

**Work-package 3:** Agroforestry for high value trees

**Specific group:** Grazed orchards in France

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**Location of meeting:** Saint Michel d’Halescourt, Seine-Maritime, France

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

## 2. Description of system

Meadow orchards in France were estimated to cover about 600,000 ha in 1950, but the current total is about 150,000 ha. It is estimated that 43% of French pre-orchards are "cider" apple orchards located in Normandy, Brittany and the north of the Loire river (Table 1). One of the new features being attempted by some growers is the grazing of "low-stem orchards" by Shropshire sheep, as the experience of some growers is that the Shropshire breed do not eat the bark of apple trees.



Figure 1. Sheep grazing in high density orchard apple cider in France at Saint Michel d'Halescourt

Table 1. Regions in France with the greatest area of high-stem orchards (Coulon, 2005 from SCESS 2003)

Region	High-stem orchards in 2003 (ha)	Proportion (%)
Basse-Normandie	38,794	27
Lorraine	23,566	16
Alsace	15,730	11
Haute-Normandie	13,043	9
Pays de Loire	9,845	7
Rhône-Alpes	8,386	6
Champagne-Ardenne	6,770	5
Bretagne	6,460	4

### 3. Description of participants

The meeting was attended by 25 stakeholders and a leader. The stakeholders included nine farmers with orchards (0.5 to 50 ha) of whom four were engaged in organic farming. There were also 10 advisors who specialised in orchard, organic, or sheep production. There was also one apple orchard researcher, one journalist (Pâtre journal), and a person representing industry, and a person from the local administration. There were also two students. The participants mainly came from Normandy and Picardy, with two from Corrèze in south western France. Most of the participants were aged 20-35 years (60%), with 30% aged 35-50 years and 10% aged 50-65 years.

### 4. Introduction session

The meeting comprised an introduction, a field visit (Figure 2), and then further discussion. The meeting was hosted by Hervé Duclos at his farm at Saint Michel d'Halescourt near Rouen in Seine-Maritime and invitations were organised by CRAN (Chambre d'agriculture de Normandie). The meeting started at 13.30 and lasted until 18.30. The meeting began with a presentation of the AGFORWARD project by Nathalie Corroyer. Then Hervé Duclos described his farm and its history before a visit to the orchard. Then, back at the farm, participants completed a questionnaire and the farmer organised an "afterwork" with his farm products.

Mr and Mrs Duclos were teachers at the Lycée Merval, where Mr Duclos was also an advisor in tree management and later oenology (the study of wine). They took over the 16 ha farm in 1985, complete with a milk quota and cider apple trees. They gradually replanted the cider apple trees: 6 ha of low-stem in 1992, 7 ha of high-stem in 1993-94 and again 3 ha of low-stem in 1998. Nowadays, four people are working on this 16 ha farm, which produces 200 to 250 tonnes of apples. All the production is processed on the farm into apple juice, cider and PDO calvados and PDO pommel. The orchard is farmed using organic farming techniques except for thinning and boll which causes recurrent and major problems in the area. Chemical interventions are reduced as far as possible. It has always had some sheep, but in 2008 they introduced the Shropshire breed, which has been previously used in France by a Christmas tree farmer as he found that this breed did not attack the bark of the trees.



Figure 2. Part of the group during the presentation by Hervé Duclos

## 5. Field visit

The low-stem orchard on the farm is planted at 4.5 m x 2.2 m and the standard fruit (high-stem) orchard is planted at a spacing of 10 m x 10 m. The farm produces more than 150,000 bottles of cider, Calvados, pommel and apple juice a year. This is sold directly to local consumers and restaurants, and some is exported. The farm also hosts tourists who enjoy the presence of sheep in the orchard!

From an economic point of view, sheep farming does not weigh significantly compared to the cider activity. The objective of the sheep is to at least to offset the costs and maybe to bring a little extra income. Sheep are present in the orchard from March to December and then kept in a sheepfold. The breed is rustic and lambing causes no trouble. Today, there are about 100 ewes. About 40-50% of the lambs are sold directly to local customers, and the rest are sold elsewhere.

Role of grazing on scab: This disease attacks on fallen apple leaves on the ground. It is thought that sheep trampling can help incorporate the leaves and accelerate their degradation, thereby decreasing the disease. Sawfly could also be reduced because in the spring, the sheep eat apples that have fallen to the ground. However no effect of sheep presence was observed on boll worm, and that is why it was necessary on one occasion to use agrochemicals. On the farm, there was also a large vole “problem” after planting the orchards because there had been no tillage before planting of open grassland plots. It was noted that the sheep cause high compaction of the soil surface, and this may have led to the eventual disappearance of voles from the plots.

During the talk, a strong message from the farmer was “an arboriculturist cannot improvise himself as a sheep breeder, believing the sheep will just replace the mowing of the rows. Being a breeder is a very technical full time job”.



Figure 3. The group during the visit to the high density orchard

During this meeting, there were many discussions. They particularly focused on the following points:

**Grass management in orchards:** Mr Duclos believed “that to optimize his production system he need a parcel of 3 to 4 acres of meadow without trees, to produce fodder for winter, and to put the sheep out of the orchards during apple harvest time.” He noted that the nettles and thistles on the plot are not eaten by the sheep, and this this requires “topping” about once each year in the high-stem plot and twice each year in the low-stem plots. He also used a harrow in the spring to regenerate the grassland.

**Impact of sheep manure:** “presence of droppings is not a problem for harvesting because apples are sorted by the machine and washed before being pressed.” “Probably for desert apples, this type of system would not be accepted for health reasons.”

**Susceptibility of sheep to spraying:** “The animals are not removed from plots during spraying.” One other grower from Normandy reported that “the presence of copper used against scab could be a problem” but “here there has never been a problem”.

