MIXED
EFFICIENT AND RESILIENT
MIXED FARMING & AGROFORESTRY

| MIXED | |
|---|---|
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** Deliverable title to be requested changed via amendment from "Literature study and review of results from relevant research projects" to "Literature study and review of relevant research projects".*
*** Lead beneficiary to be requested changed via amendment from 6-INRAE to 1-AU.*
*Both changes have been agreed on at the MIXED General Assembly 15/9-21, and the PO has been informed.*

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# Summary

***Context***

*Task 3.1 is about the collaboration and possible connections between the MIXED project and other projects related to mixed systems. In such task it was envisaged to organize a joint seminar with the H2020 STARGATE project, in order to find possible axes of collaboration. In addition, we decided to involve the project H2020 AGROMIX, funded within the same call as AGROMIX. This report aims at completing the connections between MIXED and other projects. In order to achieve this, we aimed at: 1) exploring the scientific literature around mixed systems, 2) exploring the English-written projects related to mixed system, that were somehow connected to MIXED, STARGATE or AGROMIX, i.e., projects in which members of the consortiums of these three core projects are taking part (or took part). This review was to provide a basis of expertise that could be useful for future collaboration for the MIXED project.*

***Methods***

*The aim of deliverable D3.1 was to make an initial introductory overview of research projects and the wider literature on the topic of mixed farming in Europe, to use as a go-to resource for the further work in the MIXED Project and parallel research projects. The focus of the deliverable is to review the broadly identified projects across Europe, using a wide range of experts connected to the project MIXED within project seminars and questionnaires A literature review covering a large and broad topic such as 'mixed farming systems' is challenging, and the report makes recommendations towards a narrower discipline focused literature search approach. Concerning the research about linked projects, we organized an initial joint seminar with members of the consortium of MIXED, AGROMIX, and STARGATE. This seminar had the purpose of increasing the mutual knowledge among the projects. For implementing the review of related projects, we involved the participants at this seminar, asking them to indicate projects to which they are taking part (or took part). A list of relevant projects was then compiled and made available.*

***Results***

*As a research field, mixed farming has increased significantly since 2015 and with a noteworthy leap since 2018. Most of the funding towards mixed farming research is provided by the European Commission and 80% of the research is carried out by 6 countries alone. The data obtained from the literature search shows that agroforestry and mixed farming approaches, which incorporate trees and bushes, provide most of the data. The projects identified within this report also showed an overrepresentation of an agroforestry focus and especially highlighted that mixed systems research which include energy-crops is limited.*

***Considerations and implications***

*This study has involved collaborative work between project partners, including participants connected to both the MIXED, STARGATE, and AGROMIX projects, where many partners have agroforestry as a focus area, and this is what is relevant and useful to this project. Twenty-two projects were discarded from the analysis, due to not disseminating their research in English. All were from France, but probably additional projects take place in other countries in native languages, adding an an unknown bias which highlights a potential barrier for knowledge base sharing.*

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# 1 Introduction

The agricultural sector in Europe is increasingly under consideration as a sector which provides not only cultivated resources but also many other vital landscape-scale functions and services to society worldwide (OECD, 2001). Agricultural production must now increase its efficiency, whilst decreasing its impacts on natural resources and maximising contributions to climate change mitigation. At the same time, the agricultural sector needs to face challenges of environmental, economic, social, and institutional type (Meuwissen et al., 2019). Every food system, on many different levels and scales, therefore, must be managed for several purposes and become multifunctional.

Mixed farming, whereby crop-livestock integration occurs in many different approaches, is increasingly recognised as a potential agricultural management system that can overcome some of these challenges and provide multiple benefits regarding ecosystem service delivery (Martin et al., 2016; Kronberg and Ryschawy, 2019). Mixed farming practices have strong traditional, historic and cultural roots and precede modern farming approaches. However, as an object of scientific study and research it is still relatively young. Now, the scientific evidence base surrounding the sustainability, efficiency and resilience of mixed systems is relatively small, but significant and quickly expanding.

This report is delivered within the Work Package 3 of the 'MIXED Project' (Efficient and Resilient Mixed Farming and Agroforestry) and supports the development of mixed farming and agroforestry systems (MiFAS). Different levels are considered within the definition: farm, landscape, value chain, country and Europe. The main focus is agricultural outputs. One of the challenges of building up an evidence base regarding mixed farming systems is clarity surrounding defining these systems, as the term can be very broad. More information on defining MiFAS is found within the WP3, Deliverable 6.1 (Accatino et al., 2021).

In particular, Task T3.1 covers the collaborations between the MIXED projects and other projects. For this reason, we aim to have a basis upon which the MIXED project can build some networking around mixed systems. In the proposal writing phase, we identified the H2020 STARGATE project as a possible "sister project" for collaboration, as it was funded within the same call in the year 2019. We decided also to consider collaborating with the H2020 AGROMIX project, funded with the MIXED project in 2020. In line with the collaborative mindset of Task T3.1, we explored the set of English-communicated projects (in progress or terminated) that could be linked to the initial "nucleus" formed by MIXED, AGROMIX and STARGATE, related to mixed systems. In other words, we explored the projects related to mixed systems, in which researchers of MIXED, AGROMIX, or STARGATE were already involved, as it could provide a basis of initial expertise. In addition, we explored the scientific literature around mixed systems. Therefore, report provides 1. an introductory literature review of mixed farming and agroforestry and 2. an overview of relevant research projects having mixed systems as object, both with a Europe focus. We aim to deliver this in a user-friendly and clear approach, so that it can be used as a useful initial resource for guidance and future work within the MIXED project and by its project partners.

# 2 Methods & materials

The challenge for this report has been to obtain a balance between ensuring that the topic is covered in-depth within a bibliographic search but also creating an output that is relevant and usable. Mixed farming is a very broad concept and the complexity surrounding its definition can pose challenges on the selection between what is included and what is not. The report is therefore delivered with the acknowledgement that it may include cases that are within the periphery of what would be considered mixed farming and agroforestry. Additionally, literature reviews about mixed farming systems are already published in the literature (see e.g., Martin et al., 2016), and our analysis of the literature is therefore on a qualitative and descriptive level instead. The emphasis of our analysis is mostly on the review of mixed farming systems addressed in other projects, as this type of analysis has never been carried out in scientific papers. This is of much interest to the MIXED project, because it provides an inventory of methods and research questions already addressed in other projects, that could be of inspiration and, collecting information about other pertinent project was a way to connect to other project leaders and participants.

## 2.1 Literature review

A systematic literature search was carried out on the 6th of September 2021 using a search string of keywords developed around the concept term 'Mixed Farming Systems' (see appendix I). Firstly, a Topic search was conducted in Web of Science, focusing on peer-reviewed articles (including reviews and research papers). We considered the timespan between 1900 and 2021, including only European focused research. This decision was made because mixed farming can be highly context-specific and can assume different forms in different continents. We restrict therefore our analysis to the European context which is the most relevant for the case studies of the MIXED project. Further qualitative refinement insured the regional focus and excluded non-related research. Full search string can be found in appendix I and a citation report in appendix IV.

A descriptive analysis was carried out to identify historic and geographic trends and funding sources behind the publications, within the data and proportional representation of sub-topics. A further focus was made on establishing the proportional difference between occurrence of organic and conventional farming systems in the literature, by carrying out an abstract search for keywords associated with each sub-topic. An attempt was made at linking and categorising with respect to the WP3 D6.1 'MIXED assessment framework report', but the result was not functional for this initial review, as many mixed systems operate at multiple levels. But synergies between this report and the D6.1 report will become apparent in more comprehensive analyses further in the project.

## 2.1 Project review

The project review aims to provide an insight into the landscape of MiFAS research projects in Europe, by identifying and cataloguing relevant current and past projects. As part of WP3, a milestone (M3.1) consisted in organizing a joint workshop with sister projects (i.e., projects funded with the same Horizon call in the same year or previous year); the project STARGATE (www.stargate-h2020.eu) and the project AGROMIX (https://agromixproject.eu). This joint seminar was held on June 14th, 2021 and served for building collaborations among project members and for identifying future points for joint work and scientific debate. That meeting was a very good opportunity for identifying people that already worked on projects (European

and national) related to mixed farming and for this reason, participants was contacted with an email enquiry to aid in the identification of relevant projects to include.

The data obtained from the two approaches was screened and catalogued in a matrix table, whereby each project was shortly introduced, and its focus areas identified using a 'tick-off' option in the categories of: 'organic', 'conventional', 'crop-livestock', 'crop-crop' 'energy-crops', 'agroforestry' and 'networking'. These categories were very broad themes and the rationale behind this is to provide an easily navigated go-to resource for information. Projects which were not disseminating their research in English were discarded. The reasoning behind this was that projects that was not disseminating their results in in English, were of little use to project partners. The MIXED project is a collaborative multi-national project and to remain inclusive to all, a shared language for dissemination is needed. Project partners were consulted in this decision and agreed that this was a the most useful approach. Furthermore, this exclusion criteria were applied to all and therefore avoided a bias in project selection.

