

Enhancing Color Stability of Norton with Different Enological Fermentation Tannin (Enartis, ScottLabs, and BSG) (2017)

Bluemont Winery

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Summary

This study examines the impact of adding different kinds of exogenous tannin prior to fermentation in Norton grape must. Norton grapes were harvested on the same day and destemmed into four T bins. The T bins then received the following treatments: 1) No tannin addition (control), 2) Tan Color (Enartis) addition at 180g/ton followed by Pro Tinto addition (150g/ton) partway through fermentation (mostly condensed tannins), 3) FT Rouge (ScottLabs) addition at 60g/hL (hydrolysable tannin), and 4) a series of BSG product additions: UVA V-Tan at 30g/hL, Premium Limousin at 15g/hL, and Premium Color at 15g/hL (mix of condensed and hydrolysable tannins). All other treatments between wines were equal. After approximately two weeks, wine was pressed off. The BSG wine and the FT Rouge wine had slightly slower fermentations. Wines had slightly differing alcohol contents (slightly higher when using condensed tannin, and slightly lower when using hydrolysable tannin), but otherwise no major chemistry differences were seen. No color differences can be seen. The addition of these products may have slightly lowered caftaric acid and increased epicatechin and gallic acid, and these increases were more correlated to products containing condensed tannin. No major tannin or anthocyanin differences could be seen. For the descriptive analysis, there were no strong trends for the descriptors used in this study. There were slight trends for the control to have lower Fruit Intensity, Astringency, and Body. The wines made with BSG products tended to have higher Fruit Intensity, Overall Aromatic Intensity (along with FT Rouge in this regard), Bitterness, Astringency, and Body. The Pro Tinto/Tan Color and FT Rouge treatments were relatively similar and often fell in-between the Control and BSG products, except for FT Rouge with Overall Aromatic Intensity (where it was higher) and for Pro Tinto/Tan Color with Herbaceous/Green quality. In general, there was a preference for the wine produced with BSG products; however, judges thought that the wines were all fairly similar. In the future, more studies should be performed with these products on different grape varieties.

Introduction

Pro Tinto (Enartis) is a fermentation adjunct made from yeast hulls, soluble mannoproteins, ellagitannin, and grape seed tannin. It is marketed to help protect color during red wine fermentation, strengthen fruit notes in the aroma, and increase softness and body of the wine (Enartis 2018a). Tan Color (Enartis) is another fermentation adjunct which also contains a mix of yeast hulls, grape seed tannin, gallic, and ellagic tannins. It is marketed more for color stability (Enartis 2018b) and is often used in conjunction with Pro Tinto. FT Rouge (ScottLabs) is a blend of hydrolysable tannins which, when added at the beginning of fermentation, may help prevent oxidation of natural grape tannin in order to promote more stable color formation. It may also inhibit oxidative enzymes (Scott Laboratories 2018). Premium Color (BSG) is a blend of condensed tannins which may help inhibit oxidative enzymes in the must and promote color stabilization during maceration (BSG 2018a). Premium Limousin Special SG (BSG) is a hydrolysable tannin blend and toasted oak tannin which may enhance oxidative resistance of wines and impart toasted flavors (BSG 2018b). V Tan SG (BSG) is a mixture of ellagic, gallic, and catechinic tannins which may help for color extraction and stabilization (BSG 2018c). These three products may also be used in conjunction with each other as well. The purpose of this study was to examine the impact of these products on Norton wine.

Results and Discussion

The BSG wine and the FT Rouge wine had slightly slower fermentations. Wines had slightly differing alcohol contents (slightly higher when using condensed tannin, and slightly lower when using hydrolysable tannin), but otherwise no major chemistry differences were seen. No color differences can be seen. The addition of these products may have slightly lowered caftaric acid and increased epicatechin and gallic acid, and these increases were more correlated to products containing condensed tannin. No major tannin or anthocyanin differences could

be seen. For the descriptive analysis, there were no strong trends for the descriptors used in this study. There were slight trends for the control to have lower Fruit Intensity, Astringency, and Body. The wines made with BSG products tended to have higher Fruit Intensity, Overall Aromatic Intensity (along with FT Rouge in this regard), Bitterness, Astringency, and Body. The Pro Tinto/Tan Color and FT Rouge treatments were relatively similar and often fell in-between the Control and BSG products, except for FT Rouge with Overall Aromatic Intensity (where it was higher) and for Pro Tinto/Tan Color with Herbaceous/Green quality. In general, there was a preference for the wine produced with BSG products; however, judges thought that the wines were all fairly similar. Norton may not have been the best grape variety to examine the impact of these products, as its inherent aromatic and color intensity may greatly override any perceivable benefits from these products. In the future, more studies should be performed with these products on different grape varieties.

