The Effect of LalVigne Mature Foliar Spray on the South 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 South 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 South side of the vine (afternoon side) and processed identically and on the same day, but kept separate. All other treatments between projects were identical. The LalVigne spray slightly decreased tannins and anthocyanins in the grape berries. Caffeic acid was higher in wine from grapes treated with LalVigne. Tannin was also increased in wine from grapes sprayed with LalVigne, but anthocyanins were decreased. Triangle sensory testing revealed no significant differences between wines, and there was no strong preference for either wine. The sprayed wines tended to exhibit greater Fruit Intensity, but this was not a strong tendency.

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 grape phenolics data is the average of two identical sample analyses. The LalVigne spray slightly decreased tannins and anthocyanins in the grape berries. Caffeic acid was higher in wine from grapes treated with LalVigne. Tannin was also increased in wine from grapes sprayed with LalVigne, but anthocyanins were decreased.

Grape Parameters at Harvest

	Berry Weight (g/berry)	Cluster Weight (g/cluster)	Harvest Yield (tons)	Tartaric Acid (g/L)	Potassium (mg/L)	IBMP (ng/L)
Control	1.5	197.8	0.89	5.2	1950	3.3
Sprayed	1.4	188.0	0.97	4.8	2050	5.0
% Change	-2%	-5%	9%	-8%	5%	52%

Grape Phenolic Profile

	Catechin (mg/L)	Catechin: Tannin	Polymeric Anthocyanins (mg/L)	Polymeric Anthocyanins: Tannin	Tannin (mg/L)	Quercetin Glycosides (mg/L)	Total Anthocyanins (mg/L)
Control	31.5	0.06	25.5	0.05	492.0	114.5	805
Sprayed	35.5	0.08	23.0	0.05	460.5	112.5	762
% Change	13%	20%	-10%	-2%	-6%	-2%	-5%

Lab Results from ETS (Including Tartaric Acid, Potassium, and IBMP above)

Juice Chemistry

	Brix	pH	TA (g/L)	YAN (mg N/L)
Control	23.2	3.81	3.6	123
Sprayed	23.4	3.80	3.6	146

Chemistry after Primary Fermentation

	Ethanol (%vol/vol)	Residual Sugar (g/L)	pH	TA (g/L)	Volatile Acidity (g/L)	Malic Acid (g/L)
Control	12.8	0	3.69	7.50	0.2	2.24
Sprayed	12.9	0	3.70	7.35	0.2	2.24

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	13.3	0.2	3.77	5.3	0.42	2.0	0.0	1.5	1.9	62.5	23.2
Sprayed	13.5	0.5	3.76	5.7	0.58	1.8	0.0	1.8	1.8	49.1	12.6

Lab Results from Enology Analytics from Early February, 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	4	8	24	29	0.83	0.05	35
Sprayed	13	2	22	27	0.81	0.04	39
% Change	225%	-75%	-8%	-7%	-2%	-20%	11%