# 3 Results

## 3.1 Literature review

The initial result from the literature search was 1,296 records. A further manual qualitative refinement was performed for ensuring topic relevance and for checking the geographic region (Europe). This reduced the dataset to 882 records. The number of publications per year is represented in figure 1. The data shows that the first European article which focused on mixed farming was published in 1984 and that the number of publications has steadily increased since. In 2018 the number of publications increased even more considerably. Six countries account for producing most of the data (80%), namely Spain, Germany, France, England, Italy and Portugal – figure 2. Table 1 show that the largest funding agency for studying mixed farming systems is the European Union, although the data behind the funding records are not complete. Organic farming is very underrepresented within the dataset with only 38 records of a total of 882. And the majority of these are from 2012 and onwards.

Figure 3 shows that the field of mixed farming systems is the subject of research in different disciplines, ranging from few contributions in disciplines such as entomology and urban studies to numerically strong contributors like forestry, which encompasses agroforestry-related publications. Figure 4 gives an example of how 5 broad diverse disciplines, such as forestry, water resources, energy fuels, biodiversity conservation and social science have developed since 1984, where the first mixed farming system publication occurred. The connection between MiFAS and biodiversity conservation has been explored consistently much earlier than other disciplines and the focus of social science and energy fuels is a relative new approach from 2007 onwards.

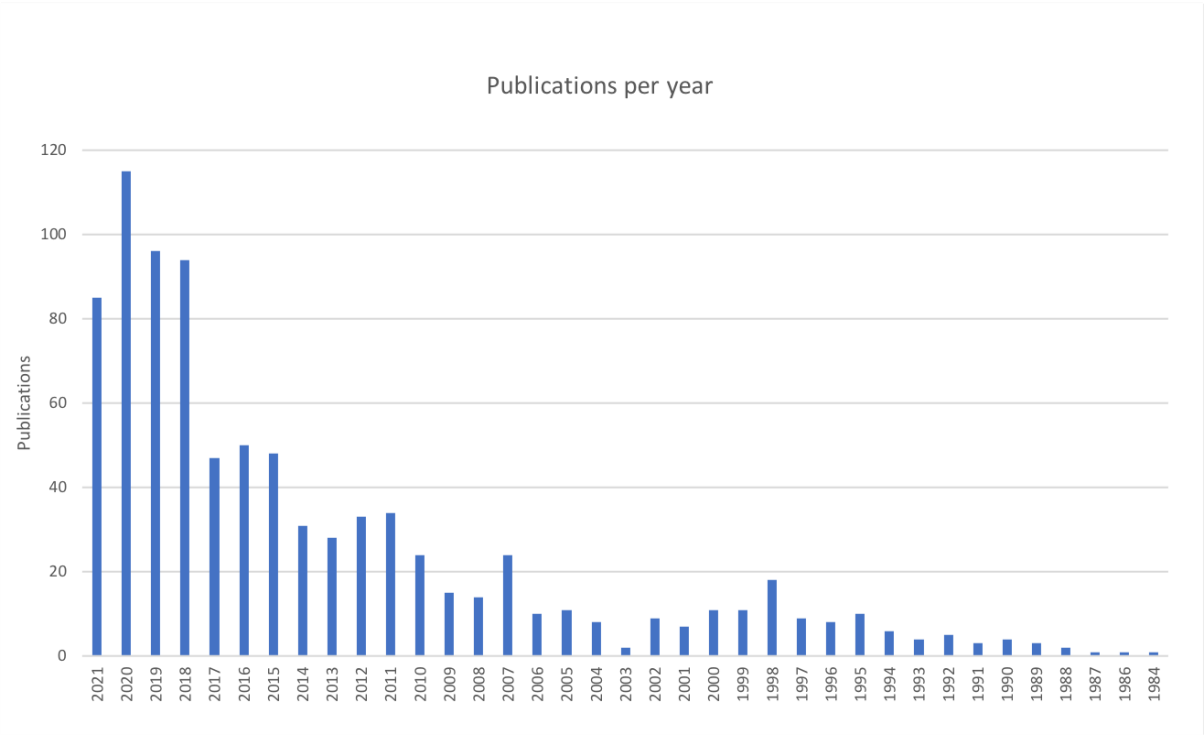


*Figure 1 – Number of publications from 1984 to present*

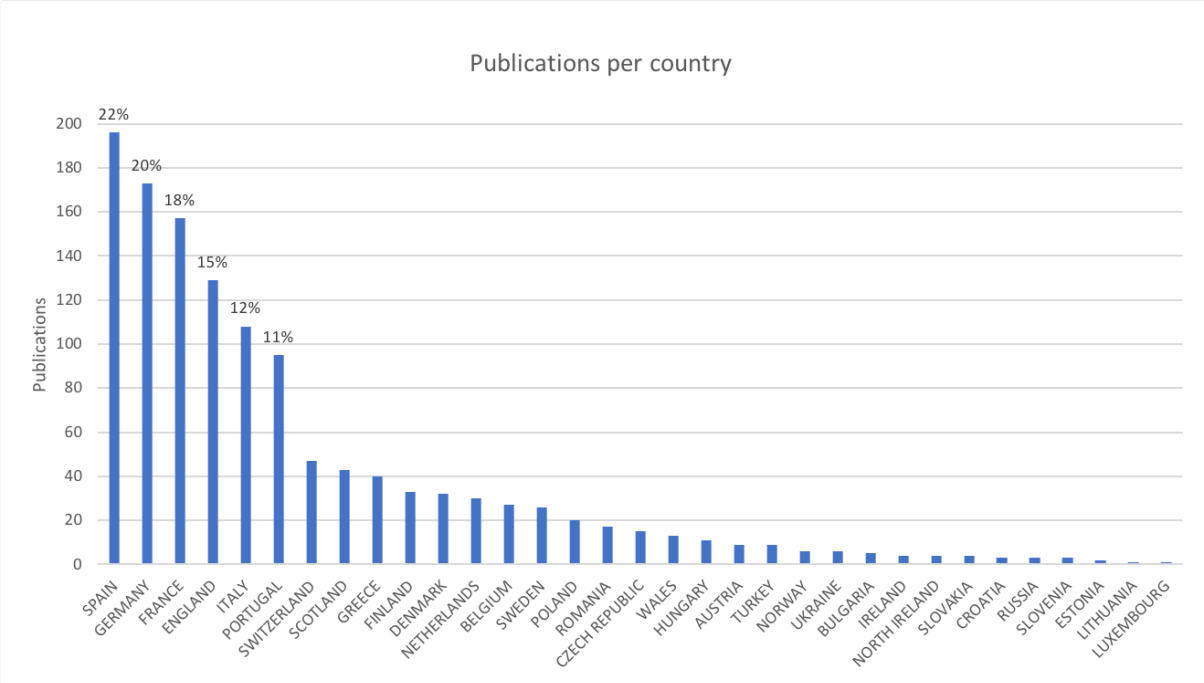


*Figure 2 – Number of publications by country*

| Funding Agencies | Record Count | % |
|---|---|---|
| European Commission | 101 | 11 |
| Portuguese Foundation For Science And Technology | 40 | 5 |
| Federal Ministry Of Education Research | 37 | 4 |
| Spanish Government | 25 | 3 |
| Foundation De France | 23 | 3 |
| German Research Foundation | 23 | 3 |
| European Commission Joint Research Centre | 20 | 2 |
| UK Research Innovation | 20 | 2 |
| Natural Environment Research Council | 19 | 2 |
| French National Research Agency | 15 | 2 |

*Table 1 – top 10 funding agencies. Note that the percentage is calculated out of 684 (42%) entries and not the total dataset, as 336 (38%) records did not contain funding data.*

