MIX-App Prototype Participatory Testing and Evaluation Report

Report on the testing of the AGROMIX MIX-app prototype called **'Treefiles'**

Deliverable D4.4

31-08-2024

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 862993.

Deliverable D4.4	**MIX-App Testing & Evaluation Report**
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[1] **R**=Document, report; **DEM**=Demonstrator, pilot, prototype; **DEC**=website, patent fillings, videos, etc.; **OTHER**=other
[2] **PU**=Public, **CO**=Confidential, only for members of the consortium (including the Commission Services), **CI**=Classified

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1 Executive Summary

Overview of the report

This report presents the outcomes of the participatory beta testing of the MIX-App across twelve multi-actor co-design pilot (see section 4) developed within AGROMIX project across Europe. It details the methodology, feedback from participants, and subsequent improvements made to the app. The goal was to refine the app's functionalities to support agroforestry practices and mixed farming effectively based on a multi-actor co-development approach.

Understanding the Mix-App as the integration of Landfiles and Treefiles

The Mix-app – as referred to in this document – is the AGROMIX project result of the integration of Landfiles and Treefiles. Landfiles is an existing platform designed for collaborative experimentation and peer-to-peer knowledge exchange among farmers, researchers, and advisors. Within the AGROMIX project, Landfiles has been enhanced with multilingual capabilities and now supports 10 different languages.

A significant additional component integrated into the Landfiles platform and app is "Treefiles," a specialised functional part of the platform with a dedicated database that acts both as a collaborative network and knowledge base for tree species knowledge sharing. Treefiles allows users to contribute and access a knowledge base for tree species and their cultivars, specifically within the context of agroforestry systems. This component is central to the AGROMIX project, aiming to empower users by providing region-specific data and enabling them to share experiences and learn from peers.

The Mix-App as referred to in this document will be called Treefiles (see also Appendices 4 and 5) in all further public communication and is intended to be a powerful tool for advancing agroforestry practices across Europe by facilitating knowledge sharing, decision-making, and the practical implementation of agroecological systems.

Key findings and conclusions

The MIX-App is highly valued by farmers for its potential to increase knowledge and facilitate the sharing of practical agroforestry practices. Facilitators and advisors highlighted areas for improvement, particularly in usability and data accuracy. The app's multilingual support and regional customisation were praised, though more localised content is needed.

Summary of recommendations

- Enhance data accuracy and expand the tree crop species database.
- Improve user interface and simplify data entry processes.
- Increase practical content and provide comprehensive guides.
- Foster wider adoption through engagement strategies and continuous updates.

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2 Introduction

2.1 Background and context of the MIX-App

The MIX-App was conceived to support the agroecological transition to mixed farming and agroforestry practices across Europe. This tool emerged to address critical challenges in adopting sustainable agricultural practices, guided by insights from twelve co-design pilot projects representing diverse agroecological contexts.

The MIX-App's development began with identifying specific needs and expectations of several stakeholders (i.e. farmers, practitioners, actors of the value chains) through interviews and surveys conducted during WP2 workshops with the co-design pilots. This revealed significant knowledge gaps for the development of sustainable and feasible practices and informed the creation of the app.

Co-design pilots identified these key priorities regarding the goals of the Mix-App:

- Explore scenarios (quantitative)
- Tree-crop interactions
- Tree species or variety choice
- Land management aspects

Based on these priorities, three initial concepts were developed:

1. **Envision Agroforestry:** visualising and planning agroforestry systems.
2. **Find My Trees:** selecting appropriate tree species and varieties.
3. **Agroecological Transition Pathway:** guidance for transitioning to diversified agroecological systems.

In May 2022, a survey conducted after a combined WP2-WP4 workshop with the pilot teams (facilitators and ambassadors) highlighted **Find My Trees** as the most preferred concept, emphasising the need for a practical tool for tree species selection.

The project team then decided (after an international tender procedure documented in AGROMIX deliverable D4.3) to collaborate with Landfiles, a farmer-conceived app with a strong user base in France, chosen for its functionalities, principally, a social networking platform for farmers, and the ability to build a collaborative database of tree species. The collaboration with Landfiles aimed to enhance multilingual capabilities and expand the app's reach across Europe.

The MIX-App aims to provide a practical, user-friendly tool that supports farmers in implementing agroforestry practices. It facilitates knowledge sharing, provides detailed species information, thus empowering farmers to make informed decisions, monitor progress, and advance regenerative agriculture across Europe.

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2.2 Objectives of the participatory testing and evaluation

1. **Validate practical relevance**: ensure the app seeks to address realistic agroforestry and mixed farming problems.
2. **User feedback:** collect detailed feedback on usability, effectiveness, and user experience to identify improvements.
3. **Increase user engagement**: engage users in the development process for customisation of the app according to user needs and preferences.
4. **Test in various contexts**: assess the performance of the application in different geographic and agroecological contexts.
5. **Refine features**: make iterative refinements on the application using feedback.
6. **Facilitate knowledge sharing**: enable and encourage effective sharing of knowledge, peer learning, and networking among end-users.
7. **Monitoring impact**: measurement of impact of the application on user knowledge and decision-making process.

Moreover, tasks 4.3 (developing the app) and 4.4 (testing the app) were combined to ensure that testing and co-development could happen in the early stage rather than after a completed app was out on the market. This is so because the app will constantly evolve with user input, achieving these objectives more effectively.

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3 Methodology

3.1 Chronology of the co-development approach

Preparation phase (March 2023 - May 2023):

March 2023: Initial planning and development of the MIX-App were directed towards creating the first prototype and collaboration with Landfiles.

May 4, 2023: In a virtual session with the pilot teams, Landfiles was introduced to initiate a process of co-creation and let participants familiarise themselves with app functionalities.

First co-development session - Angers meeting (June 2023):

June 6-8, 2023: Workshop in Angers, France, for the testing of the first version of the prototype by participants—farmers, advisors, researchers, and facilitators of pilot teams.

Activities included testing the software mock-ups with clickable features, the database on tree varieties, and gathering user feedback on the proposed functionalities.

Development using feedback and internal testing (July 2023 - September 2023):

July 2023: Feedback from the Angers meeting analysed to identify areas for further development.

August 2023: Construction of the second prototype based on first-round test feedback.

September 2023: Internal feature and enhancement testing with selected pilot team members. Establishment of a dedicated AGROMIX testing group on Landfiles, onboarding the first pilot team members.

Second co-development session - Belgrade meeting (October 2023):

October 2023: The tested second version of the prototype at the Belgrade, Serbia general assembly. Activities: Testing included the latest features of advanced search options, technical species pages, and automatic translation of content. There was feedback from the pilot teams during various workshops. Onboarding several more pilot team members.

Development using feedback and internal testing (November 2023 - December 2023):

November 2023: Detailed analysis of the Belgrade meeting feedback to further adapt and refine the app.

December 2023: Training session for further building the user base with the identified group of dedicated farmers of the European Agroforestry Federation inside Landfiles. Creation of a farmer group linked to EURAF. Testing activity within this group.

Third co-development session (January 2024 – February 2024):

January 2024: Internal bi-weekly reviews and updates based on testing done in the development group, the EURAF farmer group and other participants' comments.

February 2024: Preparations made for the next stage of testing to ensure all issues identified were addressed.

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Fourth co-development session (March 2024 - April 2024):

March 27, 2024: Facilitators training meeting to get ready for the last co-development phase with pilot ambassadors and facilitators. Activities: Create Landfiles groups on the app, facilitate onboarding, post photos, messages, and comments, and test the Treefiles database.

April 18, 2024: Encouraged early submission of surveys to integrate feedback promptly.

April 26, 2024: Final deadline for survey submission in this round.

Final evaluative round (May 2024 - June 2024):

