

# Effect of Planting Stock and Training Strategy on the Early Development and Productivity of Pinot Noir Grapevines

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## Introduction and Objectives

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.

## Materials 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 five years of vine establishment.



Pinot noir vines on November 30, 2015, at the end of the first growing season. Left is standard 30 cm dormant benchgraft; middle is 90 cm green tall benchgraft; right is 90 cm dormant tall benchgraft.



Pinot noir vines on January 26, 2017, at dormancy after the end of the second growing season. Left is standard 30 cm dormant benchgraft; middle is 90 cm green tall benchgraft; right 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. For years 4 and 5, trunk diameters remained highest for the dormant tall vines and cordon diameters and pruning weights were similar for the dormant tall and standard vines but were greater than the green tall vines. 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. There were no significant differences in yield for years 4 and 5. Fruit composition for the dormant tall and standard vines was not different in year 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 to 5 there was no difference in fruit composition between the treatments.

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
30 cm BG pruned to a trunk	82 a	8.1 c	-	-
90 cm dormant tall BG	61 b	12.1 a	7.6	6.6
90 cm 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.

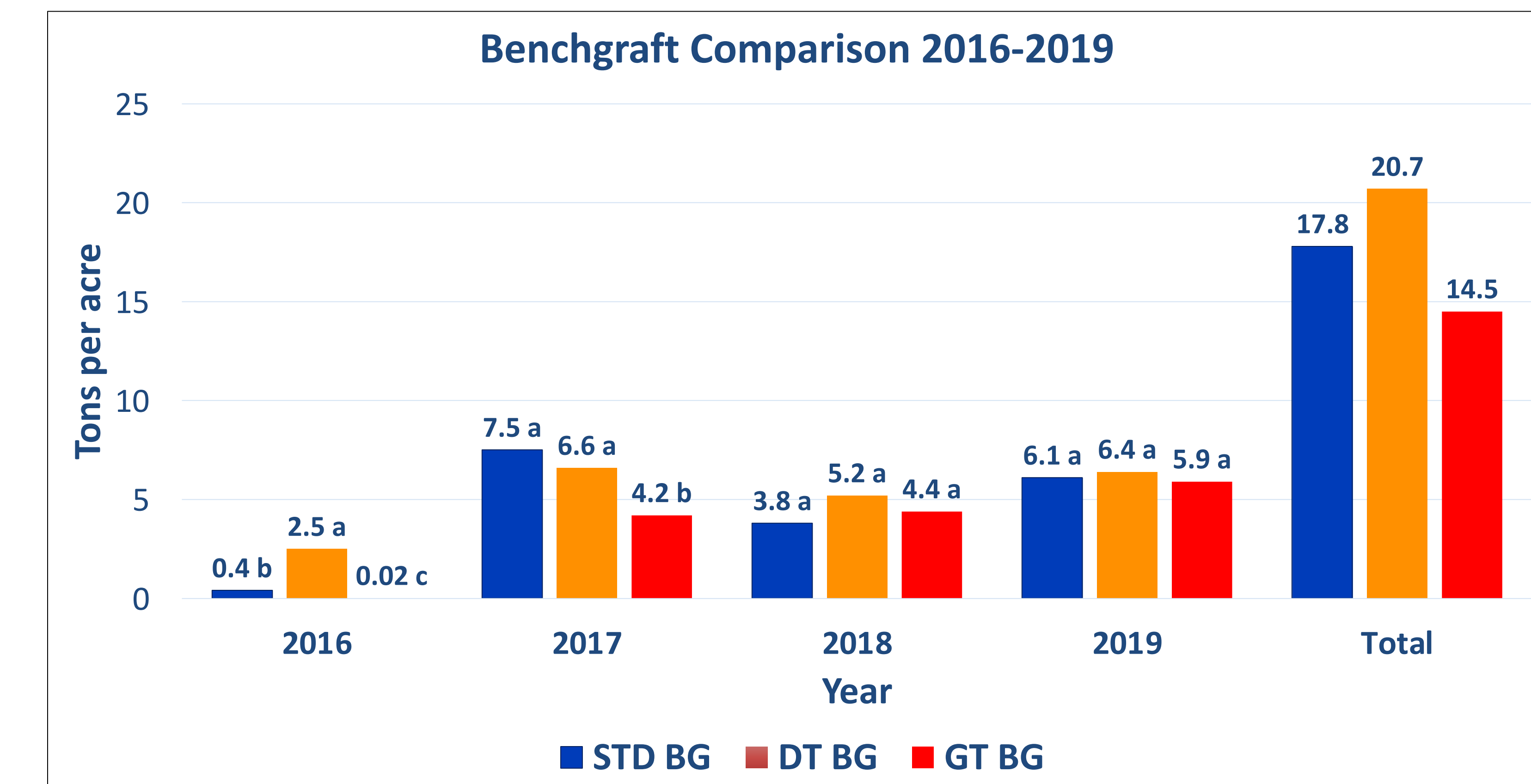
Treatment	Shoots per vine	Shoot weight, g	Pruning weight, g	Fruit: pruning wt ratio	Trunk Diameter, mm	Cordon diameter, mm	
						First internode	Last internode
30 cm BG pruned to a trunk	12 a	10 b	126 b	2.6 b	12.8 b	14.5 b	9.2 b
90 cm dormant tall BG	14 a	17 a	233 a	8.2 a	17.2 a	16.3 a	12.0 a
90 cm 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, 2019.

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	42 a	23 a	951 a	4.1 a	28 b	22 a	14 a
90 cm dormant tall BG	40 a	26 a	1001 a	4.1 a	30 a	23 a	14 a
90 cm green growing tall BG	37 a	23 a	814 b	4.5 a	26 c	20 b	12 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.