Farm payments to support integration of trees and woods into farming systems in Scotland

Report for

Soil Association & Woodland Trust Scotland

June 2024

Cumulus

Version	Date	Version Details	Prepared by	Reviewed by
1.0	02/05/2024	First draft report in progress	Richard Lockett Charlie Russ Esther Kieboom	Paul Silcock
2.0	28/05/2024	Second draft report	Richard Lockett Charlie Russ Paul Silcock Esther Kieboom	Esther Kieboom
3.0	06/06/2024	Final report	Richard Lockett Charlie Russ Esther Kieboom	Esther Kieboom

We would like to thank all the people who have contributed their knowledge and insights to this project. We hope that this work helps inform the next generation of schemes in Scotland to support farmers to incorporate trees on their farm.

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Contents

Executive Summary

This report is produced for the Woodland Trust and Soil Association in Scotland who seek to provide recommendations to the Scottish Government to encourage small-scale planting of (native) trees on farms. This report recommends a range of options for small-scale tree planting designed to integrate increased tree cover on farms and crofts.

The recommended options (see Table 1) have the potential to provide a wide range of benefits whilst improving farm productivity and resilience. Trees can also provide shelter, shade, and browse for livestock whilst integrating additional production on arable land and helping facilitate regenerative practices such as mob grazing. Increased tree cover can improve farmland biodiversity and habitat connectivity whilst enhancing landscapes and storing carbon. For riparian planting (i.e. tree planting along rivers and streams), option 2 and 3 are particularly relevant.

Table 1: Recommended options and payment rates

Option	Description	Upfront one-off payment	Unit of measure
1	Silvopastoral – low density single trees	£31.15	£/tree
2a	Silvopastoral – enclosed trees (small enclosure)	£195.45	£/enclosure
2b	Silvopastoral – enclosed trees (medium enclosure)	£363.05	£/enclosure
2c	Silvopastoral – enclosed trees (large enclosure)	£531.90	£/enclosure
3	Farm woodland – small-scale (<0.25ha)	£7,231.38	£/ha
4a	Silvoarable – alley cropping (standard trees)	£9.33	£/tree
4b	Silvoarable – alley cropping (fruit trees)	£13.99	£/tree
5a	Hedgerow and field boundary trees (with cactus guards)	£65.26	£/tree
5b	Hedgerow and field boundary trees (without cactus guards)	£50.67	£/tree
6	Boundary – biodiverse hedgerows	£2,462.78	£/100m

The term ‘agroforestry’ includes all trees and shrubs which are deliberately integrated (managed) as part of a farm enterprise and provide multiple benefits. This report is primarily aimed at tree planting options which deliver public benefit (enhanced biodiversity, landscapes, carbon storage) and indirect benefits to farmers (rather than food and fibre).

The proposed tree planting options were informed by a literature review (including schemes in Scotland, Wales, Northern Ireland and England) and stakeholder engagement. These options reflect the benefits they can provide, the practical appeal to farmers and crofters, and the 'gap' in the existing Scottish Forestry Grant Scheme (FGS) Agroforestry options.

The following recommendations are made for consideration of the Scottish Government:

1) **These options for small-scale tree planting could be offered to farmers and crofters in Scotland and integrated into existing and future schemes.** These options complement the higher density, larger-scale options offered under the FGS. The silvoarable option (Section 4.4) is presented as a possible alternative to the FGS silvoarable option, which could also be changed to make it more attractive.
2) These options should be made **accessible to as many land managers as possible**. A simple, non-competitive application process would encourage much greater uptake without making large spending commitments, thus offering good value for money.
3) Ideally options for capital payments would be available under 'Tier 2 'of the future proposed support. However, if they are to sit in 'Tier 3', it remains essential that support for small scale tree planting is fully accessible to as many farmers and crofters as possible. To this end, it is strongly **recommended that these options are included as a separate, 'capital only' scheme in either 'Tier 2' or 'Tier 3' of future farm support.** In addition to the capital payments, there is also the potential for areas of newly created agroforestry land to be covered by Tier 2 support measures.
4) **Budgets of £10 million p.a. or more would double the land involved with agroforestry and woodland in Scotland** with significant outputs in terms of trees, enclosures, area of woodland planting and/or length of hedgerow planted.
5) **Training and advice are critical for a successful roll-out.** Advisors of the existing Farm Advisory Service (FAS) 'One-to-One' advisory support scheme could advise farmers and crofters on these options. This could be combined with demonstrations farms, farm talks, videos, and case studies. In future, this could fall under 'Tier 4' of farm support which will focus on skills, knowledge and training as well as advisory support services.
6) **Guidelines could be developed** regarding **site location** ('right tree in the right place'), **procurement and sourcing** (e.g. local source where possible), **Basic Payment Scheme (BPS) eligibility** (so farmers are not penalised), and **long-term maintenance**.
7) **These new tree planting options could be implemented quickly.** As these options have already been tested by farmers in Scotland, they are relatively simple, and could easily be rolled out more widely across Scotland.
8) **Regular review and fine tuning of the payment rates may be required.** More detailed management prescriptions may be required, and costings and payment rates may need to be adjusted. Payment rates could be set higher to increase the incentives to drive uptake or set below the costs of the 'typical' farm if wide uptake is expected.