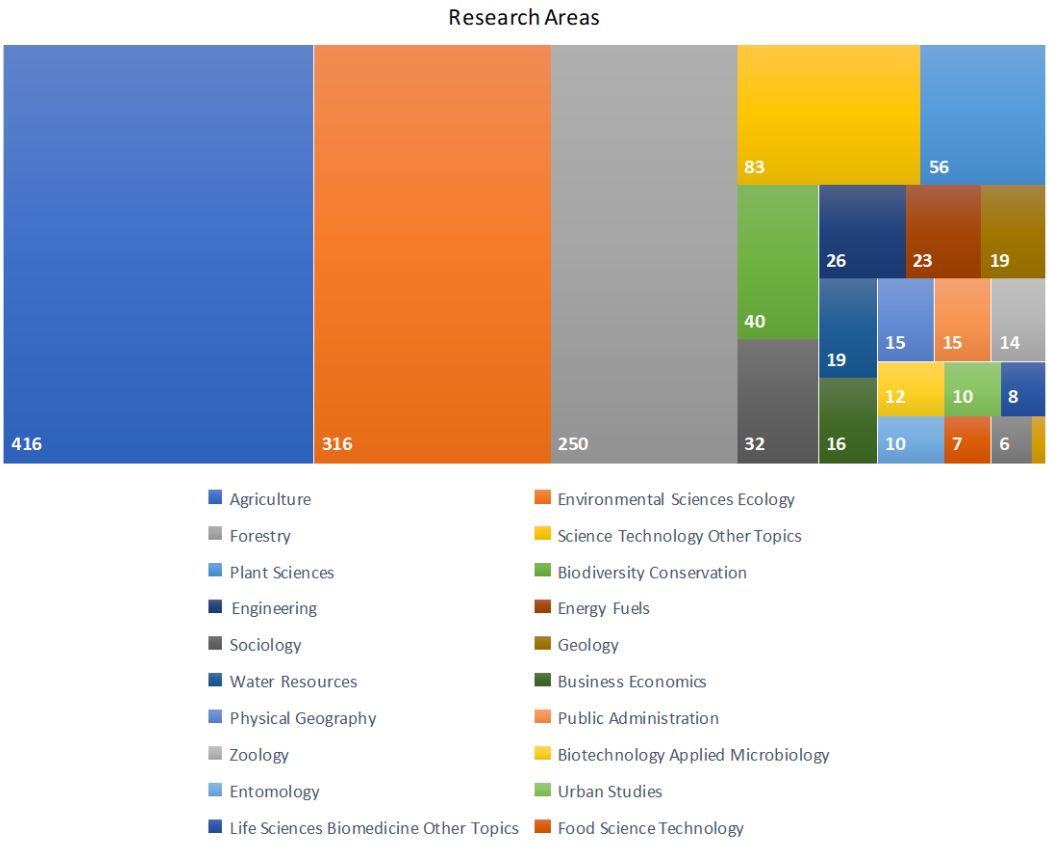


*Figure 3 – Publications by research area*

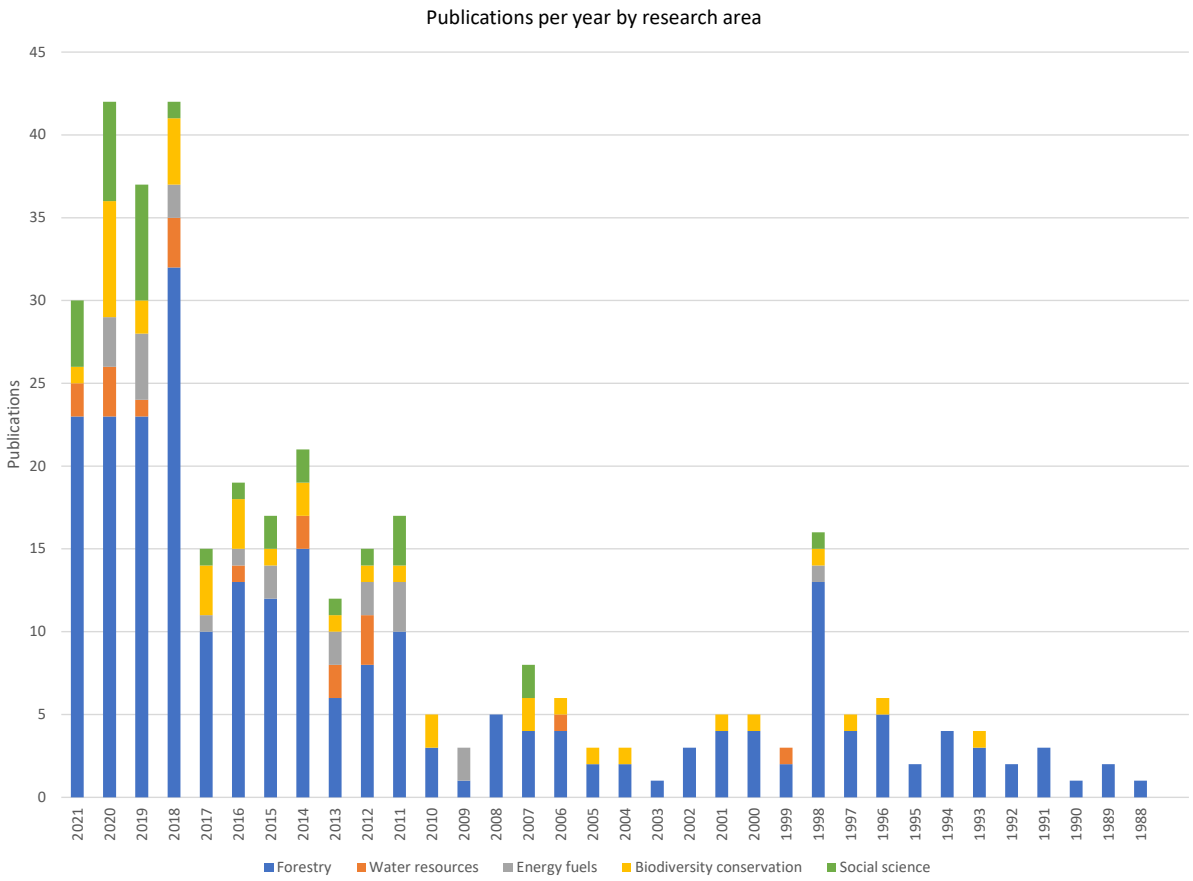


*Figure 4 – Proportional differences between selected broader research areas per year within the data set*

## 3.2 Project review

The initial project review resulted in the identification of 24 research projects related to mixed farming in Europe. In the follow-up email enquiry, a further 28 projects were identified, which totalled 52 projects. Projects which were not disseminating their research in English (all from France) were discarded (22). The projects were inserted in table 2, referred to as "Project Matrix" and catalogued the identified projects within the following focus areas: 'organic' (13), 'conventional' (3), 'agroforestry' (21) 'crop-livestock' (11), 'crop-crop' (12) 'energy-crops' (2), and 'networking' (17). There was often an overlap between focus areas and although all projects had an element of research, then some were related to practical farming, advocacy groups or professional organisations.

The results show that within the identified projects there is a tendency towards mixed systems that focus on organic as opposed to conventional farming approaches and, similarly to the literature search, agroforestry is well represented. Energy crop focused projects are not well represented, again a pattern similar to the literature study. Exchange of knowledge, networking and implementation features high and is an area that is given importance.

*Table 2 – Project matrix, which introduces relevant mixed farming projects and certain focus areas. Contact details for each project in appendix III.*

| ID | Acronym | Description | Scale | Organic | Conventional | Agroforestry | Crop-livestock | Crop-crop | Energy crop | Network |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | AFINET | The project will build a forum aimed at fostering the exchanging of knowledge between scientists and practitioners in agroforestry. | EU | | | x | | | | x |
| 2 | AGFORWARD | The overall aim of the project is to promote agroforestry practices in Europe to advance rural development i.e. improved competitiveness, and social and environmental enhancement | EU | | | x | x | x | | x |
| 3 | Agricology | The ultimate aim is to become the 'go-to' resource for farmers and landowners who will be juggling demands of food production. The project provides a national network of agroforestry farms. | UK | | | x | | | | |
| 4 | AgriLink | The project will link farmers, advisors and researchers to boost innovation on the wide variety of different farm types that exists in Europe. | EU | | | | | | | x |
| 5 | Agroforestry ELM | The aim is to design an environmental land management system for UK agroforestry. The project investigates two factors, payment incentives and advice and guidance that are significant barriers to increased uptake of agroforestry by UK farmers. | UK | | | x | | | | |
| 6 | AGROMIX | AGROMIX bring together farmers, researchers and policymakers to increase agricultural sustainability. They explore solutions and develop new tools for a more resilient land use in Europe. | EU | | | x | | | | x |
| 7 | ALL-Ready | ALL-Ready aims to prepare a framework for a future European network of Living Labs (LL) and Research Infrastructures (IR) that will enable the transition towards agroecology throughout Europe. | EU | | | | | | | x |

| ID | Acronym | Description | Scale | Organic | Conventional | Agroforestry | Crop-livestock | Crop-crop | Energy crop | Network |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | ARBRATA-TOUILLE | The project aims at improving our knowledge on interactions between trees and vegetable production, and to propose new perspectives for agroforestry system conception and management. | F | | | x | | | | |
| 9 | Bezdínek Farm | The project considers one farm where the aim is to optimise crop and animal production through a hi-tech hydroponic greenhouse for year-round vegetable growing. | CZ | | | | x | | | |
| 10 | BIOEAST | The project seeksseek to develop knowledge and cooperation based circular bioeconomies, to enhance growth and create jobs especially in rural areas while maintaining or even strengthening environmental sustainability. | EU | | | | | | | (x) |
| 11 | BIOVINE | The project will develop natural solutions based on plant diversity to control pests. | EU | x | | | | x | | |
| 12 | BRANCHES | The project will facilitate sharing of information, new ideas and technologies among European agriculture and forestry – especially in rural areas. | EU | | | x | | | | x |
| 13 | CanTogether | The project will design innovative sustainable mixed farming systems and define the best systems based on economy and environment. | EU | | | | x | | | |
| 14 | Co-Free | The project aims to replace the use of copper in European organic and low input fruit, grapevine, potato, and tomato production systems. More specifically the agro-forestry based apple system will be investigated. | EU | x | | x | | | | |
| 15 | CONSOLE | The project focuses on developing the agri-environmental public goods that are delivered by agriculture and forestry by improving the relationship between the public administration and the farmers. | EU | | | x | | | | x |

