NEWSLETTER

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REFOREST

DigitAF

Climate Resilience through Agroforestry and Carbon Farming

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Carbon farming is an agricultural approach that enhances the ability of soils and vegetation to absorb and store carbon dioxide (CO_2) from the atmosphere. By adopting sustainable land management techniques, such as agroforestry, cover cropping, no-till farming, and improved pasture management, carbon farming reduces greenhouse gas emissions from agriculture and removes CO_2 from the atmosphere. This approach contributes to climate change mitigation and holds the promise of farm income diversification through carbon credits and ecosystem service payments

Unlocking the potential of carbon farming in the EU requires innovation, and agroforestry presents a particularly viable and scalable solution. As the EU accelerates its effort to achieve climate neutrality by 2050, carbon farming has emerged as a promising strategy to enhance soil carbon sequestration while supporting sustainable agriculture. Agroforestry integrates trees and shrubs with crops or livestock, providing an opportunity to continue producing food and capture atmospheric CO_2 and store it in woody biomass and soils. These systems enhance soil health, reduce erosion, increase biodiversity, and strengthen farm resilience against extreme weather events. Unlike conventional monocultures, agroforestry diversifies income sources through timber, fruits, nuts, and non-wood products and services, thereby reducing economic risk for farmers.

Read more

Agroforestry: A Key Solution for Sustainable Farming?

Joint Interview with ReForest & DigitAF Projects

Agroforestry is increasingly recognised as a crucial solution to balance agricultural productivity with environmental sustainability. Integrating trees into farming systems offers potential benefits for carbon sequestration, biodiversity, and soil health. To better understand its role and future in European agriculture, we interviewed representatives from the **ReForest (Martin Lukáč - Professor, The Czech University of Life Sciences, Prague, Coordinator of the ReForest project)** and **DigitAF (Gerry Lawson, policy advisor, European Agroforestry Federation)** projects.

Why is it urgent to rethink farming practices to reduce carbon emissions, and how do ReForest and DigitAF address this challenge?

Martin Lukáč, ReForest project coordinator, CZU: Agriculture has long been a major contributor to carbon emissions. This needs to change if we want to prevent further global warming. Additionally, soil carbon is crucial in maintaining soil health and agricultural productivity. Unfortunately, the amount of carbon in agricultural soils has been drastically reduced. Agroforestry can help to restore some of it.
Our project provides scientific evidence and practical tools to help farmers understand how agroforestry retains carbon and how they can integrate these practices into their farming

systems.

Gerry Lawson, DigitAF project partner, EURAF: Agricultural emissions have remained stable since 2000, despite initial reductions due to lower livestock numbers. Trees and agroforestry could be part of the solution.

Agroforestry can reduce methane emissions and even increase methane absorption in soils. It also plays a role in reducing nitrous oxide emissions, which are highly potent greenhouse gases. However, agroforestry must be combined with other nature-based solutions for maximum impact.

One area of concern is no-till farming, which avoids ploughing and retains soil carbon. While beneficial overall, its application may lead to competition between tree roots and crops in arable agroforestry systems.

What tools or technologies from your projects help farmers adopt agroforestry and track carbon flows more effectively?

Martin: We are developing a semi-automated tool that allows farmers to track carbon stored in their agroforestry systems visually. Using drones and visual spectrum imagery, the tool detects trees, shrubs, and other woody features in the landscape. Algorithms then estimate their size and carbon storage capacity.

This enables farmers, policymakers, and researchers to measure agroforestry's impact on carbon sequestration better.

Gerry: We provide a broad set of digital tools to help predict agroforestry's impact. Our database includes over 40 tools covering soil depth, tree species, and above- and below-ground interactions.

A key challenge is the lack of a universal definition for agroforestry across Europe. Different countries classify agroforestry based on tree density per hectare, but there is no clear distinction between seedlings and mature trees.

To address this, we use satellite imagery (Copernicus) combined with the Land Parcel Identification System to create a pan-European agroforestry map. This will help align policies and provide clearer definitions for farmers.