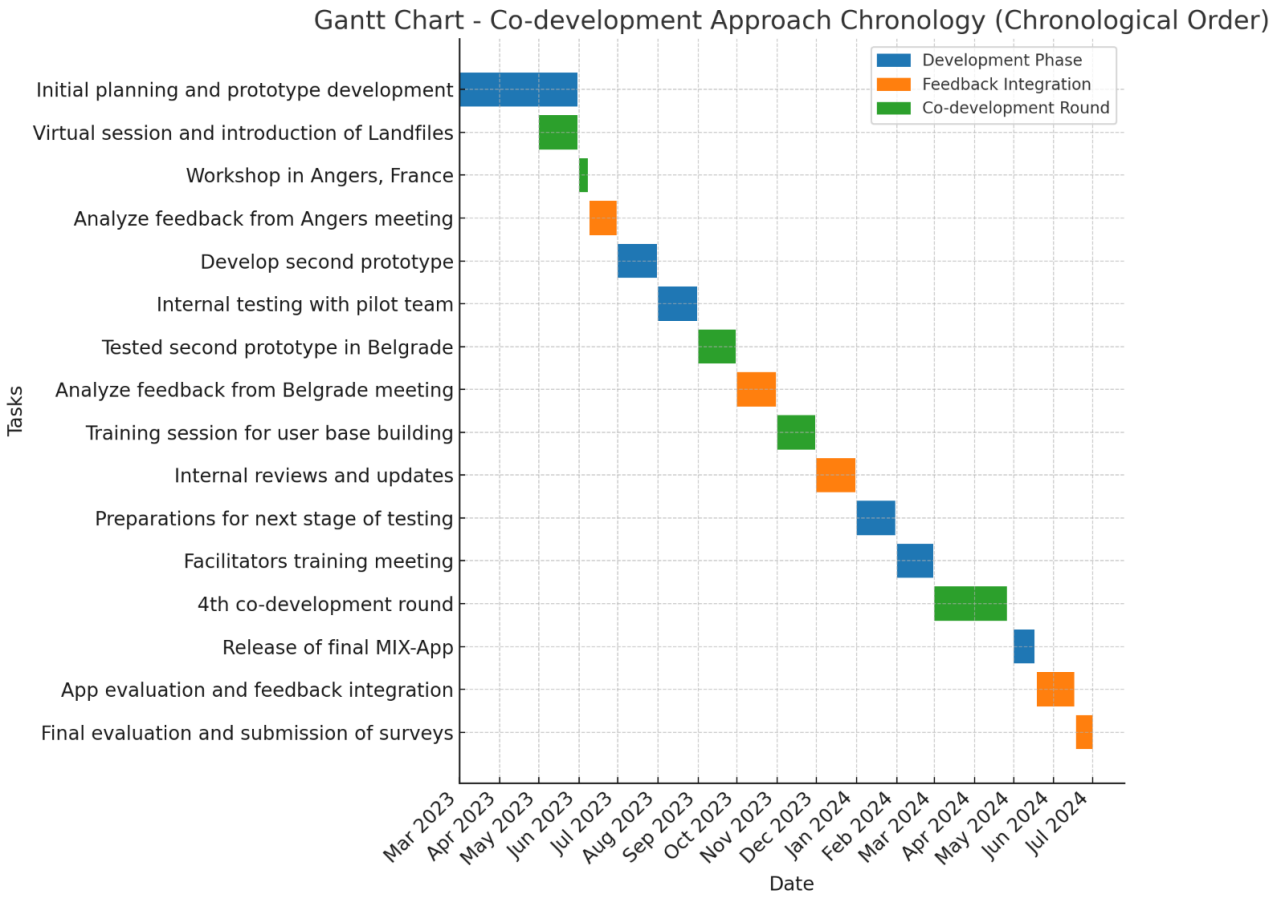
May 17, 2024: Final version of the MIX-App is released and presented at the EURAF2024 conference in both poster and oral presentations.

May 19 - June 17, 2024: App evaluation, focused on usability, working, and general influence.

July 1, 2024: Deadline for the submission of final surveys, concluding the evaluation process.

Throughout these phases, key actors included farmers, advisors, researchers, facilitators, and the project development team. Regular meetings and workshops ensured continuous engagement and alignment with user needs, leading to iterative improvements and successful co-development of the MIX-App.

An overview of the chronology is shown in this Gantt chart:



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3.2 Data collection

The data collection methods employed throughout the MIX-App testing and evaluation process were designed to capture detailed user feedback and insights at various stages. Here is an overview of the tools and techniques used:

First co-development session:

Tool used: Figma in dedicated workshop

Purpose: To test the initial clickable software mock-ups and gather user feedback on the proposed features and functionalities.

Method: Participants interacted with the Figma prototypes, providing real-time feedback on usability, design, and functionality. Observations and comments were recorded during the workshop sessions.

Second and third co-development sessions:

Tool used: One-minute Google Forms in workshop

Purpose: To gather quick, focused feedback on the onboarding process and the Treefiles database, as well as to collect impressions on new features and updates.

Method: During workshops, participants completed short surveys immediately after specific interactions with the app. The forms included questions on ease of use, initial user experience, and immediate issues encountered. Feedback from these rounds focused on the usability of new features, technical issues, and overall satisfaction with improvements.

Fourth co-development session:

Tool used: Extensive Google Form

Purpose: To gather comprehensive feedback on the app's overall performance, usability, and impact

Method: Detailed survey covered two main areas:

Social networking aspects (17 questions):

- 1 yes/no question
- 7 rating questions
- 9 open-ended questions

Treefiles database (15 questions):

- 2 yes/no questions
- 7 rating questions
- 6 open-ended questions

The survey (full version included as Appendix 1) covered several areas: the onboarding experience, focusing on ease of use, account creation, and farm profile motivation; the process of creating groups and inviting members; the intuitiveness of knowledge sharing and interactions within groups; the experience with using forms and suggestions for improvement; and the Treefiles database, assessing its ease of use, visual attractiveness, data comprehensiveness, and user-friendliness.

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Final evaluative round:

Tool used: Extensive Google Form

Purpose: To evaluate the final version of the MIX-App comprehensively.

Method: Smaller survey to capture overall user experience and specific feedback on the app. They included:

- 6 open-ended questions
- 2 multiple-choice questions
- 5 rating questions

The survey evaluated the Landfiles app across the following themes: identifying the respondent's role, assessing the Treefiles element's impact on knowledge enhancement, examining Landfiles' support for practical regenerative and sustainable farming steps, evaluating the app's effectiveness in monitoring farm-level progress, determining how well it facilitates knowledge sharing among farmers, gauging the likelihood of recommending the app to colleagues and the reasons for it, and gathering details about the specific Landfiles group used for testing, including the group's name and language used. It ended with an “any other feedback” question.

3.3 Data analysis

All the co-development feedback data was analysed at each step of the co-development. The feedback was shared and prioritised for further development during bi-weekly meetings by the development team, consisting of WUR, Landfiles, WERVEL and CU. A summary of the feedback of the last co-development round can be found in Appendix 2. A collection of key recommendations based on this feedback can be found in Appendix 3.

The co-development and testing mainly took place in the development team and twelve AGROMIX pilot teams and connected stakeholders, throughout the entire development process from March 2023 to June 2024.

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4 Presentation of the twelve co-design pilots that participated in co-development and evaluation

1. France: **Blue Pig Farm (testing meeting took place in June 2024)**
   Stakeholders: ITAB, local farmers
   Context: Organic pig farm integrating agroforestry and fodder crops to enhance autonomy, animal welfare, and meat quality.
   Challenges & Ambition: The practice of pig grazing needs more references for broader application; current trials show promising economic viability but face complexities in meadow management.
2. Germany: **Integrated AF Fruit & Chicken Farming for CSA (testing meeting took place in June 2024)**
   Stakeholders: Stadtbauernhof Saarbrücken, IfaS
   Context: Integration of fruit and poultry products in an agroforestry system within growing micro-farming and CSA niches.
   Challenges & Ambition: High complexity in diversification, with the need to harmonise operations or cooperate with third parties for successful small-scale production.
3. Italy: **Cheese Valley (testing meetings took place in April, May and June 2024)**
   Stakeholders: Scuola Superiore Sant'Anna di Pisa, Università di Pisa, local sheep farmers, advisors, dairy company.
   Context: Supporting the Pecorino Toscano PDO value chain in Tuscany through agroforestry and mixed farming systems.
   Challenges & Ambition: Addressing soil erosion and improving farmer perceptions, with successful poplar-based agroforestry trials enhancing ecosystem services and production.
4. Italy: **VenetoMix (testing meeting took place in June 2024)**
   Stakeholders: Veneto Agricoltura, local farmers
   Context: A group of seven diverse organic farms aiming to enhance sustainability, soil fertility, and biodiversity through agroforestry and mixed farming.
   Challenges & Ambition: Managing outdoor poultry systems amid avian influenza outbreaks and exploring new market supply chains for better sustainability.
5. Netherlands: **Winthagen (testing meeting took place in June 2024)**
   Stakeholders: WUR, local farmers, municipality Voerendaal
   Context: Addressing flooding and soil erosion in Winthagen through innovative land management and agroforestry.
   Challenges & Ambition: Balancing biodiversity and recreation and finding economically viable solutions for farmers while improving water management.
6. Poland: **OIKOS Farm (testing meeting took place in June 2024)**
   Stakeholders: Local farmers, Agricultural Processing Incubator
   Context: Transforming a Carpathian organic farm towards agroforestry to enhance biodiversity and profitability.
   Challenges & Ambition: Improving soil quality and fodder base, while building a strong market position through short supply chains and direct sales.

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7. **Portugal: Co-design Pilot (testing meeting took place in June 2024)**
   Stakeholders: MVARC, local farmers
   Context: Re-designing farms in a semi-arid region to enhance resilience, productivity, and profitability without relying on subsidies.
   Challenges & Ambition: Creating a sustainable farming model independent of subsidies, with a focus on tree resources and biodiversity.

8. **Switzerland: Agroforestry Network (testing meeting took place in June 2024)**
   Stakeholders: ZHAW, AGROSCOPE, local farmers
   Context: Developing agroforestry on a national scale, supporting farmers through a network of land managers.
   Challenges & Ambition: Anchoring agroforestry in the agricultural knowledge system and achieving monetary valorisation of ecosystem services.

9. **United Kingdom: Bedfordshire (testing in May and June 2024)**
   Stakeholders: Cranfield University, local farmers
   Context: Engaging farmers to achieve net-zero GHG emissions by integrating trees into farming systems.
   Challenges & Ambition: Balancing GHG reductions with economic viability, ensuring tree planting strategies are effective and feasible for different farm types.

10. **Belgium: PHAE (testing in May and June 2024)**
    Stakeholders: ILVO, local farmers
    Context: Enhancing soil fertility and sustainability through smart crop rotation and cooperation with neighbouring dairy farms.
    Challenges & Ambition: Optimising nutrient flows and introducing new agroforestry elements to improve agricultural practices and stakeholder involvement.

11. **Serbia: Golija-Studenica (testing in May and June 2024)**
    Stakeholders: Network for Rural Development of Serbia, local farmers
    Context: Developing innovative mixed farming approaches in small farms within a biosphere reservation.
    Challenges & Ambition: Improving agricultural practices and land management, diversifying economic activities, and enhancing market position for local products.

