Initial Stakeholder Meeting Report
Agroforestry for Arable Farmers in the South-West of France

Work-package group 4: Agroforestry for arable farmers
Specific group: Agroforestry for arable farmers in the South-West of France
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Contents

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1. Context

The AGFORWARD research project (January 2014-December 2017), funded by the European Commission, is promoting agroforestry practices in Europe that will advance sustainable rural development. The project has four objectives:

1. to understand the context and extent of agroforestry in Europe,
2. to identify, develop and field-test innovations (through participatory research) to improve the benefits and viability of agroforestry systems in Europe,
3. to evaluate innovative agroforestry designs and practices at a field-, farm- and landscape scale, and
4. to promote the wider adoption of appropriate agroforestry systems in Europe through policy development and dissemination.

This report describes one of about 40 initial stakeholder workshops to address objective 2. Further details of the project can be found on the AGFORWARD website: www.agforward.eu

2. Description of system and current agroforestry development

During recent years in the Midi-Pyrénées Region in South-West France (Figure 1), many farmers have established innovative systems of linear tree-planting in their fields. These farmers are linked together by a network, led by an association called “Arbre & Paysage du Gers” (AP32) and the “French Association for Agroforestry” (AFAF).

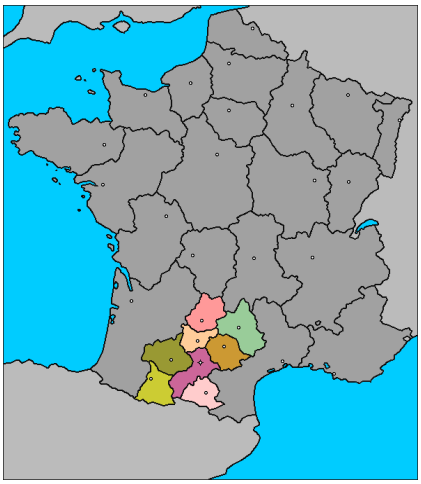

Figure 1 Midi-Pyrénées Region in the South-West of France

In the Midi-Pyrénées region, integrating farming with trees is not a traditional land use system. However, with the support of an agroforestry-oriented development program financed by the French Region Midi-Pyrénées (particularly in the framework of “Agrofproject in Midi Pyrénées”), within-field agroforestry projects have been established. The project involves a wide range of systems (Figure 2). These include integrating trees with crop fields (yellow) (Figure 3), poultry courses (blue), pastures (green), livestock farming (red), market gardening (dark green), vineyard (violet)(Figure 4), arboriculture (brown) and beekeeping (orange).

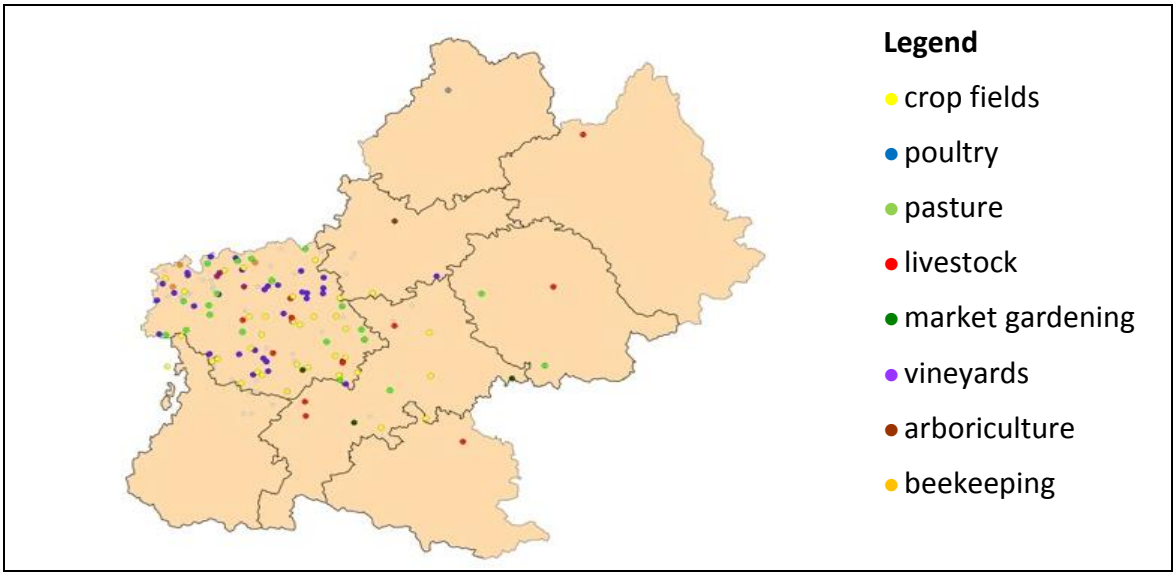

Figure 2. A wide-range of within-field agroforestry systems have been established in the Midi-Pyrénées region between 2006 and 2014. The map doesn't reference agroforestry system developed outside of the framework and without the technical support of regional operators.