This increase in agroforestry would contribute to woodland creation, biodiversity and regenerative farming ambitions and targets, with associated benefits in terms of farm resilience, farmland biodiversity and connectivity, and farm carbon reductions.

1 Introduction

1.1 Background

The Scottish Government has set ambitious targets for future woodland expansion to cover 21% of Scotland by 2032. [1] The Forestry Grant Scheme (FGS) offers financial support for the creation of new woodland and the sustainable management of existing woodland. Recently, Scottish Forestry introduced new measures to its FGS aimed at boosting agroforestry planting in Scotland.[2] These measures aim to support farmers wishing to integrate trees on their farms, whilst strengthening their business through diversification. Key new measures include a 50% increase in the agroforestry grant rate and funding for biodiversity and fruit and nut trees.[3]

Agroforestry includes all trees and shrubs which are deliberately integrated (managed) as part of a farm enterprise and provides multiple benefits. Planting trees, shrubs and hedges on farms can give farmers healthier soil and higher yields and increase biodiversity. In 2021, Soil Association Scotland and Woodland Trust Scotland highlighted the benefits, barriers and opportunities of integrating trees on farms and crofts in Scotland. It provided recommendations to the government to develop policies, funding mechanism and advice to facilitate the integration of trees into farming and crofting systems.

There is concern that the current FGS and agri-environment schemes are not sufficiently attractive to farmers to result in significant uptake of on-farm tree planting. Furthermore, farmers and crofters are concerned about productive land being taken out of agricultural production in Scotland and being bought by private investors looking to offset carbon emissions in their own industries.

Woodland Trust Scotland and Soil Association Scotland seek to provide recommendations to the Scottish Government to encourage small-scale planting of (native) trees on farms. The focus of this project is primarily on approaches to integrate trees on farms that fall outside the scope of the existing FGS (i.e. not farm woodlands or regular shelterbelts).

1.2 Aim and approach

The aim of the project is to develop clear recommendations to the Scottish Government on the nature and level of payments required to support widespread integration of trees on farms in ways that support farm businesses as well as nature and climate.

The project approach focused on identifying tree planting systems and options that would most likely be taken up by farmers and be most beneficial in terms of supporting farm businesses as well as nature and climate. The approach included: identification of options through a review of literature and evidence, an online workshop and interviews; development of technical specifications and costings; assessment of opportunities for integration, payment rates and structures, metrics and targets, and reporting.

[1] https://www.nature.scot/professional-advice/land-and-sea-management/managing-land/forests-and-woodlands/woodland-expansion-across-scotland

[2] https://forestry.gov.scot/

[3] https://www.fas.scot/article/scottish-forestry-boosts-agroforestry-funding

2 Option identification, selection and development

A range of options were identified from a wide range of information (Section 2.12.1). The options were then selected based on a set of criteria, including rationale, benefits, practical appeal and the 'gap' in existing schemes (Section 2.2). These were then further developed into a technical specification (Section 2.3.1), which formed the basis for the cost calculations (Section 2.3.2).

