Agroforst – Alley Cropping for stem wood production

Description of the measure

Alley cropping describes a system in which rows of trees or bushes and conventional arable crops are grown alternately. The cultivation of noble hardwoods is ideal for stem wood production. Suitable tree species include walnut, black walnut, service tree, wild pear, but also maple and linden. The aim is to produce high-quality trunks of sufficient size and the highest possible quality.

Choice of tree species

It is essential to match the site characteristics with the site requirements of the tree species. No tree species should be selected that cannot tolerate the climatic conditions in open spaces (strong sunlight, heat, late frosts). If possible, only regional and certified origins should be used. Exotic tree species should be avoided as far as possible due to a lack of knowledge about their distribution, growth and ecological impact.

Implementation

The design of the rows of trees leaves plenty of scope. Please note:

- Machine-compatible distances between the tree strips (everything is possible, from canopy closure over the field strip to max. 100 m distance)
- If the soil is heavily compacted, deep trenching may be necessary
- Planting of bare-root or balled and burlaped young plants with the best possible characteristics (straight-shafted, no deformation of the stem axis, fine branching, regularly formed crown)
- Distance within the row: 8-10 m
- Installation of tree shelter against game browsing
- Setting up perches for birds of prey to control the mouse population
- Provide tree strips with brushwood piles and integrate weasel boxes (see „For further reading“)

Maintenance

- Regular (at least annual) inspection of the quality and vitality of the trees
- Replanting failed trees
- Annual pruning of the tree crown: remove the lowest branches and steep branches (1-2 per year, never more than a third of the green crown); break up tree forks; if necessary, remove water sprouts; if possible, do not remove branches with a diameter > 4 cm.
- No further pruning measures from 4 m knot-free trunk area (the longer the knot-free trunk, the higher the timber value)
- Harvestable at a diameter of at least 60 cm (the thicker, the higher the timber value)

Effects on biodiversity

Agroforestry systems bring about a significant and lasting increase in structural and habitat diversity. With the right choice of tree species (especially roses), they provide flowers, nectar and pollen for wild bees, bumblebees and other insects. They also serve as a refuge for various animal species during agricultural work and as a habitat for field birds and small mammals.

Further positive effects

Leaf fall and root growth on the wooded strips lead to a substantial accumulation of humus and thus to an improvement in the soil. At the same time, agroforestry systems protect agricultural land from drought and wind erosion. They thus mitigate the consequences of climate change and relieve the burden on irrigation systems in the future.

Finally, with the right choice of tree species, fruit and nuts and the resulting foods can have a positive impact on the overall economic result even before the logs are harvested.

Further recommendations

Injuries to the logs should be avoided at all costs. Any resulting discoloration will devalue the logs.

Shallow roots should be regularly directed downwards by appropriate soil cultivation (shearing) so that they do not extend into the field strips. There is not sufficient experience regarding the growth and quality development in the open for some noble deciduous trees. Accordingly, there is a lack of maintenance concepts from forestry/silvicultural practice that can be transferred to the agricultural context.

For further reading: *www.defaf.de* • *https://www.bund-lemgo.de/Mauswiesel_und_Hermelin.html*

Sources: *Hübner, R.; Guenzel, J. Agroforstwirtschaft: Die Kunst, Bäume und Landwirtschaft zu Verbinden; Deutscher Fachverband für Agroforstwirtschaft (DeFAF) e.V. Cottbus: Cottbus, Germany, 2020.*