

Oregon Wine Advisory Board Research Progress Report

1996 - 1997

Effect of Canopy Location on Yield Components and Fruit Composition in Pinot noir Grapevines Trained to the Scott Henry Trellis System

Joey Ratliff, M. Canno Candolfi-Vasconcelos & Scott Henry
Department of Horticulture
Oregon State University

ABSTRACT

Pinot noir vines, trained to the Scott Henry trellising system were separated into four different quadrants: Bottom canopy, trained toward the ground; Top canopy, trained upwards; East orientation, receiving the morning sunlight; and West orientation, receiving afternoon sunlight. Yield components and fruit composition were measured for each canopy, orientation, and then for each quadrant. The bottom canopy had higher yield, cluster weight, titratable acidity, and total sugar per vine, than did the top canopy. Must soluble solids were not significantly different between the two canopies. The top canopy had a significantly higher pH. The East side of the vine, the side that receives direct morning sunlight, had a higher yield, cluster weight, and total sugar per vine than did the West side of the vine. The West side of the vine, the side that receives direct afternoon sunlight, had higher titratable acidity than did the East side of the vine. Must soluble solids were not significantly different between the two sides of the vine. The bottom-east quadrant had a significantly higher yield, and total sugar per vine, than did the other three quadrants.

INTRODUCTION

The Scott Henry trellis was developed in the Umpqua Valley of Oregon by Scott Henry at Henry Estate Vineyards. This training system consists of two canopies, one trained up, and the other trained towards the ground. The key to the Scott Henry system is the window left between the two canopies which allows sunlight to reach the clusters directly, and aids air circulation in the fruiting area. The Scott Henry trellis and training system is being used in many wine grape regions, particularly in the New World. It is a promising trellis option for vineyards planted on high vigor sites. With the growing popularity of this trellis system, and the unique opportunity of having in close proximity, both the inventor of, and the original site the system was developed for, it is important to study the potentials of this trellis system.

MATERIALS AND METHODS

This trial was performed at Henry Estate Vineyards in the Umpqua Valley. Two rows of Pinot noir vines were selected from the vineyard in a high vigor area. Sixteen vines were randomly picked from the two rows and marked as trial plants. The vine spacing was 6 ft. x 12 ft. (1.8 m x 3.66m). Prior to harvest, a representative shoot was collected from both the bottom and top canopies. This shoot was used to measure shoot length and leaf area. The vines were harvested October 5, 1996. Each of the four

quadrants of each vine (top-east, top-west, bottom-east, bottom-west), were picked and weighed separately. A subsample was then removed from each and crushed to determine fruit composition. The fruit from each vine was combined by quadrant and then made into wine. Each quadrant had 3 replications of wine made. Post harvest, shoot number was determined, as was average node length and diameter for the top and the bottom canopies.

RESULTS AND DISCUSSION

Table 1 summarizes yield components and fruit composition measured for each canopy and orientation of the Pinot noir vines trained to the Scott Henry system. The bottom canopy had higher yield, cluster weight, and titratable acidity than did the top canopy. The top canopy had higher pH than did the bottom canopy. Clusters per square meter, berry weight, berries per cluster, skin weight, and must soluble solids were not significantly different between the top and bottom canopies. There was also no difference in shoot morphology between the top and bottom canopies.

Tables 1 and 2: Effect of canopy location on yield components and fruit composition in Pinot noir grapevines trained to the Scott Henry trellis system

TABLE 1		Yield (Kg/m ²)	Berry wt.(g)	Cluster wt.(g)	Clusters/ m ²	Berries/ Cluster	Skin wt. (g)	Skin/ Berry wt.	Brix	pH	TA	Sugar (Kg/Vine)
Canopy	Bottom	0.44 a ¹	1.19 a	163.55 a	3 a	138 a	0.139 a	0.12 a	23.1 a	3.11 b	8.62 a	0.10 a
	Top	0.33 b	1.15 a	147.92 b	2 a	129 a	0.140 a	0.12 a	23.3 a	3.15 a	8.07 b	0.08 b
		**	ns	**	ns	ns	ns	ns	ns	**	**	**
Orientation	West	0.33 b	1.13 a	145.32 b	2 a	129 a	0.132 a	0.12 a	23.2 a	3.12 a	8.58 a	0.08 b
	East	0.44 a	1.21 a	166.16 a	3 a	138 a	0.147 a	0.12 a	23.2 a	3.14 a	8.11 b	0.10 a
		**	ns	***	ns	ns	ns	ns	ns	ns	**	**
<u>Main Effects</u>												
Canopy		**	ns	**	ns	ns	ns	ns	ns	**	**	**
Orientation		**	ns	***	ns	ns	ns	ns	ns	ns	**	**
Canopy x Orientation		**	ns	ns	ns	ns	ns	ns	ns	ns	ns	**

¹, *, **, *** indicate not significant and statistically significant at the 0.05, 0.01, and 0.001 levels. Values followed by the same letters do not differ significantly.

The East side of the vine, the side that receives morning sunlight, had a higher yield and cluster weight than did the West side. The West side of the vine had a higher titratable acidity than did the East side of the vine. Clusters per square meter, berry weight, berries per cluster, skin weight, must soluble solids, and pH were not significantly different between the East and West sides of the vine.

Table 2 summarizes yield components and fruit composition measured for each quadrant of the Pinot noir vines trained to the Scott Henry system. The bottom-east quadrant had a significantly higher yield, and total sugar than did the three other quadrants. All other fruit characteristics were not significantly different between the four quadrants of the vine.

TABLE 2		Yield (Kg/m ²)	Berry wt.(g)	Cluster wt.(g)	Clusters/ m ²	Berries/ Cluster	Skin wt. (g)	Skin/ Berry wt.	Brix	pH	TA	Sugar (Kg/Vine)
Canopy x Orientation												
Bottom-east		0.54 a ¹	1.20 a	175.68 a	3.07 a	147 a	0.15 a	0.12 a	23.0 a	3.10 a	8.36 a	0.12 a
Bottom-west		0.34 b	1.18 a	151.43 a	2.23 a	130 a	0.13 a	0.11 a	23.2 a	3.11 a	8.88 a	0.08 b
Top-east		0.34 b	1.22 a	156.64 a	2.24 a	129 a	0.15 a	0.12 a	23.4 a	3.17 a	7.86 a	0.08 b
Top-west		0.33 b	1.08 a	139.21 a	2.34 a	129 a	0.13 a	0.12 a	23.3 a	3.14 a	8.28 a	0.08 b

¹, *, **, *** indicate not significant and statistically significant at the 0.05, 0.01, and 0.001 levels. Values followed by the same letters do not differ significantly.

CONCLUSIONS

The results of this study suggest that there are yield component differences between not only top and bottom canopies of the Scott Henry system, but also in canopy orientation to the sun, i.e. receiving

morning sunlight or afternoon sunlight. According to this study, the most productive area of a Pinot noir vine, trained to the Scott Henry trellis system is the bottom canopy on the side that receives direct morning sunlight.

ACKNOWLEDGMENTS

We would like to thank Richard Smart for urging us to conduct this project. Special thanks to the team at Henry Estate Vineyards, Steve Castagnoli, and OSU viticulture crew for help with this trial.