2.1 Option identification

Options were first identified based on the client specification and the literature review. The literature review built on the review undertaken by Cumulus as part of the UK agroforestry report for the Soil Association in 2022 titled 'Woodland and trees in the farmed landscape: Towards a diverse, resilient, and vibrant agroforestry and farm woodland economy for the UK' (Cumulus, 2022).

The literature review included 'agroforestry' payments in England, Wales and Northern Ireland, and a review of Scottish 'agroforestry' payments, such as those available through the FGS. FGS agroforestry options were assessed to identify the kind of farm woodlands and agroforestry systems that are already being supported and those that are not yet supported (systems in the latter category are the focus of this project)Agroforestry payments in the Scottish Forestry Grant Scheme . The research also explored how to support existing agroforestry/woodland systems, i.e. on-going maintenance of such systems. (See Appendix 1 – References literature review)

The review considered the factors that influence uptake of agri-environment options, existing option participation, any evidence on land manager interest in different agroforestry options, and relevant evidence from similar schemes elsewhere.

An online workshop was held on 17 January 2024, to consult with farmers and advisors (including colleagues from the Woodland Trust and Soil Association) on various tree planting systems and options. This workshop was attended by a range of land managers, practitioners and advisors (see Appendix 2 – List of stakeholders). The workshop provided a wide range of suggestions and important points to consider.

2.1.1 Agroforestry payments in England, Wales and Northern Ireland

Whilst the benefits of agroforestry and farm woodland planting are widely acknowledged, UK uptake has been inconsistent and slow. Certain forms of agroforestry and farm woodland planting, such as hedgerow planting have seen wide uptake and integration into farming. Others, such as arable agroforestry, are barely present. In recent years, policy makers have tried to respond to the slow uptake of agroforestry and farm woodland planting by raising awareness and devising policies to support establishment.

We set out below some of the key policies in England, Wales and Northern Ireland, paying particular regard to any lessons that can be applied in the Scottish context.

England

Sustainable Farming Incentive

Defra is introducing two new agroforestry actions under the Sustainable Farming Incentive (SFI) scheme this summer, to create and maintain in-field silvoarable and silvopastoral systems. The arrangements and densities of trees will be flexible to allow farmers to decide what is best for their circumstances. The lower tree density actions enable agroforestry to be carried out on land with low sensitivity to tree planting without requiring Environmental Impact Assessments.

Countryside Stewardship

Whilst there are no specific agroforestry options under Countryside Stewardship, funding is available for a number of hedgerow options, including BN11 – planting new hedges; BE3 – management of hedgerows; BN7 – hedgerow gapping up; and TE1 – planting standard hedgerow trees. Payment rates are enclosed in Appendix 3 – Summary tables England and Wales.

Defra has also made several improvements to its existing offer for trees and woodland within Countryside Stewardship. These include:

- reducing the minimum threshold from 3ha to 0.5ha, so more farmers and land managers can access funding
- increasing payment rates to ensure funding better reflects the costs incurred by woodland managers
- making it simpler and more flexible including removing the deadline for when Woodland Management Plans must be submitted for the woodland improvement offer
- expanding the range of supplements to target priorities with 8 new actions available
- retaining existing capital items, for example to produce a plan for action within woodlands (Woodland Management Plan)
- combining actions for lowland and upland wood pasture, having aligned the payment rates earlier this year. Take up in lowlands remains low.

Defra is also improving its species management support to protect trees, woodland habitats and threatened woodland species by funding the control of invasive non-native grey squirrels; managing the impact of deer, and rhododendron control and management.

It was recently announced that 57 improved versions of actions previously offered through CS Mid Tier will be part of SFI with a single application process. Within this, a farmer can apply for Capital grants such as BN7 and BN11 to complement new maintenance options in SFI such CHRW2 Manage Hedgerows. Higher Tier CS is set to continue as a standalone part of ELM and we assume (although not confirmed) that current wood pasture & parkland options WD4 - WD12 would continue to be available. Defra are expected to publish more details on Higher Tier which will include new medium and higher density agroforestry options in July (although this may be delayed).

Landscape Recovery Scheme

The Landscape Recovery Scheme offers bespoke agreements to deliver landscape and ecosystem recovery through long-term, land use change projects across a minimum area of

500ha. Agroforestry systems may well be eligible for support under Landscape Recovery, depending on the specific priorities for the individual projects.

