The Effect of LalVigne Mature Foliar Spray on the North Side of Merlot Vines

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Summary

This study examines the impact of LalVigne Mature Foliar Spray (ScottLabs) on ripeness and the chemical and sensory qualities of the North side of Merlot vines planted East-West. Every other row of a block of Merlot was sprayed at 5% veraison and 10 days later following the LalVigne spray protocol with a tunnel recycle sprayer, allowing for a treatment of sprayed Merlot and a treatment of unsprayed Merlot. Both treatments were harvested only from the North side of the vine (morning side) and processed identically and on the same day, but kept separate. All other treatments between projects were identical. The LalVigne spray slightly increased tannins and anthocyanins in the grape berries, but lowered cluster weight (although not berry weight). Anthocyanins were decreased in the wine from grapes treated with the LalVigne spray. Triangle sensory testing found significant differences in the wines ($p<0.05$), although there was not much of a preference for one wine over the other. No major descriptive sensory trends can be seen.

Introduction

LalVigne Mature Foliar Spray (ScottLabs) is a yeast-derived organic foliar spray which is marketed to concentrate aroma precursors and mature phenolic attributes in berries. It is intended to help produce grapes of higher quality in shorter growing/ripening seasons (Scott Laboratories 2016). Several studies have shown tasters who prefer wine produced with LalVigne Foliar Spray. It has been said to increase mouthfeel and volume in Merlot and Syrah, and to increase aromatic intensity in Merlot. It also appears to reduce IBMP, depending on the base levels of this compound (Lallemand 2015).

Fruit on different sides of the canopy ripen at different rates due to differing sunlight and heat exposure. Fruit on southern or western sides of the vine generally ripen faster than eastern and northern sides of the vine. Harvesting grapes on different sides of the vine generally results in increases in tannin content on the sun side (up to 31% sometimes), even if Brix is the same between sides (Zoecklein 2001). This project was performed in conjunction with another project harvesting the South side of the vines on an earlier date due to differences in ripening times on the sun and shade side of the vines.

Results and Discussion

The LalVigne spray slightly increased tannins and anthocyanins in the grape berries, but lowered cluster weight (although not berry weight). Anthocyanins were decreased in the wine from grapes treated with the LalVigne spray.

Grape Characteristics at Harvest

	Berry Weight (g/berry)	Cluster Weight (g/cluster)	Harvest Yield (tons)	IBMP (ng/L)
Control	1.5	166.2	0.92	4.1
Sprayed	1.4	129.4	0.93	3.8
% Change	-4%	-22%	2%	-7%

Grape Phenolic Chemistry

	Catechin (mg/L)	Catechin: Tannin	Polymeric Anthocyanins (mg/L)	Polymeric Anthocyanins: Tannin	Tannin (mg/L)	Quercetin Glycosides (mg/L)	Total Anthocyanins (mg/L)
Control	40	0.083	21	0.043	484	105	804
Sprayed	37	0.071	22	0.042	518	97	859
% Change	-8%	-14%	5%	-2%	7%	-8%	7%

Lab Results from ETS

Juice Chemistry

	Brix	pH	TA (g/L)	YAN (mg N/L)
Control	23.4	3.97	4.05	121
Sprayed	22.7	3.96	3.60	116
% Change	-3%	0%	-11%	-4%

Chemistry after Primary Fermentation

	Ethanol (%vol/vol)	Residual Sugar (g/L)	pH	TA (g/L)	Volatile Acidity (g/L)	Malic Acid (g/L)
Control	13.5	0	3.70	7.5	0.32	0.66
Sprayed	13.7	0	3.67	7.5	0.33	0.93

Wine Chemistry

	Ethanol (%vol/vol)	Residual Sugar (g/L)	pH	TA (g/L)	Volatile Acidity (g/L)	Tartaric Acid (g/L)	Malic Acid (g/L)	Lactic Acid (g/L)	IBMP (ng/L)	Total SO2 (ppm)	Free SO2 (ppm)
Control	13.6	1.4	3.65	5.8	0.61	2.0	0.2	1.3	1.5	35.8	15.5
Sprayed	13.2	1.4	3.66	5.9	0.6	2.0	0.3	1.4	1.6	57.1	12.9

