

**Work-package group 4:** Agroforestry for arable farmers

**Specific group:** Silvoarable systems in Spain

**Date of meeting:** 21 October 2014

**Date of report:** 29 October 2014

**Location of meeting:** Casa da Cultura de Boimorto , Boimorto, A Coruña, Galicia, NW Spain

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AGFORWARD (Grant Agreement N° 613520) is co-funded by the European Commission, Directorate General for Research & Innovation, within the 7th Framework Programme of RTD. 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.

## 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](http://www.agforward.eu)

## 2. Description of system

Silvoarable agroforestry consists of widely-spaced trees intercropped with annual or perennial crops (Figure 1). In general, silvoarable production systems are very efficient in terms of resource use, and could introduce an innovative agricultural production system that will be both environment-friendly and economically profitable. Growing high quality trees in association with arable crops may improve the sustainability of farming systems, diversify farmer incomes, provide new products to the wood industry, and create novel landscapes of high value.



Figure 1. Silvoarable system established in Boimorto, A Coruña, Galicia, NW Spain

### 3. Participants

The meeting was attended by 14 stakeholders (nine men and five women), of whom 13 answered the questionnaire. Of these 14 participants:

- 2 were dairy farmers
- 1 participant worked in the “Agroamb” company ([http://www.agroamb.com/spanish/index\\_spain.htm](http://www.agroamb.com/spanish/index_spain.htm))
- 1 was a timber producer
- 2 participants worked in the “Melisanto” cooperative (<http://www.melisanto.es/melisanto/>)
- 1 participant worked in the Sociedad Agraria de Transformación (SAT; a cooperative with specific restrictions) “Fungocerga” (<http://www.fungocerga.com/es>)
- 1 was a producer of ecological agricultural products
- 1 was a representative of the Rural Development Group “Terras de Compostela”
- 1 was a representative of the Rural Development Group “Ulla Tambre Mandeo”
- 1 participant was an employment counsellor in the “Servipertu” company
- 1 participant worked in the “Bosques Naturales” company (<http://www.bosquesnaturales.es>)
- 1 participant worked in the laboratory of plant biotechnology “Cultigar” (<http://www.cultigar.es/>)
- 1 was representative of “Puraga” (Association of breeders of horses of Galician pure race) ([www.puraga.es/](http://www.puraga.es/))

The USC team was represented by seven members: one presenter/speaker, six assistants and one photographer. Of those who answered the questionnaire, eight participants were aged 35-50, four were aged 20-35 years old, and one person was aged 50-65 years. The stakeholders came from different parts of Galicia (NW Spain).

### 4. Introduction session

The meeting comprised an initial introduction session and a field visit. The meeting was held at the “Casa da Cultura de Boimorto” (Boimorto, A Coruña, Galicia, NW Spain). The meeting started at 10.30 am with a brief presentation on agroforestry and the AGFORWARD project by María Rosa Mosquera Losada from the University of Compostela de Santiago (USC). A second presentation by Mr Ignacio Urbán (Head of the Forest Department of the “Bosques Naturales” company) focused on the silvoarable experiments they were carrying out in several locations in Spain (Figure 2).



Figure 2. Presentation of AGFORWARD project and Bosques Naturales silvoarable systems carried out by Mrs. Rosa Mosquera and Mr. Ignacio Urbán

The program included a 17 minute film directed by F. Liagre and N. Girardin called “Agroflorestas: oportunidades e desafíos”, with Portuguese subtitles by Joao Palma. Before the coffee break, María Rosa Mosquera Losada described the AGFORWARD questionnaire which sought to highlight key positive and negative aspects of the agroforestry.

There was an open discussion after the coffee break (Figure 3), focusing on the advantages, problems and challenges for the implementation of silvoarable systems in the region. The opinions of the participants were collected in the questionnaires (section 5 and 6 of this document). The participants were then offered a lunch in a local restaurant, where the discussion on the main subjects continued until 16.00.