12. **Spain: Alburquerque (testing meetings took place in April 2024 and June 2024)**
    Stakeholders: University of Extremadura, local farmers
    Context: Guaranteeing farm sustainability through eco-friendly practices in a low-density rural area.
    Challenges & Ambition: Addressing biosafety, sustainability, water management, and profitability while diversifying farm products and activities.

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5 Results of the participatory evaluation of the Mix-app prototype

Preliminary remark with the following analysis: in the development group we decided to make a fully operational version of the Mix-app (rather than a prototype), before doing the final evaluation round. This was done to increase the reach of the app itself, and to extend a working version beyond the project lifecycle. We provided an additional (5th) development round to produce an even better final product, considering all the feedback and addressing some identified development and wider adoption opportunities. This development round is ongoing while this delivery is being written.

The survey consisted of the following questions:

1. You are a ... (farmer/researcher/advisor/facilitator/other)

2a. Did the Treefiles app increase your knowledge base? Examples?
2b. Rate from 1 (very poor) to 5 (very well).

3a. How does Landfiles support practical steps towards regenerative farming? Examples?
3b. Rate from 1 (very poor) to 5 (very well).

4a. How does the app allow monitoring progress on a farm level? Illustrate.
4b. Rate from 1 (very poor) to 5 (very well).

5a. How does the app enable knowledge sharing among farmers? Illustrate.
5b. Rate from 1 (not easy at all) to 5 (very easy).

6a. Would you recommend the app to colleagues? (1: No, not at all / 5: Wholeheartedly)
6b. Why (not)?

7a. Name of the Landfiles group where you tested the app?
7b. Language used in that Landfiles group?
(French/English/Catalan/Italian/Spanish/Portuguese/Dutch/Serbian/Polish/German)

8.Any other feedback for the AGROMIX team or for Landfiles?

In what follows the answers of the 29 respondents to these questions will be summarised.

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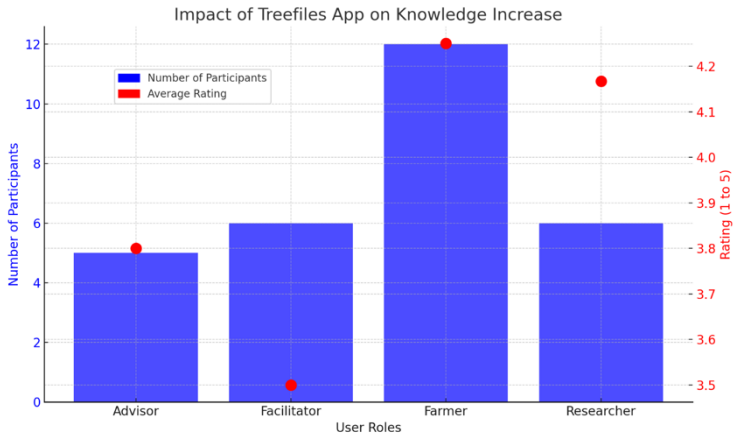
5.1 Detailed analysis of the final survey results

Question 1: Identity

Of 29 answers, 12 identified as farmers, 6 as facilitators, 6 as researchers and 5 as advisors.

Question 2: Impact of Treefiles app on knowledge increase



Average ratings:

- **Farmers**: 4.25
- **Advisors**: 3.80
- **Facilitators**: 3.50
- **Researchers**: 4.17

Some quotes:

- **Farmers**:

  “Yes, some experiences shared by other farmers were helpful for my farm”

  “In general yes, although I have several doubts, regarding presented list of species and their description.”

- **Researchers:**

  "Most of the examples are very scarce in practical agronomic information and productivity parts."

  "Yes, I learned more about tree species which can be used in different conditions."

  "In general yes, although I have several doubts and would like more scientific references."

- **Facilitators**:

  “Good visibility of all tree species that may exist.”

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> "Not that much, most of the examples are very scarce in practical agronomic information and in the productivity part, for example, I cannot find any unity of measure near the numbers."

Key insights:

Detailed and practical information: a recurring theme in the feedback is the need for more detailed and practical information. The absence of some concrete information, such as tree plantation density for some species, was noted by users, especially those who needed very precise data. This means a gap in the content that could be filled in to make the app more comprehensive for practical purposes.

Accuracy and verification of data: the comments raised concerns regarding the inaccuracy and verification of botanical and ecological data submitted through the app. This ranges from inconsistencies in plant family records to the soil pH range of species. These are sections where accuracy is important because it influences the credibility and trustworthiness of the app as a scientific source.

Users experience design: feedback on the way the app connects different realities in a simplified way suggests that the user experience design is great for some but can be improved. Making data more accessible and integrating tools like tooltips for more in-depth understanding of complex data—for instance, characteristics of soil texture or pH ranges—can really take user interaction to a different level, enhancing the learning outcomes overall.

Richer content for a wider coverage of regions and species: users mentioned that the app should have more content covering a much wider scale of regions and species to suit local contexts. The presentation of a wealth of variation in agroforestry practices and tree species—native to different climates and areas of the planet—would make this app universally useful and helpful.

Recommendations for better knowledge increase

Improve content depth and accuracy: provide more detailed information on tree species and agroforestry systems. Correct inconsistencies, for instance in pH ranges and soil characteristics.

Expand multilingual and localised content: increase multilingual support to broaden the app's reach. Localise content with region-specific examples and data.

Improve user interface: add tooltips for technical terms and data explanations. Simplify navigation to make complex information more accessible and understandable.

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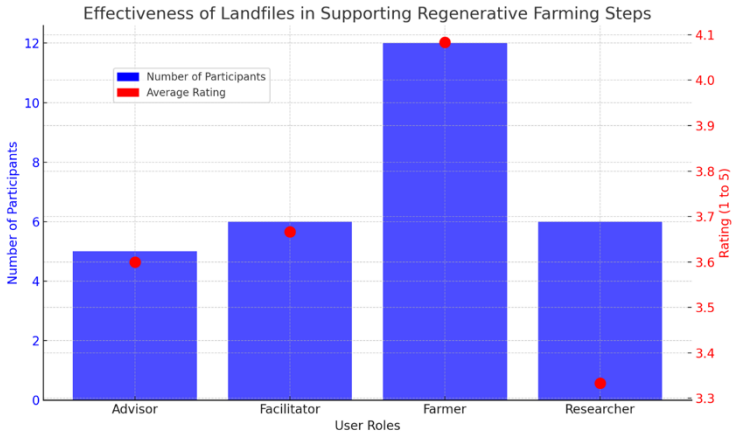
Question 3: Effectiveness of Landfiles in supporting regenerative farming steps



Average ratings:

- **Farmers:** 4.08
- **Advisors:** 3.60
- **Facilitators:** 3.67
- **Researchers:** 3.35

Some quotes:

- **Farmers**:

  “It supports me giving me new ideas for the management of my farm.”

  "It might be very useful, once it is more common among the farmers in my region of Europe."

  "I can exchange experiences, see what others have done, and select tree species that are appropriate for my area."

- **Advisors**:

  "Not really supporting."

  "Not all details are available for various trees, but this is an excellent first step. One can navigate and find, for example information on labour rates, establishment costs, how fast a particular tree grows, how fast it produces fruit, or economic yield. This is a well-structured tree-database that will aid in decision-making relating to establishing or managing agroforestry systems.

- **Facilitators**:

  "Navigating on different thematic groups, there are some good examples of circular economy, even though not always applicable in our situation."

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"There are a lot of groups sharing virtuous practices, such as crop associations, biostimulants, cover crops, etc. This potentially could be of great stimulus for farmers and advisors."

- **Researchers**:

"In the way that I see examples from other farmers and researchers to incorporate new strategies."

Key insights:

Examples and local relevance: practical examples are appreciated, and local relevance in the content of the app cannot be stressed enough.

Knowledge exchange: a section of respondents appreciates the platform for its potential to facilitate knowledge exchange and provide ideas on regenerative practices.

Need for expansion: comments in this category raise the need for the tool to be more available, both in terms of region and adoption, to be effective for use across regions.

Recommendations for more effective support in regenerative farming:

Local and practical content: focus on more local content and practical issues that address actual farming practices in farming conditions.

Widen user base: platform value will increase if there is widespread adoption and participation, as this generates a diversity of examples and experience.

Detailed information on agroforestry: more detailed information related to agroforestry components, like tree species and management practices.

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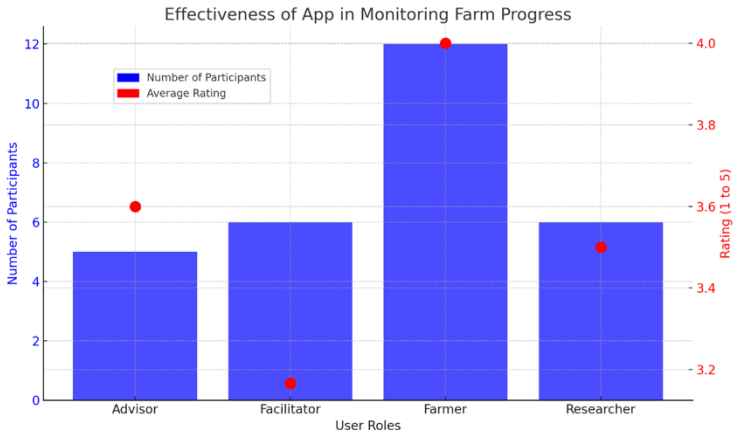
Question 4: Effectiveness of app in monitoring farm progress



Average ratings:

- **Farmers:** 4.00
- **Advisors:** 3.60
- **Facilitators:** 3.17
- **Researchers:** 3.50

Some quotes:

- **Farmers**:

  “I think it is still too early to have such an assessment; everything will be related to use by many users in an extended and targeted way.”

