



## Initial Stakeholder Meeting Report Grazed Orchards in the UK

**Work-package group 3:** High value trees

**Specific group:** Grazed orchards in the UK

**Date of meeting:** 19 June 2014

**Date of report:** 18 July 2014

**Location of meeting:** Showle Farm, Monkhide, Ledbury, Herefordshire, UK

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Sheep grazing within a traditional orchard at Showle Farm, Herefordshire

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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

It is estimated that there are 28,750 ha of traditional orchards in the UK (UK BRIG, 2010). The majority of the systems occur in Western England, the South West, and the South East (Fig 1). The principal crop is apple (*Malus domestica*), although pears (*Pyrus communis*) are also grown. The area of grazed orchards (Fig 2) is not known.

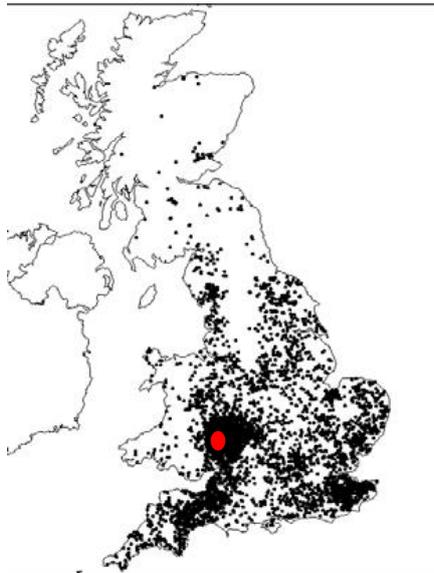


Fig 1. Distribution of traditional orchards in the UK (BRIG, 2010); red dot shows location of meeting.



Fig 2. Photo of Shropshire sheep within a wide-spaced traditional orchard

### 3. Participants

The meeting was attended by 14 stakeholders and three presenters. Of 11 stakeholders who completed a survey form, 10 were involved in orchard management. The area of the orchards ranged from 0.2 to 24 hectares. Four of the ten respondents said that they were already managing an agroforestry system. Because the initial stakeholder invitations were arranged by the Soil Association, a number of the participants were managing organic farms. There was a broad age range with four people aged 20-35 years, one person aged between 35 and 50, five people aged 50-65 years, and one over 65. The gender mix was five women and nine men. The stakeholders were mainly from Western England, although one had travelled from Devon.

### 4. Introduction session

The meeting comprised an initial introduction (Fig 3), a field visit, and then further discussion. The meeting was hosted by Harvey Clay and family at their farm near Ledbury in Herefordshire and invitations were organised by the Soil Association. The meeting started at 9.30 a.m. and lasted until 2.30 p.m.

The morning included presentations by Liz Bowles (Head of Farming at the Soil Association), Emily Durrant (Bulmers Foundation) and Paul Burgess (Cranfield University and the Agforward project). Harvey Clay also welcomed people to the farm. Liz Bowles is managing a number of “field labs” across the UK organised by the Soil Association; this is one of the field labs focusing on an agroforestry system. Liz is also a member of the Shropshire Sheep Breeders Association.

The introduction section covered evidence that Shropshire sheep, a particular breed of UK sheep, has been identified as being “tree-friendly”. A pamphlet produced by the Shropshire Sheep Breeders’ Association (2008) notes the work of Graham Allan, a Scottish shepherd, who used sheep to manage weeds within conifer plantations in Denmark. It says that “experiments” were carried out on a range of UK sheep breeds, valued for meat production, including the Leicester, Dorset, Suffolk, and Oxford Down breeds. The Shropshire breed “proved consistently to be the most reliable”. As a result of such work, Shropshire sheep are being imported in Austria and Switzerland, and 250 British Shropshire sheep were imported by French fruit producers between 2008 and 2009 (Geddes & Kohl, 2009). Decouzon (2011) describes the use of Shropshire sheep in orchards in France.