Figure 3. Wheat with different 6-year-old tree species such as walnut, ash, wild cherry and maple

Figure 4. Agroforestry project in a vineyard plot, in Lagraulet, Gers

3. Description of participants

This report summarizes the findings of a meeting organised in Auch, Gers in South-West France by the association Arbres & Paysage 32 and the local organic agriculture group (GABB32), titled "Workshop of cover crops, soil superficial work and direct seeding". During the meeting, eleven participants (Table 1) answered a questionnaire on agroforestry. Of these 11, nine were farmers, one an elected member of the Chamber of Agriculture of Gers (also a farmer with an interest in agro-ecology) and there was an agroforestry technician from the association Arbres & Paysage 32.

Among the farmers, five of them manage an agroforestry system and four have an agroforestry project on their own land. Each of them answered the question with respect to the planting of linear lines of trees in arable field. Five of the participants also farm livestock.

Table 1. Profession of the stakeholders answering the questionnaire

Profession	Number of participants
Farmer with agroforestry system	5
Farmer with agroforestry project	4
Elected member of the Chamber of Agriculture	1
Local technician for agroforestry plantations	1
Total	**11**

4. Ranking of positive and negative aspects of silvoarable agroforestry

During the meeting, farmers and experts talked about their experience or their knowledge regarding soil conservation. Agroforestry was mentioned as a solution against soil erosion.

The eleven participants ranked what they saw as the key positive and negative attributes of silvoarable systems (starting with 1 for the highest rank and then down to 10). In order to help determine the key factors, a weighted mark was determined using the following equation:

$$Mark = (10 - (Sum\ of\ points / frequency)) * frequency$$

Those factors which received no mark are not included in the table. Values indicated in **blue** are the factors most often quoted and/or received the highest ranking. The **orange** values, were less quoted, but were still considered important.

Positive aspects

The most positive aspects (Table 2) included: timber/wood/fruit/nut production, the development of pollarding, and soil conservation. Other important factors were: animal health and welfare, animal production, crop or pasture quality/food safety, diversity of products, biodiversity, income diversity, development of production industry and the association with hedges, riparian forest and buffer strips.

Table 2. Positive aspects of within-field silvoarable agroforestry, with 1 being the highest rank, 2 being the second highest rank, down to a value of 10.

Aspect	Ranking by 11 participants											Freq. (/10)	Times ranked first	Mark
	1	2	3	4	5	6	7	8	9	10	11			
Production effects														
Animal health and welfare	1		4						9		1	4	2	25
Animal production	1								2		2	3	1	25
Crop or pasture production								2				1	0	8
Crop quality/food safety			6	6	5				10	2		5	0	21
Disease and weed control					5		9					2	0	6
Diversity of products		4		7				8		4		4	0	17
Wood/fruit/nut production	3	2	1	1		1	4	4	4	1		9	4	69
Wood/fruit/nut quality											6	1		4
Management effects														
Mechanisation		5										1	0	5
Originality and interests		1		10								2	1	9
Project feasibility										5		1	0	5
Environmental effects														
Biodiversity and wildlife habitat	8		5	5		9		1	8	6	10	8	1	28
Carbon sequestration						5	6				9	3	0	10
Climate moderation	9	10		9			1			10		5	1	11
General environment					6				5	9	8	4	0	12
Landscape aesthetics			10									1	0	0
Reduced groundwater recharge			7						7			2	0	6
Runoff and flood control											3	1		7
Soil conservation	7	6	8	2	1	3	3	9	1	7	7	11	2	56
Water quality					7		5					2	0	8
Socio-economic effects														
Business opportunities	6										4	2	0	10
Farmer image	2	7			8	7	10					5	0	16
Income diversity			2	4	9					8	5	5	0	22
Local food supply										3		1	0	7
Rural employment						8			6			2	0	6
Other effects														
Development of production industry	4			8		3	4					4	0	21
Litter self-sufficiency			3									1	0	7
Rural network	10				3	4		7				4	0	16
Association with hedges, riparian forest, buffer strips	5	9	9		2			10	3			6	0	22
Water regulator				3			2					2	0	15
Input saving		8			4		7	6				4	0	15
Development of pollarding		3	2	1		2	4	5				6	1	43

Negative aspects

The most negative issues (Table 3) were considered to be management costs, lack of knowledge, project feasibility and lack of support. The analysis of the questionnaires also highlighted concerns about crop production, disease and weeds control, complexity of work, specific labour, administrative burden, and plantation cost and time.