Juice Chemistry		
	Brix	pH
Juice Chemistry	24.5	3.58

In House Data

Wine Chemistry										
	Ethanol (%vol/vol)	Residual Sugar (g/L)	pH	TA (g/L)	Volatile Acidity (g/L)	Malic Acid (g/L)	Lactic Acid (g/L)	Total SO2 (ppm)	Free SO2 (ppm)	Molecular SO2 (ppm)
Control	14.22	4.1	3.72	6.99	0.99	<0.15	1.89	39	25	0.47
Pro Tinto/Tan Color	14.53	4.3	3.77	6.77	0.94	<0.15	1.93	38	20	0.34
FT Rouge	13.86	4.3	3.83	6.92	1.09	<0.15	1.98	41	21	0.31
BSG Product	14.71	4.3	3.75	6.96	1.07	<0.15	2.02	34	16	0.29
% Change Pro Tinto/Tan Color	2%	5%	1%	-3%	-5%		2%	-3%	-20%	-28%
% Change FT Rouge	-3%	5%	3%	-1%	10%		5%	5%	-16%	-34%
% Change BSG Products	3%	5%	1%	0%	8%		7%	-13%	-36%	-38%

Results from ICV in Mid April

Color Profile						
	A420	A520	A620	Hue (420/520)	Intensity (420 + 520 + 620)	
Control	0.862	1.304	0.309	0.661	2.475	
Pro Tinto/Tan Color	0.829	1.247	0.302	0.665	2.378	
FT Rouge	0.888	1.284	0.318	0.692	2.490	
BSG Product	0.868	1.300	0.314	0.668	2.482	
% Change Pro Tinto/Tan Color	-4%	-4%	-2%	1%	-4%	
% Change FT Rouge	3%	-2%	3%	5%	1%	
% Change BSG Products	1%	0%	2%	1%	0%	