English Woodland Creation Offer

Like Countryside Stewardship, the English Woodland Creation Offer (EWCO) is not specifically targeted at agroforestry systems. Indeed, eligibility rules around planting density may preclude some agroforestry systems. However, EWCO does support shelterbelts to min width of 10m and riparian planting which can be part of an agroforestry scheme. Some of the principles behind the EWCO scheme are noteworthy, particularly the idea of optional 'Additional Contributions' where the location of the woodland and its design will deliver public benefits. These include, for example, up to £3,300 per ha premium for nature recovery, or £1,000 per ha for woodlands that help reduce the risk of flooding.

Wales

Habitat Wales Scheme

Habitat Wales is an area-based agri-environment scheme available to all eligible farmers in Wales. The aims of the scheme are to protect habitat land previously under Glastir in 2023 up to the full introduction of the Sustainable Farming Scheme (SFS) The scheme pays flat rates for the management of eligible habitat land or woodland. Agroforestry is not specifically recognised under the scheme, but habitats typical of an agroforestry system (including trees, traditional orchards, scrub, and hedgerows) are eligible.

Sustainable Farming Scheme

The SFS will be introduced in 2026, replacing the Basic Payment Scheme (BPS), and will have 3 layers – Universal, Optional and Collaborative – each containing a set of options. Universal actions are required for a baseline payment. These actions include managing/ enhancing habitats across > 10% of the farm and having >10% tree cover on the 'plantable' area of the farm. Trees and woods count to both the habitat and tree cover, and all exiting tree cover is included in calculations. These targets have not been confirmed as yet. Universal actions also include completing an annual benchmark.

The Welsh Government plans to continue to support tree planting through capital payments, which currently range from £2,100 to £4,500 per ha dependent on planting location. Importantly, while trees and woodland had been designated 'ineligible features' under the BPS and therefore excluded from the payable area), trees and woodland will be included in SFS payments 'in recognition of the many benefits they provide'. Agroforestry systems and hedgerows will be a focus for incentives under the SFS, but payment levels have not yet been published. They are expected to be published in the summer following consultation outcomes and further economic analysis.

Northern Ireland

Environmental Farming Scheme

For agreements commencing in 2023, funding was available for establishment of agroforestry systems (a capital payment and an annual grant for years 2 – 5); creation of a traditional orchard (a capital payment and an annual grant for years 2 – 5); planting of new hedgerows including two protective fences (a capital payment); creation of riparian buffer zones with native trees (a capital payment and an annual grant for years 2 – 5). Options for 2 m-wide zone or 10 m-wide zone available); planting native tree corridors (shelterbelt or downwind of farm buildings to capture gaseous emissions) (a capital payment and an annual grant for 2 – 5 years); and natural regeneration of native woodland (an annual grant for 5 years). There was also a grant available for areas where grazing is excluded, and where

the carbon sequestration and biodiversity value of the site will be enhanced as outlined in a site-specific Remedial Management Plan.

However, the Environmental Farming Scheme is now closed, and there is no specific support for agroforestry in 2024. There will be support for planting of new woodlands of at least 0.2 ha under the Small Woodland Grant Scheme.

2.1.2 Agroforestry payments in the Scottish Forestry Grant Scheme

Grant Summary

The Scottish Forestry Grant Scheme (FGS) Agroforestry grant is designed to help create agroforestry systems within grazing pasture land (silvopastoral system) or on arable land (silvoarable system). The scheme supports investment in three main areas:

Aim 1 – Broadleaves suitable for timber production.
Aim 2 – Broadleaves for biodiversity.
Aim 3 – Fruit/nut trees for business diversification.

This grant has two payment types:

- a capital grant for initial establishment
- an annual maintenance grant that is paid for five years

The rate of capital grant depends on the number of trees planted per hectare. Two stocking levels and grant rates are available:

Planting density	Initial payment	Annual maintenance
300-400 trees/hectare	£5,400/hectare	£126/hectare/year
150-200 trees/hectare	£2,790/hectare	£72/hectare/year

The minimum eligible area is 0.5 hectares with a maximum area of fifteen hectares per farm business unit. There is a requirement for trees to be protected from livestock. The requirement for protection will depend on the livestock to be grazed. Minimum protection requirements are:

Cattle:

- A 1600mm (minimum) high aggressive, cattle-proof guard, for example a Cactus Guard, supported with three 1500mm x 10mm diameter rebar rods.

