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## WINEMAKER TRIAL

# Wine Stabilization with Enartis Surlì KPA

Pezzi King Winemaker Tests New Stabilization Product's Acidity Retention



*Bryan Avila*

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**Lead: Chris Barrett, winemaker, Pezzi King, Dry Creek Valley, Healdsburg, CA**

As winemaker for Pezzi King and St. Anne's Crossing wineries, Barrett has won seven sweepstakes awards, including at the most recent San Francisco Chronicle Wine Competition for the 2020 Los Chamizal Malbec. He's always had one foot in the lab, and another in the cellar. During his time working for Vinqury, he learned the ins and outs of wine analysis while developing skills in fining and other winemaking products

before taking the senior analyst position at Sonoma Wine Company, though he was quickly promoted to enologist. With his strong desire to make his own wines, he took the helm at Pezzi King with the 2008 harvest, producing multiple gold medal-winning wines from the start.

**BOUTIQUE PRODUCERS THAT EXCLUSIVELY** hand-sell their wines out of tasting rooms have the ability to explain that wine is a natural product and may form crystals or "wine diamonds" if the wine gets too cold. White wine producers that sell beyond the tasting room realize that they will not be present to provide that lesson.

Rather than leaving these natural sediments to the creative interpretation of store merchandisers, retail customers and legal counsel, most winemakers opt to skip this conversation altogether and test these wines in the lab prior to bottling for tartrate instability.

The old test for checking for tartrate instability was to throw a wine sample in the freezer and see if it threw tartrate crystals. If the answer was "yes," essentially, the entire wine tank was thrown into the proverbial freezer by turning up the chillers to near- or sub-freezing temperatures.

In a March 2010 Purdue Extension newsletter, Dr. Christian Butzke of Purdue University eloquently described this process as "...a giant waste of energy and a sad example of unnecessary over-processing of a natural product." Most people talk about the massive amount of energy it takes to take a wine down to below freezing temperatures but less people talk about a cold wine's voracious appetite for oxygen at that temperature where gas solubility is the greatest, requiring significant amounts of argon gas to keep that tank's headspace inert.

While electrodialysis (ED) does a great job of removing excess tartrate in the cellar using electrochemistry with significantly less energy than brute cold insolubility, it requires one to schedule a trailer to visit, set-up, perform the ED,



BUTZKE, PURDUE UNIVERSITY

**FIGURE 1:** A light shows tartrate instability within the bottle (*right*); cold stabilization via in-tank chilling was debunked as an effective method by Dr. Christian Butzke at Purdue University in 2010 (*left*).

then break it down, adding significantly more complexity than a tank addition. This option is best for larger lots and it removes the tartrate, decreasing some minerality in the wine's midpalate. Gum Arabic and carboxymethylcellulose (CMC) also offer some remedy but come with a few more side effects, such as a shorter life span, color interactions and greater potential for haze formations<sup>1,2</sup>. The new kid on the block, potassium polyaspartate (KPA), is the next generation of cold additive stabilizers<sup>3</sup>. Its mechanism of action, rather than removing excess tartrate from the system, is to bind to the active site to prevent further crystal growth, keeping the tartrate in solution.

In this article, Pezzi King winemaker, Chris Barret, is primarily attracted to the tartrate preservation aspect of this product as well as the retained minerality, and perceived freshness that comes with this aspect, in addition to its ability to provide additional tartrate stability.

### TRIAL OBJECTIVE:

This trial compares Chardonnay harvested from the same Russian River vineyard block, sourced from Limerick Lane on Sept. 4, 2022. This lot was whole-cluster pressed and tank-settled for two days prior to barreling down for fermentation. Twenty-three barrels on two-barrel racks yielded 11 full racks for fermentation, reserving the remaining barrel for topping up after fermentation. A dose of 40 g/hL of Enartis Surlì KPA was then added to the right-side

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barrel of each rack, making for 11 barrels dosed with the max recommended addition rate, 40 grams/hL.

**CONTROL:** No addition

**TREATMENT:** 40 g/hL Enartis Surli KPA

Full composite barrel samples were pulled from the control and treatment lots and sent to ETS Labs for chemical analyses of titratable acidity (TA), pH, volatile acidity (VA) and Ethanol (alc). Winemaker sensory evaluation was used to select the favored treatment. It was expected that a wine that retains its acidity over another treatment would taste more tart.

CONCLUSIONS:

The Chardonnay juice for this trial was barreled down onto 11 barrels each. After alcoholic fermentation and malolactic conversions were over, full composite samples were chemically analyzed for TA, pH, VA and alc as shown in **FIGURE 3**, below:

	No Addition	Enartis Surli KPA
TA (g/L)	4.5	5.5
pH	3.97	3.83
VA	0.3	0.25
Ethanol (20°C)	15.41	15.28

FIGURE 3: Acidity comparison between the no addition control

Winemaker Chris Barrett noted that the acidity numbers were indeed higher and that the wine also tasted “fresher” as to be expected on a wine with slightly higher acidity. Barrett has since expanded the use of this product on several other whites and Rosé wines.

Post-Mort Q&A

*What was the motivation to conduct this trial? Why were you interested in studying Surli KPA?*

**Barrett:** Things are getting warmer; we are getting longer heat spikes and we are losing acidity during the ripening season. This product touted preserving the grape’s natural acidity, so it sounded like a good fit.