| ID | Acronym | Description | Scale | Organic | Conventional | Agroforestry | Crop-livestock | Crop-crop | Energy crop | Network |
|---|---|---|---|---|---|---|---|---|---|---|
| 16 | CORE Organic Cofund | CORE Organic is an ERA-NET - a network of European ministries and research councils funding research in organic food systems at national levels. | EU | x | | | | | | |
| 17 | CropBooster-P | The aim is to increase crop production without compromise. The project will evaluate the most promising systems, evaluate economic, social and environmental impacts, and build international networks. | EU | | | | | x | | x |
| 18 | DiverIMPACTS | The goal is to increase plant diversification through rotation and intercropping and arable/livestock interactions to increase sustainability. The project will focus on how to remove existing barriers to ensure implementation in rural areas. | EU | | | | x | x | | |
| 19 | DOMINO | The project seek to demonstrate that innovative orchard management can enhance soil fertility, biodiversity and economic sustainability of intensive organic fruit orchards by the use of e.g. secondary crops. | EU | x | | | | x | | |
| 20 | DSCATT | The focus of this project is an Agricultural intensification and soil carbon sequestration in tropical and temperate farming systems while increasing local food security. | F EAK ZW, SN | | | x | x | x | | |
| 21 | EFFECT | The project aims to analyse, develop and test contract frameworks within environmental quality, economic sustainability, interdisciplinary research and stakeholder demands and needs. | EU | | | | | | | |
| 22 | EUdaphobase | The ultimate goal of EUdaphobase is to establish a pan- European soil-biological data and knowledge warehouse, which can be used for understanding, protecting and sustainably managing soils, their biodiversity and functions. | EU | | | | | | | x |

| ID | Acronym | Description | Scale | Organic | Conventional | Agroforestry | Crop-livestock | Crop-crop | Energy crop | Network |
|---|---|---|---|---|---|---|---|---|---|---|
| 23 | EUREKA | EUREKA brings together diverse partnerships through optimizing an open source e-platform (the FarmBook). | EU | | | | | | | x |
| 24 | FarmLife | The project contributes to a climate-resilient Europe by developing and demonstrating innovative adaptation technologies and approaches for the transition of conventional agriculture towards climate resilient agroforestry. | EU | | | x | | | | |
| 25 | Fodder trees | The project aims at developing the outdoor environment of organic livestock through the introduction of trees (fodder trees). | B/N | x | | x | x | | | |
| 26 | FRAMEwork | The main focus is on how to improve and sustain biodiversity and thereby benefit agriculture. The project seek to strengthen local groups and sharing share of international research. | EU | | | | | | | x |
| 27 | GreenResilient | The main objective of the project is to demonstrate that an agroecological approach to greenhouse production is feasible and allows the establishment of robust agroecosystems in different European areas. | EU | x | | | | x | | |
| 28 | ICT-AGRI-FOOD | The project wants to underpin the transition towards more sustainable and resilient agri-food systems with digital technology. Data from the entire food chain is used for this purpose. | EU | | | | | | | |
| 29 | Legcombio | The project focuses on poultry and the use of space by the chickens, the impact on soil quality, the impact on crop yield (poultry in combination with berry), plant quality and health, economic feasibility / added value, management and the legislative framework. Poultry in combination with berry. | B/N | | | | x | | | |

| ID | Acronym | Description | Scale | Organic | Conventional | Agroforestry | Crop-livestock | Crop-crop | Energy crop | Network |
|---|---|---|---|---|---|---|---|---|---|---|
| 30 | LIASON | The project aims to understand better what makes a successful partnership for innovation in business between agriculture, forestry and rural business. | EU | | | | | | | x |
| 31 | LIFE-MONTADO-ADAPT | The project aims at promoting the adaptation of the Montado/Dehesa system in Portugal and Spain. | P, E | | | x | | | | |
| 32 | LIFT | The goal is to identify the potential benefits of the adoption of ecological farming in the European Union (EU) and to understand how socio-economic and policy factors impact the adoption, performance and sustainability of ecological farming at various scales, from the level of the single farm to that of a territory. | EU | x | | | x | x | | |
| 33 | Mix-Enable | The project will explore the conditions of sustainability and robustness of organic mixed livestock farms in Europe. At farm scale and together with farmers, a more integrated, sustainable, and robust organic mixed livestock system is tested. | EU | x | | x | | | | |
| 34 | MIXED | The project explores the benefits of mixed farming and agroforestry systems to climate, environment and society and supports the further development of such systems. | EU | x | x | x | x | x | x | x |
| 35 | NEFERTITI | The overall objective is to establish an EU-wide highly connected network of demonstration and pilot farms designed to enhance knowledge exchanges through peer-to-peer demonstration of techniques on 10 major agricultural challenges in Europe. | EU | | | | | | | x |
| 36 | OPTAIN | The project aims to identify efficient and easy-to-implement techniques for the retention and reuse of water and nutrients in small agricultural catchments across Boreal, Continental, and Pannonian regions. | EU | | | | | | | |

| ID | Acronym | Description | Scale | Organic | Conventional | Agroforestry | Crop-livestock | Crop-crop | Energy crop | Network |
|---|---|---|---|---|---|---|---|---|---|---|
| 37 | P'Orchard | Pig farmers will work together and use agroforestry to set up an outdoor area for pigs. Knowledge, experience and innovative ideas from different pig farmers and other stakeholders will be brought together, exchanged and possible bottlenecks will be jointly identified. | B/N | | | x | | | | x |
| 38 | PolyFarming | Demonstration project of an agro-silvo-pastoral integrated management system to lower land abandonment, improve environmental, social and economic sustainability in mediterranean mountain areas. | EU | | | x | | | | |
| 39 | Prodehesa Montado | The project aims to promote actions to add value to the Spanish dehesas and Portuguese montados from a sustainable development perspective. | S/I | | | x | | | | |
| 40 | Remix | The project will allow designing cropping systems based on agro-ecology for the benefit of farmers and the whole EU agricultural community using e.g. intercropping, species mixtures. | EU | x | x | | | x | | |
| 41 | SAFE | The project is concerned with silvoarable agroforestry with including widely-spaced trees intercropped with arable crops. | | | | x | | | | |
| 42 | SHOWCASE | The project aims to achieve understanding of the integration of biodiversity into farming in the field of agroecology, socioeconomy, science networks, science communication specialists and nature conservation. | EU | | | | | | | x |
| 43 | SOLID | The project aim to evaluate competitiveness and environmental sustainability of organic and low-input systems (feeding of ruminants with forage-based diets and home-grown feeds). | EU | x | | | x | | | |

| ID | Acronym | Description | Scale | Organic | Conventional | Agroforestry | Crop-livestock | Crop-crop | Energy crop | Network |
|---|---|---|---|---|---|---|---|---|---|---|
| 44 | SPEAL | Participatory selection of annual or woody species adapted to agroecological practices | | | | x | | | | |
| 45 | STARGATE | The project is focused on integrating data on sustainable productivity and microclimate features to provide a better model for policymakers | EU | | | | x | x | | |
| 46 | SURE-FARM | The project aims at developing a framework to measure resilience, understanding farmers risk behaviour, assess farm demographics, and construct a roadmap for implementation. | EU | | x | | | | | |
| 47 | SureVeg | The projects aim at making the vegetable production more sustainable. The systems are based on strip-cropping, and fertility strategies combined from recycling of waste and plant-based soil-improvers and fertilizers. | EU | x | | | | x | | |
| 48 | SustainFARM | The project focus is innovative and sustainable intensification of integrated food and non-food systems to develop climate-resilient agro-ecosystems in Europe. | EU | | | | | | | |
| 49 | TWECOM | The project embraces the economic potential of using biomass from landscape elements (such as hedges) for local energy or heat production with respect for the current ecological, cultural and social functions that these landscape elements fulfil. | EU | | | | | | x | |
| 50 | WaterAGRI | The project focus is integrated water resource management of small agricultural catchments to improve both European agricultural production and the status of ecosystems | EU | | | | | | | |
| 51 | Weidescherm | The project aims at determining adequate planting as shelter for animals that are kept outside. | B/N | | | x | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 52 | WOOFS | The project investigating the benefits of linking woodchips to increased soil health and structure. | | x | | | | | | |

# 4 Perspectives

The literature and project review were carried out to provide an initial introduction and understanding for the European landscape of MiFAS research. The MIXED project is collaborative and about sharing knowledge between partners. This review is therefore carried out within this mindset and furthermore aiming to be complementary to other analytical reviews and knowledge bases. The literature overview generated a database of literature bibliography of 882 records and a Project Matrix of 52 projects and their focus areas. The report has carried out a descriptive introduction to the dataset. The data does, however, have limitations and we acknowledge that there are more in-depth reviews available, such as Martin et al. (2016) and Sekaran et al. (2021). Carrying out a broad literature search on the concept of MiFAS is challenging, and this overview acts as a complementary and preliminary report to the WP3 D6.1 Framework deliverable (Accatino et al., 2021) wherein a stronger focus on the sub-topics is available. MiFAS exist on many levels, and this is not well defined in the literature. There is also confusion about what constitutes a MiFAS even within projects and academic departments. It would therefore be beneficial for further research that investigates transition to MiFAS and the performance (sustainability, efficiency, resilience etc.) of these systems to investigate the evidence-base on sub-topic level instead. This is especially true for MiFAS that consists of crop-crop systems as these may not be identified in a general MiFAS search.

Another limitation of the literature search may be that farms and landscapes that would fall under the category of MiFAS have not been described as 'mixed system' until recently. Our method tried to mitigate this by using several words in the search string. Organic farming may be particularly susceptive to this, as organic farming systems often are within the definition of a MiFAS system but may not identify themselves as such. This could explain why organic farming was underrepresented within the data, especially since organic MiFAS systems are well represented in the identified project matrix.

The results confirmed that looking at farming systems with a MiFAS approach is a growing field of research. It is however interesting to note that within Europe, 80% of this research is generated by 6 countries alone. Also, within the project matrix, 22 projects from France were discarded due to not disseminating their project outcomes in English. The outputs from these projects could have added to the evidence-base and the report recommends that this should be considered by project teams.