Sheep & Poultry:

- A 1.5 metre (minimum) high net cage made from 50 mm square weldmesh or similar with a 'cage' diameter of no less than 450mm, supported by two posts of minimum diameter / cross section of 75mm

Challenges

The introduction of the FGS agroforestry grant is a positive step, and the grant option provides a useful incentive, particularly for those who wish to develop a commercial, productive agroforestry system. However, there are several drawbacks associated with the grant that are likely to limit uptake. These are both practical and financial. Additionally, evidence suggests that the grant is not well suited to those who would like to increase within field tree cover without wanting to develop a relatively high tree cover agroforestry system. As of May 2024, Scottish Forestry have had a total of eight Agroforestry applications. Five of these applications have been approved and three are pending approval.

The current level of grant payment for planting trees is likely to limit uptake. Total grant payments (including management payments over five years) equate to £20 - £21 per tree. The FGS silvoarable option requires that each tree is protected by a cactus guard. Costing work carried out as part of this report suggests that the actual cost of planting trees with cactus guards is higher than this: cactus guards alone cost more than £17.00. (Note that we arrive at a rate of £9-£14 per tree for silvoarable planting, but our costings assume planting at medium-high density – so it is not directly comparable with the current FGS silvoarable option – and we do not stipulate that cactus guards should be used).

The main practical challenges include the very high planting density requirement which equates to a spacing of 7m – 12m (depending on planting design). This density is appropriate for some, but not all, agroforestry systems. It is also likely to limit uptake of the options.

The scheme also includes a requirement for mesh guards to be used in all situations. This is appropriate in a livestock situation but not necessarily a requirement in an arable situation.

The tree planting options set out in Section 4 are, for the most part, designed to complement the existing FGS agroforestry grant. The newly proposed options are generally focused on lower density planting and where the objectives target non-market benefits (biodiversity, landscape enhancement, carbon storage, flood mitigation, habitat connectivity and stock shelter / shade). The silvoarable option (Section 3.4) is presented as an alternative to the FGS silvoarable option. However, an alternative would be to introduce some changes to the FGS silvoarable option, making it more attractive. For example, removing the requirement for trees to be protected with tree cages (cactus guards) in all situations.

2.2 Option selection

The tree planting options were informed by the literature review, stakeholder workshop and one-to-one interviews. Drawing on 3.1, options were selected based on:

- Benefits that the various tree planting options can provide
- Practical appeal to farmers and crofters
- Ideas and approaches that came through strongly in the workshop and one-to-one discussions with land managers and advisers
- Lessons learnt from other schemes (Section **Error! Reference source not found.**)
- The 'gap' in the Scottish Forestry Grant Scheme (FGS) (Section 2.1.2)

Benefits

The benefits of integrating trees into farm enterprises were documented in (Cumulus, 2022). Integrating trees can enhance and diversify the provision of ecosystem services (ESs) from agricultural land, thereby improving the integrated sustainability. Meta-analysis has shown agroforestry and farm woodland can reduce flood risk and climate impacts; and benefit soil health, biodiversity, and recreation.

It has also been shown that agroforestry can increase total yields from an area. This is because the integration of trees, crops and/or livestock into a system can utilise more of the productive capacity of the land, enabling more efficient resource use.

Trees on farms can also enhance the resilience of other farm enterprises. They provide shelter, fodder, and bedding for livestock; habitat for pest predators and pollinators; materials for construction; biofuel for on-farm heating and power; and can aid resource use efficiency. They can also provide a range of less tangible and less commonly assessed services. These include recreation, education, and cultural heritage.

Practical appeal to farmers

Feedback from the workshop and interviews with farmers, crofters and practitioners identified strong enthusiasm for incentives to plant more trees on farm. However, these incentives require:

- Flexibility (e.g. in terms of location, area size, density)
- A range of different options, e.g. for protecting the trees
- A payment that sufficiently covers the cost, including fencing and maintenance
- Minimum administrative burden
- A one-off, upfront payment for capital and maintenance (reducing administration)

Key themes that came through strongly included:

Knowledge and training

- The importance of knowledge and skill sharing through advice and demonstration sites.
- Winning ‘hearts and minds’ by helping land managers develop a better understanding of the benefits of trees and why / where planting can be beneficial.

