

## Fifteen-Year Evaluation of the Influence of Mechanical Pruning on Olive Yield

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### Abstract

In Portugal, olive (*Olea europaea* L.) groves with the traditional tree density of around 100 trees ha<sup>-1</sup> require an urgent reduction in production costs in order to survive. This requirement becomes imperative at the present state of low prices of olive oil in the world market. Three treatments were followed in field trials: T1 - manual pruning with a chain saw, performed in 1997, 2006 and 2011; T2 - mechanical pruning, performed by a tractor mounted cutting bar provided with 6 circular disc-saws, in 1997, 2006 and 2011; in 2011 the mechanical pruning was followed by a manual pruning complement to eliminate the great diameter suckers from the central part of the canopy; T3 - mechanical pruning, as in T2, followed by a manual pruning complement in 1997, 2006 and 2011; in 1997 and 2011 the manual pruning complement was done immediately after the mechanical pruning; in 2006 only mechanical pruning was done and the manual pruning complement intervention was done in the following year (2007). The effect of the above treatments on olive yield was evaluated at an annual basis for 15 years. The main results showed that over the first 9 years period mechanical pruning (T2) revealed a higher accumulated yield. However, over the following 6-years period, the yield obtained by the mechanical pruning treatment (T2) was lower than the yield of the other two treatments, which showed to be similar. Following this results a pruning strategy was put forward based on mechanical pruning, complemented by manual pruning. The manual pruning complement should always be evaluated on a case by case basis, although this study points that it could be performed after the second or third mechanical pruning intervention.

### INTRODUCTION

In Portugal, olive (*Olea europaea* L.) groves with the traditional tree density of around 100 trees ha<sup>-1</sup>, require an urgent reduction in production costs in order to survive. This requirement becomes imperative at the present state of low prices of olive oil in the world market.

In 1997, the authors started the study of a mechanized alternative to the expensive and labor intensive manual pruning practice. The results obtained in the first years of trials revealed that this alternative technique can increase the pruning rate which can contribute to reduce pruning costs (Peça et al., 2002). Results obtained by the authors, revealed that after mechanical pruning (topping at the uppermost part of the canopy) trees can be kept for 8 years without any significant loss in olive yield and no effect in harvesting efficiency (Dias et al., 2012). For the same period, the selective manual complement to the mechanized pruning does not provide any further advantage in olive yield or in the shaker efficiency (Dias et al., 2012). The execution of the selective manual pruning complement two years after the mechanical pruning revealed no significant influence on olive yield in the subsequent 4 years after the pruning intervention in comparison of the mechanized trees (Dias et al., 2011).

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