the aromas well, which was not the case at the beginning. This behaviour confirms that the opening of the bottle is not the optimal moment for the wine because it is then in a period of austerity. One is well advised to give it a period of development to then be able to discover all its personality.

Main center on the left, now horizontal. Without contact with the air, only part of the personality of this wine is revealed. Two other oblique sections: very pleasantly changing aromas, but it takes patience to gain access to the whole personality of this wine.

No signs of wear or tearing of the tissue in the first stage: disease markers are not eliminated, but enveloped and thus invisible. It is a very lively wine with extremely active behaviour when in contact with oxygen. Naturally, it has no oxidation or reduction markers, and so it can afford to remain in the air for six to ten hours before being tasted. Of course, this is a point not to be neglected for gastronomy, and although I am generally not in favour of decanting, it should clearly be done in this case.

Edge areas Retains all its strength. A small area of soil moisture has not yet "dried" and remains visible. Overall, the character of the terroir has been excellently brought out. One encounters this wine at its optimum after 24 hours of air contact, during which it stabilises and develops. However, I think that half a day will be enough for its fullness and fineness to be discovered.

Texture No coarse elements. Cellar technique without stress and perfectly controlled, in accordance with the grape variety.

Pinot 1 - Summary after 24 hours of air contact: *Fruit profile with traces of flowers: the growth of the vines had been slowed down (by the cold spring). The power and volume accompanying the aromas are developing. Full-bodied notes of red cherries. In the mouth, one texture with a lot of body can be experienced alongside another with a little less body. The cracks of stage 1 have disappeared: the disease markers are enveloped. Without contact with air, the personality of this*



wine does not fully reveal itself. In gastronomy, it is therefore necessary to decant it. One should be patient for six to ten hours, and ideally 24 hours, so that its fullness and finesse can be fully revealed.

PINOT 2

After opening the bottle

Concentration Without excess and without deficiency, as with Pinot 1.

Middle When opened, a mirror image appears, as with Pinot 1. However, the **behaviour is** completely different.

Signature Slightly distorted in the first wine (Pinot 1), very clear and distinct here. Main signature on a horizontal axis: stable metabolism and better response of the aromatic profile to uncorking than in Pinot 1, although the **other two centers are** also skewed here (alternating aromas).

Red notes accompany, along with floral aromas, a well-formed fruit and flower signature. However, this is slightly hollowed out in one of the centers. The reason is a fungal attack on the vine towards the end of ripening.

Tissue system in general Not the same cracks as Pinot 1. The centers are black, proving the infestation to which the vine has been exposed. However, the wine behaves better and its tissue is more spread out

Structure Identical to that of the other wine. The texture is better distributed and has more relief. When opening the bottle, more fullness and more crispness will be experienced in this wine without any aeration. Its structure does not show any breakage, which indicates advantages in terms of durability.

Acid-base ratio Equal to the other, thus equally present and balanced.

Tissue The low, young fan figures are characterised by continuity compared to the Pinot 1. This wine will appear more harmonious, fresh and round. The tannins are well integrated into the texture and fine, as in the Pinot 1. This picture better shows the typical elegance of Pinot Noir, whereas in the case of sample 1, inconsistencies initially hide the full profile.

Extraction Perfectly done, in accordance with the needs of the grapes, which are better recorded

than in Pinot 1. No uneven scattering, everything is continuous, except for the small dark circle. This is reminiscent of a heel during fermentation, but nothing has been injured or damaged. The vinification has added forces that have "filled the voids". Likewise, the **absence of stains** confirms that the temperature was perfectly controlled during pressing, as with the other sample.

No exogenous components present, the **work with the sulphur** was impeccable. A difference to Pinot 1 is evident in its stability to oxygen: this wine breathes better, it is slower, presents itself less greedy and will stand up better in the long run.

No inclusions No risk on Brettanomyces.



Marginal zones No exogenous markers, no negative influences from neighbouring plots and appropriate cultivation practices. Signs of residual moisture in the subsoil. Given the quality with which this wine responds to terroir memories, the difficult growing conditions of the 2015 vintage may have been a one-off burden.