Why focus on digital tools when farmers often rely on intuition and experience?

Martin: Farmers know their land well, but digital tools provide economic opportunities beyond traditional farming. Agroforestry can generate additional income through carbon credits and biodiversity incentives, but farmers need verification tools to access these markets.

Digital classification bridges the gap between traditional farming and new environmental demands. Farmers must balance food production with societal expectations for climate action, biodiversity, and landscape preservation.

Gerry: Agroforestry is highly complex, requiring knowledge from both agriculture and forestry. However, many foresters and agronomists lack experience with agroforestry systems, demonstration farms are rare in agroforestry and cover only a tiny fraction of the variety of possible associations between trees and crops.

Digital simulation models allow conducting virtual experiments on a larger sample of tree

and crop species and management practices, thus answering help answer critical "what-if" questions (what if I used this or that tree species, what if I chose this or that tree row orientation…). More importantly, digital tools allow combining knowledge from different disciplines. Therefore, they allows trade-offs to be examined between different dimensions of the performance of agroforestry systems, for example financial and environmental trade-offs. Finally, digital tools offer formidable opportunities to facilitate dissemination of research results in a form that is easily and readily used by farmers.

By capturing and disseminating this knowledge, we can make agroforestry more accessible to farmers and policymakers alike.

How do your initiatives help farmers balance profitability with sustainability?

Martin: One of our major objectives is to map financial tools that support agroforestry adoption. Farmers often face a dilemma: they can be profitable without being sustainable, or sustainable without being profitable.

We aim to create new income streams by integrating agroforestry into carbon markets and subsidy programs. This makes farmers financially more profitable while improving soil health and carbon sequestration and thus environmental sustainability.

Gerry: Currently, farming is not very profitable on its own. Many farmers rely on subsidies, but these are under pressure. Agroforestry could offer an alternative income source. However, current environmental subsidies are small compared to general farm payments. To make agroforestry viable, we must move towards results-based incentives rather than subsidising certain practices.

Carbon farming fits into this model by paying farmers based on actual environmental benefits. While still voluntary, carbon farming could become a statutory program, further integrating sustainability into farming economics.

What is the future of carbon farming in European agriculture?

Martin: Carbon farming should not replace food production as the primary goal of agriculture. While it is an important tool, European farming is deeply tied to regional traditions and food security. Over-prioritising carbon sequestration could create conflicts with traditional farming models.

Instead, carbon farming should act as a support mechanism to make agriculture more sustainable without disrupting its core function: food production.

Gerry: Agroforestry has been recognised as one of the first certified carbon farming methods under the Carbon Removal Certification Framework. However, carbon farming must move from a voluntary program to a statutory system for it to be impactful. Voluntary carbon payments are currently low (~€20 per ton of CO_2). Farmers could receive €80-100 per ton if integrated into statutory schemes, making carbon farming a serious economic incentive.

The challenge lies in developing robust monitoring, reporting, and verification systems. Agroforestry is harder to model than traditional agriculture, meaning higher uncertainty levels. This must be factored into pricing and policy decisions.

Summary: The Road Ahead for Agroforestry

Agroforestry presents a major opportunity to make European farming more resilient, sustainable, and economically viable.
The ReForest and DigitAF projects are helping bridge the gap between traditional farming and modern sustainability goals by providing scientific tools, financial models, and policy insights.

For agroforestry to scale, key challenges remain:
- Defining agroforestry consistently across Europe
- Providing farmers with clear incentives and financial support
- Ensuring robust carbon monitoring frameworks

With the right tools, policies, and farmer engagement, agroforestry could become a cornerstone of European agriculture, balancing productivity with environmental responsibility.

