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Project Leader: Vladimir Ivezić

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Location:
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Impact of Agroforestry Practices on Agroecological Parameters

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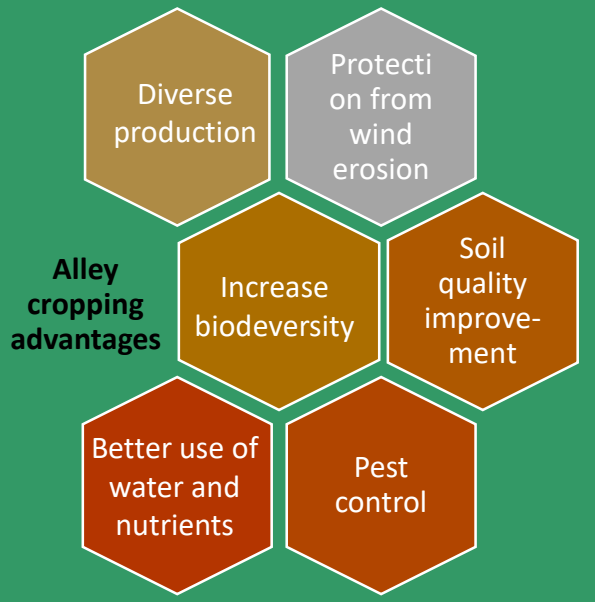
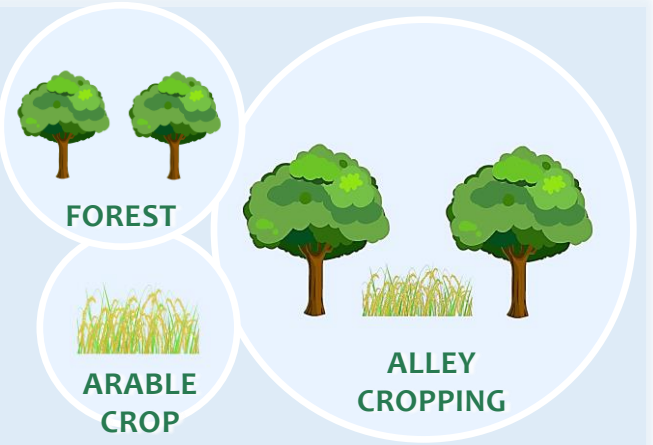
Alley cropping agroforestry systems are production systems in which arable crops are intercropped with trees planted in shelterbelts within the agricultural field itself. These systems are increasingly being promoted as a response to the growing adverse impacts of climate change.



The aim of the project is to investigate the agroecological parameters of intercropped systems combining arable crops with strips of short-rotation tree species (black locust, willow, and poplar).

Over four years, the project will evaluate the effects of these systems on the yield and biological characteristics of arable crops, the biomass production of trees, and soil quality, including its physicochemical properties, as well as indicators of soil health and soil biodiversity.



The short-rotation coppice (SRC) plantations are established in four shelterbelts, each 8 m wide. Each shelterbelt consists of six rows spaced 1–2 m apart and separated by 24 m-wide alleys to allow access for agricultural machinery. The shelterbelts are 150 m long. A control plantation is located along the southern edge of the site, while the western side borders a drainage canal where the soil has degraded characteristics.

Previous research has generally shown reduced yields of arable crops in alley cropping systems compared with yields from conventional treeless arable fields. However, productivity analyses suggest that alley cropping systems achieve higher overall productivity than monoculture systems.

Productivity is assessed using the **Land Equivalent Ratio (LER)**, which is calculated as follows:

$$LER = \frac{SRC\ yield\ in\ alley\ cropping}{SRC\ yield\ in\ the\ control} + \frac{crop\ yield\ in\ alley\ cropping}{prinocrop\ yield\ in\ monoculture}$$

For an alley cropping system to demonstrate an advantage over monoculture production, the **LER value must be greater than 1.**

Further research on these systems should provide a more detailed assessment and characterization of their effects on the microclimate, soil properties, biodiversity, crop yields, and the physical characteristics of arable crops. We will also investigate the interactions between short-rotation coppice (SRC) and arable crops—including competition for light, water, and soil nutrients—as well as evaluate the economic viability of these systems.

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