Fig 3. Photo of the initial discussions on the opportunities and challenges of grazed orchards

In 2006, a trial with three treatments was established at a Research Centre for Fruit Growing in Bavendorf, Germany to determine the response of Shropshire sheep (Mayr et al 2007 quoted by Geedes and Kohl, 2009). It established that the sheep kept the ground vegetation tidy and short, with the exception of nettles. The sheep did graze the foliage of fruit trees to a height of 1 m, but woody branches and twigs with buds generally remained safe. It was also recognised that any chemical spray treatments for the trees needed to be carefully co-ordinated with sheep grazing management. It is also noted that ram must not be allowed in the orchards.

Emily Durrant who works the Bulmer Foundation indicated that the “Hereford Orchard Network of Excellence” (HONE) had previously looked at sheep in orchards. She noted that some cider companies had up to a 56 day exclusion period for sheep prior to the harvest of fruit to minimise any faecal contamination (Parrett, 2010). Hence one particularly appropriate time to introduce sheep is after apple harvest in October.

Paul Burgess described the AGFORWARD project (2014-2017), and how the project was interested in setting up a stakeholder group in the UK focused on orchard grazing (Agforward, 2014).

## 5. Field visit

The participants then visited an orchard purchased by Clay family in 2009. The trees had been planted in 1998 and the lower branches had been recently pruned (Fig 4). The plan was for the sheep to come back into the orchard after apple harvest in the autumn. There was a need to ensure that noxious hedgerow weeds, such as hemlock (*Conium maculatum*), were controlled before the introduction of the sheep. The provision of mineral blocks was also noted. Emily Durrant explained that HONE had undertaken some work on green manures for the tree understorey. Researchers at Reading University had suggested white clover, fescues, and kidney weed (*Dichondra repens*).



Fig 4. Emily Durrant described some of the work on understorey management

We then visited a more traditional orchard where the trees were at an approximate 8 m x 8 m spacing (Fig 2). Sheep were placed in this system in March. Again prior to adding the sheep it was necessary to remove hemlock from the hedgerows and minimise the amount of mistletoe. Harvey Clay noted that as long as the sheep density was not too high, then the sheep did not suffer from worms.

## 6. Oral comments after field visit

Liz Bowles facilitated an open discussion on what had been discussed and each participant was asked to outline what they saw as the key issues moving forward. A wide range of topics were covered. Oral comments related to the selection of grass species, the potential loss of apple production due to the loss of lower tree branches, and the timing of grazing. Other topics were reducing mowing costs, a new revenue stream, and the availability of information.

**Grass species:** it was noted that “hard-wearing” grass species are often recommended when designing orchards to account for the machinery use. However in a grazed orchard, palatable grass species are desirable. Was there a possibility of having different grass species for the headlands and the alleys? Comfrey (*Symphytum officinale* L.) was identified as a useful understorey species by two participants.

**Loss of apple production due to loss of lower branches:** there was some discussion about whether the removal of lower branches reduced fruit production. One participant considered that it depended on the shape of the tree and it may be an issue in intensive systems with an “A” shaped frame. Another noted that the removal of lower branches may have benefits in terms of improving air flow through the orchard.

**Timing of grazing:** at least two people raised the issue of how the timing of grazing related to orchard operations, such as spraying and harvesting. It was noted that some orchards almost follow a biennial cropping pattern, which may offer greater opportunities for the use of sheep. One person asked “how long after planting can you put sheep in?”

**Reducing mowing:** at least two participants were interested in whether sheep were a way of minimizing mowing costs.

**New revenue stream:** sheep grazing could offer a new revenue stream from orchards. Another placed emphasis on the commercial viability of the system.

**Information:** at least two participants mentioned that a document that would help people graze sheep in orchard would be helpful.

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

The participants were asked to complete a brief questionnaire which sought to highlight the key positive and negative aspects of grazed orchard systems. Seven participants completed the form in a consistent way. Whilst the positive aspects broadly followed the oral and written comments, the negative aspects highlight the complexity of the systems and management costs.

**Positive aspects:** the most positive aspects, identified by two, were a reduction in management costs, presumably in relation to grass cutting. Another three recognised the reduction in labour. The benefits of animal production and pasture production were also highly rated. One participant considered the animal health and welfare issue highly, and another focused on the originality and interest (Table 1).

