‘Kicker’ Canes Removed at Bloom Affect Hedging Weights in Cabernet Franc, Chambourcin, and Chardonnay in Southern New Jersey

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‘Kicker’ cane is a supplemental cane retained during winter pruning, typically at the crown or the apical end of the grape vine. These disposable canes can suppress the grapevine vigor at the onset of the growth cycle. Though it is not uncommon practice, its effectiveness has not been studied in high vigor agro-climates such as New Jersey. Excess vigor during growth cycle requires multiple hedgings and can increase the cost of canopy management. Reduced vigor not only requires less number of hedging but can improve light penetration in to canopy and fruit zones and enhance fruit quality.

An experiment was conducted in *Vitis vinifera* and hybrid varieties of wine grapes to study, if by retaining kicker cane at various positions on the grapevine cordons, excessive vegetative growth (vigor) of a vine could be diverted into those kicker canes. Those canes can then be removed at bloom to get rid of the extra vigor. The principle behind this strategy was that vines distribute the vigor proportionately to the number of nodes or buds. Having extra buds at the kicker canes will take some of the vigor of the vine, since the extra 10-12 buds will have at least those many shoots after the bud break. Consequently, shoots from the standard spurs may have less vigor, grow less, and require less frequent hedging.

Materials & Methods

“Kicker” canes were retained then pruned off at bloom to evaluate their effects on hedging weight in Cabernet Franc, Chambourcin, and Chardonnay in southern New Jersey in 2015. Mature vines trained to a bilateral cordon VSP system were used for the experiment. The trials were located in several vineyard blocks in southern New Jersey. These blocks included about; one acre of Cabernet franc planted in 2006 at Repoupo Road in Salem County, an acre block of Chambourcin and a 5 acre block of Chardonnay planted in 2009 and 2008, respectively at Belleview vineyards at the border of Atlantic and Gloucester County. Each of these blocks is trained to a standard bi-lateral cordon system and drip irrigated. A randomized, complete-block experimental design was employed in each block with at least four replications of four treatments each. Each treatment plot consisted of three consecutive vines of which the middle vine was marked for observation. With the exception of the kicker cane pruning treatment, leaf removal and cluster thinning, the experimental areas were managed identically using standard cultural practices under the supervision of vineyard owners and managers.

Four treatments were performed at winter pruning: ‘control’, standard cultural practices throughout the growing season; ‘only distal’, one kicker cane each at distal end retained at winter pruning; ‘only proximal’, one kicker cane each at proximal end retained at winter pruning; and ‘distal plus proximal’, one kicker cane each at distal and proximal end retained at winter pruning (Figure 1). Two hedgings removed excess shoot growth after which air dried hedged shoots were weighed. All the treatments were applied on the same date close to standard winter pruning. For all the treatments, standard spurs had two nodes while each kicker canes had 10-12 nodes. Two hedgings were performed after kicker cane removal. Hedged shoots were air dried and then weighed.

Data were analyzed using *STATISTICA* software program.

