

Making the most of farm woodlands

on the demonstration network



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Foreword

The Welsh forestry sector provides valuable employment opportunities for rural communities, with farming businesses involved in the management of predominantly smaller and more diverse native woodlands. There are large areas of currently unmanaged broadleaf and farm woodland in Wales. Collectively these represent a major opportunity to increase production of usable timber in response to increasing demand, predominantly for energy.



Farming Connect has helped a range of livestock businesses across Wales investigate existing woodland management, woodland creation and wood fuel sourcing and supply opportunities. The benefits are wide ranging and encourage a long term perspective of land management and business priorities going forward, with 10+ year management plans being a feature of this support.

Developing woodland management as an additional business feature isn't just about diversifying, it can bring benefits to the agricultural business as well. Agroforestry i.e. co-planting agricultural and tree crops, has been investigated on farms with Farming Connect support. Practical management advice for the industry will help with wider adoption of agroforestry principles, resulting in animal health and welfare benefits, increased agricultural productivity, and additional income streams.

Woodland management and creation are useful tools for managing nutrient losses, flooding risk, and improving health and welfare of stock. Work on several focus farms has explored these benefits, and provided best practice management advice to share more widely with the industry.

Farming Connect is also helping farmers and other rural businesses protect the woodland asset base from emerging disease issues facing the trees of Wales. Helping land managers be more vigilant to the spread of disease, being able to identify the signs of disease on trees, and knowing where to go to report infections is essential.

This booklet is an illustration of the wide range of projects that have taken place over the last three years and the outcomes which have been demonstrated to farmers. They highlight the potential for earning an income from our woodlands in Wales, whilst managing them sustainably for the long term.

For updates on projects and trials at all the sites in the Farming Connect demonstration network, visit our website at **www.gov.wales/farmingconnect**

Dewi Hughes

Technical Development Manager, Farming Connect
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Farming Connect - helping you drive your business forward

Eligible businesses registered with Farming Connect can tap into a wide range of Farming Connect support services, guidance and training.

Many services are fully funded, others are subsidised by up to 80%.

Visit our website to find out how you can:

- benefit from subsidised business support, tailored to your business needs
- benchmark your performance and work towards progress and growth
- develop your skills as part of our professional development/lifelong learning programme
- keep up to date with the latest innovations in technology through industry developments and the latest research projects
- share best practice and benefit from the knowledge of other farmers, industry experts and academic research
- be inspired by new ideas and find more efficient and innovative ways of working



Developing a wood fuel business



Woodland management and the processing of wood products can be valuable alternative income streams for livestock farmers. Garthmyn Isaf focus farm, near Llanrwst, diversified from traditional sheep farming and built on existing agricultural contracting and plant hire activities to develop a business based on the processing and supply of timber. This timber processing operation is now worth over £2 million, extracting raw timber from local woodlands to produce and supply wood fuel to a range of customers.

Being in control of both the supply of raw material, and developing a customer base for a range of added value wood fuel products can be a route to sustainable diversification, alongside a farming enterprise. Farm businesses can be well suited to this type of model, due to the on farm infrastructure available, engineering expertise, and a knowledge of land management already present within a farming family.

The business worked with Farming Connect to look at business expansion requirements, including:

- The creation of revenue via the renewable heat incentives (RHIs) scheme with on farm energy generation
- Developing a more secure supply chain – sourcing of raw material locally
- Securing new customers for a range of wood fuel based services
- Becoming certified as a grower and supplier

Investment required at Garthmyn Isaf

- A mobile chipper
- Combined Heat and Power (CHP) plant powered by three tonnes of woodchip daily
- Drying floors force warm air through the woodchip, via energy from the Garthmyn CHP plant

Developing a more secure supply chain requires a good understanding of where wood will be available in the local area. To achieve this a range of different contacts were made and options investigated including;

- Private estates
- Woodland managers and agents
- Local farms
- Own woodland management
- Other privately owned woodlands
- Local arboriculture businesses
- Foresters/agents/consultants
- Timber contracts



On investigation it was found that ‘green’ timber is a more suitable resource to work with and provides greater flexibility. It is easy to handle and cheaper to source and now that there are excellent drying facilities at Garthmyn Isaf the correct moisture content can be achieved in hours. This has enabled the production of a range of products that suit customers’ exact requirements.

Outcomes from the project

Production of woodchip at **15%** moisture level, for use in Garthmyn boilers for energy generation, selling **30kW** to the National Grid per hour



Reduced reliance on livestock production as an income stream



A ready supply of timber for the business coupled with a market demand for woodchip



Purchase locally to reduce haulage costs



Employment for all family members



It has also been found beneficial to become certified with a quality assurance scheme. This provides assurance that the wood is produced to specific standards and provides evidence of the quality of the products. The result has been an increase in customer confidence and growth in sales.

What is required to successfully run a wood fuel business?