Agroforestry represents most of the data, both within the literature and the project matrix. This is noteworthy and the reason should be considered. Perhaps agroforestry as a concept is well defined, in comparison to for example crop-crop farming systems or mixed-energy crop systems. Overrepresentation within the project matrix may be explained by the fact that the data sampling was carried out in collaboration with project partners and participators from a recent joint event between the MIXED, AGROMIX and STARGATE projects. The project does, however, provide a novel catalogue of projects relevant to all project partners, but also the wider academic, farming and advisory sectors, that carries out work with farming of a mixed nature. It is to be considered, that during the joint seminar, we found more points in common with the AGROMIX project than with the STARGATE project, as the AGROMIX project is really focused on promoting "mixedness" in landscapes.

For future interactions, we therefore envisage organising more joint activities with the AGROMIX project than with the originally-identified STARGATE project. However, the aim is to promote open seminars and activities of relevance for all European projects and interested stakeholders, for the benefit of Research and Development within the field of MIXED Farming Systems and Agroforestry in Europe, in line with the ongoing triumvirate seminar series coorganized by MIXED, STARGATE and AGROMIX.

Next steps forward from this initial review of literature and projects would be to contact all projects within the Project Matrix for data sampling of potential outputs from each project. This would aid the overall aim of WP3 to assess efficiency, sustainability and resilience, of landscapes from a bottom-up and from a top-down approach. A further step would be to gain an increased understanding for the evidence-base of MiFAS on the different levels (farm, landscape, value chain, country and Europe), identified in the WP3 D6.1 framework.

# 5 Appendix

## 5.1 Appendix I – Literature search string

Query link:

https://www.webofscience.com/wos/woscc/summary/26ff3d9a-21e1-4670-96ba-dee0fda559ad-070a1895/relevance/1

(TS=(“mixed farm* system*” OR “agricultural diversification*” OR “agricultural diversity” OR “crop-livestock integration” OR ”integrated crop-livestock system” OR “mixed crop-livestock systems” OR agroforestry)) NOT (DT==("PROCEEDINGS PAPER" OR "EARLY ACCESS" OR "EDITORIAL MATERIAL" OR "BOOK REVIEW" OR "MEETING ABSTRACT" OR "CORRECTION" OR "BOOK CHAPTER" OR "NEWS ITEM" OR "NOTE" OR "LETTER" OR "DATA PAPER" OR "RETRACTED PUBLICATION" OR "DISCUSSION" OR "REPRINT") OR CU==("USA" OR "BRAZIL" OR "INDIA" OR "PEOPLES R CHINA") OR CU==("KENYA" OR "AUSTRALIA" OR "CANADA" OR "INDONESIA" OR "MEXICO" OR "ETHIOPIA" OR "COSTA RICA" OR "CAMEROON" OR "COLOMBIA" OR "NIGERIA" OR "SOUTH AFRICA" OR "JAPAN") OR CU==("GHANA" OR "THAILAND" OR "BENIN" OR "BURKINA FASO" OR "CHILE" OR "NEW ZEALAND" OR "PHILIPPINES" OR "UGANDA" OR "PERU" OR "MALI" OR "SENEGAL" OR "ARGENTINA" OR "MALAWI" OR "BANGLADESH" OR "ECUADOR" OR "CUBA" OR "PAKISTAN" OR "TANZANIA" OR "MALAYSIA" OR "ZAMBIA") OR CU==("MOROCCO" OR "IRAN" OR "ZIMBABWE" OR "VENEZUELA" OR "MADAGASCAR" OR "SRI LANKA" OR "EGYPT" OR "BOLIVIA" OR "ISRAEL" OR "NEPAL" OR "COTE IVOIRE" OR "SUDAN" OR "TUNISIA" OR "SOUTH KOREA" OR "RWANDA" OR "VIETNAM" OR "NIGER" OR "FED REP GER" OR "SYRIA" OR "DEM REP CONGO" OR "SAUDI ARABIA" OR "KYRGYZSTAN" OR "ALGERIA" OR "NICARAGUA" OR "TRINIDAD TOBAGO" OR "KAZAKHSTAN" OR "SIERRA LEONE" OR "SINGAPORE" OR "TAIWAN" OR "URUGUAY" OR "COMOROS" OR "FIJI" OR "GEORGIA" OR "GUINEA" OR "HAITI" OR "HONDURAS") OR CU==("W IND ASSOC ST" OR "UZBEKISTAN" OR "U ARAB EMIRATES" OR "SOMALIA" OR "SENEGAMBIA" OR "SAO TOME PRIN" OR "QATAR" OR "PAPUA N GUINEA" OR "OMAN" OR "NEW CALEDONIA" OR "PANAMA" OR "LESOTHO" OR "JORDAN" OR "GUYANA" OR "GABON" OR "EL SALVADOR" OR "CAMBODIA" OR "BOSNIA HERCEG" OR "ALBANIA" OR "SERBIA" OR "REP CONGO" OR "NAMIBIA" OR "MOZAMBIQUE" OR "MOLDOVA" OR "GUINEA BISSAU" OR "DOMINICAN REP" OR "BRUNEI" OR "BOTSWANA" OR "BELARUS" OR "VANUATU" OR "TOGO") OR TASCA==("VETERINARY SCIENCES" OR "METEOROLOGY ATMOSPHERIC SCIENCES" OR "CHEMISTRY ANALYTICAL" OR "IMAGING SCIENCE PHOTOGRAPHIC TECHNOLOGY" OR "TRANSPORTATION SCIENCE TECHNOLOGY" OR "ENGINEERING CHEMICAL" OR "CHEMISTRY MULTIDISCIPLINARY" OR "COMPUTER SCIENCE INTERDISCIPLINARY APPLICATIONS" OR "MATERIALS SCIENCE MULTIDISCIPLINARY" OR "CHEMISTRY APPLIED" OR "HISTORY PHILOSOPHY OF SCIENCE" OR "BIOCHEMISTRY MOLECULAR BIOLOGY" OR "COMPUTER SCIENCE INFORMATION SYSTEMS" OR "ENGINEERING MULTIDISCIPLINARY" OR "HOSPITALITY LEISURE SPORT TOURISM" OR "INSTRUMENTS INSTRUMENTATION" OR "PHARMACOLOGY PHARMACY" OR "PHYSICS APPLIED" OR "PUBLIC ENVIRONMENTAL OCCUPATIONAL HEALTH" OR "SPECTROSCOPY" OR "THERMODYNAMICS" OR "BIOCHEMICAL RESEARCH METHODS" OR "CHEMISTRY PHYSICAL" OR "CONSTRUCTION BUILDING TECHNOLOGY" OR "ENGINEERING ELECTRICAL ELECTRONIC" OR "LIMNOLOGY" OR "MATERIALS SCIENCE PAPER WOOD" OR "MATHEMATICAL COMPUTATIONAL BIOLOGY" OR "ARCHITECTURE" OR "BUSINESS" OR "CELL BIOLOGY" OR "CHEMISTRY ORGANIC" OR "COMPUTER SCIENCE ARTIFICIAL INTELLIGENCE" OR "ENDOCRINOLOGY METABOLISM" OR "ENGINEERING GEOLOGICAL" OR "GEOCHEMISTRY GEOPHYSICS" OR "HUMANITIES MULTIDISCIPLINARY" OR "INFORMATION SCIENCE LIBRARY SCIENCE" OR "MATERIALS SCIENCE COMPOSITES" OR "MATHEMATICS APPLIED" OR "METALLURGY METALLURGICAL ENGINEERING" OR "MYCOLOGY" OR "PALEONTOLOGY" OR "PHYSICS CONDENSED MATTER" OR "PSYCHOLOGY BIOLOGICAL" OR "PSYCHOLOGY MULTIDISCIPLINARY" OR "SOCIAL ISSUES" OR "SOCIAL SCIENCES MATHEMATICAL METHODS" OR "STATISTICS PROBABILITY" OR "TOXICOLOGY" OR "WOMEN S STUDIES") OR LA==("FRENCH" OR "GERMAN" OR "SPANISH" OR "RUSSIAN" OR "PORTUGUESE" OR "CZECH" OR "CROATIAN" OR "DUTCH" OR "POLISH" OR "TURKISH")