Agroforestry Tools in the Spotlight

REFOREST

FarmTree Tool

The FarmTree® Tool

quantifies and projects
agro-forestry system performance
Carbon
Finance
Environment
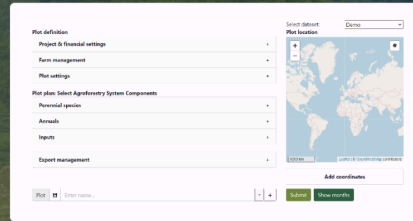
Go to the FarmTree Tool

FarmTree Tool is an innovative digital solution to support practitioners in planning and implementing agroforestry systems. Users can customise species composition, arrangements, and management practices by simulating existing and hypothetical scenarios to suit their specific needs. The tool calculates long-term productivity, financial outcomes, and agroecological impacts, including yields, costs and revenues, nutrient and water dynamics, and biodiversity. It offers detailed forecasts of carbon sequestration, enabling assessment of the carbon farming potential of the agroforestry designs. Powered with real-world data from the ReForest Living Labs, the tool facilitates informed decision-making and promotes sustainable land-use practices across Europe.

Discover the advantages of the FarmTree Tool at

https://tool.farmtree.earth

DigitAF

Tools Catalogue

Tools, Data and Projects Catalogue

To support stakeholders in making informed decisions, DigitAF has compiled a catalogue featuring 41 specialised digital tools designed to facilitate agroforestry planning, implementation, and monitoring.

Finding the right tool for your needs has never been easier! The DigitAF Tools Catalogue includes a filtering system that allows you to search based on end users (farmers, advisors, policymakers, etc.), available languages, and key agroforestry indicators. Whether you need decision-support tools, carbon assessment models, or biodiversity monitoring solutions, you can quickly identify the most relevant resources.

The catalogue is continuously evolving, and we welcome contributions! If you know of a tool that could benefit the agroforestry community, you can propose it for inclusion in the catalogue.

Browse the 41 tools and find the best fit for your needs at

DigitAF Tools, Data and Projects catalogue

ReForest – DigitAF meeting: supporting agroforestry through targeted communication
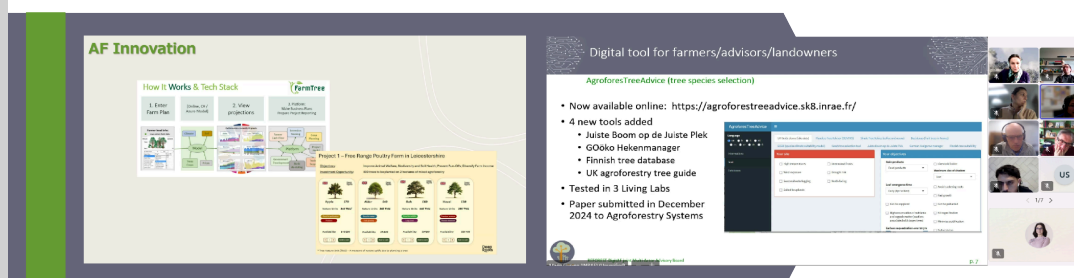
On **January 20, 2025**, the **DigitAF** and **ReForest** teams held their annual virtual meeting to review achievements and strengthen collaboration for the year ahead. Discussions focused on **enhancing the usability and accessibility of digital agroforestry tools, improving stakeholder engagement, and fostering cross-project synergies.**

A key takeaway from the meeting was the need for a **clear, user-friendly matrix** to guide stakeholders in selecting the right digital tools based on their needs. While **DigitAF** and **ReForest host tool repositories**, users often struggle to identify the most suitable options. To bridge this gap, the teams will develop a **classification matrix** that categorises tools based on the intended user's stage in agroforestry adoption (e.g., from initial exploration to full system management), objectives (e.g., biodiversity, carbon storage, climate adaptation), type of agroforestry system (e.g., livestock-based, arable, perennial), etc.

The meeting also highlighted the importance of **effective communication with agroforestry stakeholders**. In engaging working group discussions, participants proposed developing short, engaging videos showcasing practical applications of agroforestry and tool functionalities, organising more webinars, including ones in local languages, to enhance tool adoption, and creating infographics and podcasts to make technical knowledge more accessible.

