Crown systems artistically espaliered in the apple tree

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Abstract: The technique of the espalier art appeared between the 16th-17th centuries when the exceptional gardeners of Europe, using the artistic and scientific principles of stocking, invented ways to cultivate fruit trees that are decorative at the same time. This technique is very useful today: on one hand there can be obtained many fruits in a small space, along a fence or a wall, in a garden or plantation and on the other hand the effect is also decorative. Even the smallest garden can be accommodated with such a technique. The majority of these are plain, but there are some with a circular projection on the ground. There are many artistically espaliered types of crowns that were created to use small spaces for the fruit production and also for ornamental purposes. To obtain them we use trees with a low vigour that have rigorous cuts throughout the year, with the purpose of realizing the wanted geometrical scheme. What is more interesting is the fact that we can make all sorts of objects from these trees, for example bicycles, chairs etc.

Key words: crown shapes, apple tree, ornamental cuts

Apple art (*Malus domestica* Borkh) espalier sells trees that have been trained into a few basic designs: tiered designs (Palmette Verrier, Horizontal Cordon “T”), multiple cordon designs (Single “U”, Double “U”, Candelabra), design fence (Belgian fence, Drapeau Marchand, Arcure), fan designs (Fan, Informal), serpentine designs (Serpentine, Heart, Crossover espalier). On this page, we highlight the forms, as well as some other popular shapes which can be trained with relative ease. With practice and patience, anyone can become a botanical architect! The variety in espalier designs is limited only by a gardener's imagination. The crown is made by shortening and rarefying cuts of the branches. These cuts have the purpose to split the main branches (the thickest) equally around the trunk, and to arrange them in height on the tree’s axe. Regarding some placement rules of the branches of the tree in a crown, we make the light and the air to easily reach the crown, and this has as a consequence the making of a larger quantity of food in the leafs. Also, through cuts we make easier the thickening of the branches, through this making the crown stronger to hold easily the weight of the fruit.

Also through cuts we help the dressing of larger branches with medium ones, of the medium ones with smaller ones and so on. All these branches form the skeleton of the crown and are called skeleton branches. On the medium and small branches (skeleton) appear fruit branches that have flowers and then fruits. The more numerous the fruit branches are more flowers and fruits are formed, and the tree begins to make fruits sooner.

All these advantages are obtained through the shortening and rarifying of branches regarding the crown shape we want to obtain. For the apple tree are presented and recommended many types of crowns. For the urban area or the orchard near the house we will present the most used and most beautiful crown shapes that do not need large expenses like: Horizontal Cordon, Palmette Verrier, Candelabra, Double “U”, Simple “U”.

Biological Material and Method

The planning of the sample can be used to produce a variety of samples. The fruit trees usually grow horizontally to maximize the fruit production. Or the branches can be twisted to produce a more compact sample. For a quick covering of long walls we should plant more trees and their growth should be led in the way of the wanted sample. To choose a location any solid support will do, as long as it is enough light and space for the growth of the tree. Also we can use a container that is still large enough when the tree reaches maturity. To choose a proper tree, almost every plant can have a led growth, but is best suited to that plant with a natural branch growth, like the apple tree. We must choose a favourable place and a tree that already started growing. The preparing of the support system is made like: we position the wire caught in the wall or fence and at the ends in the ground, making
three horizontal lines. The wire is not necessary for the vertical branches; they will naturally grow up. We need to use hard wires that will resist to branch growth that will grow towards the sun. The tree planting is made through the placing of trees at approximately one meter in front of the support system. We position them so that at least two of the most vigorous branches to be led between wires. Branch cutting: all twigs are taken, only two are left on each branch. The twigs that remain are led around the wire with soft ropes. As the main trunk grows the twigs that grow laterally must be cut. When the trunk reached the next wire we allow the growth and development only of the necessary twigs (but the rest of the twigs are cut) that will be attached to the wire. So, to form a crown this must be cut to create a main vertical trunk, then we cut the lateral branches to reach the wanted shape. In accordance with the chosen shape this work can take up to a year, two or three years to establish the exact shape. After this the tree will need only light cuts to be maintained in the wanted shape.

Results and Discussions

Unlike the crown shapes from the big commercial plantations, regarding the artistic shapes, the strong shortenings even from the first years, practiced at 3-4 buds, in the summer time and during the vegetative repose (winter, spring) prevail. The tiered designs are: Palmette Verrier, Horizontal Cordon “T”. The tiered form, also known as the "Horizontal Cordon “T” (fig.1) is characterized through 3 or more horizontal branches in opposition and that are led on a fixed wire at a height of 40 – 60 cm. This is the most basic of forms. It is attractively simple (especially trained against a stone wall), while also makes the perfect starting point for more complex shapes such as the "Palmette Verrier.” Apples are easily formed into this shape because their growth is more uniform than that of other fruits and most ornamentals. During the entire forming process we watch that the superior branches (advantaged by polarity) are kept on the spot, to stimulate growth of the inferior ones that are in disadvantage, growing slower.

Palmette Verrier (fig. 2) with 4 vertical arms is characterized by the fact that these arms are placed like a narrower simple “U” placed inside the arms of a larger “U”. Palmette Verrier is the most striking of the various forms of espalier, but by no means the most difficult to achieve, as it can easily be adapted from a tiered tree. Apples work best with this design. The multiple cordon designs are: Single “U”, Double “U”, Candelabra. Candelabra is used in the ornamental cultures at the low and medium low vigour types of apple. The height of the tree is after formation 1.5-2 m. We think this form is among the loveliest in espalier; it works best in tall, narrow spaces and is perfect for small gardens. It looks stunning against a stone wall and is one of the best for sprucing up the side of a building or an ugly wall. Again, apples and pears make the best candelabras. The simple “U” shape is used in artistic espaliered cultures at the types with a low and medium low vigour; the distances between trees must be 80-120 cm; the axe is absent, the trunk has 30-40 cm; from the trunk we have two horizontal arms, that at 20-30 cm are vertically curved; the height of the led tree is 2 m.

The double “U” shape is characterizes by 4 vertical arms obtained through two successive intersections (fig. 3 - 5) and so the planting distance on the row is 2-2.5 m; the trunk has 30-40 cm; in the first stage we obtain a simple “U” shape, but with a distance of 1-1.2 m between branches; after this each of these branches ramifies itself in the same way as the initial branches and so a double “U” is formed; the skeleton branches are directly garnished with fruit branches.
Figure 1
Horizontal Cordon „T“

Figure 2
Palmette Verrier

Figure 3
Duble „U“

Figure 4
Duble „U“
Conclusions

1. To obtain artistically espaliered crowns we use trees with a low vigour that are submitted to rigorous cuts throughout the year with the purpose to realize the imposed geometrical scheme.
2. For the apple tree are presented and recommended many types of crowns. For the urban area or the orchard near the house we will present the most used and most beautiful crown shapes that do not need large expenses like: Horizontal Cordon, Palmette Verrier, Candelabra, Double “U”, Simple “U”.
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