Figure 3. Photos of the stakeholders during the open discussion

## 5. Field visit

The participants visited plantations of high quality trees (*Juglans* hybrids and *Prunus avium* L clones) and a silvoarable system (*Juglans* clones and maize) established in Boimorto (A Coruña, Galicia, NW Spain) (Figure 4). These systems are managed by the Bosques Naturales company (<http://www.bosquesnaturales.es>) and supervised in part by USC. Bosques Naturales is a forestry company devoted to the management, maintenance, monitoring and research of



high-value hardwood species plantations, mainly walnut and cherry. In 2013, Bosques Naturales had 1380 ha of high value hardwood plantations, with 300,000 trees planted on farms in different locations in Spain.

Finally, the participants visited the forest community of Boimil (Boimorto, A Coruña, Galicia NW Spain), to see a chestnut and an oak plantation established 5 years ago, and a 15 year-old mixed plantation of *Pinus pinaster* and *Castanea sativa*.



Figure 4. Photos of the stakeholder field visit

## 6. Questionnaire results: ranking of positive and negative aspects

In total, 13 participants completed the AGFORWARD questionnaire, which were asked to rank the importance of the positive and negative aspects of agroforestry, from 1 to 10, where 1 was the highest rank. Despite our efforts, most participants filled the questionnaire providing the same value to different aspects within the same category, but the results were consistent with the oral discussions. To help rank the issues, we used the scoring system described by Crous-Duran et al (2014) (Table 1).

Table 1. Scores assigned to the ranking scale

Rank	1	2	3	4	5	6	7	8	9	10
Points	25	18	15	12	10	8	6	4	2	1

### Positive effects

The most positive aspects of the agroforestry systems (Table 3) were identified under the headings of production, management, environment and socio-economic issues.

**Production effects:** the most positive aspects identified by the respondents were “diversity of products”, “crop quality and safety” and “animal health and welfare”. During the open discussion most of the participants indicated the importance of these aspects in their farms.

**Management effect:** the respondents considered that the aspect “originality and interest” and “project feasibility” were the most positive aspect in this category.

**Environmental effects:** the most positive aspects identified by the respondents were “general environment”, followed by “carbon sequestration”, “biodiversity and wildlife habitat” and “soil conservation”.

**Socio-economic effects:** in the ranking, the most positive aspects selected by the respondents were “business opportunities”, “income diversity”, and “local food supply”.

### Negative effects

The most negative aspects of the agroforestry systems (Table 3, identified by the respondents were:

**Production effects:** the respondents considered that the aspect “losses by predation” was the most negative aspect in this category, probably due to the presence of wolves in the region.

**Management effect:** the most negative aspect identified by the respondents was “complexity of work”, probably because the management of agroforestry systems is more complex as compared to monoculture agricultural or forestry systems. Mechanisation and management costs also featured highly.

**Environmental effects:** in this category, the most negative aspects considered by the respondents were “landscape aesthetics”, “runoff and flood control” and “control of manure/noise/odour”.

**Socio-economic effects:** “inheritance and tax” was the most negative aspect selected by the respondents.

**Table 2.** Positive aspects of agroforestry as ranked by 14 respondents, with a weighted score using the scoring system in Table 1. The ranks ranged from 1 for 1<sup>st</sup> to 10 for 10<sup>th</sup>.

