

Scotland's Rural College

Climate ready farming: integrating livestock and trees

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Climate ready farming: integrating livestock and trees

Adding trees to agricultural systems adds resilience but benefits may take time, explain Meg Pollock and John Holland.

Interest in agroforestry in Scotland is greater than it ever has been. Agroforestry can be defined as the integration of trees on farmland, and this can take the form of individually protected trees within grazed (silvopastoral) or arable (silvoarable) fields, or blocks of fenced woodland, shelterbelts, hedges or individual trees. In this article we focus on silvopastoral and silvoarable agroforestry systems. For decades (apart from a few exceptions, notably the James Hutton Institute's Glensaugh research farm) agriculture and forestry were separated on the ground and in people's minds. Slowly but surely, this is beginning to change. The Scottish Government is committed to supporting agroforestry because of its potential to mitigate the biodiversity and climate crises. To achieve this, we need farmers to choose to plant trees on their farms.

There has been financial support for silvopastoral agroforestry since

Riparian woodland designed to provide habitat for biodiversity and keep sheep away from a dangerous gorge at SRUC Kirkton & Auchtertyre Farms. Photo: John Holland.

March 2016 under the Scottish Forestry (SF) Grant Scheme, but until July 2023 it was very prescriptive, offering support only for fairly high densities of trees with sheep. The new Agroforestry Option under the SF Grant Scheme is less prescriptive and more generous, offering support for systems with any livestock or crop, and with trees grown at a wider range of densities. Areas from one-half to 15 hectares can be supported. Support for smaller parcels of land is available from Woodland Trust, Loch Lomond & The Trossachs National Park Authority, and the Scottish Government's Rural Payments Schemes.

The SF Agroforestry Option is restricted to land classified as productive, with rough grazing land ineligible. While more generous than the old scheme, the current Agroforestry Option is unlikely to cover all the costs of materials and labour. The old SF Agroforestry Option resulted in three schemes covering a total of over 13 hectares. We hope that the more flexible and generous new scheme and the greater

interest in agroforestry will result in increased uptake.

A small minority of farmers are passionate about trees and either have already, or are planning to, establish woodlands or agroforestry systems on their farms. The Integrating Trees Network and the Farming Advisory Service (FAS), funded by the Scottish Government, give the farming community the opportunity to learn from their peers and see agroforestry in practice. NGOs including the Woodland Trust, Soil Association and Farm Woodland Forum promote agroforestry, with the Woodland Trust offering some grant funding.

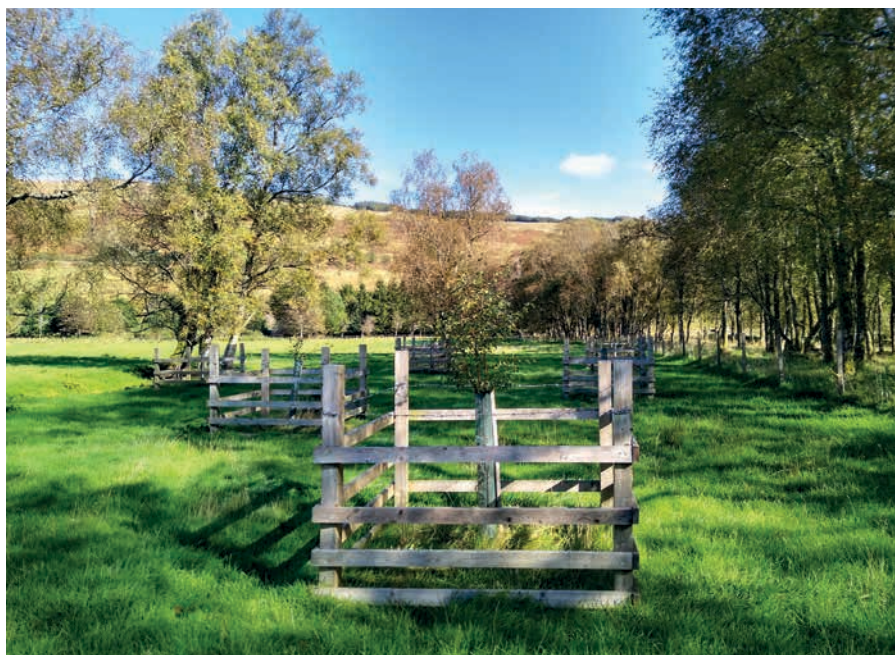
Farmers are good at growing livestock and crops to produce food annually. As well as different practical skills, growing trees requires a different mindset, as the benefits are realised on longer timescales. Agriculture students seeing a silvopastoral system established at SRUC Kirkton and Auchtertyre Farms were sceptical about the benefits. There is work to be done to educate young and current farmers in the benefits of integrating

trees within farming systems and in finding solutions to potential problems.