Luminosity Intact. Rests over a dark area. Without overshooting, this wine has enough strength for good persistence.

In contrast to the other wine, here all the qualitative criteria are visible, can be evaluated and are already present when the bottle is opened, the optimal moment. This allows it to be tasted without waiting and naturally gives it a great advantage. This fact will be confirmed or not in the second stage, after airing.

Pinot 2 - Summary after opening the bottle: *Same average concentration as Pinot 1 in this study. The behaviour on opening is different: the signature clear, the character more stable, the aromatic profile noticeable, with more volume and pithiness. Red notes with floral aromas, traces of fungal attack at the end of ageing. Same balanced acid-base ratio as Pinot 1, same good integration of the tannins, same good extraction, but better, harmonious, fresh and round behaviour of the tissue. The picture shows the typical elegance of Pinot Noir. The extraction process has better brought out the needs of the grapes. The pressing was done at the right temperature and added strength. Likewise, the sulphur was correctly incorporated. This Pinot 2 is more stable to oxygen than Pinot 1, and its lower craving will make it last longer. Also no risk for Brettanomyces. No negative influences from the environment, good growing practices. For this wine, the bottle opening is the optimal time to be tasted.*

After 24 hours of air contact

In Pinot 2, coordination and joining of forces are well established, unlike in Pinot 1. A single image and a single **center**: the wine reorganises itself, its center wobbling slightly. This indicates a somewhat unstable metabolism, as was the case with Pinot 1, albeit only under oxygenation. It reacts very quickly, although it does not show any oxidation. This wine is highly reactive, which is often reserved for very lively wines.

Volume Spread out, with beautiful chasing. But loses some density, as it does not necessarily like the added oxygen. The **tannins do** not stand out, nor do they show any breaks. A **slight wear at the edge**, however, shows that this wine does not appreciate the

oxygen. This is logical, since it has already acquired its breath when the bottle was opened.

A little more fluid on the palate On the other hand, the core and the silkiness of the tannins remain even after a pleasantly fruity attack of the red cherry type. So this wine shows that it does not necessarily need aeration to develop, or then at most one to two hours.

Center This naturally tightens, while in the other sample it is somewhat distended. Beyond a certain point, the wine tightens its tissue to protect itself from an air supply it does not need.



Acid-base ratio Does not weaken and shows fine, somewhat unstable colloids that will cause this wine to precipitate in the bottle if the temperature does not suit it.

Respiration process Remains in place. The wine "tires" because it does not need air supply, but has nevertheless had to accept it.

Pinot 2 - Summary after 24 hours of contact with air: *Under oxygenation, the character becomes unstable. This reactivity without oxidation shows the vitality of the wine. But it then loses fullness. The taste is lighter on the finish, with persistent pithy and silky tannins after a red-fruited cherry-type approach. It therefore needs no aeration, at most an hour or two, to develop. Forms sediment in the bottle if the temperature does not suit it.*

Conclusion of the study

PINOT 1 - Conventional concrete and

PINOT 2 - Pneumatit® -Concrete

Both wines are of very good quality in terms of vinification. The differences lie mainly in their respective development as a function of their history.

The control wine (Pinot Noir 1) shows more growth lesions of the vines.

The wine that comes from an environment with Pneumatit® -concrete (Pinot Noir 2) has a more stable metabolism today. This makes it possible for the consumer to discover it immediately, because it is more expressive compared to the control wine, with a wider pronounced and more complex flavour bouquet. Since it is more stable in the area of metabolism, it changes more slowly.

In addition, it is superior in the density of vital forces, which optimises its duration in a non-negligible way. Pneumatit® -Concrete has thus made it possible for wine to retain more vitality in the long term.

The harmonies of structure and texture also come into their own more strongly with him; they are experienced as more distinct and more valuable in volume and length with the Degu station.

A very convincing comparison test in favour of Pneumatit® .

Margarethe CHAPELLE.

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