  “When sharing my experiences I’m more aware of the progress made every day.”

  “Allows continuous and illustrative monitoring.”

  "You can track your actions throughout the year and find your entire technical plan at the end of the year."

- **Advisors**:

  "The evolution of actions in a comparative and shared manner is very interesting."

  “Not sure yet.”

- **Facilitators**:

  "I can add a farm and plot and record my experiences with this plot over the years to keep a monitor of what is working well and what is working less well."

  “There are parts of the Farm description (testimony) in which you could pinpoint the Farm characteristics, but they are not so easy to find, and I don't see how it could be described their evolution in time”

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- **Researchers**:

  "By uploading images and/or describing what changes have been implemented over the previous years."

  "I can post pictures every year of my plot to see how it develops. These posts will be connected to a virtual version of the plot on the platform. If I fill in the form, I can also add hard data that will be stored. I am not sure what possibilities there are to get an overview of this information per plot."

Key insights:

Improved awareness and tracking: the app effectively increases users' awareness of their daily progress and helps track actions throughout the year, aiding in planning and reflection.

Comparative and shared learning: users value the ability to compare actions and progress, supporting collaborative learning and benchmarking.

Ease of use and interface issues: some users face challenges in easily accessing and using certain features, indicating areas for interface improvements.

Data integration and visualisation: researchers and other users need better tools for integrating and visualising collected data to get a comprehensive overview per plot.

Recommendations for more effective monitoring of farm progress:

Develop intuitive monitoring features: create a system for year-round action tracking to help farmers maintain detailed activity records. Adding comparison features for advisors will support collaborative learning and benchmarking.

Provide robust user training and support: offer tutorials and webinars to maximise the app's potential, helping facilitators and others understand its features. Sharing best practices will support farmers in evaluating their actions effectively.

Upgrade ease of use and data visualisation: improve the interface for intuitive access and better integrate data types like images and hard data to provide a comprehensive overview per plot. This will help researchers and others track and analyse progress comprehensively.

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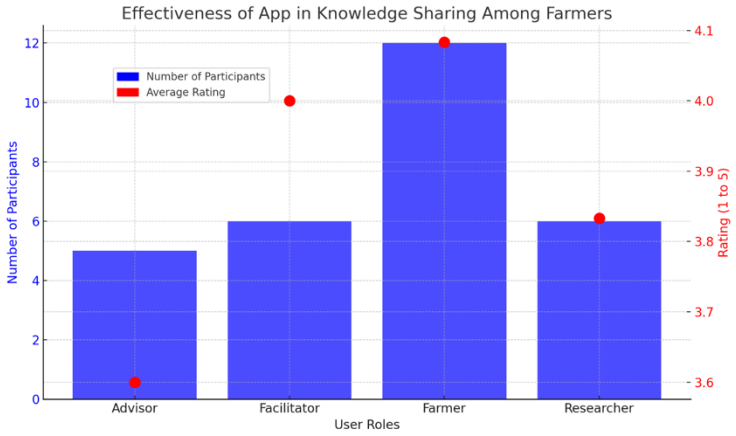
Question 5: Effectiveness of app in knowledge sharing among farmers



Average ratings:

- **Farmers:** 4.08
- **Advisors:** 3.60
- **Facilitators:** 4.00
- **Researchers:** 3.83

Some quotes:

- **Farmers**:

  "I can share my experiences in different groups in different countries, this allows me to learn from the knowledge in different countries."

  "I think it's not easy to use with this aim, with the strong competition with [other] social network[s]."

  “Networking and demonstration of the various stages of implementation of agroforestry systems in EU.”

  “For farmers with similar systems (production, soil, weather), sharing pictures, questions, and presentations can be very interesting. The key is getting farmers to start posting and create a dynamic exchange.”

- **Advisors**:

  “If it's in Dutch, it can be a useful, professional platform like Facebook. However, implementing the data can be a lot of work for farmers.”

- **Facilitators**:

  “Sharing experience is the core of the application. It facilitates connections with other professionals, including those from different regions or sectors with alternative practices.”

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement 862993.

"This should be the main goal of the app, but in my opinion it seems a little too complicated for our group of farmers, and also because it requires a lot of time to upload examples and share information."

"Farmers have the opportunity to share knowledge at national and international levels."

- **Researchers**:

"Putting in contact people working on the same things in the same geographical area."

"Certainly it has great potential. However several things need corrections. We need to notify in a transparent way the fact we present only species tested in farms or experiments. This is not clear at the moment."

"I think in a group of farmers trying the same thing in the same area it can be a really nice tool and alternative to WhatsApp. It is easier to find what was posted in the past."

Key insights:

Ease of use: some people find the app to be a little bit cumbersome and somewhat a timewaster for sharing their views, but on the other hand, many love it and see its potential for connecting people.

Networking value: the app was found to provide potential for networking and sharing experiences at the national and international level.

Visual sharing: the sharing of photos and posts is stressed as a huge benefit in helping depict practices and connecting with other farmers.

User scepticism: it is quite difficult to get the farmers to adopt the app because of scepticism or a preference for other platforms, such as existing social networks.

Recommendations for more effective knowledge sharing among farmers:

Simplify the interface for knowledge sharing: make it much easier and take less time to upload and share information. Provide tutorials and guides through the app that can help users know how to use it effectively.

Improve networking features: improve functionalities to connect users with similar geographical locations and interests in agriculture. Provide more opportunities for farmers to share their experiences and discuss things with their peers under some kind of structure.

Improve data presentation: improve some of the visual elements to make it easier to showcase photos and illustrative content. Make posts and shared information easier to find and refer back to.

Address user scepticism: just find some early adopters to relate their success stories, the benefits they have derived from using the app. Emphasise how the app is better than a regular social network and show the uniqueness of its benefits.

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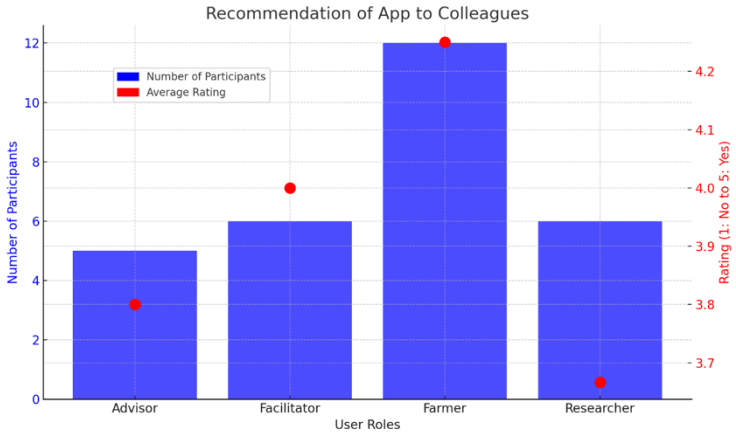
Question 6: Recommendation of app to colleagues



Average ratings:

- **Farmers:** 4.25
- **Advisors:** 3.80
- **Facilitators:** 4.00
- **Researchers:** 3.67

Some quotes:

- **Farmers**:

  "I would recommend it to bring the agroforestry community together in a collaborative learning environment. The functionality and usability can still be improved, but the core is there."

  "Because we need more exchanges between us"

  "It's not really easy to use"

  "There are crucial mistakes that need correction. The financial part is unclear, particularly the currency used for planting costs and yield prices. This information has limited value for Polish, Romanian, or Hungarian users due to currency and price volatility."

- **Advisors**:

  "It is a very interesting mutual benefit."

- **Facilitators**:

  "Yes, but we are a bit worried about the level of complexity of usage."

  "It has a big potential for thematic discussions over technical agronomical issues, but the farmers and advisors should be motivated to dedicate some time, and the problem is to convince them that it's worth it."

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- **Researchers**:

  "I think it can be used in farmer network projects and should be promoted nationally and regionally to advance agroforestry."

  "It is excellent to be in touch."

Key insights:

Use and accessibility: a number of high-scoring reviewers found the app easy to use and with great opportunities for knowledge exchange.

Technical and practical challenges: for some the app scored low for aspects of usability. They express a clearer need for the availability of financial data and localised information.

Community and collaboration: users value the app as one that might contribute to unifying the agroforestry community and can support collaborative learning.

Recommendations for more promotion of the app by users:

Improve usability and simplify interface: simplify the interface of the app in order to make it user-friendly and accessible, especially for not-so-tech-savvy users. Give detailed instructions and tutorials for new users.

Improve data accuracy and relevance: keep financial information regularly updated and represent it in a universally understandable format. Provide regionally relevant information and practical examples.

Increase engagement and community building: add features that will even more encourage interaction and collaboration, like thematic discussions. Display good case studies to drive the app user to action.

Expand multilingual support: ensure that all features and information are accessible in multiple languages and make it easy for users to find and select their preferred language settings.

Question 7: Group and languages used

The app was tested in 29 localities and in at least 8 contexts

- Italian: 7
- English: 10
- Polish: 1
- Spanish: 8
- French: 4
- Portuguese: 2
- Serbian: 6
- Dutch: 2

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Question 8: Additional feedback

Key insights:

Accuracy and comprehensiveness of data: inclusion of more species in the database and checking the species name for correctness is very important for this app to have an overall completeness that does justice to the app.

User understanding: it could be necessary to provide more guidance or further tutorials to the users so that they fully understand and can make use of all features of the application.

Positive reception: the app has received good response for being useful with the recent updates.

Strategies for engagement: introducing a reward system and holding public live events could attract more people to engage with the platform.

Integration with other projects: the app is already proposed to be used in other projects, which also demonstrates the potential for broader application and integration.

