

Mechanize more: machine thinning works for machine-pruned wine grapes

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The management of vineyards using mechanical methods is becoming increasingly important in Washington and elsewhere as a means of lowering labor costs. In some years machine pruned vines may result in heavier than desired crop loads. To address this, we evaluated the use of a mechanical grape harvester for crop thinning at or before the grapes' lag phase in a Syrah vineyard near Paterson, Washington, from 2016 to 2018. This field trial was part of larger experiment in cooperation with Ste. Michelle Wine Estates, comparing wines made from grapes from manually pruned, machine-pruned, and machine-pruned plus thinned vines.

Field Trial:

In 2015 we established a field trial in a commercial Syrah vineyard near Paterson, WA, to evaluate the effect of pruning method and crop thinning on viticulture parameters and wine. The vineyard was planted in 2000 on a 6 x 9 foot spacing, with north-south oriented rows, and trained to a unilateral cordon on a single wire 3 ft above the ground. Pruning treatments were applied as follows:

Mechanically pruned (MP) – Mechanically pruned with a VMech rotary pre-pruner in early March. The vines were pruned to target for a production type crop load.

Mechanically pruned + thinned (MP+ Th) – Mechanically pruned with a VMech rotary pre-pruner in early March, followed by crop thinning using a Korvan harvester between the pea size stage and lag phase (mid July). Amount of crop to be thinned was determined by cluster counts and weights with the intent to approximate the crop load of the hand pruned treatment. This varied between 15 to 30% reduction.

Hand pruned (HP) – Spur pruned leaving 24 buds per vine in December to January

Each treatment was applied to 30 vines in 3 adjacent rows with 4 replicates in the vineyard.

Data Collected:

Canopy size and fruit-zone light measurements at set, veraison, and pre-harvest.

Components of yield at harvest: clusters/vine, cluster weight, tons/acre.

Results from the last 3 years (2016 – 2018) are reported here.

Year	Pruning Treatment	Clusters/vine	Cluster weight (g)	Yield tons/acre	Pre-harvest fruiting zone light (% of ambient)	Pre-harvest exposed clusters (% of total)
2016	MP + Th	97 a	85.6 b	7.2 b	25.8	21
	MP	110 a	92.4 b	8.9 a	22.9	17
	HP	65 b	111.7 a	6.4 b	24.4	33
	P value	<0.001	<0.001	<0.05	ns	ns
2017	MP + Th	80 ab	70.9 b	4.9 b	19.2	41
	MP	92 a	83.5 b	6.6 a	20.4	39
	HP	59 b	115.5 a	6.0 ab	20.1	25
	P value	<0.05	<0.001	<0.05	ns	ns
2018	MP + Th	82 a	73.3 c	5.3 b	19.5 b	64 ab
	MP	79 a	96.0 b	6.3 a	18.1 b	57 b
	HP	50 b	112.0 a	5.0 b	25.7 a	87 a
	P value	<0.001	<0.001	<0.05	<0.01	<0.05

Effect of pruning treatment on yield components and canopy exposure of field-grown Syrah grapes from 2016 through 2018. Different letters within columns indicate significant differences among pruning treatments.

Results:

Hand-pruned vines had fewer clusters per vine but larger clusters than machine-pruned vines.