Lab Results from ETS from Early February, 2017

Phenolic Profile

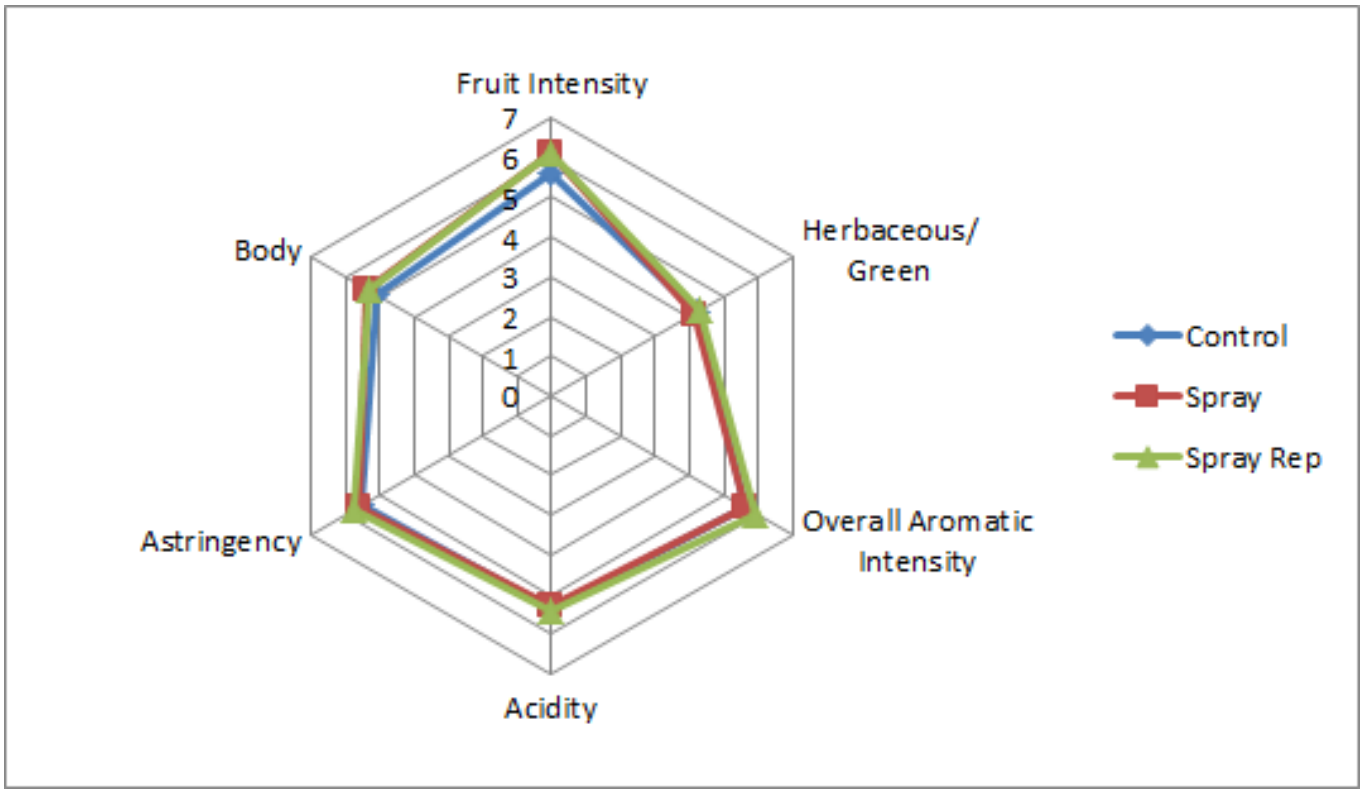
	Malvidin glucoside (mg/L)	Monomeric Anthocyanins (mg/L)	Polymeric Anthocyanins (mg/L)	Quercetin (mg/L)	Quercetin Glycosides (mg/L)	Tannin (mg/L)	Total Anthocyanins (mg/L)	Resveratrol (mg/L)
Control	140	222	26	2	23	447	248	<0.2
Sprayed	89	139	29	2	22	505	168	<0.2
% Change	-36%	-37%	12%	0%	-4%	13%	-32%	

Lab Results from ETS from Early February, 2017

For the triangle test, of 30 people who answered, 7 people chose the correct wine (23%), showing no significant differences between wines. In general, people who answered correctly preferred the control wine to the sprayed wine, although this was a weak preference by very few judges.

	Control	Spray	No preference	Total Votes
Preference	43%	29%	29%	7

No strong trends could be found for the descriptors used in this study. The sprayed wines tended to exhibit higher Fruit Intensity, but this was a weak trend.



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 aroudn 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 South side fruit was harvested on the same day (September 17) 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 4.1% saignée, and the treatment lot had a 1.9% saignée. On 9/21 350g/hL tartaric acid was added to each cold-soaking must. Both lots underwent a 9 day cold soak, and were then inoculated on 9/27 with BDX at 20g/hL and Go Ferm at 25 g/hL. The next day YAN was corrected in both lots to achieve 215ppm using 25g/hL Fermaid K and 26g/hL DAP on the following day. During cold soak there was one punch down per day, during fermentation there were twice daily punchdowns, and during extended maceration (beginning October 7) there were once daily punchdowns.

Both lots were pressed on October 17 for a total of 29 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 (1 g/hL) prior to barreling in identical cooperage (both treatments were put in their own new Francois Freres VTG M Troncais 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, one judge from group 1 was eliminated. This resulted in a final data set of 3 groups, each with 10 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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