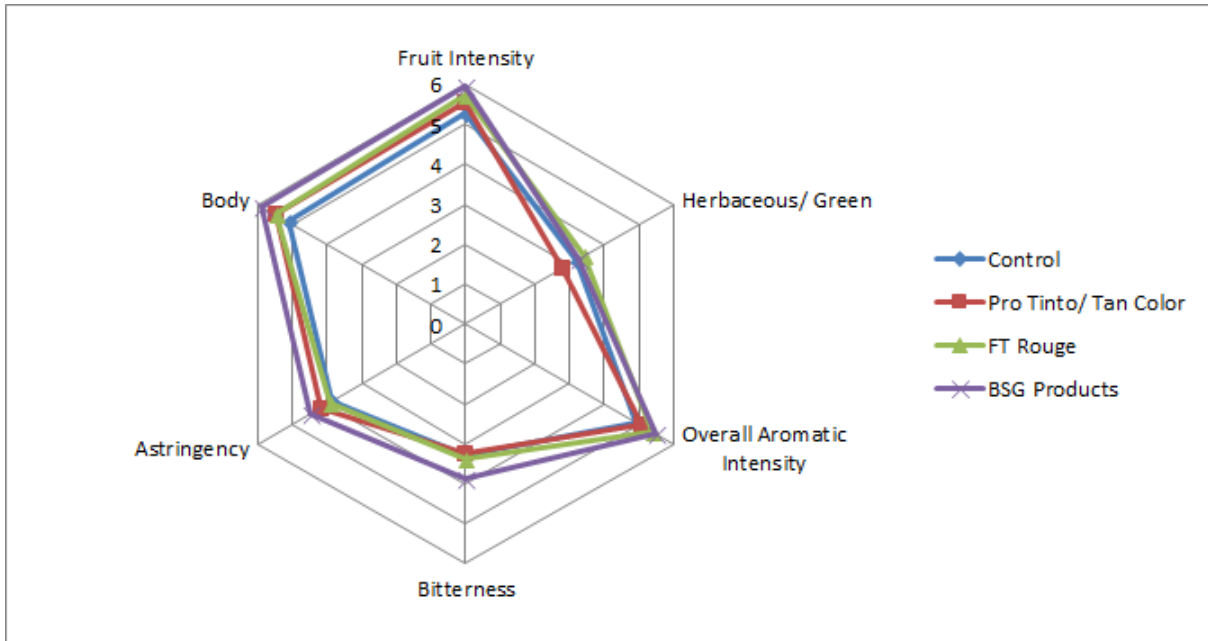
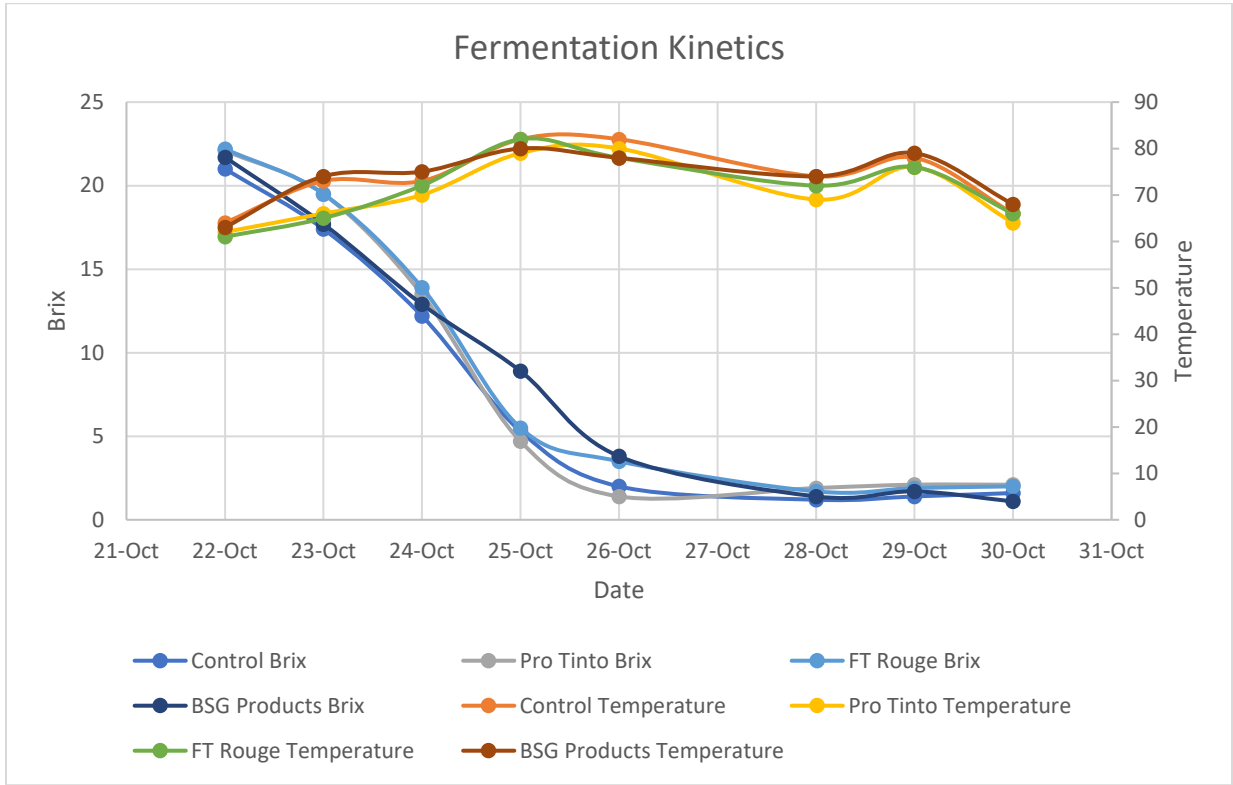
Results from ICV in Mid April