Table 3. Negative aspects of within-field silvoarable agroforestry, with 1 being the highest rank, 2 being the second highest rank, down to a value of 10.

Aspect	Ranking by 11 participants											Freq. (/10)	Times ranked first	Mark
	1	2	3	4	5	6	7	8	9	10	11			
Production effects														
Losses by predation											10	1	0	0
Crop or pasture production				3				3			9	3	0	15
Disease and weed control	1							5			8	3	1	16
Environmental effects														
Reduced groundwater recharge											6	1	0	4
Management effects														
Complexity of work			3						1			2	1	16
Labour							3			3	5	3	0	19
Management costs			4	4	3	2	4	2			2	7	0	49
Mechanisation						1						1	1	9
Originality and interest					4							1	0	6
Project feasibility	2		2	5				4	5	2	7	7	0	43
Tree regeneration/survival						3						1	0	7
Socio-economic effects														
Administrative burden					2			6			1	3	1	21
Inheritance and tax											3	1	0	7
Regulation			5								4	2	0	11
Subsidy and grant eligibility							5					1	0	5
Other effects														
Lack of knowledge	4		1		1		1		2	1		6	4	50
Lack of support				1		4	2		3			4	1	30
Plantation costs and time				2				1	4			3	1	23
Drainage infrastructure	3											1	0	7

5. Qualitative written responses

Positive aspects

The aspects that received the highest ranking were agronomic and economic: soil conservation, wood production, and the development of pollarding. For the participants, these provide the best arguments for planting trees within an arable landscape. They recognize trees to be part of a global approach to make farming more sustainable, and consider agroforestry in the same context as approaches such as conservation tillage and the use of cover crops.

Most participants pointed out the need to develop the biomass market. Several products mentioned the use of wood pellets for heat and for animal bedding, ramial chipped wood for mulching or soil amendment, and timber.

The participants think that for tree establishment, it's very important to include an economic strategy considering products diversification at a farm level. Therefore, there is a role for authorities to develop local markets linked to agroforestry products, whilst assuring the sustainable management of the resources.

The written responses indicated large interest in the development of pollarding methods. This tree management can result in high yields of wood and could be also beneficial because it reduces light and water competition with crops. Of course, this technique still needs to be studied in more detail before the wider adoption is possible.

The importance given to the soil conservation is due to erosion being an issue for all the farmers questioned. The interest in soil conservation is also triggered by an interest in soil fertility, because of the role of leaves that fall from the trees into the fields. The stakeholders indicated that it was important to plant many different tree varieties within the hedgerows, in part because it would improve biodiversity and reduce the risk of tree diseases. The farmers also highlighted that it was important that agroforestry did not stand in the way of a farmer's ability to farm and use his/her equipment.

Negative aspects

The most negative factor was perceived to be a lack of knowledge. There was a request for knowledge about trees in general, including their management (tree management intensities), tree crop interactions, and agroforestry products.

The authors note that it's important for participants to understand that within-field agroforestry practices are not possible on all farms. The local technicians must carry out a case-by-case approach. A lot of things need to be checked at the beginning of a project: the trees varieties, the way to plant, soil and climate conditions, and the different ways to give value to the plantations. The participants want to know who can and will give them advice and who can help them to manage their systems. Information was sought on cost-benefit analyses including the costs of establishment, of management, and the production of wood and pellets.

Other discussions

The discussion also covered levers to develop agroforestry. The following points were made:

- There was a need to develop applied research in different contexts. Indeed, the farmers want relevant figures (close to their farm conditions) in order to establish their own strategy;
- There is a need to give the possibility to the farmers to see fields with agroforestry. A system with pilot farms is needed, because the best way to convince a farmer of agroforestry is through showcasing working agroforestry farms. Farmers with experience of agroforestry have the best arguments, understand its limits, and know how it can be applied in practice.
- to provide technical booklets for farmers on how to establish, protect, weed and manage innovative hedgerow systems within arable fields;
- in general, there was a need to explain how silvicultural knowledge could be applied to trees within the agricultural landscape;

- there was also a need to develop innovations for mechanization. One of the participants created an engine to plant trees in hedges and within-field agroforestry. It's important to show case such local innovations as they can change farmers' vision of an agroforestry project.

6. Reference

André J, Dufour L, Le Bec J, Dupraz C (2014). Projet AgroCop - Production de biomasse énergie en système agroforestier: approche expérimentale et modélisation. 73 p.

7. Acknowledgements

The AGFORWARD project (Grant Agreement N° 613520) is co-funded by the European Commission, Directorate General for Research & Innovation, within the 7th Framework Programme of RTD, Theme 2 - Biotechnologies, Agriculture & Food. The views and opinions expressed in this report are purely those of the writers and may not in any circumstances be regarded as stating an official position of the European Commission.