



Integrating food and non-food production: making better use of on-farm resources including woody features, waste and co-products

ORC recently hosted a workshop to investigate ways to increase the value and quality of material coming from boundary hedges - for use as a fuel, as well as other uses or products such as compost, livestock bedding and tree fodder. This workshop was part of a new European project SustainFARM, which aims to investigate the economic and environmental performance of a network of traditional and innovative farming systems that integrate food and non-food production. **Jo Smith and Sally Westaway report.**

Systems to be investigated include both:

- 1. Traditional systems** which are currently managed primarily to produce food but have the potential to produce non-food biomass and additional co-products from existing on-farm resources. In the UK we will look further at producing woodchip for bioenergy from boundary hedgerows, and our Italian partners plan to investigate the use of olive processing residues to produce bioenergy, biogas, fertiliser and olive paste for animal feed.
- 2. Innovative systems** which are multifunctional systems in which food production is fully integrated with biomass production to be used as a renewable energy source, for example, agroforestry systems where short rotation coppice is integrated with arable or livestock production in an alley cropping design to fully exploit the positive interactions between the tree and crop components.

In the UK, ORC will focus on two case study farms: the traditional hedgerows and innovative silvopastoral systems on Elm Farm, Newbury, and the traditional hedgerows and innovative silvoarable systems at Wakelyns Agroforestry, Suffolk. These case studies will provide data for modelling the environmental and economic performance of integrated systems as well as trial sites for investigating the management and production of multiple non-food products including woodfuel, woodchip compost and animal bedding. ORC will also lead work to develop a list of agronomic, environmental and economic indicators to evaluate the sustainability of these systems, developing the existing Public Goods sustainability assessment tool to fully integrate the non-food component.

Local stakeholder groups are associated with each of the case study sites, consisting of farmers, foresters, advisors, bioenergy companies and conservation organisations. The workshop held on 9th May at Elm Farm brought together a good cross-section of stakeholders. Building on the work carried out in the TWECOM project (www.twecom.eu) the workshop aim was to identify research priorities for testing and comparing different harvesting, chipping and processing techniques to increase woodchip quality from traditional (hedgerows) and innovative (short rotation coppice) agroforestry systems, and to look at alternative uses of the woody material. Workshop participants were asked to identify and then score their top priorities for further research under six different headings. The results of this initial prioritisation can be seen in the table opposite.

Key conclusions from the workshop were that we need to consider the whole supply chain not just the individual parts and that a major challenge is how to facilitate the adoption of new management techniques by farmers and landowners; what are the barriers and how do we overcome them? The next step is to use this to help inform our trials at Elm Farm and Wakelyns Agroforestry in autumn and winter 2016/17.

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Top 3 priorities chosen for further research in each category

Harvesting	1	How to select appropriate machinery and methods
	2	More trials for specific machines e.g. 360 degree tree shears, Bracke felling head
	3	Hedge restoration methods and guidance on species choice
Chipping	1	Chip green and store vs store and chip (use of Toptex)
	2	Timing of harvesting and chipping (ground conditions etc.)
	3	Collecting machines for flailed material
Adding value	1	Fruit, berries, flowers, nuts (elderberries/flowers)
	2	Use of chip as a soil improver/mulch
	3	Drying, pellet production and torrefaction
End use	1	Boiler technologies including pyrolysis and suitability of hedge material
	2	How to connect supply with markets - is there a critical mass?
	3	Analysis of saved opportunity costs
Wider impacts	1	Selecting and maintaining standard trees (biodiversity and landscape)
	2	How to create resilient tree-scapes
	3	Ecosystem services - how are they monetised?
Parameters to measure	1	When to cut? Productivity curves - SRC, hedges, woods
	2	Length of rotation depending on species - to optimise yields
	3	Whole farm economics



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