Recommendations for improvement derived from additional feedback

Verify and expand species database: all species names to be checked and confirmed. Additionally, expand the database with more species as needed by users.

Improve user guidance: enlarge the set of tutorials, FAQs, and user guides that explain deeply how users should use and get the best out of all the tools available.

Implement engagement strategies: launch a rewarding system for user motivation. Organise public live events or online sessions for app promotion and showcasing its capability.

Continuous improvement and feedback integration: update the app continuously with user input, integrating suggestions on its further improvement.

Project integration: encourage and support the implementation of the app in other related projects with the intention of enlarging its sphere of relevance and influence on the maximum number within the agroforestry community.

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5.2 General observations on the final survey (per question)

1. **Diverse user base:** the survey indicates a balanced representation of different user groups, including farmers, facilitators, researchers, and advisors. This diversity is crucial for gathering comprehensive feedback that addresses various perspectives and needs within the agroforestry community.
2. **Positive impact on knowledge increase:** overall, users reported that the Treefiles app has significantly increased their knowledge base. Farmers and researchers rated the app's impact on their knowledge highly, while facilitators and advisors saw room for improvement. The need for more detailed and practical information was a recurring theme, suggesting that while the app is useful, there is potential to improve its content further.
3. **Support for regenerative farming:** the Landfiles app is seen as a valuable tool for supporting regenerative farming practices. Farmers and advisors appreciated the practical examples and local relevance of the content. However, there is a call for more detailed information on agroforestry practices and a need for wider adoption to increase the tool's effectiveness across different regions.
4. **Monitoring farm progress:** the app's ability to help users monitor farm progress received positive feedback, especially from farmers. The feature allows continuous and illustrative monitoring, which aids in planning and reflection. However, facilitators and researchers pointed out that some aspects could be improved, particularly in terms of ease of use and data visualisation.
5. **Knowledge sharing challenges:** while the app facilitates knowledge sharing among farmers, some users find it cumbersome compared to other social networks. Despite this, many users recognise the app's potential for connecting people and sharing experiences at national and international levels. There is an evident need to simplify the interface and improve networking features to improve user engagement.
6. **Recommendation to colleagues:** a significant number of respondents would recommend the app to their colleagues, highlighting its potential to unify the agroforestry community and support collaborative learning. However, some users noted technical and practical challenges, such as the complexity of usage and the need for localised financial data.
7. **Language and localisation:** the app was tested in multiple languages, but there were inconsistencies in translation, affecting user experience. Ensuring complete and accurate translations, with user verification, is necessary to make the app more accessible and useful across different linguistic contexts.
8. **Additional feedback:** users emphasised the importance of accuracy and comprehensiveness in the species database, suggesting that more species should be included and verified. The positive reception of recent updates indicates ongoing improvements, but there is a need for more user guidance, engagement strategies, and integration with other projects to improve the app's overall utility.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 862993.

6 Recommendations for the users of the Mix-app

These recommendations are grouped by the key identified stakeholder groups, but some may be applicable to multiple roles. We believe there are many opportunities for farmer groups throughout Europe, to further mixed farming and agroforestry, by utilising the Landfiles/Treefiles combination (Mix-app) and have shared the documentation included as Appendix 4 and Appendix 5 with the EU CAP Networks support staff.

6.1 Farmers:

Develop intuitive monitoring features: create a system for year-round action tracking and improve the interface for ease of use. Simplify data entry processes and provide clear tutorials. This will help farmers maintain detailed records of their activities, track progress, and plan more effectively. Address concerns about data privacy by communicating GDPR compliance and that data remains the property of the person entering it, to build trust. Ensuring the app is as easy to use as common mobile applications like WhatsApp is vital to encourage widespread adoption and regular use in the field.

Local and practical content: focus on providing site-specific, practical information that addresses local farming practices and conditions. Expand the database to include more species and ensure accuracy, for instance by a rating option for data. Make sure all information is consistently translated and provide references to improve trustworthiness. This will make the app more relevant and useful for farmers in different regions.

Community and knowledge sharing: promote the Mix-app as a platform for sharing experiences and learning from other farmers. Simplify the process of posting and accessing shared content to encourage more active participation. Highlight success stories to build trust and demonstrate the app's value. Provide opportunities for geolocating publications directly when writing them to improve usability. Introduce gamification elements, such as points and leader-boards, to incentivise user activity and engagement.

6.2 Facilitators:

Improve onboarding and group management: facilitators are crucial for maintaining group dynamics within the MIX-App. Implement interactive tutorials and tooltips to guide new users through the app’s features and provide clear instructions for setting up profiles, farms, and groups. Simplify the interface for creating and managing groups and provide clearer guidance on administrative roles and rights. Facilitators need tools for tracking group activity, easy communication with members, and features for organising and scheduling group events.

Foster engagement and interaction: facilitators prevent dead groups by setting clear objectives, posting relevant content, and encouraging interactions. They welcome new members, thank contributors, and provide quick responses to foster a supportive community. Organise workshops, webinars, field visits, and share newsletters to keep the group vibrant and productive. Emphasise the importance of involving real farmers and collecting genuine data. Key aspects of group facilitation should include defining objectives, identifying the target audience, specifying the group's purpose, and developing long-term visions for group expansion. Facilitators should create and share various types of content, such as field observations and technical documentation, to improve engagement. Gamification elements, like badges for active participants, or tailor-made personalised newsletters, can help maintain group interest and participation.

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Provide support and training: facilitators require training resources to improve their facilitation skills and quick access to support. Develop comprehensive guides and provide regular training sessions to ensure facilitators are well-equipped to manage their groups effectively. Highlight best practices for maintaining active and engaged groups and offer support channels for facilitators to seek help when needed.

6.3 Advisors:

Comparative analysis tools: add features that allow advisors to compare actions and progress over time. This will support collaborative learning and benchmarking, helping advisors provide better guidance based on comparative data.

Detailed and accurate information: ensure the app provides comprehensive and accurate data on tree species, agroforestry systems, and management practices. Address any inconsistencies and provide detailed explanations for technical terms and data. Include clear units of measurement and references to ensure the reliability of information. Encourage the use of the bulk data entry to help manage large available datasets efficiently.

Facilitate knowledge exchange: improve functionalities that connect users with similar interests and geographic locations. Encourage advisors to share their insights and experiences and make it easier to access and contribute to relevant discussions. Address access issues to ensure all users can see the necessary data tables.

6.4 Researchers:

Data integration and visualisation: improve tools for integrating and visualising data, such as images and hard data, to provide a comprehensive overview per plot. This will help researchers track and analyse progress more effectively.

Expand multilingual support: increase multilingual support to broaden the app's reach. Localise content with region-specific examples and data to make it more accessible and useful for researchers in different areas. Ensure that all content, including species data and descriptions, is fully translated. Consider translation verification by users to improve accuracy and cultural relevance.

Continuous improvement and feedback: regularly collect and analyse user feedback to identify areas for improvement. Engage researchers in the development process to co-create features that address their specific needs and preferences. Implement a user reporting mechanism to quickly address any issues. Advanced data import/export options and integration with other research tools (in similar projects like DigitAF on digital tools for agroforestry) can facilitate efficient data management and collaboration.

By implementing these integrated recommendations, the Mix-app can better serve the diverse needs of farmers, facilitators, advisors, and researchers, enhancing user satisfaction and the app's overall effectiveness. That's why the development team decided to prioritise these recommendations and include the most pertinent ones in the 5th development round (under way at the time of writing this deliverable). That includes a variety of interface improvements, informative tools for user engagement facilitation, linking up with other projects, and public dissemination activities.

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7 Appendices 1-5

Appendix 1: AGROMIX-App Co-development form

Appendix 2: Summary of feedback of last co-development round

Appendix 3: Recommendations for improving the app based on co-development round feedback

Appendix 4: Presentation of Landfiles and Treefiles group – onboarding document on p2p learning

Appendix 5: Treefiles leaflet

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Agromix-app - co-development form

The Agromix app is a collaborative effort of Agromix and Landfiles. This form intends to gather feedback for the co-development of the final product.

It can be completed from March 27th onwards.
Should be completed **as soon as possible, preferably by April 18th 2024.**

* Verplichte vraag

Social networking aspects: onboarding

1a - How easy and intuitive is using the application as a first time user, including creating an account? *

	1	2	3	4	5	
Very easy and intuitive	○	○	○	○	○	Very hard, not intuitive

1b Why (not)? Any comments?

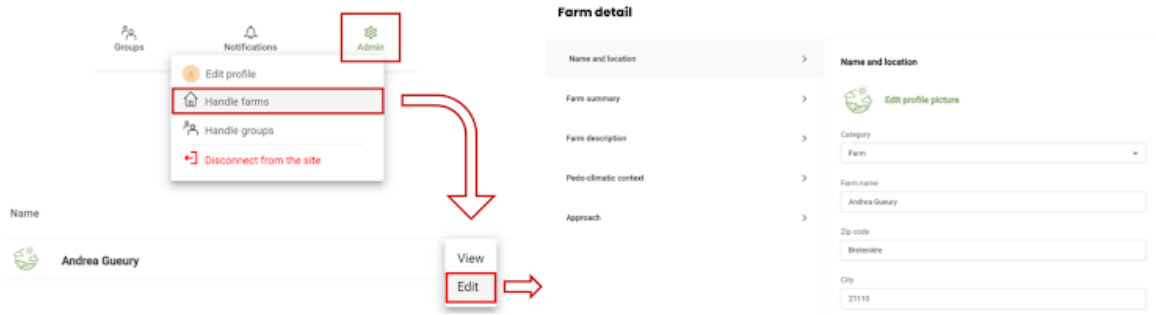
Jouw antwoord

1c - You are a ... *

If both farmer and other role, fill the rest of the form as farmer

- [ ] Farmer
- [ ] Researcher
- [ ] Advisor
- [ ] Facilitator

2a Creating a farm *How motivated are you to complete the details of the farm profile?* *



	1	2	3	4	5	
Very motivated	○	○	○	○	○	Not motivated at all

2b Why (not?)

