

MECHANICAL PRUNING OF WINE GRAPES

2. MECHANICAL VERSUS HAND PRUNING

Although hand pruning is preferred by most producers for their top vineyards, increasing labour shortages and costs have led to more vineyards being pruned mechanically. Despite incentives to pay pruners bonuses when they prune more than the norm number of vines per day, productivity and the correct application of the chosen system remains problematic.

This makes mechanical pruning an increasingly attractive option for producers. Mechanical pruning is not without challenges. Workers must be well trained to use expensive and electronically sophisticated equipment effectively. They must be able to perform basic maintenance and adjust the settings of the machines on a block basis, to ensure that maximum efficiency is maintained.

2.1 Results of different pruning trials:

- In a pruning trial in Simondium with Sauvignon blanc/101-14 Mgt the following average production was obtained over a period of six years for the different techniques: Cazenave 8.7 t/ha; Sylvoz 11.5 t/ha; mechanised pruning 10.6 t/ha and spur pruned 7.9 t/ha.
- The influence of mechanised pruning on the yield and grape composition of Cabernet Sauvignon/Richter 110 in Stellenbosch from 1994-2002 was as follows:
 - Over a nine year period, mechanically pruned Cabernet Sauvignon/Richter 110 vines in Stellenbosch produced an average of 10.03 t/ha more grapes than the hand pruned (spur pruned) control. There was no difference in the grape composition, but the grapes from the mechanically pruned sites produced noticeably more flavourful wines as a result of the open-hanging canopy, but had a lower extraction level.
- The influence of mechanised pruning on the performance of Cabernet Sauvignon/Richter 99 at Nietvoorbij in Stellenbosch from 2000-2005 was as follows:
 - The grapes from the hand pruned sites produced wine with a more vegetative character than those from the mechanically pruned sites.
 - Over a five year period, mechanically pruned vines produced nearly 8 t/ha more grapes than the handpruned (spur pruned) sites. Although there were no differences in the sugar concentration, the acid concentration and the pH of the hand pruned vines were higher.
- The influence of mechanical pruning on the performance of different cultivars on Richter 99 at the Robertson experimental farm of the Agricultural Research Council (ARC) from 2001-2006 was as follows:

- With all the cultivars, mechanical pruning produced significantly higher yields over the six year period, while there was little difference in the chemical composition of the grapes.
- At the Robertson experimental farm, over a six-year period, Chardonnay produced an average of 5.4 t/ha, Chenin blanc 10.1 t/ha, Colombar 8.3 t/ha, Sauvignon blanc 11.4 t/ha, Ruby Cabernet 4.1 t/ha and Shiraz 7.9 t/ ha more grapes with mechanical pruning than with hand pruning (spur pruned). In all cases there were no noteworthy differences in the chemical composition of the grapes.

2.2 The cost of mechanical pruning in 2015:

For the cost of mechanical pruning, refer to table 1. 'Half row' refers to machines which only prune the top and one side of the row at a time. 'Full row' refers to machines which trim the top and both sides of the row simultaneously.

Type of machine	Half row	Full row
Purchase price (R)	212 000	261 397
Depreciation (R/hour)	191	235
Interest (R/hour)	52	65
Total fixed costs (R/hour)	243	300
Repairs & maintenance* (R/hour)	74	91
Total costs (R/hour)	317	391
Total costs without interest (R/hour)	265	327
Tractor costs (R/hour)	171	171

Table 1: The cost of mechanised pruning when comparing half and full rows

* 30% of new price

Note: The unit cost of a tractor is lower than that of a mechanical pruner as the lifespan of a tractor is considerably more than a pruner. A tractor's cost is depreciated over a higher number of operational hours.

2.3 Summary:

• Mechanical pruning is a good alternative to hand pruning, but the vines must have sufficient vigour and be trained on the right trellis system. The bigger crop and expanded growth above ground require more water and nutrition to apply mechanical pruning sustainably.