The meeting marked an important step in aligning **ReForest and DigitAF's**

communication and stakeholder engagement strategies. The results of the meetings will be carefully analysed and implemented through targeted shared actions by ReForest and DigitAF consortia.
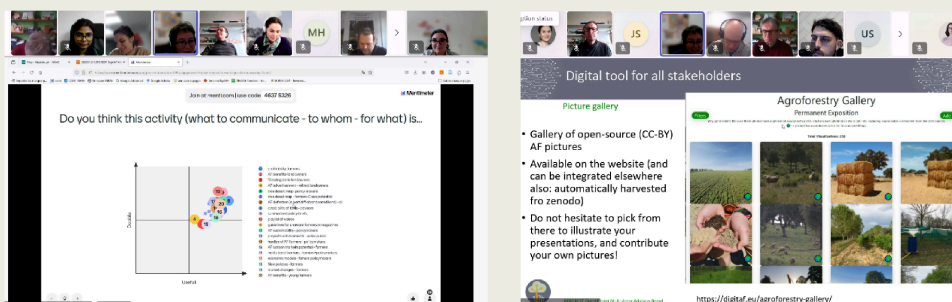
Take a Minute for a ReForest Survey and Help us Shape the Future of Agroforestry!

Your insights are key to advancing agroforestry solutions!

ReForest invites you to participate in three important surveys that are open now and will drive innovation and policy improvements in agroforestry. Share your experience to help us refine the FarmTree Tool, shape a fair financing model for agroforestry, and contribute to a Europe-wide analysis of agroforestry value chains.

Your feedback will support farmers, influence policies, and strengthen agroforestry adoption.

FarmTree Tool Survey

Short Survey for Extended Network Farmers (EU)

Analysis of Agroforestry Value Chains

Three days workshop financial tools in the Netherlands for DigitAF

In November 2024, a group of DigitAF members gathered in Bunnik, the Netherlands, for an intensive three-day workshop focused on developing financial tool s for agroforestry.
The workshop was fruitful, and the next steps were formulated to continue improving financial tools with the help of the LLs and to work towards delivering Roadmap 2.0 (deliverable 2.4).

Several tools and models were presented and discussed:

- Yield-SAFE (CRAN),
- INTACT (ILVO),
- AgroforstRechner (DEFAF),
- FINAL-ALS (VUKOZ/CVUT FEL),
- FarmTree Tool (FarmTree).

The workshop was fruitful, and next steps were formulated to continue improving financial tools with the help of the Living Labs. The next workshop of the financial tools working group will take place in the UK Living Lab, where we will focus on a case study around arable farming.

Read more

Where to meet us in the upcoming months? ReForest and DigitAF events

ReForest and DigitAF at the European Carbon Farming Summit

European Carbon Farming Summit

Supporting high-level conversations to shape up robust carbon farming markets and policies. It represents a space for sharing knowledge and experiences, upscaling solutions and enabling the multiplication of climate actions across the EU.

We're thrilled to announce that ReForest and DigitAF will participate in the [2nd European Carbon Farming Summit](), taking place March 4–6, 2025, in Dublin, Ireland!

This event is a platform for shaping the future of carbon farming in Europe, tackling crucial topics such as soil health, certification standards, and carbon monitoring. ReForest and DigitAF will contribute with insights about agroforestry's role in carbon sequestration and digital innovations for sustainable land management.

FarmTree webinar reveals practical aspects of using the tool

Designing your **agroforestry system** with the **FarmTree Tool** – A case study from the **UK Living Lab**

Online

📅 11 March 2025

🕐 14:30 h CET

ReForest is pleased to invite you to an upcoming webinar exploring how the FarmTree Tool can support the design and optimisation of agroforestry systems.

In this webinar, participants will gain practical knowledge on using the tool for training and upscaling, with a detailed look at the scenario-building process and outputs generated using UK Living Lab data. On **March 11 at 14:30 CET**, this session will present a case study from the UK Living Lab, demonstrating how real-world data is used to model agroforestry scenarios and assess their potential impacts.

Join us for an insightful session and discover how data-driven agroforestry planning can enhance sustainability and farm resilience.

More information and registration are available through the following link:

Webinar

ReForest online:

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DigitAF online:

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