**Negative aspects:** the most negative issue was seen as the complexity of work, the management costs, and the administrative burden. This analysis also picked up a concern associated with the need to inspect the sheep (Table 2). It is not clear if this was due to inspection in general or perhaps difficulties with seeing the tree in a tree covered environment.

Table 1. Positive aspects of a grazed orchard system

Aspect	Ranking by 7 respondents							Summary
Management costs	1				1			2 x 1 <sup>st</sup>
Animal production		2				1	2	1 x 1 <sup>st</sup> , 2 x 2 <sup>nd</sup>
Labour		3		1		3		1 x 1 <sup>st</sup> , 3 x 3 <sup>rd</sup>
Crop or pasture production		4	1					1 x 1 <sup>st</sup> , 1 x 4 <sup>th</sup>
Animal health and welfare							1	1 x 1 <sup>st</sup>
Originality and interest		1						1 x 1 <sup>st</sup>
Biodiversity and wildlife habitat			3	2			4	1 x 2 <sup>nd</sup> , 1 x 3 <sup>rd</sup> , 1 x 4 <sup>th</sup>
Disease and weed control						2	3	1 x 2 <sup>nd</sup> , 1 x 3 <sup>rd</sup>
Business opportunities			2	4			5	1 x 2 <sup>nd</sup> , 1 x 4 <sup>th</sup> , 1 x 5 <sup>th</sup>
Runoff and flood control					2			1 x 2 <sup>nd</sup>
Landscape aesthetics				3			5	1 x 3 <sup>rd</sup> , 1 x 5 <sup>th</sup>
Soil conservation					3			1 x 3 <sup>rd</sup> , 1 x 5 <sup>th</sup>
Diversity of products			4			6		1 x 4 <sup>th</sup> , 1 x 6 <sup>th</sup>
Carbon sequestration					4			1 x 4 <sup>th</sup>
General environment						4		1 x 4 <sup>th</sup>
Local food supply		5		5			7	2 x 5 <sup>th</sup> , 1 x 7 <sup>th</sup>
Profit			5				6	1 x 5 <sup>th</sup> , 1 x 6 <sup>th</sup>
Income diversity		6			5			1 x 5 <sup>th</sup> , 1 x 6 <sup>th</sup>
Farmer image							6	1 x 6 <sup>th</sup>
Reduced mowing time		7						1 x 7 <sup>th</sup>

Table 2. Negative aspects of a grazed orchard system

Aspect	Ranking by 7 respondents							Summary
Complexity of work	1	2	1				1	3 x 1 <sup>st</sup> , 1 x 2 <sup>nd</sup>
Inspection of animals				1			1	2 x 1 <sup>st</sup>
Management costs		1	4				3	1 x 1 <sup>st</sup> , 1 x 3 <sup>rd</sup> , 1 x 4 <sup>th</sup>
Administrative burden			3		1			1 x 1 <sup>st</sup> , 1 x 3 <sup>rd</sup>
Labour			2				2	2 x 2 <sup>nd</sup>
Tree regeneration/survival				2				1 x 2 <sup>nd</sup>
Fruit production	2							1 x 2 <sup>nd</sup>
Tourism					2			1 x 2 <sup>nd</sup>
Pasture quality/food safety		3						1 x 3 <sup>rd</sup>
Cost of fencing boundary		4						1 x 4 <sup>th</sup>

## 8. Qualitative written responses

Seven respondents gave a written answer to the question: “what constraints and challenges could be addressed by changes to an existing agroforestry system or establishing a new agroforestry system”. The themes broadly matched those given orally.

**Reduction of mowing costs:** Two respondents noted that a successful agroforestry system would help to reduce the time “spent mowing and spraying (together with associated maintenance, cost of machinery) and herbicides”. The reduction in the labour associated with mowing and spraying was also noted. One respondent indicated that an agroforestry system may help prevent “Adverse short term impacts on farm income” although the context is unclear.

**Grazing management guidelines:** One respondent noted that a grazed orchard system needed careful separation of the trees and sheep for periods when the apple trees were sprayed to control diseases. Two respondents considered that it was important to “balance stocking density to potential orchard damage”. Another respondent noted that grazing was easier when the trees were established.