**Observation of higher grass under apple trees:** “sheep eat less grass under the canopy of trees. The question is why: is the grass poorer there?”

**Role of grazing on regulation of pests and diseases:** this issue was a major concern for growers. “There is a positive role of the sheep presence on scab on sawfly and voles in the orchard” reported Mr Duclos. N. Corroyer indicated that a comparison of the incidence of pest presence or absence of sheep on an orchard will be implemented from 2015 on an organic experimental plot by the Chamber of Agriculture for a project called “Orchards of tomorrow”.

## 6. Ranking of positive and negative aspects of grazed orchards

The participants were asked to complete a questionnaire with positive and negative aspects of grazed orchard systems. In total, 21 participants completed the questionnaire but some of the aspects were unclear.

**Positive aspects:** the most positive aspects (Table 2) included: animal health and welfare, production, biodiversity, pasture, disease and weed control control. Farmer image and originality and interest were also important for most participants.

Table 2. The number of participants giving particular positive aspects of a grazed orchard system a rank between 1: highest rank, 2: second highest rank, to 10.

Aspect		Number of participants giving a given rank									
		1	2	3	4	5	6	7	8	9	10
Some production effects	Animal health and welfare	12	3			1					2
	Animal production	7	2	1	1	1					
	Losses by predation	2	2		1	1					
	Crop or pasture production	6	2	2		3	1			1	1
	Crop or pasture quality/food safety	5	5	3			1		1		
	Disease and weed control	5	5	2			1		1		
	Diversity of products	5	1	2	1	1		1	1		5
	Timber/wood/fruit/nut production	7	3	2		2					
Timber/wood/fruit/nut quality	6	1	2		2						
Some management effects	Complexity of work	4		1		1					
	Inspection of animals	4		2		1				1	
	Labour	4		1		1					
	Management costs	4		2		2	2				
	Mechanisation	4			1	1					
	Originality and interest	10	3		1	1					
	Project feasibility	5	2	1	3						
Tree regeneration/survival	6	1				1		1			
Some environmental effects	Biodiversity and wildlife habitat	12	2	1			1				
	General environment	8	2	1					2		
	Landscape aesthetics									2	
Some socio-economic effects	Administrative burden	3				2					
	Business opportunities	1	3	4	1	2					
	Cash flow	4	1	2					1		
	Farmer image	11	2	2		2					
	Income diversity	6	3	2		2					
	Inheritance and taks	3	1			2					
	Regulation	3		1			2				
	Local food supply	6	1	2	1	2					
	Marketing premium	3	2	4	2	1			1		
	Market risk	2	1			1		1	1	1	
	Profit	4	1	1	1	3				1	
	Relationship between farmer/owner	3		2	1	1					
	Rural employment	3	2	1		1			2	2	
Subsidy and grant eligibility	2	3			4			2	1		
Tourism	5	5			4			2	1		

**Negative aspects:** the most negative issue (Table 3) was seen as the complexity of work, the inspection of animals, the specific labour for animals, and the administrative burden. This analysis also picked up a concern associated with the need to inspect the sheep. It is unclear why landscape aesthetics are noted as an important negative aspect by nine participants but this could be related to the translation of the questionnaire from English.

Table 3. The number of participants giving particular negative aspects of a grazed orchard system a rank between 1: highest rank, 2: second highest rank, to 10.

Aspect		Number of participants giving a given rank									
		1	2	3	4	5	6	7	8	9	10
Some production effects	Animal health and welfare		1						1		
	Animal production			1	1	1		1			
	Losses by predation			2				1	1		1
	Crop or pasture production	1		1							
	Crop or pasture quality/food safety	1				1			1		1
	Disease and weed control										
	Diversity of products										
	Timber/wood/fruit/nut production										
Some management effects	Timber/wood/fruit/nut quality										
	Complexity of work	6	2	1	1	2		1	1		
	Inspection of animals	4	1	1	1	2		1	1		
	Labour	5	2	1	2	1			1		
	Management costs					3			2		
	Mechanisation		1	1		1	1				2
	Originality and interest										1
	Project feasibility	1			1				1		1
Some environmental effects	Tree regeneration/survival		1					1			1
	Biodiversity and wildlife habitat										
	General environment									1	
Some socio-economic effects	Landscape aesthetics	9	1	1		1					
	Administrative burden	4	1		1	2	1				
	Business opportunities	2	1	1							
	Cash flow			1	1	2	1		1		
	Farmer image										1
	Income diversity					2					1
	Inheritance and taks	1				2					1
	Regulation	3		1					1		
	Local food supply										
	Marketing premium										
	Market risk	1		1		1		2	1		1
	Profit						1				
	Relationship between farmer/owner	3				1					
	Rural employment										
Subsidy and grant eligibility	1	1						1		1	
Tourism						1				1	

## 7. Qualitative written responses

Fifteen respondents gave a written answer to the question: *What key constraints or challenges could be addressed by either changes to an existing agroforestry system or establishing a new agroforestry system?* The answers were:

- decreased production (6 times)
- sheep management (4 times)
- working time (3 times)
- investment
- Common agricultural policy (CAP) grants
- require large surfaces
- the requirement for multiple expertise

Ten respondents gave a written answer to the question: *“What kind of solutions or research themes would you propose to solve these problems? The answers included:*

- increasing technical knowledge, more experiments (3 times)
- training (3 times)
- complementary competencies on farm (2 farm partners for instance)

Of the 21 people completing a form, 18 indicated that they would be interested in supporting research related to orchard grazing.

## 8. Reference

Coulon, F., Pointereau, P., Meiffren, I. (2005). *Le Pré-verger pour une Agriculture Durable*. Ed Solagro. 186 pp.

## 9. Acknowledgements

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