## 5.2 Appendix II – Citation report

| | |
|---|---|
| Timespan:1900-2021. | |
| | |
| Results found | 882 |
| Sum of the Times Cited | 19011 |
| Average Citations per Item | 21.55 |
| h-index | 65 |

| Title | Authors | Source Title | Pub. Year | Total Cita Tions | Aver. Per Year | DOI |
|---|---|---|---|---|---|---|
| Biodiversity, disturbances, ecosystem function and management of European forests | Bengtsson, J et al. | FOREST ECOLOGY AND MANAGEMENT | 2000 | 582 | 26.45 | 10.1016/S0378-1127(00)00378-9 |
| Agroecological practices for sustainable agriculture. A review | Wezel, A. Et al. | AGRONOMY FOR SUSTAINABLE DEVELOPMENT | 2014 | 362 | 45.25 | 10.1007/s13593-013-0180-7 |
| Biodiversity impacts of some agricultural commodity production systems | Donald, PF | CONSERVATION BIOLOGY | 2004 | 339 | 18.83 | 10.1111/j.1523-1739.2004.01803.x |
| The development of indigenous knowledge - A new applied anthropology | Sillitoe, P | CURRENT ANTHROPOLOGY | 1998 | 337 | 14.04 | 10.1086/204722 |
| Territory distribution and breeding success of skylarks Alauda arvensis on organic and intensive farmland in southern England | Wilson, JD et al | JOURNAL OF APPLIED ECOLOGY | 1997 | 264 | 10.56 | 10.2307/2405262 |
| Soil management in relation to sustainable agriculture and ecosystem services | Powlson, D. Et al | FOOD POLICY | 2011 | 263 | 23.91 | 10.1016/j.foodpol.2010.11.025 |
| The role of grasslands in food security and climate change | O'Mara, F. P. | ANNALS OF BOTANY | 2012 | 252 | 25.2 | 10.1093/aob/mcs209 |
| Silvoarable systems in europe - past, present and future prospects | Eichhorn, M et al | AGROFORESTRY SYSTEMS | 2006 | 229 | 14.31 | 10.1007/s10457-005-1111-7 |
| Geobotanical survey of wood-pasture habitats in Europe: diversity, threats and conservation | Bergmeier, E et al | BIODIVERSITY AND CONSERVATION | 2010 | 186 | 15.5 | 10.1007/s10531-010-9872-3 |
| Size structure and regeneration of Spanish holm oak Quercus ilex forests and dehesas: effects of agroforestry use on their long-term sustainability | Pulido, F et al | FOREST ECOLOGY AND MANAGEMENT | 2001 | 174 | 8.29 | 10.1016/S0378-1127(00)00443-6 |

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|---|---|---|---|---|---|---|
| Do European agroforestry systems enhance biodiversity and ecosystem services? A meta-analysis | Torralba, M et al | AGRICULTURE ECOSYSTEMS & ENVIRONMENT | 2016 | 166 | 27.67 | 10.1016/j.agee.2016.06.002 |
| The role of saltbushes (atriplex-spp) in arid land rehabilitation in the mediterranean basin - a review | LEHOUEROU, H | AGROFORESTRY SYSTEMS | 1992 | 160 | 5.33 | 10.1007/BF00115408 |
| Combining solar photovoltaic panels and food crops for optimising land use: Towards new agrivoltaic schemes | Dupraz, C et al | RENEWABLE ENERGY | 2011 | 152 | 13.82 | 10.1016/j.renene.2011.03.005 |
| The central agroforestry hypothesis: The trees must acquire resources that the crop would not otherwise acquire | Cannell, M et al | AGROFORESTRY SYSTEMS | 1996 | 152 | 5.85 | 10.1007/BF00129630 |
| Spatial and temporal changes to the water regime of a Mediterranean vineyard due to the adoption of cover cropping | Celette, F et al | EUROPEAN JOURNAL OF AGRONOMY | 2008 | 148 | 10.57 | 10.1016/j.eja.2008.04.007 |
| Energy and the food system | Woods, J et al | PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B-BIOLOGICAL SCIENCES | 2010 | 146 | 12.17 | 10.1098/rstb.2010.0172 |
| Molecular diversity of a germplasm collection of squash (Cucurbita moschata) determined by SRAP and AFLP markers | Ferriol, M et al | CROP SCIENCE | 2004 | 141 | 7.83 | 10.2135/cropsci2004.6530 |
| Fine root distribution in Dehesas of Central-Western Spain | Moreno, G et al | PLANT AND SOIL | 2005 | 127 | 7.47 | 10.1007/s11104-005-6805-0 |
| Agroforestry systems for the production of woody biomass for energy transformation purposes | Gruenewald, H et al | ECOLOGICAL ENGINEERING | 2007 | 122 | 8.13 | 10.1016/j.ecoleng.2006.09.012 |
| Increasing Demand for Natural Rubber Necessitates a Robust Sustainability Initiative to Mitigate Impacts on Tropical Biodiversity | Warren-Thomas, E et al | CONSERVATION LETTERS | 2015 | 120 | 17.14 | 10.1111/conl.12170 |
| Designing cropping systems from nature | Malezieux, E | AGRONOMY FOR SUSTAINABLE DEVELOPMENT | 2012 | 119 | 11.9 | 10.1007/s13593-011-0027-z |
| Restoration of Biodiversity and Ecosystem Services on Agricultural Land | Rey B et al | ECOSYSTEMS | 2012 | 116 | 11.6 | 10.1007/s10021-012-9552-0 |
| Multi-objective optimization and design of farming systems | Groot, J et al | AGRICULTURAL SYSTEMS | 2012 | 115 | 11.5 | 10.1016/j.agsy.2012.03.012 |
| Biodiversity and conservation of Turkish forests | Kaya, Z et al | BIOLOGICAL CONSERVATION | 2001 | 114 | 5.43 | 10.1016/S0006-3207(00)00069-0 |

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|---|---|---|---|---|---|---|
| Introducing the montado, the cork and holm oak agroforestry system of Southern Portugal | Pinto-Correia, T et al | AGROFORESTRY SYSTEMS | 2011 | 113 | 10.27 | 10.1007/s10457-011-9388-1 |
| Biomass energy in industrialised countries - A view of the future | Hall, D | FOREST ECOLOGY AND MANAGEMENT | 1997 | 113 | 4.52 | 10.1016/S0378-1127(96)03883-2 |
| Cultivation techniques and medicinal properties of Pleurotus spp. | Gregori, A et al | FOOD TECHNOLOGY AND BIOTECHNOLOGY | 2007 | 109 | 7.27 | |
| Habitat loss, fragmentation, and alteration - Quantifying the impact of land-use changes on a Spanish dehesa landscape by use of aerial photography and GIS | Plieninger, T | LANDSCAPE ECOLOGY | 2006 | 104 | 6.5 | 10.1007/s10980-005-8294-1 |
| Impact of residue quality on the C and N mineralization of leaf and root residues of three agroforestry species | Vanlauwe, B et al | PLANT AND SOIL | 1996 | 102 | 3.92 | 10.1007/BF00011437 |
| Streuobst: a traditional agroforestry system as a model for agroforestry development in temperate Europe | Herzog, F | AGROFORESTRY SYSTEMS | 1998 | 99 | 4.13 | 10.1023/A:1006152127824 |
| A physiological production model for cocoa (Theobroma cacao): model presentation, validation and application | Zuidema, P et al | AGRICULTURAL SYSTEMS | 2005 | 97 | 5.71 | 10.1016/j.agsy.2004.06.015 |
| Effects of land-use and landscape structure on holm oak recruitment and regeneration at farm level in Quercus ilex L. Dehesas | Plieninger, T et al | JOURNAL OF ARID ENVIRONMENTS | 2004 | 97 | 5.39 | 10.1016/S0140-1963(03)00103-4 |
| Ecological benefits provided by alley cropping systems for production of woody biomass in the temperate region: a review | Tsonkova, P et al | AGROFORESTRY SYSTEMS | 2012 | 96 | 9.6 | 10.1007/s10457-012-9494-8 |
| Using modified foragers to harvest short-rotation poplar plantations | Spinelli, R et al | BIOMASS & BIOENERGY | 2009 | 96 | 7.38 | 10.1016/j.biombioe.2009.01.001 |
| Chemical composition, or quality, of agroforestry residues influences N2O emissions after their addition to soil | Millar, N et al | SOIL BIOLOGY & BIOCHEMISTRY | 2004 | 92 | 5.11 | 10.1016/j.soilbio.2004.02.008 |
| Ecological benefits of the alley cropping agroforestry system in sensitive regions of Europe | Quinkenstein, A et al | ENVIRONMENTAL SCIENCE & POLICY | 2009 | 89 | 6.85 | 10.1016/j.envsci.2009.08.008 |
| Rain forest promotes trophic interactions and diversity of trap-nesting hymenoptera in adjacent agroforestry | Klein, A et al | JOURNAL OF ANIMAL ECOLOGY | 2006 | 88 | 5.5 | 10.1111/j.1365-2656.2006.01042.x |