Aspect	Ranking by 13 respondents													Sum
	1	2	3	4	5	6	7	8	9	10	11	12	13	
<b>Production issues</b>														
Diversity of products	1	4	1	1	1	5	1		4	1	10	5	4	207
Crop quality/food safety	2	1	2	2	1	2	5	2	2	8	5	9	9	186
Animal health and welfare	4	1	4	4	1	9	6	7	7	4	3	1	1	185
Disease and weed control	3	4	3	3	3	1	2	2	9	5	1	6	8	182
Crop or pasture production	7	2	6	8	4	3	6	7	3	2	2	2	6	154
Animal production	8	1	5	9	3	4	6	7	6	3	4	1	5	152
Timber/wood/fruit production	6	1	8	7	2	7	3		5	6	6	2	2	144
Timber/wood/fruit/nut quality	5	2	9	6	2	6	3		1	7	8	3	3	144
Losses by predation	10	3	10	10	2	8	7	7	8	9	8	5	7	78
<b>Management issues</b>														
Originality and interest	2	2	2	3	1	7	2	7	2	1	7	1	1	223
Project feasibility	1	3	1	1	7	5	1	2	1	3	3	4	8	220
Tree regeneration/survival	3	3	3	2	8	6	1	3	3	2	8	5	4	174
Labour	4	3	4	4	3	4	7	2	4	5	5	6	3	157
Management costs		1			2	2	3	7	5	6	2		6	126
Mechanisation	5	1	5		6	3	9	7	6	8	1		5	123
Complexity of work		3			5	1	8	2	8	7	6	3	7	111
Inspection of animals		4		5	4	8	8	2	7	4	4		2	108
<b>Environmental issues</b>														
General environment	1	1	1	1	2	8	3	3	1	4	9		2	209
Carbon sequestration	2	1	2	2	5	1	3	2	6	5	4		5	187
Biodiversity & wildlife habitat	3	5	3	3	1	3	6	5	2	1	1		9	183
Soil conservation	10	3	10	7	3	6	1	1	5	2	1	1	7	180
Water quality	5	1	5	6	4	7	2	2	4	10	1	1	8	174
Change in fire risk	7	1	7	5	6	10	4	3	7	7	6	4	3	130
Climate moderation	4	1	4	4	7	2	5	4	8	6	7		10	126
Runoff and flood control	6	3	6	8	9	5	2	3	10	3	3		4	123
Landscape aesthetics	9	2	9	10	8	10	3	2	10	9	2	5	1	117
Reduced groundwater recharge		4		9		4	2	2	9	7	5	2		98
Control of manure/noise/odour	8	3	8	5	10	9	7	7	9	8	8	3	6	81
<b>Socio-economic issues</b>														
Business opportunities	2	2	2	2	1	1	3	3	1	1	4	3	10	230
Income diversity		4		4	5	3	1	1	7	1	3	2	2	181
Local food supply	1	4	1	1	9	7	8	7	10	2		4	3	151
Profit	10	4	10	5	8	4	5	4	3	4	1	1		139
Rural employment	8	1	8	7	10	6	6	5	4	2	5	2	7	130
Farmer image	5	3	5	5	2	8	8	7	2	8	10		1	125
Subsidy and grant eligibility	3	1	3	3		5	8	7	10	6	4		6	119
Tourism	9	3	9	4		7	4	3	5	1	8		8	110
Regulation		4	4	2		2	5	4	8	3				101
Marketing premium		3		1	7	5	8	8	9	6	3			89
Farmer/owner relationship	7	3	7	8	4	8	8	6	10	5	3			85
Opportunity for hunting		5		9	3	5	4	5	10	10	8		4	77
Cash flow		2		6	6	9	7	6	6	3				73
Market risk	6	6	6	10		4	5	4	10	10	7		9	69
Farmer/hunter relationship		4		6		10	8	7	9	9	2		5	63
Inheritance and tax	4	4		3			8	7	10	9	9			54
Administrative burden		3				9	7	6	10		2			50

Table 3. Negative aspects of agroforestry, as ranked by 13 respondents, with a weighted score using the scoring system in Table 1. The ranks ranged from 1 for 1<sup>st</sup> to 10 for 10<sup>th</sup>.