Many benefits

With ‘the right tree in the right place’, the benefits of agroforestry are significant for many ecosystem services [1]. As well as providing a source of timber or firewood, fruit and nuts, and having the potential to sequester carbon, trees improve soil water infiltration [2], reduce soil erosion, and increase soil nutrient cycling. Trees and woodlands provide habitat for many plants, invertebrates (including pollinators) and birds [3,4]. Trees can also mitigate atmospheric ammonia emitted from fertiliser and dung. Widely spaced trees are less susceptible to wildfire than those in a dense plantation. Overall, adding trees to agricultural systems adds resilience, which is likely to be critical in the face of climate change [5].

There are significant benefits to livestock from well-run silvopastoral systems [1,6]. Trees and hedges can provide shelter, shade, an ‘early bite’ (as grass grows earlier in spring), scratching posts, additional food (fresh browse or dried ‘tree hay’; see article on page 17) which includes micronutrients and is potentially medicinal. Trees and hedges can also improve animal welfare through better air quality and reduced incidence of pests and diseases. In Scotland shelter from wind and rain is important for livestock and with climate change, shade is increasingly important.



Planting is the easy bit

Being open about the potential problems of agroforestry systems, and proposing solutions to these, is important. Ill-designed schemes could make moving animals around the farm difficult, increase fly problems, or get in the way of fertiliser and/or muck spreading and harvesting of silage. Densely planted or unpruned trees will reduce pasture and crop production; there is an art to balancing the different components of an agroforestry system. The protection of young trees from stock and wildlife is a key issue. Options include individual tree protection using tubes, wooden cages, weld mesh or spiked metal guards, group protection using stock fencing or deer fencing, or in some cases a combination of fencing

and individual tree protection. Woodland creation can change the land use classification, meaning that reverting ground to purely agricultural use could require an Environmental Impact Assessment—perhaps it is not surprising that farmers think hard before planting trees using grant funding.

There is a plethora of information on the web about agroforestry and finding information relevant to a particular farm or situation is likely to be time consuming. Providing farm advisors with appropriate information and involving farmers in the planning process will ensure that schemes are practical, fitting in with and even facilitating farm management.

Maintenance of trees is important to ensure that, in time, they produce the desired benefit, be that timber, fruit, nuts, biodiversity and so on, without casting excessive shade. It is relatively easy to plant trees; committing to the on-going maintenance required can be more difficult. Finding the time to fertilise and weed trees, maintain fencing or deer culling to keep damage at an acceptable level, remove tree tubes once they are out-grown, prune trees to allow them to reach their timber or fruit objectives, and to re-



Above: Young birch trees protected with a wooden post and rail box in an agroforestry plot at SRUC Kirkton and Auchtertyre Farms.

Left: Pigs farmed among oak trees in Northern Ireland. Photos: John Holland.



integrate livestock at the correct time (if they were excluded at planting) is key to a successful scheme.

Patience

Few of the Scottish agroforestry sites are old enough for the tangible tree products to be ready for harvest, so there is little direct information on the economic benefits to farmers. The existing grant schemes reduce the cost of planting, protecting and maintaining trees but do not completely cover them, and the

financial benefits from the trees can be decades away. However, evidence from agroforestry systems in other cool-temperate parts of the world suggest that there will be an economic benefit to farmers in time [6]. Income from fruit and nut harvests may be realised sooner than that from timber and firewood. When livestock are re-introduced to planted areas, their productivity can increase, giving farmers a shorter-term return.

For most farmers, implementing an agroforestry system means stepping out of their comfort zone to create benefits that may be decades away. There is work to be done to ease this process.

There are significant benefits from well-designed and maintained agroforestry schemes for livestock, farmers, society and the wider environment. The current agroforestry grant scheme, though an improvement on the old scheme, is unlikely to cover the full costs of planning, planting and maintaining an agroforestry system—this may need to change to increase uptake. Agroforestry is not yet mainstream,

and a critical mass of sites planted by early adopters is needed before uptake can increase significantly. The groundswell of interest in agroforestry is, however, very promising.

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Meg Pollock and John Holland work for SRUC Hill and Mountain Research Centre and thank Lyn White and Gareth Phillips for information and helpful comments.



Above: Sheep using pasture below mature ash trees in a silvopastoral system at Loughgall, County Armagh.

Left: Newly planted agroforestry plot on improved grassland at SRUC Kirkton & Auchtertyre Farms (March 2020). Photos: John Holland.