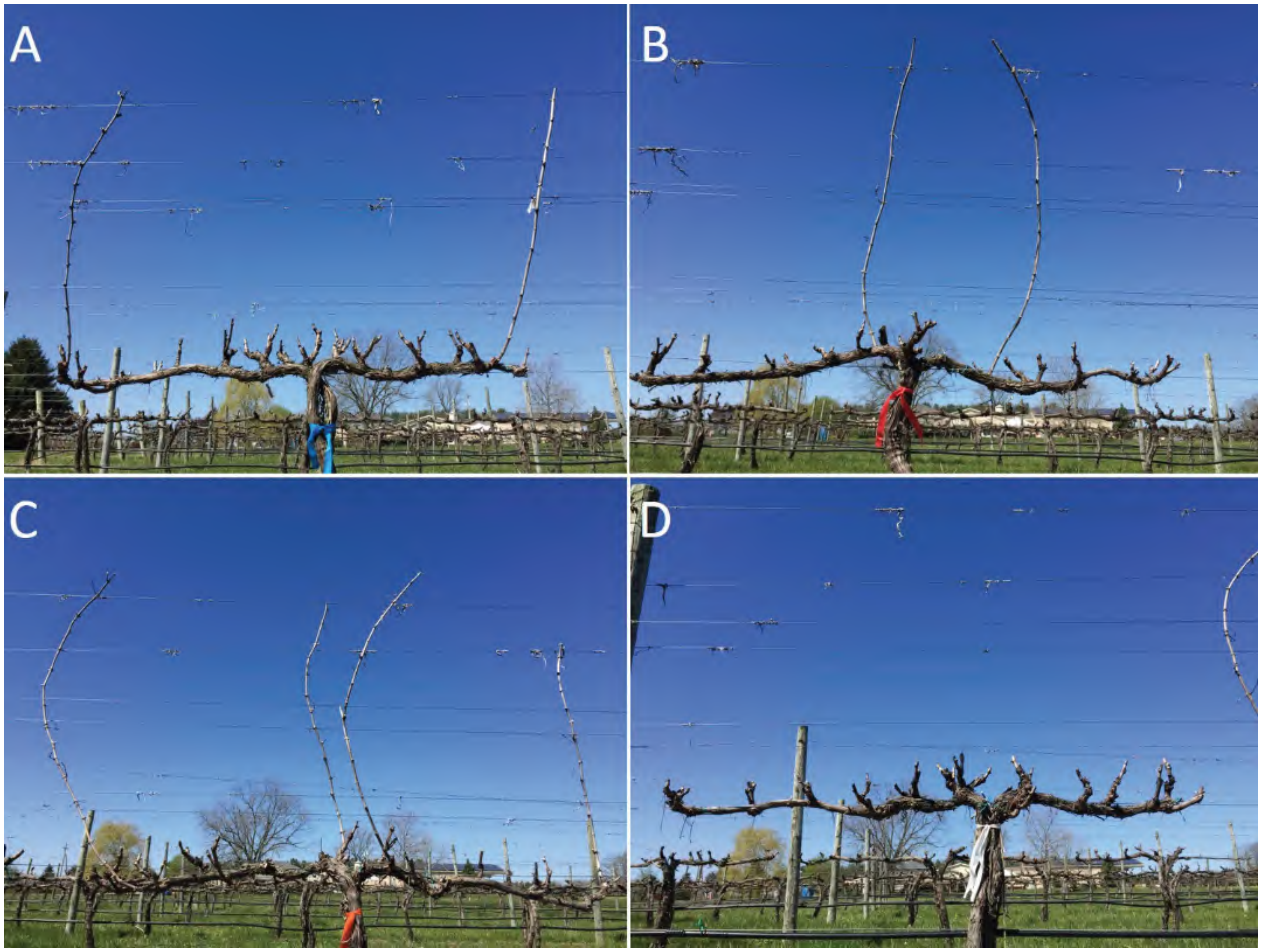


Figure 1. Kicker cane treatments; 'only distal' kicker cane (A), 'only proximal' kicker cane (B), 'distal and proximal' kicker cane (C) and untreated 'control' (D), performed during pruning in Chardonnay grown in south New Jersey.

Results & Discussions

Table 1 summarizes the average hedging weights in all three varieties. In Cabernet Franc, average hedging weights of the control was highest and the distal and proximal treatments were lowest after the first hedging, although the differences were not statistically significant. After the second hedging, the control had

Table 1. Average hedging dry weights in response to kicker cane treatments; 'control', 'distal and proximal', 'only distal', and 'only proximal' in Cabernet Franc, Chardonnay, and Chambourcin of wine grapes varieties grown in New Jersey in 2015.