Lab Results from Enology Analytics from Late January, 2017 (Tartaric Acid and IBMP from ETS)

Phenolic Profile

	Caffeic Acid (mg/L)	Caftaric Acid (mg/L)	Catechin (mg/L)	Epicatechin (mg/L)	Catechin: Epicatechin	Catechin: Tannin	Gallic Acid (mg/L)
Control	5	8	29	33	0.88	0.05	45
Sprayed	5	8	23	31	0.74	0.04	45
% Change	0%	0%	-21%	-6%	-16%	-20%	0%

Lab Results from ETS from Late January, 2017

Phenolic Profile

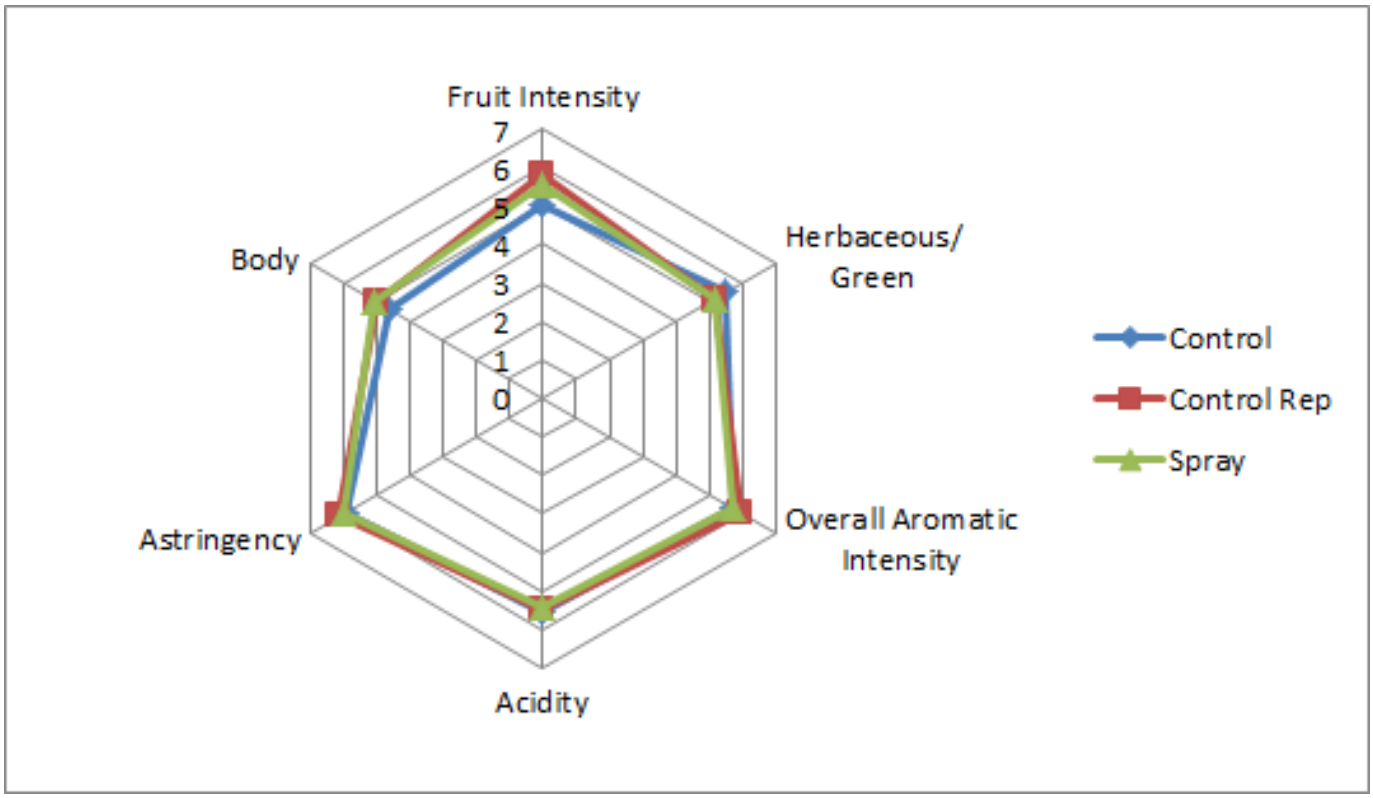
	Malvidin glucoside (mg/L)	Monomeric Anthocyanins (mg/L)	Polymeric Anthocyanins (mg/L)	Quercetin (mg/L)	Quercetin Glycosides (mg/L)	Tannin (mg/L)	Total Anthocyanins (mg/L)	Resveratrol (mg/L)
Control	100	159	32	<1	17	541	191	0.7
Sprayed	64	107	38	1	17	549	145	0.6
% Change	-36%	-33%	19%		0%	1%	-24%	-14%