Jouw antwoord

3a - Creating a group *

- ◯ I have not created a new Landfiles group (go to question 4)
- ◯ I have created a new Landfiles group in web browser
- ◯ I have created a new Landfiles group on mobile app

3b - How easy was it to create and invite members to a group?

	1	2	3	4	5	
Very easy	◯	◯	◯	◯	◯	Very difficult

3c - Why was it (not) easy? Any comments?

Jouw antwoord

Social networking aspects: sharing knowledge within groups

4a Posting photos, messages - *How intuitive did you find posting?* *

	1	2	3	4	5	
Very intuitive	◯	◯	◯	◯	◯	Not intuitive at all

4b - *Why (not)?*

Jouw antwoord

4c - *My rating above applies to posting on:* *

- ◯ Android mobile app
- ◯ Iphone mobile app
- ◯ Web browser

5 Liking, commenting, tagging *What would you improve with regards to liking, commenting and tagging?*

Jouw antwoord

6a Using forms - *What forms have you used when posting?* *

Type the name(s) of the form(s)

Jouw antwoord

6b How intuitive were the forms to use? *

	1	2	3	4	5	
Very intuitive	◯	◯	◯	◯	◯	Not intuitive at all

6c - *Why (not)?*

Jouw antwoord

6d - *My rating above applies to using forms on:* *

- ◯ Android mobile app
- ◯ Iphone mobile app
- ◯ Web browser

Social networking aspects: using groups and different languages

7a What other groups did you browse? *

Type the name(s) of the group(s)

Jouw antwoord

7b How informative did you find the discussion and posts? *

	1	2	3	4	5	
Very informative	◯	◯	◯	◯	◯	Not informative at all

7c How simple was the automatic translation to use? *

	1	2	3	4	5	
Very simple	◯	◯	◯	◯	◯	Not easy

7d How would you improve the translation function?

Jouw antwoord

Treefiles: consulting the database

8 How easy was it to find the species comparison table? *

	1	2	3	4	5	
Very easy	○	○	○	○	○	Very difficult

9 Visual attractiveness of species comparison table *

	1	2	3	4	5	
Very attractive	○	○	○	○	○	Not attractive at all

10 Visual attractiveness of cultivar page *

	1	2	3	4	5	
Very attractive	○	○	○	○	○	Not attractive at all

11a - *Were all the data shown in your own language?* *

- ○ Yes
- ○ No

11b - *Please explain what happened, if the data were not shown in your own language.*

Jouw antwoord

12a - How user friendly is browsing and filtering the comparison table? *

	1	2	3	4	5	
Very userfriendly	○	○	○	○	○	Not userfriendly at all

12b - How would you improve *user experience in the database interface?*

Jouw antwoord

13 - *Does the application include enough information to encourage farmers to sign up and use the application?* *

- ○ Yes
- ○ No

14 - *Are there specific areas of information or knowledge missing that you would find valuable? Which ones?*

Jouw antwoord

15a - *How easy is it to use and interpret the data table?* *

	1	2	3	4	5	
Very easy	○	○	○	○	○	Very difficult

15b - *What specifically would you like to see improved to aid data interpretation?*

Jouw antwoord

16 - *How much would you value being able to filter based on geographical location?*

	1	2	3	4	5	
It's essential	○	○	○	○	○	Could do without

Treefiles: contributing to the database

17a - *How easy is it to enter data in the observation form?*

	1	2	3	4	5	
Very easy	○	○	○	○	○	Very difficult

17b - *Why (not)?*

Jouw antwoord

17c - *What would encourage farmers to submit an observation to the database from their own context?*

Jouw antwoord

17d - *What would help you to be more active on the platform and share observations from your own context?*

- [ ] Email recap e.g. "Here 's what you missed on Landfiles the last month"
- [ ] A competitive element e.g. "You scored 10 points by contributing, 5 by commenting, 1 by liking"
- [ ] Anders: _____

18a - *What's the name of the Landfiles group where you tested the app?* *

Jouw antwoord

18b - *What language did you use in that Landfiles group?* *

- [ ] French
- [ ] English
- [ ] Catalan
- [ ] Italian
- [ ] Spanish
- [ ] Portuguese
- [ ] Dutch
- [ ] Serbian
- [ ] Polish
- [ ] German

Verzenden

Formulier wissen

Appendix 2: Summary of co-development form responses

Content overview

Part 1: Social networking aspects

Ease and intuitiveness of use

First time use (Q1a, Q1b, Q1c):

- **Farmers:** generally found it moderately difficult (ratings 3-4)
- **Researchers:** mixed feedback, some found it intuitive (ratings 2-3).
- **Advisors:** similar mixed responses, with some issues noted in initial usability.

Average score: 3.03 (1-5 scale, the lower the better)

Key points:

- **Difficulty in navigation:** users struggled to find groups and navigate the application.
  "I was just lost alone in Landfiles!"
  "Brainstorming and non-intuitive group access. Only for experienced users: difficult for farmers."
- **Mixed experiences:** while some found the process straightforward, others faced challenges.
  "Creating an account went quite easy. However, the different applications of the platform are hard to find."
- **Language barriers:** confusing or misleading translations impacted usability.
  "Selected language was German: some used words are a bit confusing/misleading."

Motivation and profile completion

Farm profile (Q2a, Q2b, Q2c):

- **Farmers and advisors:** motivated if relevant, otherwise uncertain.
- **Researchers:** more motivated if they have all necessary information.

Average score: 3.1 (1-5 scale, the lower the better)

Key points:

- **Relevance to role:** non-farmers found it less relevant to complete farm profiles.
  "If we are not a farmer I don't really understand why we have to complete this section. Can't we be just an advisor for example?"
  "I don't have a farm. The program assumes I have a farm. This shouldn't be assumed."
- **Information requirement:** users were only motivated if they had all the required information readily available.
  "Only motivated if I know all the asked information by heart, otherwise it's a lot to type in."
- **Preference for in-person sharing:** some users preferred to share information through workshops or in-person.
  "I prefer to share this kind of information in person."
- **Complexity and time:** the process was seen as time-consuming and complex.
  "To many hurdles to understand why and what for this is useful. If this is unclear there is no motivation."

"It's long to enter all the parcelles one by one... But I understand that it is nice for others (and for me) to see the link between the posts I publish and the parcelle."

Group and posting features

Creating groups (Q3a, Q3b, Q3c):

Key points:

- Many users did not attempt to create a new group.
- Those who did create groups often found the process challenging.

Average score: 2.1 (1-5 scale, the lower the better)

"Not possible to send group invitations in-app."

"It was easy to create the group, when you have a clear defined issue, not easy to get people to join in."

Posting photos and messages (Q4a, Q4b, Q4c):

Average score: 2.5 (1-5 scale, the lower the better)

Key points:

- Posting was generally seen as somewhat intuitive, but there were specific challenges.
- Issues included difficulty with geolocation, translation inaccuracies, and complex posting formats.
  "I can only insert the pictures one by one, and not several at once as with X or Bluesky."
  "To make a post with pictures and comments is easy, even though some categories are not so clear because the translation is not accurate."

Interaction features and form use

Liking, commenting, tagging (Q5):

Key points:

- Users had several suggestions for improving the functionalities related to liking, commenting, and tagging.
- The need for clearer instructions on tagging and the ability to edit or reply to comments were common themes.

  "You couldn't change comments, which would be good to have as option. You couldn't reply to a specific comment, only to the general 'thread'."

  "Maybe add an edit button?"

Using forms for posting (Q6a, Q6b, Q6c, Q6d):

Usage of forms varied: some users did not understand what forms were or had difficulty using them.

"I am just able to use the tree files form."

"I don't understand what 'forms' are."

Average score: 2.9 (1-5 scale, the lower the better)

"The purpose and method are complex to understand."

"Mostly straightforward but finding the crop species is difficult as there are so many to scroll through. Would it be possible to either group or have a search function?"

Key points:

- **Complexity:** the complexity of forms and unclear purposes were common issues.
- **Translation issues:** inaccurate translations affected usability for non-English speakers.

Browsing and translation

Browsing groups and discussions (Q7a, Q7b, Q7c, Q7d):

Discussions were informative; mixed feedback on translation accuracy.

Key points:

- Users browsed a variety of groups, with AGROMIX and treefiles being the most commonly mentioned. This indicates a low visibility of other groups.

Average score: 3.07 for informativity of posts (1-5 scale, the lower the better)

Average score: 2.25 for ease of use of automatic translation (1-5 scale, the lower the better)

Key points:

- Users generally found the automatic translation feature to be less than satisfactory, with many encountering issues.
- Suggestions for improving the translation function included adding manual adjustment options and making the feature more visible and reliable.
  "Make it more present and available on each post."
  "Be able to change the translation?"

Part 2: Treefiles

Data and visual features

Species comparison table (Q8, Q9):

Average score: 3.14 for ease of finding the species comparison table (1-5 scale, the lower the better)

Average score: 3.29 for visual attractiveness of the species comparison table (1-5 scale, the lower the better)

Cultivar page (Q10):

Average score: 2.91 for visual attractiveness of the cultivar page (1-5 scale, the lower the better)

Language and user experience

Data language (Q11a, Q11b):

Score: 18/32 experienced language inconsistencies

Key points:

- **Mixed language data:** users experienced data in multiple languages within the same interface, which caused confusion and hindered usability.
- **Translation gaps:** specific languages such as German and Italian had notable gaps in translation, affecting the user experience.