**Environmental benefits:** one respondent considered that grazed orchards would help “build” the soil, and have positive effects on “carbon sequestration, increased production, biodiversity, and resilience”.

**Effect on trees:** One respondent noted that a successful agroforestry system would require knowledge on the “potential damage to trees”. In the context of a focus on Shropshire sheep, it seems that direct tree damage was not the issue, but rather the impact of “lower branch grazing”.

**System design:** one respondent outlined a whole range of issues including the spacing of the trees, mechanisation in the field, and the herbage quality of the inter-row grass.

Seven respondents gave written responses to what were potential solutions or research themes.

**Impact of removing lower branches on apple yield:** Four placed weight on the impact of sheep grazing of apple production, with three focused on how sheep grazing the lower leaves of an apple tree will affect apple production. For example is there a significant negative effect on apple yields, or is production simply displaced further up the tree. The type of question was: “Does increasing the height of canopy result in a loss of fruit?”

**Timing of grazing:** two respondents thought that sheep management was important. For example, how should grazing been integrated with the pesticides being used in apple production?

**Choice of grass species:** Two respondents placed weight on the different grass species used for the inter-row areas where the sheep were grazing.

**System design:** One person felt that it would be useful to determine the “ideal spacing to maximise yields of trees and pasture”

**Information:** one person placed weight on making better use of existing information. There was a “need to embrace evidence from farmers themselves” perhaps by “collating anecdotal evidence”. However the same person was also interested in “setting up a database of papers relating to this issue”

## 9. Next steps

Of the ten people completing a form, nine indicated that they would be interested in supporting research related to orchard grazing. The remaining person said “may be”. From the AGFORWARD project perspective, the plan was to identify such researchable issues before the end of 2014. An initial stakeholder meeting was also planned in Northern Ireland, and it would be useful to determine if current themes emerge.

## 10. References

Agforward (2014). Agforward website. [www.agforward.eu](http://www.agforward.eu)

Decouzon J (2011). Introduction of Sheep in Commercial Cide Orchards: Sheep and orchards: a promising association for more sustainable cide apple production. Unpublished report.

Geddes P, Kohl R (2009) Shropshire sheep control weeds in orchards. Pesticide News 86 <http://www.pan-uk.org/pestnews/Issue/pn86/Shropshire%20sheep.pdf>

Mayr U, Spath S, Bruder A, Kohl R (2007). Report on the trial with Shropshire sheep grazing in apple orchards at the Research Centre for Fruit Growing, Lake Constance, Bavendorf, Germany, Obst und Garten, Issue 05/2007. 5. LUBW- Landesanstalt.

Parrett S (2010). Public and private policy affecting the grazing of animals on commercial cider apple orchards in the UK. The Bulmer Foundation, University of Worcester. Report commissioned by Heineken UK Ltd.

Shropshire Sheep Breeders’ Association (2008). Two Crops from One Acre: A Comprehensive Guide to using Shropshire Sheep for Grazing Tree Plantations. [www.shropshire-sheep.co.uk](http://www.shropshire-sheep.co.uk)

Townsend, M. (2012) Benefits of Trees on Livestock Farms. Woodland Trust Report. Grantham, Lincolnshire: Woodland Trust. <http://www.woodlandtrust.org.uk/mediafile/100083885/Benefits-of-trees-to-livestock-farms-evidence-report.pdf>

UK BAP Biodiversity Reporting and Information Group (BRIG) (2010) Traditional orchards In: UK Biodiversity Action Plan; Priority Habitat Descriptions 89-91 (Ed. Ant Maddock) (Updated July 2010). [http://jncc.defra.gov.uk/PDF/UKBAP\\_PriorityHabitatDesc-Rev2010.pdf](http://jncc.defra.gov.uk/PDF/UKBAP_PriorityHabitatDesc-Rev2010.pdf)

## 11. Acknowledgements



Co-funded by the European Union

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Herefordshire Orchards Network of Excellence was part funded by the European Union (EAFRD) and Defra through the VITAL Herefordshire LEADER programme.

Paul acknowledges the support of the Soil Association and Harvey Clay in organising the workshop.