- Engineering expertise and operation skills
- Source a steady supply of raw material
- Work towards gaining and maintaining accreditation
- Produce high quality timber for sustainable markets
- Adhere to all health and safety guidelines and ensure staff are correctly trained

Integrating agroforestry into livestock enterprises



Agroforestry is the growing of both trees and agricultural or horticultural crops on the same piece of land. The aim is to earn an income from co-located trees and crops whilst protecting and conserving natural resources. Agroforestry differs from traditional forestry and agriculture in that it focusses on the interactions between growing plants rather than on each individual crop in isolation. There is increased interest into incorporating these systems into livestock enterprises as animals can also benefit from the environmental conditions provided by the trees.

Benefits

- Trees provide shade and wind protection, reducing heat stress and wind chill of livestock
- Livestock performance can be improved and mortality reduced
- Wider environmental benefits are created by including more trees in the landscape
- The combined tree plus forage productivity of these 'silvopastures' can substantially exceed that of pastures or forests grown alone

Drawbacks

- The cost of protecting trees from livestock can be expensive
- Damage can cause crooked growth which reduces the economic value of the timber. This can be overcome by corrective pruning or use of nurse trees
- Competition between trees and grass or other crops, for resources such as light and nutrients will occur. However, the associated benefits of intercropping trees with other crops generally outweigh this

Silvopasture systems involve deliberately introducing trees into a forage production system where animals are also grazed. The forage system is usually permanent pasture, although hay or silage crops may also be grown. The choice of tree varies from high-value timber species to those that produce a nut or fruit crop.



Henfaes Research Centre, near Bangor, worked with Farming Connect to demonstrate and raise awareness of agroforestry. An established area of agroforestry was planted with areas of forage crops among the trees. A range of fodder crops, including stubble turnips and kale, as well as different grass mixtures were demonstrated highlighting the potential to increase productivity by adopting these systems.

Recommendations from the project

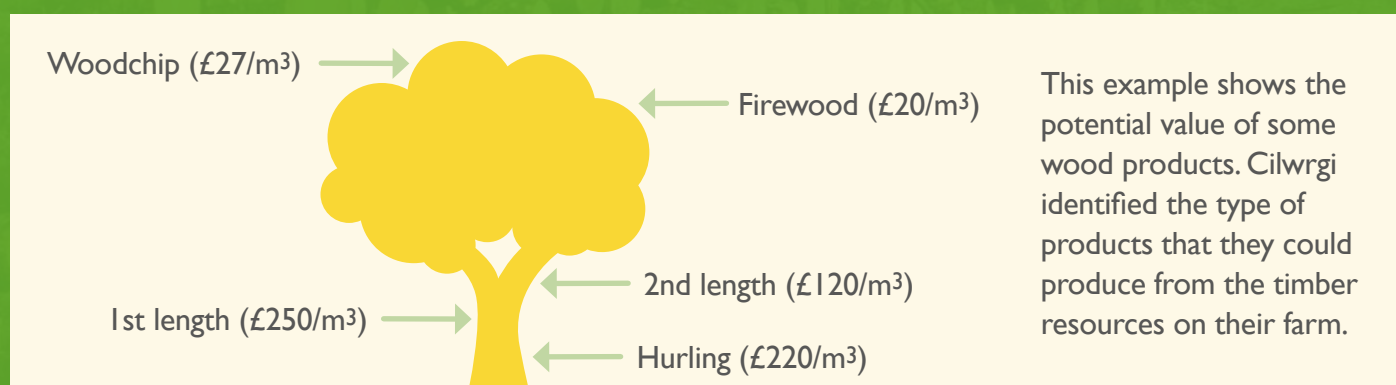
- Prune sycamore and alder trees regularly to increase light levels below the canopy
- Direct drill break crops of hybrid kale, stubble turnips or a mixture
- Analyse fodder quality to ensure animal requirements are met
- Analyse sward productivity and composition
- Record daily live weight gain of lambs to evaluate animal productivity
- Plant trees in clumps of 400 stems per ha, including:
 - Slow growing, high value species such as sessile oak
 - Fast growing, light demanding species such as silver birch
 - Aim for the final density of the mature crop to be 50 stems per ha
- Introducing agroforestry into a business provides opportunities to store carbon and improve the environmental credentials of the farm

Adding value to farm woodlands



Many farms have areas of woodland that are underutilised and could, through careful management, provide an additional income stream to the business.

Cilwrgi Farm focus site, near Bridgend, hosted an event to focus on how woodland management can improve the farm business.



Topics discussed at the event

- Alleviating diffuse pollution and reducing overland flow with trees and hedgerows
- Providing shelter for livestock to improve welfare and performance
- Improving animal biosecurity with robust hedgerows
- Reduced soil erosion from wind and water through strategically placed shelter belts

- Revenue streams from timber

Attendees at the event were also signposted to the legislation regarding felling licences as well as their responsibilities regarding Environmental Impact Assessments. Opportunities for funding were also outlined including access to woodland management plans, Glastir Woodland Creation and Glastir Woodland Restoration.



Viability of small conifer woodlands

Skirrid Farm, which is part of Great Tre Rhew demonstration site, near Abergavenny, had a small conifer woodland that was typical of many unmanaged blocks that exist on farms in Wales. The project looked at whether it could be efficiently felled and extracted and what the value of the timber would be.