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| Belowground interactions in a vine (Vitis vinifera L.)-tall fescue (Festuca arundinacea Shreb.) Intercropping system: Water relations and growth | Celette, F et al | PLANT AND SOIL | 2005 | 86 | 5.06 | 10.1007/s11104-005-4415-5 |
| Introducing urban food forestry: a multifunctional approach to increase food security and provide ecosystem services | Clark, K et al | LANDSCAPE ECOLOGY | 2013 | 82 | 9.11 | 10.1007/s10980-013-9903-z |
| Reconciling productivity with protection of the environment: Is temperate agroforestry the answer? | Smith, J et al. | RENEWABLE AGRICULTURE AND FOOD SYSTEMS | 2013 | 82 | 9.11 | 10.1017/S1742170511000585 |
| Modeling environmental benefits of silvoarable agroforestry in Europe | Palma, J et al | AGRICULTURE ECOSYSTEMS & ENVIRONMENT | 2007 | 82 | 5.47 | 10.1016/j.agee.2006.07.021 |
| Effects of chemical-composition on n, ca, and mg release during incubation of leaves from selected agroforestry and fallow plant-species | TIAN, G et al | BIOGEOCHEMISTRY | 1992 | 82 | 2.73 | |
| Understanding the value and limits of nature-based solutions to climate change and other global challenges | Seddon, N et al | PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B-BIOLOGICAL SCIENCES | 2020 | 81 | 40.5 | 10.1098/rstb.2019.0120 |
| Current extent and stratification of agroforestry in the European Union | Den Herder, M et al | AGRICULTURE ECOSYSTEMS & ENVIRONMENT | 2017 | 81 | 16.2 | 10.1016/j.agee.2017.03.005 |
| Increased soil organic carbon stocks under agroforestry: A survey of six different sites in France | Cardinael, R et al | AGRICULTURE ECOSYSTEMS & ENVIRONMENT | 2017 | 80 | 16 | 10.1016/j.agee.2016.12.011 |
| Yield-SAFE: A parameter-sparse, process-based dynamic model for predicting resource capture, growth, and production in agroforestry systems | Van der Werf, W et al | ECOLOGICAL ENGINEERING | 2007 | 80 | 5.33 | 10.1016/j.ecoleng.2006.09.017 |
| Development and application of bio-economic modelling to compare silvoarable, arable, and forestry systems in three European countries | Graves, A et al | ECOLOGICAL ENGINEERING | 2007 | 79 | 5.27 | 10.1016/j.ecoleng.2006.09.018 |
| Robinia pseudoacacia L.: A Lesser Known Tree Species for Biomass Production | Gruenewald, H et al | BIOENERGY RESEARCH | 2009 | 78 | 6 | 10.1007/s12155-009-9038-x |
| Moving towards the second generation of lignocellulosic biorefineries in the EU: Drivers, challenges, and opportunities | Hassan, S et al | RENEWABLE & SUSTAINABLE ENERGY REVIEWS | 2019 | 77 | 25.67 | 10.1016/j.rser.2018.11.041 |
| Impact of alley cropping agroforestry on stocks, forms and spatial distribution of soil organic carbon - A case study in a Mediterranean context | Cardinael, R et al | GEODERMA | 2015 | 77 | 11 | 10.1016/j.geoderma.2015.06.015 |

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|---|---|---|---|---|---|---|
| Competition with winter crops induces deeper rooting of walnut trees in a Mediterranean alley cropping agroforestry system | Cardinael, R et al | PLANT AND SOIL | 2015 | 77 | 11 | 10.1007/s11104-015-2422-8 |
| A comparison of environmental, soil fertility, yield, and economical effects in six cropping systems based on an 8-year experiment in Norway | Eltun, R et al | AGRICULTURE ECOSYSTEMS & ENVIRONMENT | 2002 | 75 | 3.75 | 10.1016/S0167-8809(01)00198-0 |
| Testing the safety-net role of hedgerow tree roots by N-15 placement at different soil depths | Rowe, E et al | AGROFORESTRY SYSTEMS | 1998 | 75 | 3.13 | 10.1023/A:1022123020738 |
| Do combined applications of crop residues and inorganic fertilizer lower emission of N2O from soil? | Frimpong, K et al | SOIL USE AND MANAGEMENT | 2010 | 74 | 6.17 | 10.1111/j.1475-2743.2010.00293.x |
| Organic matter management for soil conservation and productivity restoration in Africa: a contribution from Francophone research | Roose, E et al | NUTRIENT CYCLING IN AGROECOSYSTEMS | 2001 | 74 | 3.52 | 10.1023/A:1013349731671 |
| Regional Farm Diversity Can Reduce Vulnerability of Food Production to Climate Change | Reidsma, P et al | ECOLOGY AND SOCIETY | 2008 | 73 | 5.21 | |
| LAND DEGRADATION IN MEDITERRANEAN EUROPE - CAN AGROFORESTRY BE A PART OF THE SOLUTION - A PROSPECTIVE REVIEW | LEHOUEROU, H et al | AGROFORESTRY SYSTEMS | 1993 | 72 | 2.48 | 10.1007/BF00704925 |
| Aspects of nitrogen-fixing Actinobacteria, in particular free-living and symbiotic Frankia | Sellstedt, A et al | FEMS MICROBIOLOGY LETTERS | 2013 | 71 | 7.89 | 10.1111/1574-6968.12116 |
| Comparing hybrid Populus clones for SRF across northern Italy after two biennial rotations: Survival, growth and yield | Paris, P et al | BIOMASS & BIOENERGY | 2011 | 70 | 6.36 | 10.1016/j.biombioe.2010.12.050 |
| N2O emission from soil following combined application of fertiliser-N and ground weed residues | Garcia-Ruiz, R et al | PLANT AND SOIL | 2007 | 70 | 4.67 | 10.1007/s11104-007-9382-6 |
| A general classification of agroforestry practice | Sinclair, FL | AGROFORESTRY SYSTEMS | 1999 | 70 | 3.04 | 10.1023/A:1006278928088 |
| Compatibility of livestock grazing with stand regeneration in Mediterranean holm oak parklands | Plieninger, T | JOURNAL FOR NATURE CONSERVATION | 2007 | 69 | 4.6 | 10.1016/j.jnc.2005.09.002 |
| Potential benefits of commercial willow Short Rotation Coppice (SRC) for farm-scale plant and invertebrate communities in the agri-environment | Rowe, R et al | BIOMASS & BIOENERGY | 2011 | 68 | 6.18 | 10.1016/j.biombioe.2010.08.046 |

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|---|---|---|---|---|---|---|
| A systematic map of ecosystem services assessments around European agroforestry | Fagerholm, N et al | ECOLOGICAL INDICATORS | 2016 | 67 | 11.17 | 10.1016/j.ecolind.2015.11.016 |
| Fractal analysis of the root architecture of Gliricidia sepium for the spatial prediction of root branching, size and mass: model development and evaluation in agroforestry | Ozier-Lafontaine, H et al | PLANT AND SOIL | 1999 | 66 | 2.87 | 10.1023/A:1004461130561 |
| Agricultural land-use and the spatial distribution of granivorous lowland farmland birds | Siriwardena, G et al | ECOGRAPHY | 2000 | 65 | 2.95 | 10.1034/j.1600-0587.2000.230608.x |
| Assessing Light Competition for Cereal Production in Temperate Agroforestry Systems using Experimentation and Crop Modelling | Dufour, L et al | JOURNAL OF AGRONOMY AND CROP SCIENCE | 2013 | 64 | 7.11 | 10.1111/jac.12008 |
| Foraging trip duration and density of megachilid bees, eumenid wasps and pompilid wasps in tropical agroforestry systems | Klein, A et al | JOURNAL OF ANIMAL ECOLOGY | 2004 | 64 | 3.56 | 10.1111/j.0021-8790.2004.00826.x |
| Agroecosystem restoration through strategic integration of perennials | Schulte, L et al | JOURNAL OF SOIL AND WATER CONSERVATION | 2006 | 63 | 3.94 | |
| Managing water resources for crop production | Wallace, J et al | PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B-BIOLOGICAL SCIENCES | 1997 | 63 | 2.52 | 10.1098/rstb.1997.0073 |
| Assessing linkages between ecosystem services, land-use and well-being in an agroforestry landscape using public participation GIS | Fagerholm, N et al | APPLIED GEOGRAPHY | 2016 | 62 | 10.33 | 10.1016/j.apgeog.2016.06.007 |
| Soil organic carbon and root distribution in a temperate arable agroforestry system | Upson, M et al | PLANT AND SOIL | 2013 | 62 | 6.89 | 10.1007/s11104-013-1733-x |
| Morphological and molecular diversity of a collection of Cucurbita maxima landraces | Ferriol, M et al | JOURNAL OF THE AMERICAN SOCIETY FOR HORTICULTURAL SCIENCE | 2004 | 62 | 3.44 | 10.21273/JASHS.129.1.0060 |
| Land-use legacies in the forest structure of silvopastoral oak woodlands in the Eastern Mediterranean | Plieninger, T et al | REGIONAL ENVIRONMENTAL CHANGE | 2011 | 61 | 5.55 | 10.1007/s10113-010-0192-7 |
| Transfer of nitrogen from a tropical legume tree to an associated fodder grass via root exudation and common mycelial networks | Jalonen, R et al | PLANT CELL AND ENVIRONMENT | 2009 | 61 | 4.69 | 10.1111/j.1365-3040.2009.02004.x |
| Conversion of a tropical forest into agroforest alters the fine root-related carbon flux to the soil | Hertel, D et al | SOIL BIOLOGY & BIOCHEMISTRY | 2009 | 61 | 4.69 | 10.1016/j.soilbio.2008.11.020 |
| Economic and management characterization of dehesa farms: implications for their sustainability | Gaspar, P et al | AGROFORESTRY SYSTEMS | 2007 | 61 | 4.07 | 10.1007/s10457-007-9081-6 |

