PRUNING OF FRUIT TREES

Managing trees for the production of fruit in Northwestern Europe

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THE WHAT AND WHY

Fruit production in agroforestry systems

For centuries, in Northwestern Europe, the production of fruit has been integrated in agroforestry practices. Several traditional systems were widespread over Europe whereby fruit trees were combined with cattle (e.g. “pré-vergers”) or with arable cropping (e.g. “streuobstäcker”). Up till present, the landscape of several regions such as Haspengauw (Belgium) or the Regional Nature Reserve of Avesnois (France) is still characterized/dominated by orchards with high standard fruit trees. Thereby, apple, pear, plum and cherry are the main types of produced fruit.
Ascertaining and maintaining good production of fruit trees requires adequate management. Particular attention should be paid to the consistent pruning of the fruit trees throughout their lifecycle. During the first years after plantation, pruning determines the development of the desired tree shape. In later years, this directly affects both the quantity of fruits produced as well as their quality (e.g. size, color, taste).

A traditional agroforestry system in large parts of Northwestern Europe whereby sheep graze in fruit tree orchards.
(c) Bert Reubens - ILVO

Tree shape with 3-4 equivalent main branches.
(Consortium Agroforestry Vlaanderen)

HOW IS THE CHALLENGE ADDRESSED

Selection of the tree shape and subsequent pruning

The different stages throughout the lifecycle of a fruit tree require a different pruning regime.
Right before or after planting, the main branch(es) which will constitute the lasting basis of the tree are selected and withheld. Thereby, either 3-4 equivalent side branches can be selected and growth of the central leader is suppressed by pruning it to approximately the same height as the side branches to create a wide crown. Alternatively, the central leader can be selected as a single main branch to create a smaller (and higher) tree.

In a second phase, starting from the plantation year until the start of fruit production, yearly formative pruning is required as the number of lateral branches increases to further establish a desired crown form.
In the third and final phase when trees start to bear fruit (approximately after 10 years in most parts of Northwestern Europe, depending on the species), maintenance pruning (e.g. every 5 years) is conducted to preserve the tree shape and produce sufficient quantities of high-quality fruits.

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Keywords: Orchard, Pruning, Fruit trees, Yield, Quality, Apple, Pear, Tree management

ADVANTAGES AND DISADVANTAGES

Effect of pruning and selected tree shape on fruit production

HIGHLIGHTS

- Pruning of fruit trees is indispensable for the production of enough quantities of high quality fruit.
- The selected tree form affects both quality of the fruit and management activities.
- Trees may either be pruned to maintain 3-4 equivalent side branches or one central apical branch.

Tree form with one central apical branch. (Consortium Agroforestry Vlaanderen)

watch video

By pruning, the light availability in the tree crown is modified, with increased light resulting in more flower buds and sweeter fruit of larger size and better color. As a rule of thumb, it is advised to eliminate maximally 20 % of the crown volume in already pruned orchards. To avoid a large number of fruits of undesirable small size, part of the flower buds can be eliminated by pruning which results in a larger average size of the remaining fruits.

The light availability in the tree crown is further affected by the tree shape whereby the type with one apical branch generally results in a higher quantity of sweet fruit of higher quality when compared to the type with 3-4 main branches. In the latter type, the fruit on the inner branches receives less light and high quality fruit is mainly located at the outside of the tree. As a result, use of this tree form often necessitates more pruning to deliver high quality products

Besides the increased proportion of high quality fruits, additional advantages of the tree shape with one apical branch is the shorter period before the tree starts to bear fruit (already after 3-4 years). It should, however, be noted that not all cultivars are equally easy to prune to this tree form. The narrower tree shape furthermore results in an easier use of agricultural machinery, which may be of particular importance in a silvoarable agroforestry context. Alternatively, trees may be planted in higher densities.

A disadvantage of the tree shape with one single main branch is the increased height, which may impede pruning of the upper branches and harvesting of the upper fruits (if conducted manually). In addition, in an agroforestry context where trees are often planted at lower densities than in conventional permanent crops systems, they may be relatively exposed to extreme events such as storms. Thereby, higher trees may be more susceptible to wind damage. Therefore, the use of seedlings with a taproot is strongly advised as a rootstock when compared to rootstocks originating from vegetative propagation.

Pruning activities can be conducted in winter which stimulates branch formation in the subsequent growing season. Alternatively, e.g. in case of water sprouts, pruning in summer can be advisable to avoid regrowth. The timing of pruning may furthermore affect susceptibility to diseases. For example, in case of pome fruit, no pruning should be conducted between October and December, since during this period mold spores are highly active resulting in a high infection risk through the pruning wounds. Faster covering of the wounds may occur during summer, further decreasing the risk of contamination.

FURTHER INFORMATION

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