

# SNOW ON WINE

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## STEMS = SKINS = SEEDS & STAVES



### *A Tannic Tale*

We have all experienced the “pucker” sensation of young red wine, although today typically much tamed by modern winemaking advances. But for millennia wine drinkers knew the “best” vintages, of the finest wine from grapes like Cabernet, Syrah, Pinot Noir, etc. needed years of barrel and/or bottle aging for harsh astringency to soften and the wine to be enjoyable. People call such wines “*tannic*”. Sounds simple enough, however, the term really covers several hundred naturally occurring chemical compounds called *Polyphenolics* (including many anthocyanins and numerous tannins). For simplicity lets just let the term TANNINS refer to this whole host of chemicals.

TANNINS first show up in grape skins in mid-summer as green grapes begin to take on color (called *Veraison*). TANNINS are not evenly distributed throughout the grape. They are mostly in the skin, although seeds and stems have small amounts of TANNINS. It is important to know that when grapes, red or white, are pressed, the juice is white! When making white wine the juice is separated from skins, seeds and stems and fermented separately. To make red wine the entire crushed grape (skins, seeds and juice -- called *Must*) is fermented together – and occasionally some stems too (more on that later). As the fermentation progresses, TANNINS are gradually extracted from the skins and the developing wine slowly begins to show color. A good thing since TANNINS not only provide the color and the mouth feel characteristic of red wine, but are also an important preservative<sup>1</sup> allowing wine to age and develop great finesse and complexity (for patient winos). And from the skins also come the myriad flavor compounds locked up with the TANNINS. To extract even more flavor and TANNINS the skins and seeds are often left to “*macerate*” in the wine *must* for days or weeks after primary fermentation has ended and sometimes also before it begins. Winery folk describe such “highly extracted” wines with glowing smiles.

So what about stems? If you are inclined to read wine bottle “back” labels, or you dote on the words of your favorite wine maker, you know that most red grapes go through the stemmer/crusher and into the fermentation vat totally free of stems. But occasionally the term “*whole cluster*” is slipped in, often with proud winks and nods. Seeing the term “*whole cluster*” associated with some of my best Syrah and Pinot Noir wine led me to inquire about it from several winemakers scattered about the West. Their replies were remarkably similar: whole clusters means lots o’stems. They are included, at least in part, when the overall tannin situation is maybe a bit scanty. But stems are not just about tannin quantity, they can also bring new tannin quality, type and variety. Stem tannins tend to be softer and less astringent while giving a more complex and enjoyable mouth feel and body. Beyond tannin, stems may also produce subtle changes in the flavor profile. Some of my vigneron thought it accentuated and promoted high tone red flavors. Added or accentuated floral tones and brought in subtle and complex flavors such as star fruit. *L o n g* maceration increases extraction, especially from stems. Then finally, with or without stems, the fully fermented wine is “*racked*” from fermentation tanks (called *free run wine*). Then the remaining wine *must* is pressed to remove the last so-called “*press wine*.” The remaining skins, seeds and stems are discarded. Interestingly, one winemaker remarked that the matt of stems remaining from whole clusters provided channels for press wine to more easily flow out using gentler pressure.

At this point premium red wine is racked into barrels, the free run wine and the press wine often kept separate. There the wine undergoes many complex changes<sup>2</sup> under the general term “*maturation*.” Oak barrel staves do contain a TANNIN, called *vanillin*, which leaches into the wine adding delightful notes of vanilla. I know, I know, I promised not to repeat “*Polyphenolic*”, but please allow a gentle reminder (to all the non-chemists), the “poly” means “many” and refers to long chains of many repeating small molecules. These TANNINS begin to chemically react with each other, making longer, often branching chains. And do we care? Maybe, once you know that in the TANNIN world short chains are generally more harsh and astringent (and incidentally colored darker – most red but some blue – yes who knew). Longer chains are softer, mouth coating with deeper structure and silky texture (while fading to lighter color). And eventually some are large enough to lose solubility, precipitating as sediment – gone, done, leave it behind! And of course all this continues in the bottle and at an accelerated pace after pouring into decanter and/or glass. There – no more chemistry!

Perhaps the best two clues as to the progressive loss of astringent, pucker and harshness, and associated development of balance, structure and silky mouth feel, are changing color and sediment. Different grapes have differing ranges of color. But in general each begins dark red or even violet and fades through red, orangish red to brick. This is best seen in the thin rim of color at the edge of a wine glass held almost horizontal over a white background. Sediment accumulates at the bottom of the barrel (and eventually in bottle).



TANNINS, this tale has told us, are important components of red wine that we see as color and perceive in our mouth as the mouth feel. So important parts of red wine, although having neither smell nor taste. They first emerge at the stage of grape development called “*Veraison*,” when color begins to appear in grape skins where most of it’s TANNINS occur.



Crushing red grapes gives white juice, which gradually colors as TANNINS are extracted from skins during fermentation. *Maceration*, the prolonged soaking of skin, seeds, and sometimes stems, extracts not only more TANNINS, but also the complex flavor chemicals that we sniff and sip lovingly. Barrels? Important for oak staves contributing vanillin. And within them, TANNINS develop and mature. During barrel sampling at wineries, be sure to note improving mouth feel along with the accompanying fading of red color when moving from recent to longer time in barrel. And when “scraping the bottom of the barrel” the sediment can also be seen. Winemakers will sometimes add some whole clusters, with stem tannin, augmenting less tannic grapes and adding interesting complexity to mouth feel and surprisingly also new flavors. From a practical point, you can carefully observe the thin color rim of wine in glass and development of sediment, and correlate that to improving TANNIN development.

So although sniffing and tasting are important in evaluating wine, don’t miss visual inspection of the color rim in the glass, and when it passes the lips, the astringency, structure and mouth feel.

#### Notes:

- 1) The natural preservatives in wine are: Alcohol, Tannins, Acids, and Sugar. Before the advent of refrigeration this allowed the preservation of nutrients of fresh grapes during the rest of the year. Diseases caused by deficiencies of vitamins and other nutrients could thus be prevented.
- 2) During barrel maturation of red wine much is happening beyond vanillin extraction and complex chemical reactions involving various polyphenolics and phenolics and other TANNIN components. Essentially all red wine undergoes Malolactic Fermentation, a secondary bacterial (as opposed to yeast) fermentation, where the very sharp malic acid (like a Granny Smith acid) is converted to the soft and buttery lactic acid as well as some CO<sub>2</sub> gas which helps keep the wine reduced. Slow evaporation (Angel’s Share) concentrates the wine. Gradual influx of oxygen starts the gradual progression from reduced immature to more oxidized mature wine. A host of other organic compounds, esters, aldehydes, ketones, complex acids and complex alcohols (i.e. *Geranolol*) react chemically in a variety of ways.

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