Lab Results from ETS from Late January, 2017

For the triangle test, of 30 people who answered, 16 people chose the correct wine (53%), showing a significant difference between the wines ($p<0.05$). The wine was voted to have an average degree of difference of 4.4, suggesting that these wines were moderately different. In general, people who answered correctly slightly preferred the sprayed wine, although this was a weak preference.

	Control	Spray	No Preference	Total Votes
Preference	38%	50%	13%	16

No strong trends could be found between wines with the descriptors used in this study.



Methods

Every other row of a 2.66 acre block of East-West Merlot planted in 1989 on Sandy Loam Soil with a light east-facing slope (22 rows total) was sprayed following the LalVigne spray protocol (at 5% veraison and again 10 days after at around 20% veraison). A tunnel recycle sprayer (GSG-A1.N Cross Flow Recycling Spray) was used, which allowed for the ability spray with zero drift and thus creating a control with every other row. The result split the blocks essentially into equal geography, ensuring control and more accurate results. Because it was performed on every other row as opposed to separation by larger blocks it is geographically almost identical.

The North side fruit was harvested on the same day (September 26) keeping control and treatment rows separate. Both lots were chilled overnight prior to destemming into matching T-bins. Both lots had saignée performed in order to achieve an equal skin:juice ratio between lots based on a desired berry weight of 1.45g/berry. As a result, the control lot had a 5.2% saignée, and the treatment lot had a 3.2% saignée. On 10/2, 400g/hL tartaric acid was added to each cold-soaking must. Both lots underwent an 8 day cold soak, and were then inoculated on 10/4 with CSM at 20g/hL and Go Ferm at 25 g/hL. The next day YAN was corrected in both lots to achieve 270ppm using 25g/hL Fermaid K and 66g/hL DAP over the following 2 days. During cold soak there was one punch down per day, during fermentation there were twice daily punchdowns, and during extended maceration (beginning October 12) there were once daily punchdowns.

Both lots were pressed on November 3 for a total of 37 days of maceration and only the free run wine was used for this project. The wine was settled two days in tanks where they were both inoculated with O-Mega malolactic culture (1g/hL) prior to barreling in identical cooperage (both treatments were put in their own new Taransaud Ref 103 M+TH Alliers and their own Second fill 2014 Magrenan Troncais M barrels). Both treatments completed malolactic conversion and were stabilized with 8g/hL KMBS on November 22, 2016.

For the triangle test and preference analysis for the March 8 tasting, anybody who did not answer the form were removed from consideration for both triangle, degree of difference, and preference. Additionally, anybody who answered the triangle test incorrectly were removed from consideration for degree of difference and preference. Additionally, any data points for preference which did not make sense (such as a person ranking a wine and its replicate at most and least preferred, when they correctly guessed the odd wine) were removed.

In order to balance the data set to perform statistical analysis for descriptive analysis on the March 8 tasting, any judge who had not fully completed the descriptive analysis ratings were removed. In order to then make the amount of judges between groups equivalent, two judges from both group 1 and 2 were eliminated. This resulted in a final data set of 3 groups, each with 8 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, Acidity, Astringency, and Body.

References

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