

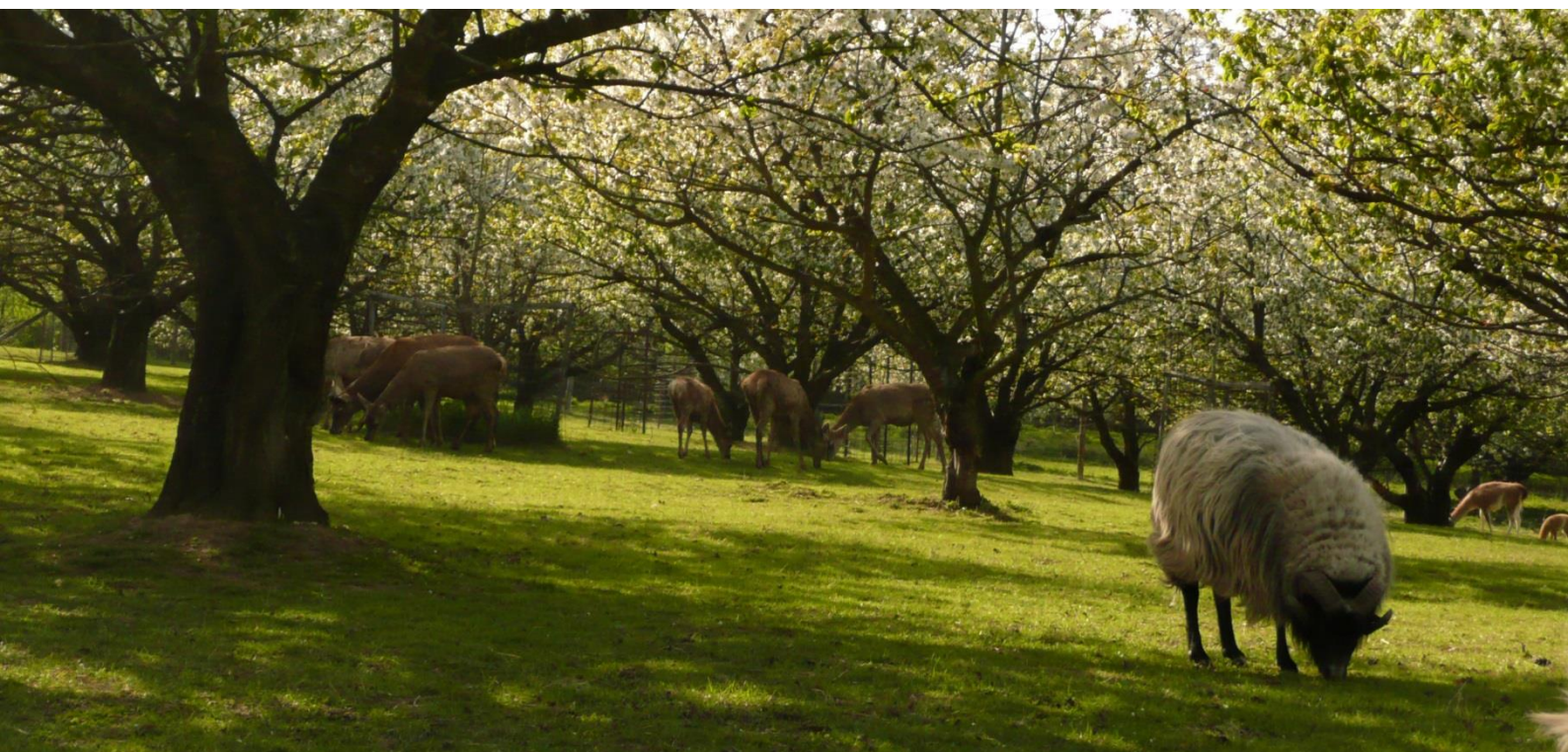


AGROFORESTRY SYSTEMS: SILVOPASTORAL and MULTIFUNCTIONAL



Year of foundation	2007
Specialization	Deer, guanaco, sheep and poultry, fruits, various berries and herbs, fire wood, highly valued trees, landscape improvement
Farm area	3.5 ha
Number of employees	0 (2 parents + 3 kids)
Year of starting agroforestry practices	2007
Location	Miskovice 38, 285 01, Miskovice u Kutné Hory
Facebook page	Jelen z Misek

The Kotrba family farm in Miskovice with a total area of 3.5 hectares is located under the Vysoká hill on the outskirts of the central Elbe River lowland and focuses on silvopastoral **husbandry of European red deer, guanaco and German Grey Heath sheep in combination with fruit production**. Radim and Linda has started in 2007 on one hectare of old extensive cherry orchard, which they fenced and used grassland for deer and sheep to maintain grassland. Gradually they expanded the orchard by grazing other areas, where they combine fruit and forest trees with the production of berries, small fruit, herbs and vegetable. In a part they established a **short rotation coppice plantation of poplar and willow in combination with wild cherry and a plan to establish poultry breeding there**. **The whole production is focused primarily on the family use and on improvement of the environment where the family lives.**



The landscape around Miskovice is cultivated for more than 7 thousand years, which makes it one of the longest agriculture managed areas in our country. Nowadays, industrial agriculture use of land prevails in this region. Radim comes from nearby Kutna Hora city from a forester family with farming roots, where all agriculture buildings were confiscated and demolished during past communist regime. The only agricultural building that was preserved was a house for farm servants, or a municipal pastor house in nearby Miskovice with adjacent land. This building was reconstructed as family house. After graduation at Czech University of Life Sciences Prague (CZU) and the birth of their daughters, he and his wife moved from Prague, where Radim doing research at Institute of Animal Science (IAS) and lectures at CZU. **Family crofting farming they do in their free time, so they decided on extensive farming and species that do not require intensive care and husbandry interventions. They call that approach sustainable „robbery“ harvest (predominant labour demand is only during harvest).**