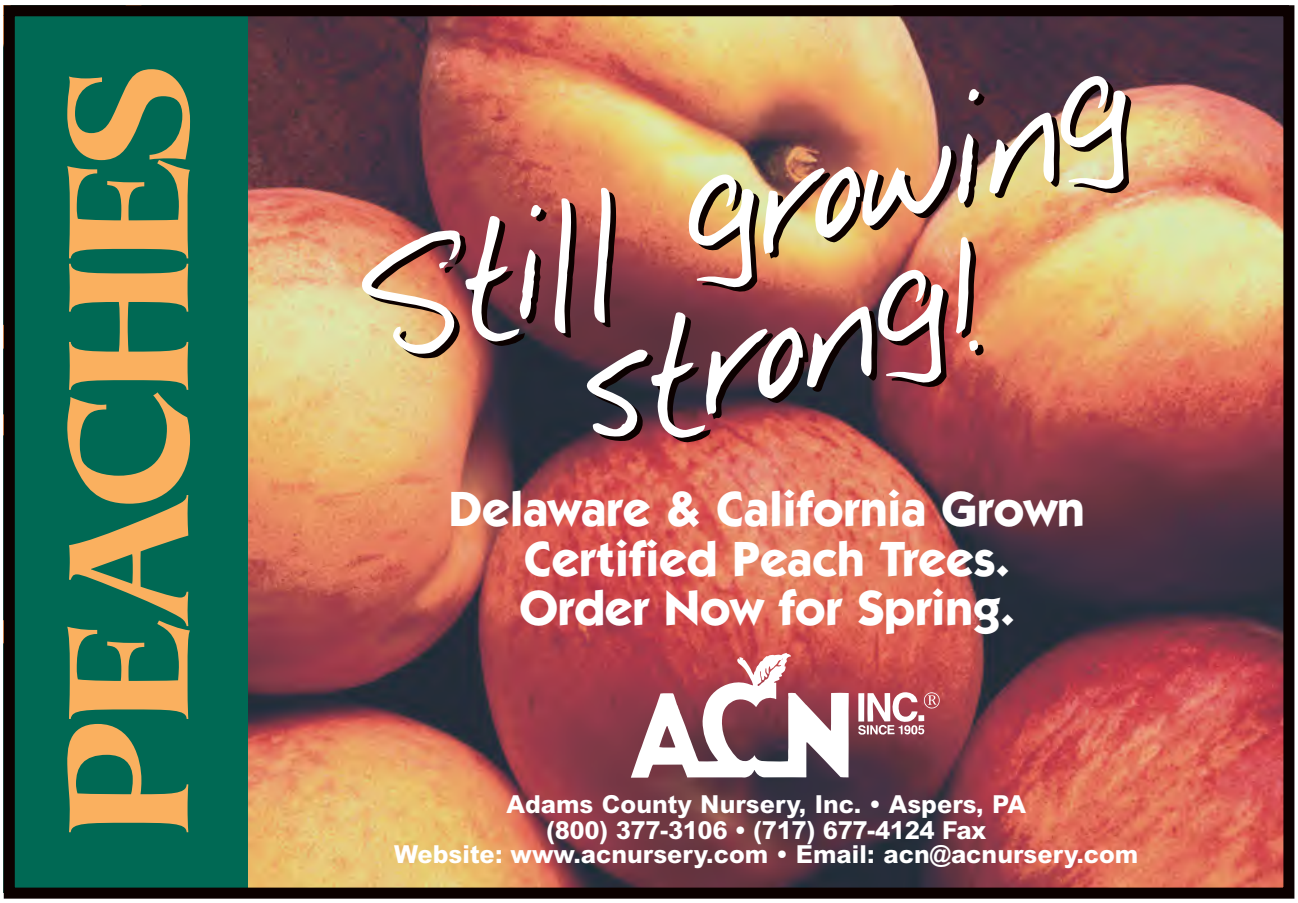
Treatment	Average hedging dry weight (g)								
	First	Second	Total	First	Second	Total	First	Second	Total
	Cabernet Franc			Chardonnay			Chambourcin		
Control	35.5	210 [z] a	246 a	186 a	235	421 a	66.0	237 ab	303
Distal and proximal	6.2	155 ab	161 b	58 b	199	257 b	45.6	269 a	315
Only distal	26.5	125 b	152 b	81 b	181	262 b	48.3	190 b	238
Only proximal	11.3	128 b	139 b	98 b	214	312 b	37.6	244 ab	282
P value	0.134	0.057	0.057	0.001	0.275	0.005	0.052	0.147	0.211

[z] Means followed by different letters within columns differ significantly at $P = 0.05$ by Duncan's new multiple range test.

significantly higher hedging weight compared to other three treatments, and the same pattern was reflected in a total hedging weight (Table 1). In Chardonnay, hedging weights after the first hedging were significantly lower in all three treatments compared to the control; however, hedging weights of all treatments were comparable after the second hedging, still, the combined hedging weight in all treatments were lower compared to 'control' (Table 1). In Chambourcin, the first hedging resulted in comparable dry weights of hedged shoots, even though average hedged weights from the control were higher compared to the other three treatments. There were no significant differences in the hedging weight after the second hedging, although the distal and proximal treatment had higher hedging weights compared to the only distal treatment. Total hedging weights were comparable for all the treatments in Chambourcin (Table 1).

There was inconsistency of hedging weight reduction due to treatment/ however, kicker cane retention and its removal at bloom reduced hedging weights in all three varieties. In all three varieties, typically the second hedging had higher dry weight compared to the first hedging which could be due to enhanced growth of grapevine following the first hedging. Removal of the proximal plus distal cane resulted in reduced vigor in Chardonnay and Cabernet Franc but not in French-American hybrid variety Chambourcin. There was no clear trend between the only distal or the only proximal treatments in all three varieties.

Overall results indicate that 'kicker' cane treatment has the potential to reduce vigor in *Vitis Vinifera*; however, the results could depend of the variety and other factors such as site-vigor and the overall season. For example, here we found that, 'kicker' cane reduced average hedging weights more so in Chardonnay than in Cabernet Franc. Also, it seems that in hybrid varieties, 'kicker cane' may reduce vigor initially; however, due to its inherent rapid growth, it may catch up with normal vigor, and one may not see the difference after second hedging or in overall hedged weights.

Acknowledgements

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