Phenolic Profile					
	Caffeic Acid (mg/L)	Caftaric Acid (mg/L)	Catechin (mg/L)	Epicatechin (mg/L)	Gallic Acid (mg/L)
Control	12	72	<1	20	38
Pro Tinto/Tan Color	15	55	<1	25	44
FT Rouge	13	64	<1	20	41
BSG Product	13	69	<1	24	51
% Change Pro Tinto/Tan Color	25%	-24%		25%	16%
% Change FT Rouge	8%	-11%		0%	8%
% Change BSG Products	8%	-4%		20%	34%

Results from ETS in Mid April

Phenolic Profile								
	Malvidin glucoside (mg/L)	Monomeric Anthocyanins (mg/L)	Polymeric Anthocyanins (mg/L)	Quercetin (mg/L)	Quercetin Glycosides (mg/L)	Tannin (mg/L)	Total Anthocyanins (mg/L)	Resveratrol (cis and trans) (mg/L)
Control	72	1800	78	2	3	864	1878	<0.1
Pro Tinto/Tan Color	75	1827	73	1	3	825	1900	<0.1
FT Rouge	73	1838	76	2	3	868	1914	<0.1
BSG Product	69	1815	79	2	3	896	1894	<0.1
% Change Pro Tinto/Tan Color	4%	2%	-6%	-50%	0%	-5%	1%	
% Change FT Rouge	1%	2%	-3%	0%	0%	0%	2%	
% Change BSG Products	-4%	1%	1%	0%	0%	4%	1%	

Results from ETS in Mid April



	Control	Pro Tinto/ Tan Color	FT Rouge	BSG Products	Total Votes
Most Preferred	21%	7%	7%	64%	14
Second Most Preferred	18%	27%	45%	9%	11
Third Most Preferred	22%	56%	11%	11%	9
Least Preferred	33%	17%	33%	17%	12

Methods

Norton grapes from Bluemont Vineyard Stable Block were harvested on October 19, 2017 and processed the following day. 5.2 tons of Norton were destemmed (not crushed) into four T bins. Very little juicing occurred. At this time, each bin received 30ppm sulfur dioxide, and then the bins received the following treatments:

1. No tannin addition (Control)
2. Tan Color (Enartis) at 180g/ton, followed by Pro Tinto at 150g/ton later on
3. FT Rouge (ScottLabs) at 60g/hL
4. UVA V-Tan at 30g/hL, Premium Limousin at 15g/hL, and Premium Color (BSG) at 15g/hL

Bins were also inoculated with 25g/hL CLOS yeast with 30g/hL Goferm. 150g/ton Pro Tinto was added to the Enartis fermentation on October 24. An addition of 25g/hL DAP was added over October 23-24 in each treatment. On October 26, each fermentation received 1g/hL VP41. Wine was punched down 2-3 times per day (mostly 2 times per day) was pressed on November 3, settled, and then barreled down. Only free run wine was used. On January 3, 50ppm sulfur dioxide was added (after malolactic conversion).

These wines were tasted on May 16. In order to balance the data set to perform statistical analysis for descriptive analysis, any judge who had not fully completed the descriptive analysis ratings were removed. In order to then make the number of judges between groups equivalent, one judge from groups 1 and 2 were eliminated. This resulted in a final data set of 3 groups, each with 5 judges (considered as replications within groups, and groups were considered as assessors). Data was analyzed using Panel Check V1.4.2. Because this is not a truly statistical set-up, any results which are found to be statistically significant ($p < 0.05$) will be denoted as a “strong trend” or a “strong tendency,” as opposed to general trends or tendencies. The statistical significance here will ignore any other significant effects or interactions which may confound the results (such as a statistically significant interaction of Judge x Wine confounding a significant result from Wine alone). The descriptors used in this study were Fruit Intensity, Herbaceous/Green, Overall Aromatic Intensity, Bitterness, Astringency, and Body.

References

BSG. 2018a. Premium Color: Oenological tannin.

BSG. 2018b. Premium Limousin Special SG: Tannin for oenological use.

BSG. 2018c. V Tan SG: Granulated product tannin-based.

Enartis. 2018a. Enartis Pro Tinto: Biological coadjunct for the fermentation of red wines.

Enartis. 2018b. Enartis Tan Color: Tannin and yeast hull formula with antioxidant protection and stabilization effect on color.

Scott Laboratories. 2018. FT Rouge: Fermentation tannin for red wine.