



AGROFORESTRY SYSTEMS:

SILVOARABLE,

AF WITH HIGH NATURAL AND CULTURAL VALUE

Year of foundation	1995
Specialization	Zemědělská produkce, lesnictví
Farm area	927 ha (841 ha zemědělská půda, 86 ha les)
Number of employees	23
Year of starting agroforestry practices	2016 (multifunkční sady); 2018 (nově zakládané větrolamy)
Location	Hrušky 691 56, jižní Morava
Year of foundation	www.forestagro.estranky.cz

The farm is located in South Moravia in one of the warmest areas in the Czech Republic with a high percentage of agricultural land (approx. 80%). Forest-Agro farm **grows traditional crops, mainly wheat, corn, sunflower and rapeseed**. The farm also manages a complex of floodplain forests. **Windbreaks** were established in this area in large complexes of agricultural land in the 1950s. The farm also includes **old apricot orchards, which are currently being renovated and converted to agroforestry systems** - part of the orchard is already **extensively grazed by horses** (silvopastoral) and other part is composed by **lines of old trees** between which the agricultural production is operated (silvoarable practice). The new windbreak was established in the farm in 2018.



The farm has been doing standard forest operations since establishment, so the employees and owners had experience in growing trees. The farm's landscape also includes old windbreaks, which have often other owners than the Forest-Agro farm. The health condition, vitality and economic potential of woody species in existing windbreaks is very poor due to lack of management. Trees in windbreaks often expanded into fields, but on the other hand, in windbreaks, expansive species such as tree of heave or ash maple spread. **Not only because of the low functionality of existing windbreaks, but also because of their low density, the owner of the Forest-Agro farm decided to establish new windbreak on their own land.** The owner cooperates with Mendel University in Brno (MENDELU) in establishing of windbreak and a wide range of woody plants and shrubs is used. The establishment of a windbreak is financially supported by a project of the Technology Agency of the Czech Republic .

The reason for planting new windbreak is **to divide large plots of land, prevent wind erosion, improve climate conditions and increase the biodiversity of the landscape.** At the present, mainly the questions of the tree species planting optimization in large agricultural units are solved, both in technological and economic terms. **Survival of planted trees is low due to long-term drought.** The issues of protection against game as well as financing of the new planting and management of newly established elements are investigated .



- To evaluate the benefits of newly established windbreaks is still premature.
- New experiences about the tree planting on the agricultural land were gained, mainly concerning the choice of tree species and the technology of planting.
- Even in this short period of time the biological importance of the newly established tree vegetation became apparent: **in the new windbreak, small animals, such as the partridge, are already living.**



Multifunction windbreaks can be considered as the best proven systems in the area. Knowledge of the application of this system was drawn from both previous experience and literature. Researchers from MENDELU, as well as employees of the civic associations Rezekvítek and Veronika participated in the establishment of the system. Rezekvítek and Veronika organizations engaged in the care of landscape, environmental education and public relations.

DESCRIPTION OF USED TECHNICS DURING ESTABLISHING OF AGROFORESTRY SYSTEMS

The windbreaks were established on the land of the farmer, which seems essential for such a long-term project. The own planting was preceded by demarcation of the area and deep soil preparation was carried out. The windbreaks were established by a combination of different procedures. The windbreaks are multifunctional with a width of about 15 m. **The aim of such type of plantation is to achieve high biodiversity (a mixture of woody plants) and also a rich vertical structure.** Fast-growing tree species (aspen and gray poplar), valuable broad-leaved trees (cherry, checker), long-age tree species (oak) and other trees (field maple, hornbeam) and shrubs (hawthorn, common privet) were used in the windbreaks. Both bare and rooted seedlings were used. In addition to the traditional tree planting, a grass sowing was used on the area in-between trees. In the future it is also planned to do tree and especially shrubs sowing. The trees were planted both in dense groups, which were fenced, and in the form of individual planting with greater spacing and individual protection against game. Planting took place in the autumn.



THREATS/CHALLENGES

- The most serious problem in establishing woody formations are the climatic conditions. Planting was carried out in the area **stressed by drought**, where it is necessary to combine a suitable tree species composition, optimize the selection of planting material, planting technology and subsequent care of trees. Despite high care and professional knowledge, farmers must count with losses in planting. Planting should be divided into a longer period - **do not carry out single planting.**
- Another problem is the choice of optimal protection against game. Moreover, in the case of wider application of sowing, **rodents** are a serious danger.
- It is advisable to invite the general public to the set up the plantings - **social dimension.**
- Challenges include testing of new tree species, but also methods (e.g. **sowing**).
- In terms of subsidies, it was not necessary to exclude land from the agricultural land or from the SAPS, it was enough to transfer it to another culture within the LIPS.

The owners of the Forest-Agro farm tried to improve the condition of the agricultural landscape and their efforts have resulted in the establishment of a new species-diverse windbreak. This is a long-term project that needs to be carefully planned in advance - trees are a long-term project. Windbreaks, as well as other elements of permanent greening, should be based on own, not rented land. Although the main effects of the windbreak can be expected after several years, multifunctional windbreaks fulfill many of biological, but also aesthetic and social functions at the time of its establishment. The impulse to establish a new windbreak was also cooperation with Mendel University in Brno and financial support of the TAČR.

The process of windbreak establishing begins with the selection of the land, the design of its parameters and the delimitation of the area. It is also necessary to consider and plan the spectrum and distribution of tree species on the windbreak area, choose the optimal reproductive (planting) material and the method of protection against game. **It is advantageous to organize the planting in the form of events for the public.**

A certain specificity of the established windbreak is its dedication - the windbreak was founded in honor of an important forester and landscape ecologist Doc. Antonín Buček.



FUTURE PLANS

The gradual establishment of windbreaks will continue in the coming years. Other perspective trees and technologies will be tested. In the future, we can expect greater state support in the creation of such agroforestry systems.

FINAL RECOMMENDATION

Planting of trees in the agricultural landscape requires theoretical knowledge of the issue and knowledge of the specifics of local conditions. At present, the main problem is drought and thus it is necessary to use non-standard ways of establishing woody vegetation (sowing, group plantings, irrigation) and also to use previously neglected tree species - Turkey oak, field maple, mahaleb cherry.

Farmer recommendation:

„Do not be afraid to experiment, try new types and technologies, count on partial setbacks, spread planting over a longer period, involve local people in planting“

KEY WORDS

Crop production, forestry, orchards, arable land, windbreaks, individual and group tree protection, sowing, drought



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