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|---|---|---|---|---|---|---|
| Mapping traditional cultural landscapes in the Mediterranean area using a combined multidisciplinary approach: Method and application to Mount Etna (Sicily; Italy) | Cullotta, S et al | LANDSCAPE AND URBAN PLANNING | 2011 | 59 | 5.36 | 10.1016/j.landurbplan.2010.11.012 |
| Experimental evidence for stronger cacao yield limitation by pollination than by plant resources | Groeneveld, J et al | PERSPECTIVES IN PLANT ECOLOGY EVOLUTION AND SYSTEMATICS | 2010 | 59 | 4.92 | 10.1016/j.ppees.2010.02.005 |
| The contribution of cacao agroforests to the conservation of lower canopy ant and beetle diversity in Indonesia | Bos, M et al | BIODIVERSITY AND CONSERVATION | 2007 | 58 | 3.87 | 10.1007/s10531-007-9196-0 |
| Target regions for silvoarable agroforestry in Europe | Reisner, Y et al | ECOLOGICAL ENGINEERING | 2007 | 58 | 3.87 | 10.1016/j.ecoleng.2006.09.020 |
| Nitrogen fixation by trees in relation to soil nitrogen economy | Dommergues, Y | FERTILIZER RESEARCH | 1995 | 57 | 2.11 | 10.1007/BF00750516 |
| Inca agroforestry: Lessons from the past | Chepstow-Lusty, A | AMBIO | 2000 | 56 | 2.55 | 10.1639/0044-7447(2000)029[0322:IALFTP]2.0.CO;2 |
| Combining livestock and tree crops to improve sustainability in agriculture: a case study using the Life Cycle Assessment (LCA) approach | Paolotti, L | JOURNAL OF CLEANER PRODUCTION | 2016 | 54 | 9 | 10.1016/j.jclepro.2016.05.024 |
| Mitigating the impacts of agriculture on biodiversity: bats and their potential role as bioindicators | Park, K | MAMMALIAN BIOLOGY | 2015 | 54 | 7.71 | 10.1016/j.mambio.2014.10.004 |
| Accelerating the Domestication of New Crops: Feasibility and Approaches | Osterberg, J et al | TRENDS IN PLANT SCIENCE | 2017 | 53 | 10.6 | 10.1016/j.tplants.2017.01.004 |
| Stratification ratio of soil organic C, N and C:N in Mediterranean evergreen oak woodland with conventional and organic tillage | Corral-Fernandez, R et al | AGRICULTURE ECOSYSTEMS & ENVIRONMENT | 2013 | 53 | 5.89 | 10.1016/j.agee.2012.11.002 |
| MICROLEIS - A MICROCOMPUTER-BASED MEDITERRANEAN LAND EVALUATION INFORMATION-SYSTEM | DELAROSA, D et al | SOIL USE AND MANAGEMENT | 1992 | 53 | 1.77 | |
| Which agroforestry options give the greatest soil and above ground carbon benefits in different world regions? | Feliciano, D et al | AGRICULTURE ECOSYSTEMS & ENVIRONMENT | 2018 | 52 | 13 | 10.1016/j.agee.2017.11.032 |
| Is farming enough in mountain areas? Farm diversification in the Pyrenees | Lopez-i-Gelats, F et al | LAND USE POLICY | 2011 | 52 | 4.73 | 10.1016/j.landusepol.2011.01.005 |

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| Analysis of spatial patterns of oak decline in cork oak woodlands in Mediterranean conditions | Costa, A et al | ANNALS OF FOREST SCIENCE | 2010 | 51 | 4.25 | 10.1051/forest/2009097 |
| A renewed perspective on agroforestry concepts and classification | Torquebiau, E | COMPTES RENDUS DE L ACADEMIE DES SCIENCES SERIE III-SCIENCES DE LA VIE-LIFE SCIENCES | 2000 | 51 | 2.32 | 10.1016/S0764-4469(00)01239-7 |
| Agroforestry systems of high nature and cultural value in Europe: provision of commercial goods and other ecosystem services | Moreno, G et al | AGROFORESTRY SYSTEMS | 2018 | 50 | 12.5 | 10.1007/s10457-017-0126-1 |
| Yy Trees increase soil organic carbon and nutrient availability in temperate agroforestry systems | Pardon, P et al | AGRICULTURE ECOSYSTEMS & ENVIRONMENT | 2017 | 50 | 10 | 10.1016/j.agee.2017.06.018 |
| Valuing the carbon sequestration potential for European agriculture | Aertsens, J et al | LAND USE POLICY | 2013 | 50 | 5.56 | 10.1016/j.landusepol.2012.09.003 |
| Response of understorey forage to multiple tree effects in Iberian dehesas | Moreno, G | AGRICULTURE ECOSYSTEMS & ENVIRONMENT | 2008 | 50 | 3.57 | 10.1016/j.agee.2007.04.006 |
| Ziziphus spina-christi (L.) Willd.: a multipurpose fruit tree | Saied, A et al | GENETIC RESOURCES AND CROP EVOLUTION | 2008 | 49 | 3.5 | 10.1007/s10722-007-9299-1 |
| Relationships between N2O emissions and water-soluble C and N contents of agroforestry residues after their addition to soil | Millar, N et al | SOIL BIOLOGY & BIOCHEMISTRY | 2005 | 49 | 2.88 | 10.1016/j.soilbio.2004.08.016 |
| Ecological-economic trade-offs of Diversified Farming Systems - A review | Rosa-Schleich, J et al | ECOLOGICAL ECONOMICS | 2019 | 48 | 16 | 10.1016/j.ecolecon.2019.03.002 |

## 5.3 Appendix III – Project contact details

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|---|---|---|
| 1 | AFINET | https://agroforestrynet.eu/afinet/ rettet link til |
| 2 | AGFORWARD | www.agforward.eu/ |
| 3 | Agricology | www.agricology.co.uk/national-network-agroforestry-farms |
| 4 | AgriLink | www.agrilink2020.eu/ |
| 5 | Agroforestry ELM | www.organicresearchcentre.com/our-research/research-project-library/agroforestry-elm-test-designing-an-environmental-land-management-system-for-uk-agroforestry/ |
| 6 | AGROMIX | https://agromixproject.eu/ |
| 7 | ALL-Ready | www.all-ready-project.eu/ |
| 8 | ARBRATATOUILLE | https://arbratatouille.projet-agroforesterie.net/ |
| 9 | Bezdínek Farm | https://enrd.ec.europa.eu/projects-practice/modernisation-farma-bezdinek-sro-agricultural-holding_en |
| 10 | BIOEAST | https://bioeast.eu/vision-objectives/ |
| 11 | BIOVINE | https://projects.au.dk/coreorganiccofund/core-organic-cofund-projects/biovine/ |
| 12 | BRANCHES | www.branchesproject.eu |
| 13 | CanTogether | www.wur.nl/en/show/cantogether.htm |
| 14 | Co-Free | https://www.organicresearchcentre.com/our-research/research-project-library/innovative-strategies-for-copper-free-low-input-and-organic-farming-systems/ |
| 15 | CONSOLE | https://console-project.eu/about/ |
| 16 | CORE Organic Cofund | https://projects.au.dk/coreorganiccofund/ |
| 17 | CropBooster-P | www.cropbooster-p.eu/ |
| 18 | DiverIMPACTS | www.diverimpacts.net/about.html |
| 19 | DOMINO | www.domino-coreorganic.eu |
| 20 | DSCATT | https://dscatt.net/ |
| 21 | EFFECT | http://project-effect.eu/ |
| 22 | Eudaphobase | www.eudaphobase.eu/ |
| 23 | EUREKA | www.h2020eureka.eu/ |
| 24 | FarmLife | www.farm-life.eu |

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|---|---|---|
| 25 | Fodder trees | www.agroforestryvlaanderen.be/en/projects/voederbomen |
| 26 | FRAMEwork | www.framework-biodiversity.eu |
| 27 | GreenResilient | www.greenresilient.net |
| 28 | ICT-AGRI-FOOD | www.ictagrifood.eu/ |
| 29 | Legcombio | www.agroforestryvlaanderen.be/en/projects/legcombio |
| 30 | LIASON | https://liaison2020.eu/ |
| 31 | LIFE-MONTADO-ADAPT | www.lifemontadoadapt.com/?l=EN |
| 32 | LIFT | www.lift-h2020.eu |
| 33 | Mix-Enable | https://projects.au.dk/coreorganiccofund/core-organic-cofund-projects/mix-enable/ |
| 34 | MIXED | https://projects.au.dk/mixed/ |
| 35 | NEFERTITI | https://nefertiti-h2020.eu/ |
| 36 | OPTAIN | www.optain.eu/ |
| 37 | P'Orchard | www.agroforestryvlaanderen.be/en/projects/porchard |
| 38 | PolyFarming | https://polyfarming.eu/objective-and-actions/?lang=en |
| 39 | Prodehesa Montado | https://prodehesamontado.eu/en/objetive |
| 40 | ReMix | www.remix-intercrops.eu/ |
| 41 | SAFE | www1.montpellier.inra.fr/safe/ |
| 42 | SHOWCASE | https://showcase-project.eu |
| 43 | SOLID | www.solidairy.eu |
| 44 | SPEAL | www6.val-de-loire.inra.fr/biofora/Projets/SPEAL |
| 45 | STARGATE | www.stargate-h2020.eu/ |
| 46 | SURE-FARM | www.surefarmproject.eu/ |
| 47 | SureVeg | https://projects.au.dk/coreorganiccofund/core-organic-cofund-projects/sureveg/ |
| 48 | SustainFARM | www.sustainfarm.eu/en/ |
| 49 | TWECOM | www.twecom.eu |
| 50 | WaterAGRI | https://wateragri.eu/# |
| 51 | Weidescherm | www.agroforestryvlaanderen.be/en/projects/weidescherm |

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|---|---|---|
| 52 | WOOFS | www.organicresearchcentre.com/our-research/research-project-library/woofs-woodchip-for-fertile-soils/ |

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