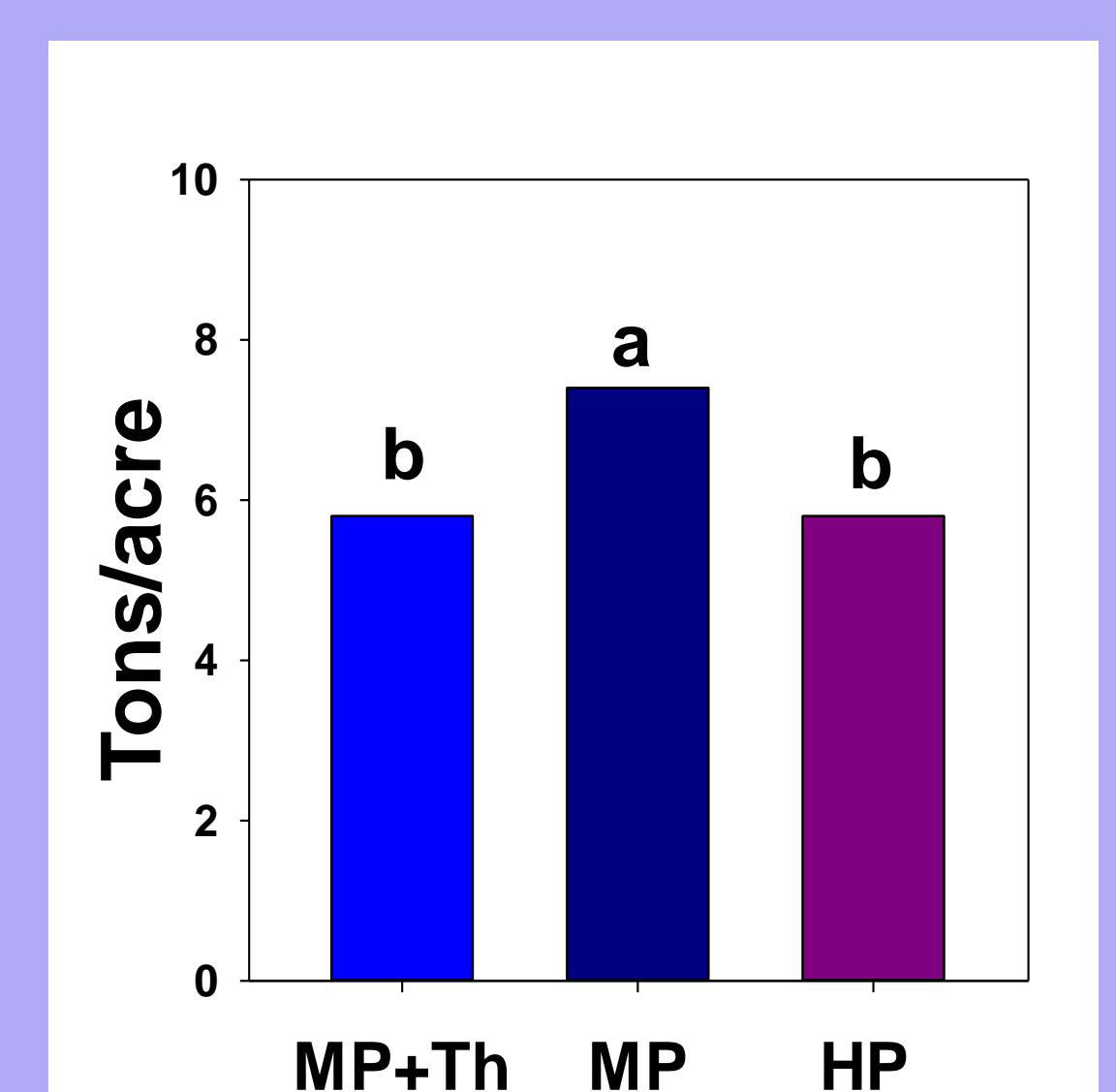
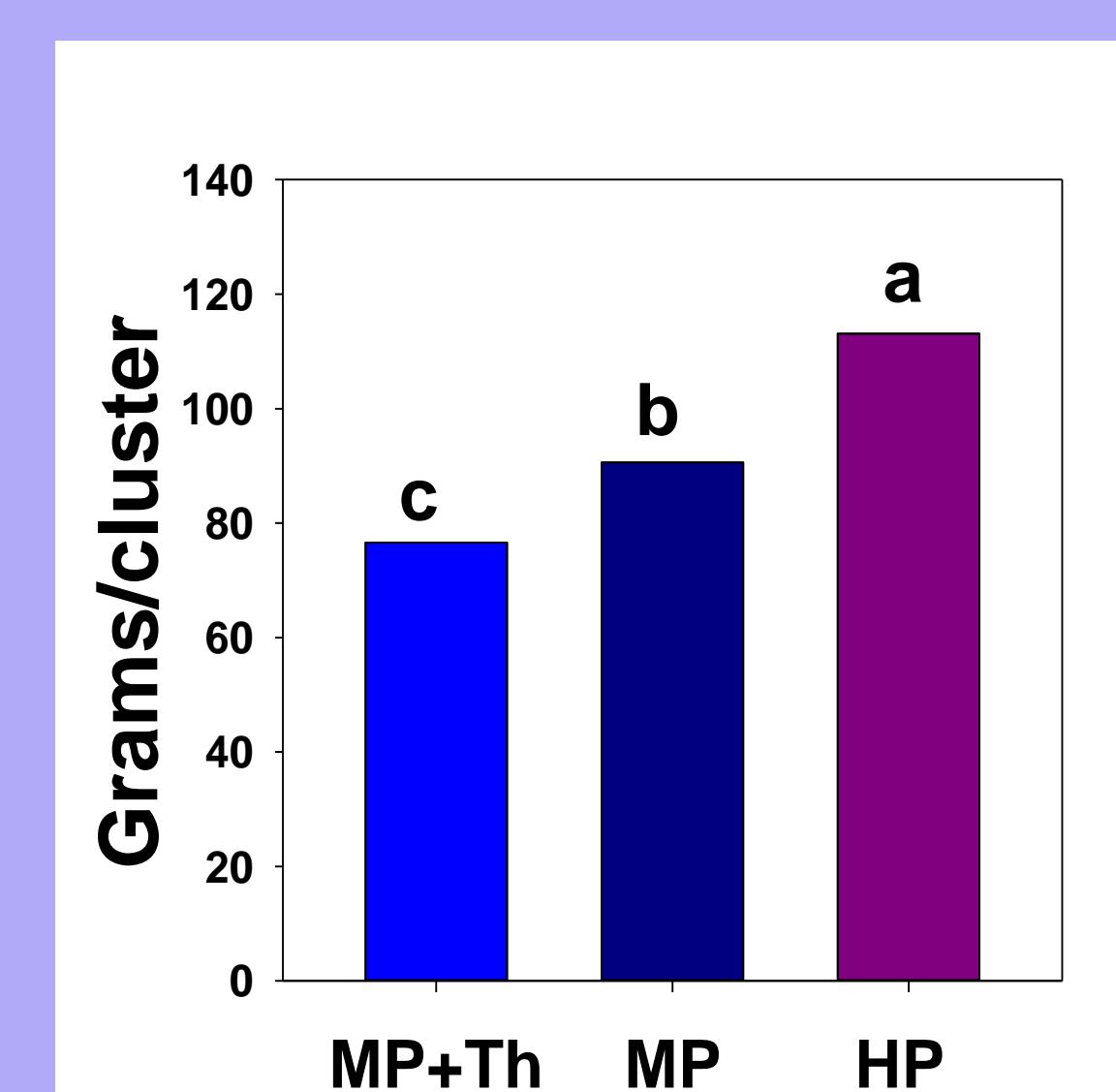
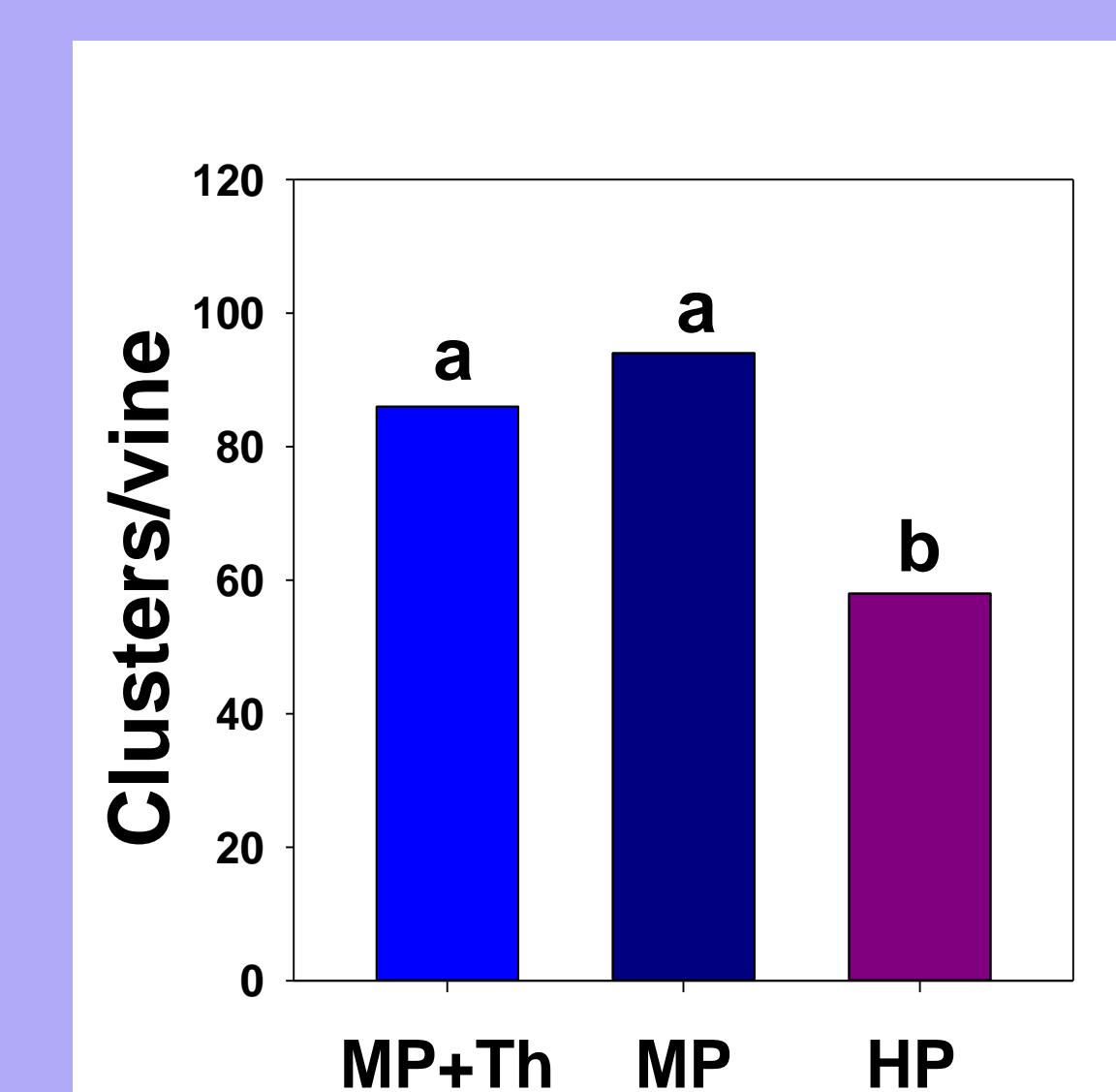
Even though clusters from machine-pruned vines were smaller than those from hand-pruned vines the overall yield of machine-pruned vines was greater because of the higher cluster number.

Machine thinning of machine-pruned vines was very effective in reducing the yield to close to the level of the hand-pruned vines.

Machine thinning at pea size stage tended to drop whole clusters, while thinning at lag phase dropped more individual berries; irrespective of timing, thinning effectively reduced cluster compactness and size.

We found no permanent damage from machine thinning to the clusters or canopy.

3-Year overall average



Effect of pruning treatments on yield components in Syrah grapevines over 3-year period (2016-2018). Different letters indicate significant differences among pruning treatments (Fisher's LSD test, P < 0.05).

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