Aspect	Ranking by 13 respondents													Sum
	1	2	3	4	5	6	7	8	9	10	11	12	13	
<b>Production issues</b>														
Losses by predation	1	6	1	1	1	4	3	3	6	3	2	2	2	227
Crop or pasture production		6		2	2	3	6	5	1		8	5	5	126
Timber/wood/fruit/nut production		9	2	3	3	5	7	6	4	6	4		7	112
Disease and weed control		8				8	8	7	2	1	10	1	3	102
Crop or pasture quality/food safety		8				10	4	4		2	5	7	1	88
Diversity of products		6				7	7	6	3	4	1		6	88
Animal production		7				1	5	5	7	5	8		4	83
Animal health and welfare		8				2	5	4	8	8	6	10	9	63
Timber/wood/fruit/nut quality		9				6	7	6	5	7	2		8	62
<b>Management issues</b>														
Complexity of work	1	3	1	1	1	2	2	2	8	3	4	2	4	230
Mechanisation	2	3	2	2	3	4	1	1	1	2	10	1	5	225
Management costs	3	4	3	3	2	1	2	2	5	1	8	3	1	215
Labour	4	4	4	4		5	3	3	6	4	5		8	122
Project feasibility		4				3	7	6	4	5	7	5	2	97
Tree regeneration/survival		4			4	8	8	7	2	7	2		3	95
Originality and interest		3				7	6	5	3	6	3		7	83
Inspection of animals		3				6	6	5	7	8	6	4	6	79
<b>Environment issues</b>														
Landscape aesthetics	1	5	1	1		6	4	3	5	1	1	10		181
Control of manure/noise/odour		5		3		1	6	5	7	4	2	7	1	135
Runoff and flood control		3			1	7	8	7	1	5	6	2	4	129
Soil conservation		4	2	2	2	2	8	8	2	6	10		5	129
General environment		5				5	5	4	6	8	1			79
Reduced groundwater recharge		5				4	7	7	4	2	5			74
Climate moderation		8				8	6	5	8	7	3		2	69
Change in fire risk		5				5	7	6	9	3	4	8		67
Biodiversity and wildlife habitat		6				9	9	8	8	7	10	5	3	52
Water quality		8				3	8	8	3	7	10			49
Carbon sequestration		6				10	7	6	10	6	6			40
<b>Socio-economic issues</b>														
Inheritance and tax		1		3		1	3	2	4	1	2	1	4	190
Cash flow		4		5	1	3	5	4	3	1			2	142
Market risk	2	3		2	2	4	6	5	8	2	3		7	142
Administrative burden		3		7		2	4	3	2	1	8	2	7	137
Opportunity for hunting		3	1	1		5	5	6	9	3	2			128
Profit	1	8		1		7	6	5	10	2	10		1	123
Marketing premium		2	2	3		9	5	4	7	3	7	4		114
Regulation		1		2		8	5	4	5	4			3	106
Farmer image		3		4		10	3	2	10	3	1			102
Business opportunities		3		6			6	5	1	5	6	3		99
Farmer/owner relationship		2		5		6	3	3	8	4	7		6	96
Farmer/hunter relationship		2		4		5	3	2	9	3	8			94
Subsidy and grant eligibility		5	10	9		7	5	5	10	1	6	5	5	93
Tourism		2		10		8	5	5	9	2	2			81
Local food supply		1				9	3	3	6	6				73
Rural employment		8		8		7	4	4	9	7	5			56
Income diversity		2				9	8	7	10	5	7			47



## 7. Questionnaire results: qualitative written responses

Six respondents gave a written answer to the question “What key constraints or challenges could be addressed by either changes to an existing agroforestry system?” In general, the comments matched those given orally during the open discussion in which most participants gave their opinion. The topics involved the following:

- Complexity of mechanisation
- Small-scale farming or “Minifundismo”
- Abandonment of rural areas by young people
- Lack of financial support

Seven respondents gave written responses to “What kind of solutions or research themes would you propose?” The suggestions included the following:

- Introduction of new crops on farms
- Financial support from the Government
- Legal clarity and flexibility
- Development of economically viable systems
- Alternative uses of forest land
- Establishment of practical trials

## 8. Next steps

Most participants expressed their interest in participating in further meetings and in being informed about the progress/results of the project. According to the results obtained in the open discussion session and in the questionnaires, the group proposed the following potential innovations:

- Integrating maize and medicinal plant production with trees
- Tree protection from animals in combination with medicinal plants

## 9. Reference

Crous-Duran, J., Amaral Paulo, J., Palma, J. (2014). Initial Stakeholder Meeting Report Montado in Portugal. Instituto Superior de Agronomia (ISA), Universidade de Lisboa, Portugal.

## 10. 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. The organizers (University of Santiago de Compostela) would like to acknowledge Boimorto Council, Rural Development Group “Ulla Tambre Mandeo”, Rural Development Group “Terras de Compostela” and “Bosques Naturales” company for the support in organizing the event. The report was edited by Paul Burgess.