0.65 Ha site



450 m³ Sitka spruce was felled which produced
1,000 fencing stakes - value **£1,500**



Some oak was felled to produce
beams, sills and joists to repair old cider mill
on site - value **£1,500**



Larch was felled and used for **25m²** of flooring
planks - value **£1,000**



The project showed the potential for these small areas that were originally planted as shelter belts or for timber production. The wood was a valuable resource to the farm and was used in renovation projects on site as well as the fencing stakes being used to repair and maintain fences.

Using trees to enhance free range egg production



Providing tree cover for free range chickens benefits the welfare of the birds and their performance. Wooded environments have been identified as replicating conditions which encourage natural poultry behaviours such as foraging, scratching and dust bathing. Poultry systems are rich in nutrients, with associated pollution risks. There is the potential for tree planting to help reduce nutrient loading in poultry systems by acting as barriers to emission sources, intercepting ammonia emissions and particles and slowing down water run-off from these areas.

Gaerfechan focus site, Cerrigydrudion, diversified into free range egg production with a unit comprising of 32,000 birds. They undertook a

project to investigate whether tree planting in the free range areas could improve the welfare and performance of the birds.

Project objectives

- Consider tree planting design, species choice and protection, for establishment with ranging birds
- Mitigate against issues such as compaction and excess loading of nutrients
- Identify the benefits and value of trees to health and welfare of poultry units
- Investigate economic benefits that establishing tree cover can provide for poultry units

Using existing baseline data from the farm, comparisons were made on how the birds' behaviour altered as a result of having trees in their ranging area. Assessments were also made on the birds' health and welfare. Several tree species were used and establishment of the trees was monitored to determine what size of tree is best to plant. A ten year management plan was developed to ensure appropriate management of the new wood resource on the farm.

Due to the timescales involved with growing trees the project has focused on establishment methods. It is anticipated that introducing trees will result in a reduction in feather pecking. Improved levels of shade and shelter encourage the birds to roam further from the sheds. This increased activity reduces abnormal behaviours such as feather pecking having an overall improvement in health and welfare. This will hopefully result in benefits such as lower veterinary costs and increased egg production.

Recommendations from the project

- Trees closest to the poultry sheds are difficult to establish, but they are the most important as they encourage hens to range, provide screening and soak up ammonia
- Tree thinning is required once the canopies have started to close
- Plant native species suitable to the soil and local climate conditions
- Choose fast growing species to plant near the shed e.g. white or grey poplar (part of the willow family), or hybrid varieties, alongside native species
- 15 years ahead: where poplars are planted they must be thinned out as the wood becomes established to allow for the slower growing native species to dominate



Disease threats to trees in Wales



Both native and introduced trees in Wales are potentially susceptible to a wide range of pests and pathogens. Outbreaks of pests and diseases which affect large numbers of trees can have significant effects on our landscapes, natural habitats and economy.

In the last few years, the outbreaks of *Phytophthora ramorum* and Chalara dieback of ash have raised the profile of tree diseases in the UK. Acute oak decline has also been confirmed on oaks in Wales.

You can play your part in helping Wales minimise the negative effects of these tree diseases.

Be aware of the current
and potential threats
to trees



Know how to identify
pests and diseases and
how to report them



Take simple biosecurity
precautions when visiting
the countryside to avoid
spreading pests and diseases



How can I help stop the spread?

Arrive at woodland sites wearing clean boots, disinfected vehicle tyres and practice good biosecurity.

Be aware of disease issues

Report any tree diseases to TREE alert
treealert@forestresearch.gov.uk

Identification and significance of diseases in Wales



Disease	Symptoms	How it's spread	Outlook and risk for Wales
<p>Phytophthora ramorum <i>A fungus that infects and kills larch trees. It also affects a number of other trees, shrubs and plants.</i></p>	<ul style="list-style-type: none">• Wilted, withered shoot tips with blackened needles• Infected shoots shedding their needles• Prematurely bleeding cankers exuding resin on the upper trunk and branches	<ul style="list-style-type: none">• Moist and wet conditions• Mist, fog and watercourses• Contaminating spores can be spread by animals, footwear and machinery	<p>9,000 ha of larch trees in Wales have been infected</p>
<p>Chalara ash dieback <i>A serious fungal disease that is killing ash trees across Northern Europe</i></p>	<ul style="list-style-type: none">• Dark lesions – often long, thin and diamond shaped – appear on the trunk at the base of dead side shoots• Tips of shoots become black and shrivelled• Blackened, dead leaves – may look a bit like frost damage• Veins and stakes of leaves, normally pale in colour, turn brown• Saplings have dead tops and side shoots	<ul style="list-style-type: none">• Spread by spores from the fruiting bodies of the fungus produced on fallen ash leaves	<p>Trees outside of woodlands (parks, gardens, hedgerows) are most at risk</p> <p>Found on newly planted ash trees as well as older trees</p>

In 2019 Welsh Government published '*Phytophthora ramorum*: Strategy for Wales' that focuses on managing the disease in larch within woodlands across Wales. The strategy brings together the latest scientific knowledge on the disease and outlines different management options for dealing with it.

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