

INFLUENCE OF PLANTING STOCK AND TRAINING STRATEGY ON THE DEVELOPMENT AND PRODUCTIVITY OF PINOT NOIR GRAPEVINES

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Abstract:

Context and purpose of the study - For cool windy climates and/or lower vigor site situations delays in vine development during vine establishment can result in a greater number of growing seasons to achieve full yield potential. Plant material and training strategies utilized are critical factors in promoting vine development and production that is appropriate to the site conditions. The objective of this study was to evaluate nursery planting stock and training strategies for their potential to achieved advanced vine development and yield.

Material and methods - A field trial was established in a Pinot noir vineyard growing in the Salinas Valley of California to compare standard 30 cm long dormant benchgrafts to 90 cm tall benchgrafts that were produced by using a longer rootstock cutting. The experimental treatments were: 1) standard field grown dormant benchgrafts, 30 cm; 2) tall dormant potted benchgrafts, 90 cm; and 3) tall green growing potted, 90 cm. Dormant vines were planted on March 13, 2015 and the green growing benchgrafts on August 6, 2015. The tall vines were trained to bilateral cordons in the first year where growth was adequate. Standard vines were trained to a single trunk shoot at the end of the first year and cordon training started in year 2. All treatments were evaluated for their influence on growth and productivity during the first four years of vine establishment.

Results - The dormant tall benchgrafts at the end of year one produced vines with larger diameter trunks and growth was adequate to form the cordons. In year 2 and 3 dormant tall vines had larger trunk and cordon diameters and pruning weights, the standard was intermediate, and the tall green growing had the smallest diameters and pruning weights. In year 2 the dormant tall vines produced the highest yield; the standard was intermediate and the green growing tall vines the lowest. In year 3 the dormant tall and standard vines produced similar yield and the green growing tall vines had lower yields. Fruit composition for the dormant tall and standard vines was not different in years 2, while Brix was higher and the titratable acidity lower for the very limited fruit produced on the green growing tall vines. In year 3 there was no difference in Brix between the treatments. The results from this trial would suggest that both plant material and vine training method in the first year could advance the development of the permanent framework of the vine and promote the potential for earlier vine production especially when either of these factors improves total vine growth in the year of planting and that growth increase is used to form the vine's permanent framework. As observed in previous studies dormant benchgrafts had better vine development and early yield than green growing plants under the site conditions of this study.

Keywords: Grape, vine development, establishment, benchgraft, training

1. Introduction.

Influence of Planting Stock and Training Strategy on the Development and Productivity of Pinot Noir Grapevines

L. J. Bettiga, Viticulture Farm Advisor

Introduction and Objectives

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Materials and Methods

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Pinot noir vines on November 30, 2015, at the end of the first growing season. Upper left is 30 cm dormant benchgraft; upper right is 90 cm green tall benchgraft; bottom left is 90 cm dormant tall benchgraft.

Results

The dormant tall benchgrafts at the end of year one produced vines with larger diameter trunks and growth was adequate to form the cordons. In year 2 and 3 dormant tall vines had larger trunk and cordon diameters and pruning weights, the standard was intermediate, and the tall green growing had the smallest diameters and pruning weights. In year 2 the dormant tall vines produced the highest yield; the standard was intermediate and the green growing tall vines the lowest. In year 3 the dormant tall and standard vines produced similar yield and the green growing tall vines had lower yields. Fruit composition for the dormant tall and standard vines was not different in years 2, while Brix was higher and the titratable acidity lower for the very limited fruit produced on the green growing tall vines. In year 3 there was no difference in Brix between the treatments.



Pinot noir vines on January 26, 2017, at dormancy after the end of the second growing season. Upper left is 30 cm dormant benchgraft; upper right is 90 cm green tall benchgraft; bottom left is 90 cm dormant tall benchgraft.

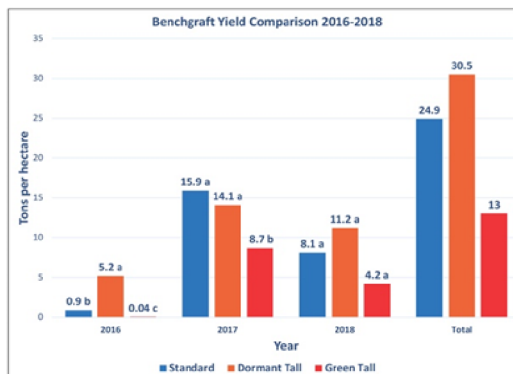


Table 1. Effect of plant material and training on vine growth of Pinot noir grapevines, 2015.

Treatment	Pruning weight, g	Trunk Diameter, mm	Cordon diameter, mm	
			First internode	Last internode
12 in BG Pruned to a trunk	82 a	8.1 c	-	-
36 in dormant tall BG	61 b	12.1 a	7.6	6.6
36 in green growing tall BG	6 c	8.9 b	-	-

* Mean separation by Duncan's multiple range test, 5% level.

Table 2. Effect of plant material and training on vine growth of Pinot noir grapevines, 2016.

Treatment	Shoots per vine	Shoot weight, g	Pruning weight, g	Fruit: pruning wt ratio	Trunk Diameter, mm	Cordon diameter, mm	
						First internode	Last internode
30 cm BG Pruned to a trunk	12 a	10 b	126 b	2.6 b	12.8 b	14.5 b	9.2 b
90 cm dormant tall BG	14 a	17 a	233 a	8.2 a	17.2 a	16.3 a	12.0 a
90 cm green growing tall BG	6 c	8 b	46 c	0.2 b	11.5 c	11.3 c	7.6 c

* Mean separation by Duncan's multiple range test, 5% level.

Table 3. Effect of plant material and training on vine growth of Pinot noir grapevines, 2018.

Treatment	Shoots per vine	Shoot weight, g	Pruning weight, g	Fruit: pruning wt ratio	Trunk Diameter, mm	Cordon diameter, mm	
						First internode	Last internode
30 cm BG Pruned to a trunk	36 a	34 a	1239 a	1.9 b	24 b	19 a	13 a
90 cm dormant tall BG	37 a	37 a	1408 a	2.4 b	26 a	20 a	13 a
90 cm green growing tall BG	38 a	22 b	838 b	3.2 a	22 c	16 b	10 b

* Mean separation by Duncan's multiple range test, 5% level.

Conclusion

The results from this trial would suggest that both plant material and vine training method in the first year could advance the development of the permanent framework of the vine and promote the potential for earlier vine production especially when either of these factors improves total vine growth in the year of planting and that growth increase is used to form the vine's permanent framework. As observed in previous studies dormant benchgrafts had better vine development and early yield than green growing plants under the site conditions of this study.