Browsing and filtering (Q12a, Q12b):

Average score: 3.1 for user-friendliness of the comparison table (1-5 scale, the lower the better)

Key points:

- Users suggested various improvements to enhance the user experience, focusing on visual aids, navigation, and additional functionalities.

  "Add photos in the database table. Or use pictograms to describe the product, for example. Improve the presentation of the table, clarifying column separations."

  "No option found to select species to compare with, only possible via filter."

  "The database should have a visible button, instead of being hidden inside the search bar. The user should be able to search directly in the database (maybe another search bar next to the filters)."

  "More functionalities. E.g., focus on outcomes of ecosystem services. Carbon, biodiversity."

Information and data interpretation

Encouragement to sign up (Q13, Q14):

Score: 18/32 indicated that the application does not provide sufficient information to encourage farmers to sign up.

Key points:

- **Economic information:** many users highlighted the need for more detailed economic information, such as costs, subsidies, and yield data.
- **Practical agricultural data:** users expressed a desire for more practical, science-based information and shared experiences from other farmers.
- **Specific attributes:** additional information on specific attributes such as soil adaptation, optimal water depth, and detailed cultivar information was also mentioned.
  "Information about subsidies."
  "Economic information: cost of seedlings, and then input the yield data."
  "More information regarding the economic aspect."
  "I want to find science-based practical information, or experience-based stories of farmers."

Using data table (Q15a, Q15b):

Average score: 3.03 for ease of use and interpretation of the data table (1-5 scale, the lower the better)

Key points:

- Users suggested various improvements, focusing on clarifying objectives, enhancing visual elements, and improving navigation.
  "Clarify the objective of using the table. Find a tree adapted to a plantation. Can't we see publications of farmers that talk about one tree in the cultivar page?"
  "Maybe using symbols and colors."

Geographical filtering

Value of location-based filtering (Q16):

Average score: 2.21 (1-5 scale, the lower the more valued)

Observation forms

Data entry (Q17a, Q17b, Q17c, Q17d):

Average score: 2.82 for ease of entering data in the observation form (1-5 scale, the lower the better)

Key points:

- Users highlighted specific issues that made data entry challenging, such as language barriers and difficulty understanding certain data fields.

"Everything is in English. Some data are not easy to know (ex: plant hardiness zone)."

"The geolocalisation is not simple."

What would encourage farmers to submit observations?

"Intrinsic motivation."

"Better to ask them."

"It is above all the fact of being able to access experiences other than their own which would encourage them. Or get feedback on questions they ask themselves."

What would help you to be more active on the platform?

"Email recap e.g. 'Here's what you missed on Landfiles the last month.'"

"A competitive element e.g. 'You scored 10 points by contributing, 5 by commenting, 1 by liking.'"

"The email is a nice idea, but not a generic list of missed posts. Something like 'what other people reported for the same species you added,' 'someone reported having less costs / bigger yields then you, comment on that'..."

Landfiles groups and languages used

Diverse group participation: the responses show that users participated in a variety of groups, indicating a wide range of interests and contexts for testing the app.

Language diversity: the responses show a diverse range of languages used: Italian, English, Spanish, French, German, and Dutch.

General sentiment and suggestions

The co-development form responses highlighted several key areas for improvement in both the social networking and Treefiles components of the application. Users, particularly farmers, found initial navigation moderately difficult, with mixed feedback from researchers and advisors. Key issues included difficulty in finding groups, confusing translations, and the time-consuming nature of completing farm profiles. Interaction features like liking, commenting, and tagging were seen as needing clearer instructions and editing capabilities, while the use of forms for posting was often not well understood. Overall, the average scores for ease of use, posting, and form use were moderate, indicating a need for enhanced user guidance and simplification.

In the Treefiles section, users experienced language inconsistencies and suggested several improvements to enhance user experience, such as adding visual aids and making the database more accessible. The species comparison table and cultivar page received moderate scores for ease of use and visual attractiveness. Users expressed a need for more detailed economic information, practical agricultural data, and better data interpretation tools. The ability to filter based on geographical location was highly valued. Overall, respondents found the app beneficial but emphasised the need for improvements in usability, intuitiveness, and relevance to their specific roles.

Appendix 3 - Recommendations for improving the app based on co-development round feedback

Social networking aspects

First-time user experience

- Improve navigation and group access: simplify the navigation structure to make it easier for users to find groups and relevant features. Add a 'join group' step early in the onboarding process to help users connect with groups quickly.
- Enhance interface and usability: simplify tasks such as georeferencing publications and adding new species. Provide detailed help or tooltips for these specific tasks to assist users.
- Address translation issues: review and improve translations in all supported languages to ensure they are clear and intuitive. Conduct user testing in different languages to identify and address localization issues.
- Improve onboarding and guidance: implement interactive tutorials and tooltips to guide first-time users through the platform's features. Provide clear instructions for setting up profiles, farms, and groups.

Motivation to complete farm profiles

- Tailor user roles: allow non-farmers (e.g., researchers, advisors) to skip sections not relevant to them.
- Simplify information requirements: make it easier to enter farm details by allowing users to save progress and return later. Provide explanations for why certain information is needed.
- Provide in-person alternatives: encourage in-person sharing options through workshops or meetings to complement digital data entry.

Group creation and invitation

- Simplify group creation and invitation: improve the user interface for group creation and provide clearer guidance on administrative rights. Introduce more intuitive methods for inviting members, such as searching for registered users by tags or geographic location.
- Clarify administrator rights: provide clear documentation on the different rights and roles of administrators versus guests.

Posting photos and messages

- Enhance posting features: allow users to upload multiple photos at once and rotate photos as needed. Simplify the posting format to be more user-friendly, potentially drawing from familiar social media formats. Address translation issues to ensure clarity and ease of use in different languages.

Liking, commenting, and tagging

- Improve tagging instructions: provide clear guidance on how to tag users, possibly with tooltips or a brief tutorial.
- Enhance commenting features: allow users to edit their comments and reply to specific comments within a thread to improve conversation flow and user interaction.

Using forms

- Educate users on forms: provide clear explanations and tutorials on what forms are and how to use them.
- Increase form accessibility: ensure all forms are easily accessible and intuitive to use, possibly with a searchable form directory.
- Simplify forms: make forms easier to understand and use by simplifying their structure and providing clear instructions.
- Improve search functionality: implement search and grouping features within forms to help users find what they need more efficiently.

Group browsing and translation

- Enhance content quality: encourage more informative and relevant discussions within groups to increase their value to users.
- Promote active groups: highlight groups with high engagement and informative discussions to attract more users.
- Improve translation accuracy: enhance the translation algorithm to provide more accurate and reliable translations.
- User control over translations: allow users to manually adjust translations or switch languages more easily.

Treefiles

Species comparison table

- Improve navigation: simplify and streamline the path to access the species comparison table to make it easier for all users to find.
- User guidance: provide clear instructions or tooltips to guide users to the species comparison table.
- Enhance visual design: improve the visual design of the species comparison table to make it more engaging and attractive. incorporate more visual elements such as icons, colors, and images to make the table more visually appealing and easier to interpret.

Cultivar page

- Enhance visual design: focus on improving the aesthetic elements of the cultivar page to make it more visually appealing. This could include better use of colors, layout adjustments, and more engaging imagery.
- Consistency in design: ensure that the visual elements are consistently applied across the page to create a cohesive and attractive look.
- User feedback integration: conduct user testing to gather specific feedback on visual elements that users find appealing and areas they feel need enhancement.

Data language consistency

- Ensure complete translations: provide comprehensive translations for all elements of the data, including column names, comments, and specific details about the cultivar.
- Regular language updates: continuously update and refine language options to cover all aspects of the data displayed in the application.
- User reporting mechanism: encourage users to report translation issues directly within the application and ensure these reports are addressed promptly.

Comparison table usability

- Clarify table objectives: provide clear explanations of the data table's objectives and how to use it to find specific information.
- Enhance visual elements: incorporate symbols, colors, and infographics to improve the visual representation of data and make it easier to interpret.
- Improve navigation: ensure that users can easily search for specific data, maintain filter settings, and navigate back to previous results without losing their place.

Geographical filtering

- Enhance geographical filtering: prioritize improving the geographical filtering feature to ensure it meets user needs effectively.
- Highlight use cases: educate users on the benefits and potential use cases of geographical filtering to increase its perceived value among those who rated it lower.

- User feedback integration: collect more detailed feedback from users to understand specific needs and preferences regarding geographical filtering, and integrate these insights into feature development.

Data entry in observation form

- Simplify data entry: make the observation form more user-friendly by simplifying the data entry process and ensuring clarity in the form fields.
- Provide multilingual support: ensure the observation form is available in multiple languages to accommodate non-English speakers.
- Highlight practical benefits: emphasize the practical benefits of submitting observations, such as accessing valuable insights and feedback from other farmers.
- Create targeted projects: develop specific projects or groups that encourage farmers to submit observations related to particular themes or geographical locations.
- Implement regular updates: send regular email recaps and in-app notifications to keep users informed and engaged.
- Introduce gamification: add competitive elements, such as points and leaderboards, to incentivize user activity.
- Provide moderator feedback: ensure moderators actively provide feedback and recognition to encourage more user participation.

Landfiles groups and languages

- Leverage popular groups: focus on enhancing features and support within the frequently mentioned groups to improve the testing experience.
- Broaden group engagement: encourage participation in a wider variety of groups to gather diverse feedback and improve the app across different contexts.
- Localized user experience: tailor the user experience to accommodate different languages, making sure translations are accurate and culturally appropriate.