Grant funding

- Payments should be focused on small-scale tree planting with a simple grant scheme.
- The grants should be a stand-alone payment and should reflect the relatively high cost of individual tree protection.
- Current FGS agroforestry measures with 7m spacing requirements are very challenging.
- Payments based on a ‘per tree’ basis would be a good approach.

Practicalities

- Recognising the importance of riparian woodlands.
- Deer are a significant issue in many areas.
- Care needs to be taken when undertaking low density planting on exposed site.

- The need to be mindful of tenant farmers.
- For many farmers trees in fields are problematic but would welcome more trees around the edges of fields.

In addition, several one-to-one interviews were held to gather specific knowledge in key areas, such as tree protection, integration with other incentives and examples of what has worked well in the past.

The following systems/options for small-scale tree planting on farms were identified as most suitable:

1. Silvopastoral – low density single trees
2. Silvopastoral – enclosed trees
3. Farm woodland – small-scale (<0.25ha)
4. Silvoarable – alley cropping
5. Hedgerow and field boundary trees
6. Boundary – biodiverse hedgerows

These options would also be relevant for crofting/crofters. One of the features of managing woodland on crofts is the expectation that this should be fully integrated with other croft activity, including livestock production and other cropping or horticulture. At present, grant support systems are skewed to conventional agricultural support, and specific agroforestry options which recognise holistic / integrated land use, and which are not exclusionary / overly prescriptive, will be particularly helpful to crofters.

A specification for each of these tree planting systems/options in Section 4.

2.3 Option development

For each system/option, a 'technical specification' was drawn up and a costing template was developed.

2.3.1 Technical specification

The technical specification describes the aim, benefits, management prescriptions (i.e. what farmers/land managers would need to do) and the eligibility criteria, i.e. the type of land, minimum and/or maximum size or number of trees, and any other additional information that is relevant. Based on the specification of the option and management prescriptions, the costings of each option were calculated.

2.3.2 Cost calculations

We have developed a costing template in the format of a partial budget, including:

- Income forgone (opportunity cost)
- Establishment costs:
    - Cost of the planting (inc cost of tree, labour, weeding, mulching)
    - Cost of protection (inc different types of tree guards, fencing)
    - Cost of on-going maintenance
- Any extra income and costs saved (it was assumed that during the first 5 years, no extra income will be generated from planting the trees)

We have arrived at the proposed payment rates by following the convention of the 'Income Forgone plus Costs' (IF+C) approach. This approach conforms with the 'Green Box' requirement under Paragraph 12b of Annex 2 of the WTO Agreement on Agriculture, specifically that "the amount of payment shall be limited to the extra costs or loss of income involved in complying with the government programme".

Payment calculations based on IF+C are intended to give an estimate of a land manager's 'indifference' price to enter the agroforestry scheme. They involve a number of components to calculate the difference in the income earned on the land (before and after participation) and in the costs incurred (and saved) when altering activity on the land, with the aim of perfectly compensating the land manager so that they are no worse off from participating in the scheme.

The **'income forgone'** element of the IF+C calculation is based on the change in the gross margin of a typical hectare for an eligible land parcel. In this context, the gross margin refers to the net income (output less variable costs) from producing one more unit. The calculations follow the format of a partial budget, with enterprise gross margins appearing on both sides of the two alternatives faced by the farm business – in other words, the baseline gross margin and the new (agroforestry option) gross margin. In order to compare these two alternatives, it is necessary to determine (a) the enterprise composition of the typical hectare under each alternative, and (b) the gross margin of the enterprise composition. We can therefore see what changes in marginal net income are expected to arise from implementing the agroforestry option.

The gross margin of an enterprise is its output less its variable costs. The variable costs must (a) be specific to the enterprise and (b) vary in proportion to the size of the enterprise, i.e. number of hectares or head of stock. The main items of variable costs for crop enterprises are fertiliser, seed, sprays, casual labour and contract work specific to the crop. For livestock, they are concentrate feed, veterinary and medicine costs, marketing expenses and forage.

