



## PRUNING ON FRUIT TREES

### ECONOMIC AND ENVIRONMENTAL BENEFITS OF FRUIT TREE PRUNING IN AN AGROFORESTRY SYSTEM, WHICH COMBINES THE PLANTING OF HORTICULTURAL SPECIES WITH FRUIT TREES

#### BEST PRACTICE OBJECTIVE



Pruning is the selective cutting of parts of trees for the correct placement of branches, achieving the improvement of the mechanical resilience of the structure and achieving adequate light and ventilation. The purpose of pruning is to obtain strong and healthy trees to facilitate and accelerate their fructification, as well as the achievement of quality fruit. For this reason, it is essential to have an in-depth knowledge of the plant species to be worked on. Depending on the objectives to be achieved in the orchard, a certain pruning will be carried out or another.

#### THE ESSENCE OF THE PRACTICE



Pruning in fruit trees is a traditional practice that has developed and improved over time in all parts of the world. In the pruning, the aged branches are reduced and replaced by young ones, renewing the leaf mass, while avoiding the solarization of the trunk and other main branches, maintaining the balance between growth and fructification.

Pruning fruit trees aims to facilitate and accelerate their fruiting. It improves sap flows and facilitates the arrangement of branches for fruit harvesting. Depending on the type of fruit tree, it will be pruned at one time or another. A balance must be sought between vigour and productivity, so as to obtain optimum and perennial production while avoiding weakening the tree and, consequently, encouraging the entry of pathogenic agents.

Formation pruning will be carried out to guide the fruit trees after the first few years of growth, bearing in mind that pruning redistributes the energy of the growth of the individual's crown. Crown development is directly related to root development. If we prune the tree eliminating more than 20% of the aerial surface we reduce its growth and, therefore, the future production of fruits. Pruning should be done after the first few years and the intensity of this pruning should vary as the fruit tree develops. If the fruit trees are formed in an inadequate way, when they are adults it will be complex to rule them.

An open structure (aparasolada) of branches that develop to the width, and to remove all the vertical branches or suckers (small branches that usually sprout in the trunks and main branches), should be fomented, to avoid that these branches absorb nutrients that could be invested in the fruit, obtaining greater production. The position of an unproductive vertical branch can be changed by guiding it to a more horizontal position, which will reduce its growth and encourage the formation of flower buds and fruit.



Different fruit trees where they were pruned. Upper image: pruned apple tree at the "Huerta la Cuna" farm. Lower image: pruned holm oaks in the farm "La Rozuela" Although the holm oak is not a fruit tree itself, it produces acorn, a product used by the cattle in the pastures. Source: Own photographs.



Once the young fruit tree has been given structure, it must be pruned periodically by removing the unproductive wood and increasing the light that reaches the rest of the branches, keeping it in an adequate size. When a fruit tree begins to bear fruit fully, growth slows down and, therefore, the need for pruning is also reduced. A tree's response to a pruning cut depends on where the cut has been made. Fruit tree pruning is based on:

- Thinning: consists of removing branches completely, making the remaining branches benefit from the remaining energy growing more vigorously.
- Beheading: leaves more buds on each branch which, as they grow, will create a more compact, branched and dense plant.

### TOOLS AND MACHINERY



There are several tools that need to be used for pruning fruit trees. The choice will depend largely on the type of pruning, size, age and type of tree, and can be done either manually or mechanically. The equipment needed for manual pruning is simple and inexpensive in some cases, but it requires greater physical effort on the part of the operator. The necessary tools would be: pruning shears, saws, axes, etc. Mechanized manual tools can also be used, such as chainsaws, high-speed saws, etc. Depending on the height of the operator and the tree, ladders or scaffolding will be used to reach the tops.

To carry out the pruning in a mechanical way, toothed steel discs mounted on a rigid arm connected to a medium-high power tractor will be used, although it is a more expensive way and not as beneficial for the orchard. The operator who carries out the pruning must be equipped with the necessary protection measures to ensure his safety in case of accident (protective glasses, reinforced trousers against cuts, helmet, gloves, etc.). It is recommended that it be carried out by a person with specific training and previous experience both in tree pruning and in handling machinery. It is very important to disinfect the cutting tools before cutting branches, in order to avoid the transmission of diseases.



Different methods of orchard pruning, from left to right: manual pruning using motorized machinery and mechanical pruning using steel toothed discs on the arm coupled to the tractor. Source: Agronomy and pruning of olive groves, Junta de Andalucía.

### PERIOD OF TIME AND PERIODICITY



The time of year in which to carry out the pruning will depend on the climate of the area. Depending on the date to be carried out, one type of pruning will be done or another.

The best time to prune the fruit trees is after the resting or sleeping period, at the end of the winter, before the spring sprouting when the sap rises. At this time any wounds that may have been caused by pruning will heal immediately, avoiding undesirable consequences. Pruning can be delayed until one week after flowering with minimal damage to the fruit tree. This type of pruning is advisable in warm areas or where the winters are not very hard.