Landfiles: Peer to peer learning, the key to upscaling regenerative agriculture

Farmers have endured top-down communication for decades from engineers and scientists. We somehow forgot the most basic principle:

« he who knows is he who does »

Many farmers who chose to evolve toward regenerative agriculture have earned the title “farmer-researcher”. Thousands of farmers have gathered many successes and established best practices from trial&error. It is time to shoot down unnecessary trials and increase deployment.

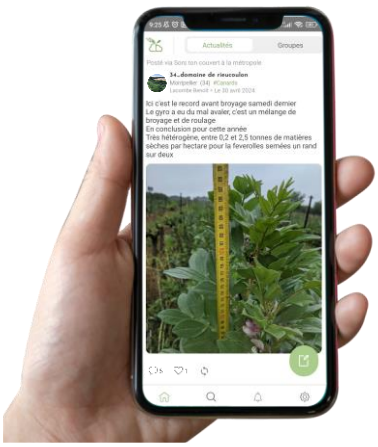
The development and implementation of new agro-ecological practices in Europe can be inspired by the wisdom of agile management in software development: « Build projects around motivated individuals. Give them the environment and support they need and trust them to get the job done. »

Digital Technology can support collective intelligence to transition toward sustainable agriculture.

Nicolas Minary grew up in a mid-mountain farm in the east of France and worked for 15 years in digital transformation: “I wanted to propose a digital tool that aggregates knowledge to accelerate the transition to ecological and sustainable agriculture”. He created Landfiles in 2017 with the support of several French agricultural institutes and the French Ministry of Agriculture. These institutions face several challenges:

- Excessive documentation or research, often unread, quickly forgotten, or inadequately indexed,
- Field experiments and successes that were overlooked or not advertised,
- Multiple financing of unconnected and under-used tools.

This results in a significant loss of time and money, as well as redundancies and loss of knowledge.



Landfiles is a multi-functional time-saving tool for farmers to improve sharing their experiences transforming agricultural communities.

A social network
With all the classic network features from Facebook and Whatsapp (share, comment, like), Landfiles is tailor-made for agronomy thanks to a specific organization - Group/Farm/Members - and the ability to search and consult plot histories.

A mobile app with offline functionality on top of a computer interface
Most of a farmer's working hours are spent on the ground—literally. What use could an app have for them if it doesn't work offline? With Landfiles, they can fill out surveys in the field whenever and however they wish.

An agronomy form manager
Landfiles has set up a user-friendly collaborative experimentation system, supported by a library of forms available to the group facilitator.

Each group can readily organize its own experiment, and there's also the option to coordinate experiments on a regional, national, or cross-linguistic scale.

In the last 8 years, Landfiles gained expertise in 49 crops and developed forms on 100+ agronomic topics, endorsed by French agricultural institutes. More than 6000 farmers have been sharing experiences in more than 450 groups.

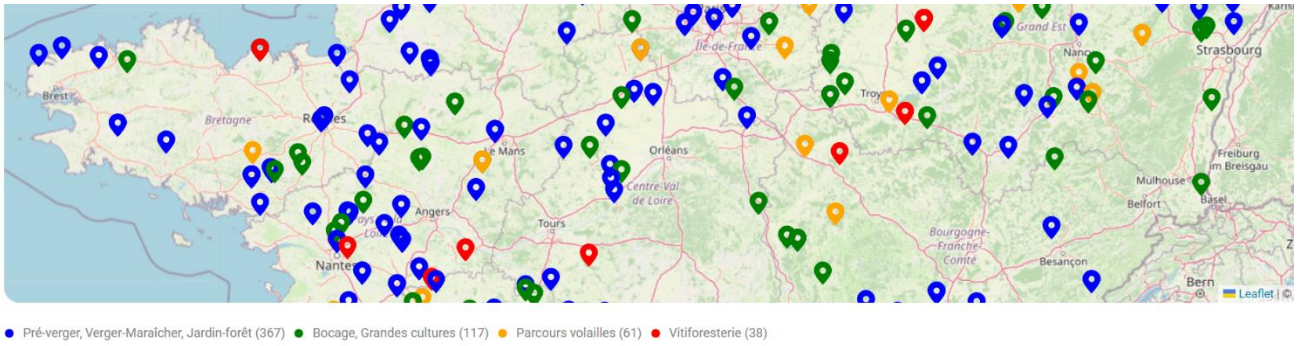
landfiles

A Reporting tool

For pilot groups, technicians, advisors and individual farmers, Landfiles enables the facilitator to customize maps and dashboards to monitor performance, at group or plot level.

Automatic summaries make the facilitoror's job easier, while alerts on missing data maximize the amount of data collected and help provide a real-time view of what's happening in the field.

A French agroforestry monitoring group created a simple map summary for easy access and understanding:

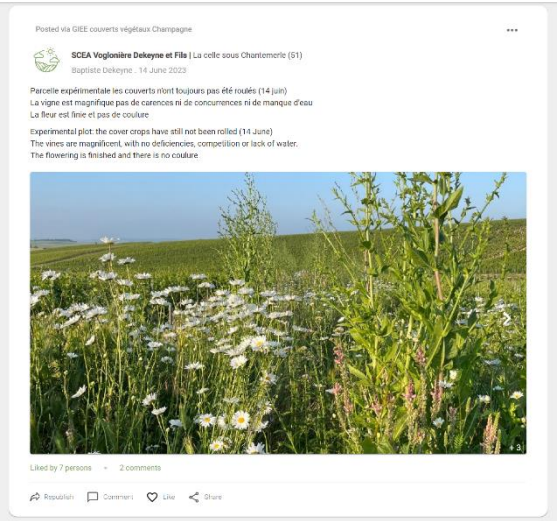


A diversified group with network effect makes for high performance.

The best groups on Landfiles platform include members with mixed job profiles (farmers, technical sales, researchers, agronomy engineers, etc.) and different types of leadership and team building skills. Landfiles provides a full set of services to help them (automated newsletters, data entry reminders, notification...).

When it comes to farming, farmers know best – and they know how to work together:

- To accelerate the validation of best practices or high-performing products,
- To monitor and alert on risks on their territory & crops,
- To demonstrate quality, trackability and collaborate with cooperatives.



Landfiles empowers farmers and their entire ecosystem.

Offered in 10 languages: Catalan, English, French, German, Italian, Dutch, Polish, Portuguese, Spanish and Serbian.

Test Landfiles, join the group **Treefiles - The collaborative tree knowledge sharing network** and consult several public groups experimenting with agroecological practices in Europe.

app.landfiles.com/join/treefiles

For more information and a demonstration, contact us: **nicolas@landfiles.com**

They support us :

Collaborative Networking

Interact

Comment, discuss and react to posts from other users.

Share

Post your own observations.

Explore

Groups and build your network.

Towards regenerative agriculture, **together.**

landfiles

agromix

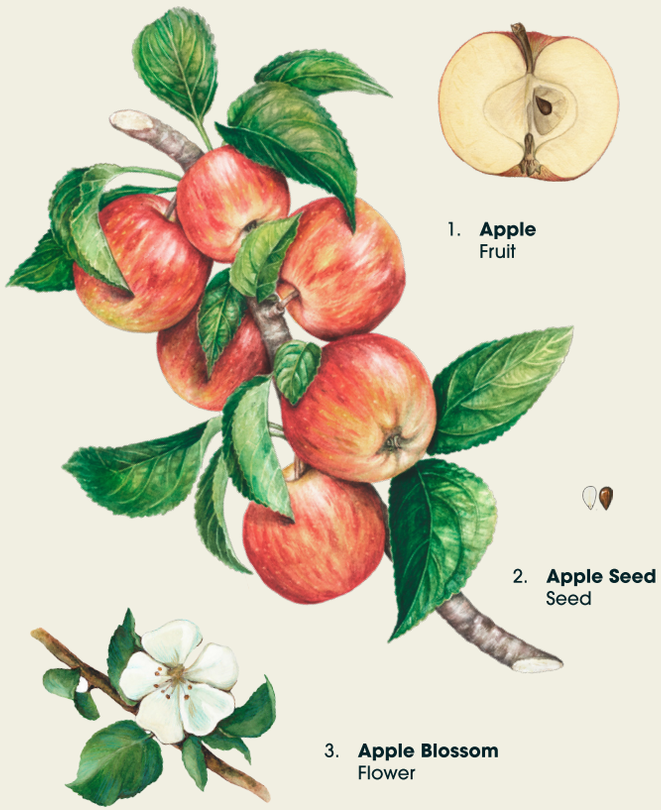
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 862993.

Treefiles

Finding the right trees for your plot

Apple Tree
Malus domestica

Time To Harvest	Growth Speed	Shade Tolerance	Drought Tolerance
1–5 years	Medium	Low	Low



1. **Apple**
   Fruit
2. **Apple Seed**
   Seed
3. **Apple Blossom**
   Flower

Welcome to Treefiles!

A collaborative app that helps you choose the right trees for your agroforestry system.

The Treefiles app, which is hosted on the Landfiles website and app, is a practical and social tool.

Gain access to a vast catalogue of species and cultivars, safely share your observations and connect with others.

You will always remain the owner of your data.

How to access

Treefiles website

1. Scan

Open the QR Code link and access the app.

2. Discover

Take a look around the Treefiles app.

3. Join

Sign up to unlock the full list of functions.

How to use

Search

Find the characteristics of individual species and cultivars.

Compare

Compare tree species and cultivars to find the best fit for your agroforestry plot.

Contribute

Share your observations with others and help to build the database.