We have drawn on published costings book data (including the John Nix Pocketbook for Farm Management, the Agricultural Budgeting and Costings Book, and the Farm Management Handbook) to establish appropriate enterprise gross margins. These are intended to be gross margins for the 'typical' farm, representative of the farming practices on the eligible land type for the action.

The **'costs incurred'** element of the IF+C calculation is based on the estimated net additional cost of implementing the agroforestry action. Following the format of a partial budget, we compare the additional costs and cost savings of alternatives faced by the farm business, including only those changes in costs that would arise from implementing the specific alternative, to give a net cost figure. The cost component is a function of unit price and volume – in other words, the number of cost units estimated for the implementation of the agroforestry option on a typical hectare of eligible land. By way of example, small-scale farm woodland planting will result in the extra costs of plants and planting, site preparation, beating up (i.e. replacing newly planted trees which have died), weed control, etc.; but it will also result in cost savings when the baseline farming activity ceases. Our partial budgets net these two figures off. Again, we have drawn on published costings book data to estimate cost components.

Some agroforestry options have a significant income forgone component, but some options are mostly action-based and have little effect on agricultural output (e.g. planting single trees in a silvopastoral system).

Of course, there are differences between the 'typical' IF+C and the individual indifference price for each land manager participating in a scheme, due to variation in the cost of delivering environmental actions, variation in farm enterprises, variation in performance, and variation in the barriers of entry to schemes. There is thus no definitive, 'one-size-fits-all' estimate of what the IF+C from a particular environmental management practice might be, and regardless of the level at which the payment rate is set, there will always be an income transfer in the form of the inframarginal rent to those farms that have production costs or generate income levels lower than those used to set the payment rate. However, the IF+C approach is a well-established methodological convention which meets WTO requirements and is a defensible basis for calculating payment rates.

We set out the key income forgone and cost elements of individual payment calculations in the relevant sections below.

3 Tree planting specifications

Below is a description for each of six selected tree planting system/options, including:

- Aims
- Benefits
- Management prescriptions, i.e. what farmers/land managers would need to do
- Eligibility criteria, i.e. the type of land, minimum and/or maximum size or number of trees
- Additional information, e.g. indicate where this option would not be suitable
- Financial calculations for payment rate

3.1 Silvopastoral – low-density single trees

Aim:

To increase the presence of scattered native trees within the farmed landscape.

Newly planted silvopasture trees in Cactus Guards. Photo credit (left) T. Nicholson (right) P. Leeson

Benefits:

These trees will provide improved wildlife habitat and diversity, shelter / shade for livestock, landscape enhancement, carbon storage and, in the long-term, create veteran trees of high wildlife value.

Management prescriptions:

Individual trees should be planted at a low density within specific fields. Trees should be planted at a minimum of 10 trees per hectare and maximum of 30 trees per hectare. Trees can be spaced / planted according to individual preference but with the aim of being reasonably evenly spaced throughout the planted area.

Trees should be protected using (minimum) 160 cm high, barbed, cattle proof guard (e.g. Cactus Guard) supported either by 3 x150 cm x 10 mm rebar rods or two wooden posts. In addition, trees should be protected with 60 cm (or taller) tree guard. Note that if cattle grazing is present the guard should be raised 20 cm off the ground to prevent the tops of trees being browsed.

Trees should be comprised of native species appropriate to the site. Species can include oak (sessile and pedunculate), birch, rowan, gean, aspen, bird cherry and Scots pine. Where appropriate, sycamore, beech and lime can also be included but these species should not make up more than one-third of the trees planted.

Trees that fail to establish should be replanted and protective guards should be maintained for a minimum of 10 years.

Eligibility criteria:

This option is only eligible in in-bye grassland fields.

Where appropriate, trees can also be planted in areas of species rich grasslands. However, care should be taken to not damage existing conservation interest. Planting on designated sites (e.g. SSSIs) should only take place after consultation with NatureScot.

A minimum of 20 and a maximum of 100 trees can be included in an application.

This option is not suitable for sites that support (or are close to) breeding populations of ground nesting waders (lapwing, snipe, oystercatcher, redshank and curlew).

This option is not suitable on sites that are very exposed.

Native and locally suitable varieties should be planted (with the exception of sycamore, beech and lime). Local provenance tree stock should be used for planting.