Another period in which we can prune the fruit tree is during the summer and autumn, called "green pruning". During this time we will limit ourselves to cutting the most vigorous shoots (suckers) to provoke the appearance of less vigorous lateral branches that will provide the tree with buds that give rise to the flower.

If we want to reduce the vigour of a certain fruit tree that is too vigorous we should prune it from the beginning to the middle of August. To obtain quality fruit we should remove the leaves that shade the fruit. Pruning in late autumn and early winter is the least suitable as the wounds will be exposed until late winter, when they will begin to heal, which can cause fungal attacks and frost wounds.

Below are some of the best times to prune various fruit trees: avocado: November; almond: February, June or July; hazelnut: January; oak or cork oak: January; cherry: February, June or July; plum: February, June or July; fig: October; lemon: March, April or May; apple: December or January; olive: January or February; or pear: July.

### ECONOMIC DATA



The investment in money and time will depend on the management chosen, whether it is manual or mechanized as well as the size and type of tree.

The investment for a manual pruning will require a smaller expense, since the tools used are usually inexpensive, around 20 € and 150 €, depending on the brand and place where the purchase is made. If motorised tools such as chainsaws, high-speed saws, etc. are used, the budget will increase to around 100-700 euros. Pruning costs between 95.1 €-126.8 € per hectare including labour, depending on whether it is done with mechanised or non-mechanised tools. It will take approximately 10-15 minutes per tree with mechanized tools. If the pruning is mechanized the budget will increase progressively. The machinery used to carry out the pruning will cost between 10,000 and 40,000 €, depending on the machine to be used and the brand. There are also companies and individuals who perform mechanized pruning so the budget would decrease. These mechanized pruning companies will charge around 142.7 €-389.6 € per hectare, depending on whether it is intensive (15.75 hours/2 years, olive trees with 20-40 years) or super-intensive (43 hours/year, olive trees of 0-10 years).

The elimination of the remains of the pruning will have an approximate budget on the 54.4 € - 81.2 € (depending on the system of culture).

The wage of the workers for the pruning of the olive tree, a very popular crop in the province of Jaén, of 6 hours and 15 minutes, will vary around 61.45 € and 57.65 € depending on the position and the machine used. In the case of pruning other fruit trees, the cost would be around 180-200 € per day of work.

The price of selling the firewood is approximately 0.1 € 0.5 € per kilo with transport included. Also other products obtained from pruning such as branches can be obtained for food or bedding for livestock.

### PRACTICAL EXAMPLE



In the "Huerta la Cuna" estate, before the plantations were carried out, the land was in an abandoned situation. Initially, horticultural crops were planted, before the tree species were planted.

Later, different tree species were planted (peach, apple, cherry, etc.). Seasonal horticultural species were planted between the rows of trees in the French style (placed in the form of a hedge), which led to the implementation of an agroforestry system with tree elements and herbaceous plants.

The final result was that we went from having a wasteland, without any productivity, to a farm that combined fruit and vegetable species, which allows us to obtain a family income and which has evolved over time from a conventional crop to an ecological one, much more respectful of the environment and whose product acquires a higher value on the market because it is produced in a sustainable way.

In addition, the farm has provided a guarantee for establishing the family's residence. Currently, the marketing of products is produced within a short radius, building customer loyalty based on product quality. The project adds value to their production thanks to the packaging and conservation of the production, also through direct marketing in the space set up as an agro-shop in the facilities built next to the farm.

### FURTHER INFORMATION



"A person who wants to start in this world, must have very clear that he is very sacrificed, on one hand, a high economic bet, on the other hand, high physical sacrifice. Therefore, we recommend a reflection before starting these proposals".



Growing fruit trees (in this case an apple tree) interspersed with horticultural species (tomatoes, peppers, etc.) on the 'Huerta la Cuna' farm. Source: Own photograph.



Winter treatment of deciduous fruit trees:

[https://www.juntadeandalucia.es/agriculturapescaydesarrollorural/raif/27/-/asset\\_publisher/l0b6oYXQMbSK/content/tratamiento-en-invierno-de-frutales-de-hoja-caduca-?inheritRedirect=false](https://www.juntadeandalucia.es/agriculturapescaydesarrollorural/raif/27/-/asset_publisher/l0b6oYXQMbSK/content/tratamiento-en-invierno-de-frutales-de-hoja-caduca-?inheritRedirect=false)



The Junta de Andalucía published a manual on the agronomy and pruning of the olive tree because of its importance in the Andalusian society, at a social, economic and environmental level:

[https://www.juntadeandalucia.es/export/drupaljda/1337165055agronomia\\_y\\_poda\\_baja.pdf](https://www.juntadeandalucia.es/export/drupaljda/1337165055agronomia_y_poda_baja.pdf)



How to prune an olive tree | Home garden: | <https://youtu.be/cJWq0KiDjrg>



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