



# Alley Cropping Agroforestry: Compatible and Scalable Systems for Agriculture

[www.af4eu.eu](http://www.af4eu.eu)



Alley cropping agroforestry offers diverse opportunities to effectively combine environmental, climate, and agricultural objectives - both on arable and grassland as well as in horticulture. A successful example is the Biophilja Permaculture Farm near Halle in Saxony-Anhalt. (photo: Thielicke / Biophilja)

Alley cropping as one agrisilvicultural practice combines rows of woody plants with agricultural crops to create productive agroecosystems. This approach is especially promising for monotonous agricultural landscapes threatened by wind or water erosion, increasing weather extremes, or soil degradation, while remaining compatible with modern farming.

Alley cropping has a set of advantages linked to (i) its adaptable design associated with flexible tree spacing (12–100 m among tree rows) that accommodates standard machinery and a huge variety of site-adapted woody species to minimize tree-crop competition for light, water, and nutrients - ensuring high productivity and efficient harvest, (ii) compatibility, as alley cropping may be integrated seamlessly with contemporary agriculture if adequately designed, allowing the use of standard machinery for planting, harvesting, and management and (iii) scalability, as the system’s modular design enables easy adoption on interested farms, from smallholders to large-scale operations.

The key benefits of alley cropping are associated with (i) enhanced ecological services (increased water retention, effective erosion control, improved soil fertility, higher carbon sequestration, and an improved microclimate), (ii) increased climate resilience, adaptability and agrobiodiversity while maintaining or increasing land productivity and efficiency over single-crop systems and (iii) long-term economic advantages through additional income, value creation, and reduced reliance on external inputs.

Alley cropping agroforestry offers a practical solution for German farmers aiming to boost sustainability, minimizing the productivity losses if adequately managed. As agricultural challenges grow, these practices provide resilience to extreme weather events, improve soil health and advance environmental goals. A wider adoption could thus sustainably transform European agricultural landscapes.



Daniel Fischer\*, Ahmed Manzim  
Ridwan\* and Peter Zander\*

\*Leibniz Center for Agricultural Landscape  
Research (ZALF), working group  
"Agricultural Economics and Ecosystem  
Services"



Funded by  
the European Union

This project has received funding from the European Union’s Horizon Europe research and innovation programme under grant agreement No GA 101086563. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.