Radim has started with agroforestry since beginning, because this systems came to him natural and he experienced them at childhood (family grew vegetables and potatoes under fruit trees). That is why they use the cherry orchard behind the house as a larger garden and introduced ruminants (European red deer, guanaco and German Grey Heath sheep) there to ensure grassland maintenance and cleaning of an unharvested fruit and fallen leaves. Thanks to that, **they do not use any chemicals or fertilizer in the system.** They gradually expanded their farming by another 1.5 hectares of arable land by transferring it into grassland and dividing it into diverse production systems, where newly planted tree species are present. Such areas include, for example, a **strawberry plantation combined with sea buckthorn**, a **lavender and herbal fields used for natural cosmetics surrounded by woody plants**, a **flowery meadow fringed with elderberries**, a **stone-fruit plant with soft fruits and berries** and a **short rotation poplar/willow coppice plantation combined with wild cherry**. Part of the plantation will also serve for **breeding/fattening poultry** and the last area is a **high trunk orchard with apple, pear, mulberry, cherry, walnuts, hazelnuts and forest trees combined with sheep and sika deer**. The whole parts of the soil blocks are lined with trees and the part adjacent to the road is separated by a **hedge of hornbeams and original shrubs, which serve as a cover and source of food for birds**. The last area is one hectare of abandoned orchard, where has not been any management apply for 30 years. There are various successive stages of trees and shrubs, which they call „jungle“. They have started to remodel it in a natural habitat of "edible forest,, with respect to its wilderness appearance.



- After herbivore husbandry began in the orchard, the number of birds increased and colony of **ground nesting solitary bees** appeared on the exposed area around the deer mud wallow. They are active when orchard bloom and they pollinate there.
- Trees **provide more favorable microclimate for livestock and diversify the food supply**. Animals use trees to **rub themselves and deer clean velvet antlers there**. Animals supply soil with nutrients from the feces and eat the fallen fruit and leaves.



The family operates **various agroforestry systems**, which it expands and combines them to meet their expectations in terms of diversity and succession of production (as longest the harvest as possible by combination of different fruit tree varieties from early to serotinous). The silvopastoral system requires no inputs other than water and in winter hay supplementation. The whole family and friends participate in the management and harvest. The family resist subsidies for establishment and farming. Radim had experience in planting tree species from his childhood, when he planted trees in the forest with his dad and grow vegetable and potatoes under fruit trees with grandfather. He is animal scientist, but he gained a lot of inspiration and experience during traveling, communication with farmers throughout Europe and during his active membership in Association of Private Farming of the Czech Republic.

DESCRIPTION OF USED TECHNICS DURING ESTABLISHING OF AGROFORESTRY SYSTEMS

The first plot was established by **integration of animals in one hectare of 35-year-old cherry orchard with additional planting of fruit and forest trees (oak, edible chestnut, linden, etc.)**. The second area (1.5 ha) was **completely transformed from arable land to permanent grassland with planting trees, shrubs and stripes of crops, herbs and fast rotational coppices**. The last area (1 ha) is a **secondary habitat of an abandoned orchard, where at light exposed places after tree pruning are planted tree seeds (oaks, apricots, walnuts and maple), fruit trees and shrubs**.



THREATS/CHALLENGES/RECOMMENDATIONS

- When planting woody plants in a grazed area, the greatest risk is **browsing/debarking**, and the **strength of individual tree protection**. The best solution was **bent Concrete Reinforcing Mesh 3x2 m, 4-5 mm wire, 10x10 cm mesh firmly anchored to the ground**. When deer and llama are farmed, protection must be extended from 2 to 2.6 m to safe tree tip. Tree must be tied to the center of protection during growth to protect tip or whole tree against damage. Particular **damage of roots and base of trees by voles** also occurs, especially in apple and pear.
- **Irrigation of planted trees is applied according to the course of precipitation** in the first years after planting. In terms of rooting, it is better to plant younger assortments of bare-rooted trees. Establishment of cherries is very good.
- **To the root system Radim bury manure and other organic residues (also wood ash) for tree nutrition and retention of moisture**.

The family combines various agroforestry systems for its own consumption in a excessively used agricultural landscape. Diverse agroforestry systems have an effect not only for **self-supply**, but especially on improving the environment and increasing **overall biodiversity** and **landscape stability**. Their agroforestry plots are located on the slope above the village, therefore they **prevent erosion** and **have soil protection function**. Living and upbringing children in such an environment is a gift for the family and, at the same time, an intergenerational link to responsible land governance.



FUTURE PLANS

The family has a plan to **expand poultry fattening under polar/willow coppice plantation**, to establish **beekeeping** and to expand the area of cultivated **herbs for the production of natural cosmetics**. Two **natural ponds** should serve for rainfall capture and as a biotope for other organisms. On one hectare of overgrown abandoned orchard they have started to transform it into a natural **“edible forest”** with a combination of valuable and edible assortments of forest trees.

TAKE HOME MESSAGE

Human life is too short to expect you may fully use of tree species for production, but long enough to hasten their planting, because where they will be planted they would grow for centuries.

Principal recommendations of Radim:

“Observe your surroundings during the year, its topography, species of trees that grow healthy, look for information what was historical land use, draw inspiration from the Czech and foreign agricultural land use and combine all of this into your expectations. Process of agroforestry systems establishment will then have a clear sense, direction and long-term sustainability. If the trees survive, you have not made a mistake; o.”

KEYWORDS

Deer, llama, sheep, poultry, orchard, pasture, natural cosmetics, self-supply, coppice plantation



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