*Which grape variety did you experiment with and why?*

**Barrett:** Logistically, our barrel-fermented Chardonnay was just easy to do. We had enough vessels to do a trial and a barrel-fermented Chardonnay is the perfect wine style to retain as much natural acidity as possible. This Chardonnay was a Wente clone, sourced from Limerick Lane.

*Describe how you set up this trial and what did you measure? How did the fermentation go?*

**Barrett:** I wanted to see impact, so I set up my treatment lot at the highest addition rate versus a no Surli KPA control. I fermented 11 barrels of each for a total of 23 barrels. The grapes were whole cluster pressed to tank, settled, and we racked 50 gallons of juice to each barrel, added nutrients, the same wine yeast to each, then added the max recommended add rate of the Enartis Surli KPA product to the treatment barrels and monitored fermentation to dryness.

I added pH and TA measurements to my sensory evaluation. Separating the fermentations out would have been cool but, in the interest of conserving time during harvest, I decided not to have the two lots tracked separately. I figured, if the product addition caused a noticeable decline in the fermentation rate, it probably wouldn’t make the cut. Honestly though, the cellar crew didn’t even know I was running a trial. No news was good news in this case.



TANK 7	LOT 007	TONS 7.0	
PRESS / CRUSH DATE 9/4	VAR CHR	GAL	
INOC DATE 9/7	VINEYARD Trip 1/2		
DATE	BRIX	TEMP	ADDITIONS
9/4	25.0	65	Press to TK7
9/6	25.0	60	BD 23 bbls
9/7	25.0	61	2.5" Arom 2.2" Blanco
9/8	24.0	64	40g/L KPA on right side
9/10	20.0	68	
9/11	18.5	68	
9/13	17.5	72	2 <sup>nd</sup> Advance
9/14	13.0	74	
9/16	8.0	74	
9/17	6.0	75	9/23 near fill
9/19	2.0	74	
9/21	0.0	72	

**FIGURE 2:** The pre-fermentation, alcoholic fermentation record showing a 17-day fermentation not including residual sugar analyses

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*Did you have any reservations to the addition of the product?*

**Barrett:** I was a little nervous because the early decisions are the most important. What we add to the wine is a big deal and I had not experimented with this type of product before. What appealed to me was not to add the product but its proposed effect of retaining natural grape acidity.

*Who else worked with you on this trial? What were the team's initial hypotheses before beginning the experiment?*

**Barrett:** Julia Gilardoni of Enartis was the representative who worked with me on this trial. She was super helpful, she even helped me pour the stuff into the barrels and reassured me that everything was going to be fine.

*Did you encounter any difficulties during the trial? If so, how did you address these complications?*

**Barrett:** No, the fermentations went smoothly. You could not tell a difference between the two by looking at the kinetics, so I just kept recording them on the same sheet. They finished at the same time and both were stirred twice a week.

*What was the outcome of the trial? Were the results as you predicted, or did anything unexpected occur?*

**Barrett:** This product had me sold on retaining the wine's acidity, so I wanted to check for an actual measured difference between the two treatments. I sent full composite samples to ETS, post-malolactic fermentation, for pH and TA as well as alcohol and VA. The Surlì KPA treatment data showed that it did preserve an extra gram per liter of acidity in the TA, and the pH followed suit. I could taste a touch more acidity on the palate too; the lab numbers matched the sensory.

To be honest, I wasn't expecting it to work as well as it does. After all, when is the last time you heard a sales rep say, 'Buy my products! They are sub-par and expensive.'? In general, products don't always work as well as the sales reps say they will, so it's always good to validate these claims at the small scale. Fortunately, having a barrel-fermented Chardonnay program makes it easy to run small-lot experiments.

*What was your and your team's impression of the resulting wines? Do you or they have a favorite?*

**Barrett:** Julia and I thought the results were positive. It was easy to use too, so that's always a plus. When we tasted these wines side-by-side, we thought that the treatment had a noticeable, brighter, fresher palate.

*Given the results of the trial, what is your opinion on Surlì KPA?*

*Do you plan to conduct a follow-up trial to re-test these results?*

*Is it something you plan to use more often moving forward?*

**Barrett:** It seems like a no-brainer to retain the natural acidity in the grapes rather than adding tartaric acid. No rocket science was required here; we just needed to taste the results and have some data to validate the claims of this new product. Since our initial test data looked and tasted good, we have already added it to our Sauvignon Blanc and Rosé and those are tasting good too. **WBM**

#### References:

<sup>1</sup> [www.ajevonline.org/content/early/2019/03/14/ajev.2019.18077](http://www.ajevonline.org/content/early/2019/03/14/ajev.2019.18077)

<sup>2</sup> [www.mdpi.com/2304-8158/9/9/1275](http://www.mdpi.com/2304-8158/9/9/1275)

<sup>3</sup> [www.asev.org/abstract/potassium-polyaspartate-new-compound-tartrate-stabilization-wine](http://www.asev.org/abstract/potassium-polyaspartate-new-compound-tartrate-stabilization-wine)

General reference about cold stabilization:

[www.extension.purdue.edu/extmedia/fs/fs-54-w.pdf](http://www.extension.purdue.edu/extmedia/fs/fs-54-w.pdf)



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