



THE EFFECT OF TREE PLANTATION-MANAGING TECHNOLOGIES ON BIODIVERSITY

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ABSTRACT

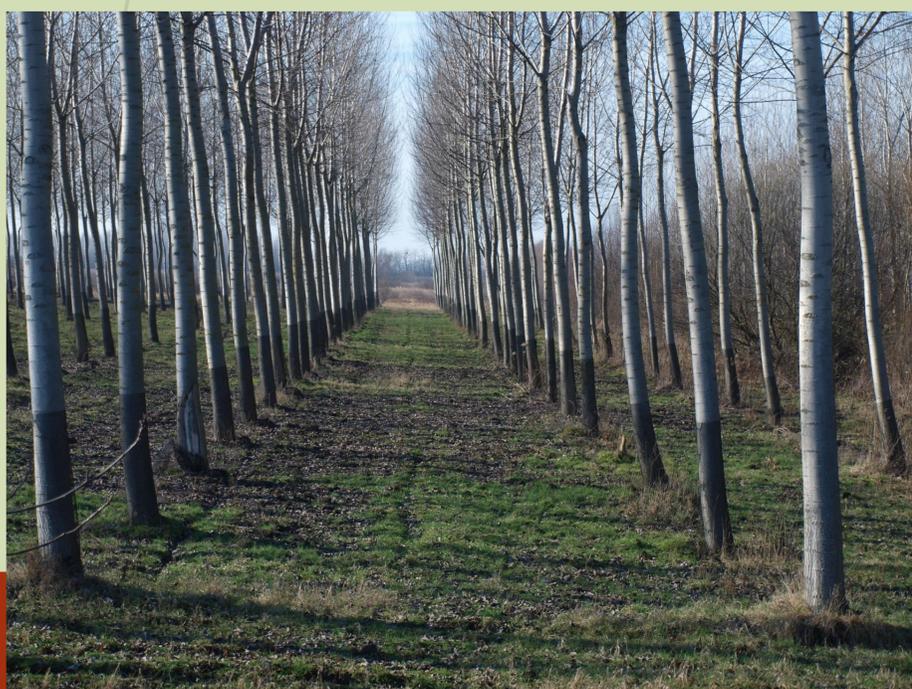
Forest plantations provide opportunity to produce a huge amount of biomass for industrial or energetic purposes. These plantations differ from natural forests due to the regular planting network, the used propagating material, and the almost fully mechanized cropping technology. Certain operations can repeat for years, or many times a year. As an effect of these features, their wildlife community differs from natural forests too. Some them are important for game management and nature conservation too, offering an ecological corridor for many insect, bird and small mammal species. However, resource fluctuations and disturbance, and the combination of these factors has a synergistic effect on plant invasion. Depending on the rotation, the planted tree species and the structure of the plantation, these biomes can offer nutrition, hiding and living opportunities for several species, which are adapted to agricultural environment.

INTRODUCTION

Agricultural tree plantations can have a positive impact on farming and quality of life in different ways. These impacts, according to Moreno et al. (2016), Vityi and Marosvölgyi (2014) and Westaway et al. (2016) are:

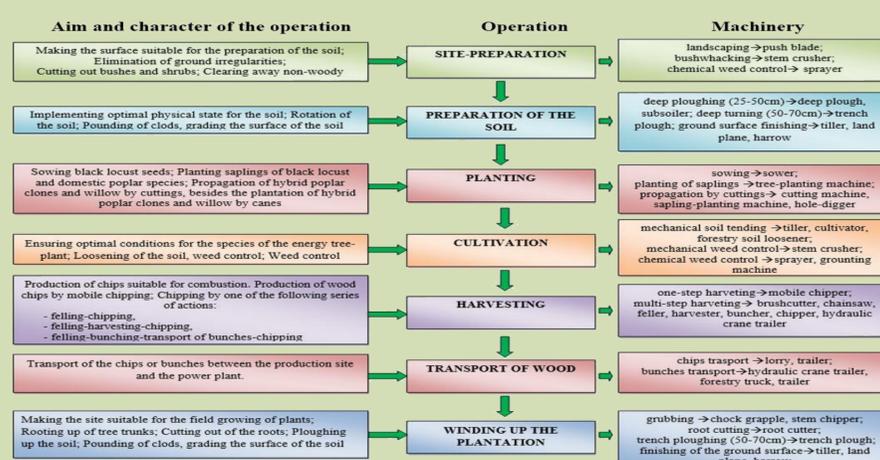
- carbon sequestration,
- water and soil protection,
- preserving biodiversity
- landscape diversity that also influences recreational opportunities
- creating a specific microclimate through windbreaking effect
- proving shade and protection for farm and wild animals
- broadening the income potential of farming
- ensuring the maintenance of farming in unfavorable conditions and protected areas
- habitat expansion of the natural enemies of pests and pathogens,
- beekeeping significance.

On these plantations, a huge amount of dendromass can be achieved in a short time for energetic or industrial purposes.



TYPES AND CHARACTERISTICS OF ENERGETIC PURPOSE TREE PLANTATIONS

- The energy plantations are classified according to the new Hungarian law:
- rolling energy plantation: there are kept up to 20 years, intended for energy recovery;
 - coppicing energy plantation: there are at most 5 years of rotation, intended for energy recovery;
 - woody industrial plantation: for the production of wood raw material. (135/2017 (VI. 9.) Decree)



Operations and machines of energy tree plantation technologies (based on Czupy et al., 2012)

SHORT ROTATION COPPICE AS HABITAT

Regarding to biodiversity, the tree species composition, the structure, and the management technologies of the plantation are extremely important.

The size of the plantation determines the applicable technologies of management. With the growing size, need for bigger mechanization in the technology occur.

In Hungary, both weaving willow and short rotation coppice are considered to be acceptable habitats for small game. These plantations are implemented on nutrient-rich soils with favourable moisture conditions, and maintained for 10-15 (-20) years, which results habitats for long term for pheasants and hares. Short rotation coppice rotations are treated with a 4-year rotation and, from the second year, provide an undisturbed hiding, resting and feeding area for wildlife, especially with permanent chemical-free technology Faragó (1997) .

References

Moreno, G., Berg, S., Burgess, P.J., Camilli, F., Crous-Duran, J., Franca, A., Hao, H., Hartel, T., Lind, T., Mirck, J., Palma, J., Pantera, A., Paula, J.A., Pisanelli, A., Rolo, V., Seddaiu, G., Thenail, C., Tsonkova, P., Upson, M., Valinger, E., Varga, A., Viaud, V. and Vityi, A. (2016) "Agroforestry systems of high natural and cultural value in Europe: constraints, challenges and proposal for the future." 3rd European Agroforestry Conference Montpellier, France. Book of Abstracts 24-27.

Czupy, I., Vágvölgyi, A. and Horváth, B. (2012) "The Biomass Production and its Technical Background in Hungary." Proceedings of 45th International Symposium on Forestry Mechanization: "Forest Engineering: Concern, Knowledge and Accountability in Today's Environment". Dubrovnik; Cavtat, Horvátország. ISBN: 978-953-292-025-3. 1-9.

Vityi, A., Marosvölgyi, B. (2014): Agroerdészet egykor és ma Agroforum 25, 10.

Westaway S., Crossland EM., Chambers EM., Gerrard C., Smith J. (2016) "Does harvesting hedges for woodfuel conflict with their delivery of other ecosystem services?" 3rd European Agroforestry Conference Montpellier, France. Book of Abstracts 54-57.

Faragó, S. (1997) Élőhelyfejlesztés az apróvad-gazdálkodásban: A fenntartható apróvad-gazdálkodás környezeti alapjai. Mezőgazda Kiadó, Budapest

The cultivation works are inevitable at least in the first two years of the plantations. In case of failing any management activities, weed competition can ruin the plantation.

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