This option can be used in the same field as tree enclosures.

Additional information and advice:

For best establishment pit planting is recommended: https://youtu.be/GpmvjSDqEFU

The planting area should be well screefed to reduce weed competition. Weed control methods such as a biodegradable mulch (e.g. mulch mat, wool or woodchip) is strongly recommended, or herbicide treatment can also be used to aid establishment.

As well as the main tree, thorny shrub species (e.g. hawthorn, blackthorn, dog rose) can also be planted within the protector. These provide additional biodiversity benefits. More tree / scrub species can be planted when the protection has a larger diameter (e.g. two Cactus Guards on their side stacked vertically).

The Highlands and Islands Woodlands Handbook is a good source of advice on tree and woodland establishment.

Financial calculations for payment rate:

Upfront payment: £31.15/tree

The key components of our partial budget for this option are as follows:

- Extra income: no extra income anticipated.

- Costs saved: no cost savings anticipated.
- Income lost: no lost income anticipated.
- Extra costs incurred: plants and planting costs; cactus guards; tubes; stakes; replacement of failed trees; weed control.

The detailed calculations can be found in Appendix 4 - Cost calculations.

3.2 Silvopastoral – tree enclosures

Aim:

To establish small copses of trees and scrub within the farmed landscape. Options for tree enclosures include creating areas of trees and scrub in open areas of hill / roughgrazing habitats, as well as the potential for enhancing riparian tree cover next to burns and rivers.

Examples of silvopasture tree enclosures. Photo credit (left) scotlandbigpicture.com (right) R. Lockett

Benefits:

These enclosures will provide 'stepping stones' of semi-natural habitat for biodiversity and a potential seed source for tree regeneration in future. Patches of trees and scrub will also provide multi-directional shade and shelter for livestock. This option also provides an opportunity to improve tree cover in more upland situations.

Management prescriptions:

Plant small fenced enclosures of trees and scrub. Three size options are available: 3.6 m x 3.6 m, 5.4 m x 5.4 m, 7.2 m x 7.2 m enclosures.

Enclosures must have top rail at stock fence height. Below the top rail can either be rylock net or 4 evenly spaced rails.

3.6m enclosures should contain a minimum of 10 trees and shrubs, 5.4 m enclosures a minimum of 20 trees and scrubs, 7.2 m enclosures a minimum of 30 trees and shrubs.

A mix of native trees and shrubs appropriate to the site should be used. A minimum of 50% should be trees. Trees can include oak, birch, rowan, gean, aspen, bird cherry, Scots pine, and alder. Native shrubs can include willow, hawthorn, blackthorn, hazel, juniper, and holly. Ideally the trees should be in the centre of the enclosure with shrubs around the edges.

Trees could be protected with minimum 0.6 m guards (avoid using tubes in riparian areas). Shrubs can be planted without protective guards although vole guards should be used.

Enclosures should be maintained in a stock proof condition for a minimum of 10 years. It is anticipated that at least 50% of planted trees/scrub should be well established by year 10.

Eligibility criteria:

This option is suitable for a wide range of locations including improved/unimproved grassland fields, rough grazing and riparian margins.

Tree enclosures should not be created in (or close to) habitats that are important for ground nesting wading birds (lapwing, snipe, oystercatcher, redshank, curlew).

Tree enclosures should be sited on mineral soils and avoid areas of deep (>30cm) peat.

Applications should be for a minimum of 2 enclosures.

Native and locally suitable varieties should be planted. Local provenance tree stock should be used for planting.

This option can be used in the same field as low-density single trees.

Additional information and advice:

For best establishment pit planting is recommended: https://youtu.be/GpmvjSDqEFU

The planting area should be well screefed to reduce weed competition. Weed control methods are strongly recommended to aid establishment, for example using biodegradable mulch (e.g. mulch mat, wool or woodchip), or herbicide treatment.

A minimum of one enclosure per hectare is recommended.

Tree enclosures are suitable in upland locations where deer (including red deer) are present. However, only smaller (3.6 m) enclosures are recommended in order to deter deer jumping in. Larger enclosures can be used but a top deer net is recommended.

The Highlands and Islands Woodlands Handbook is a good source of advice on tree and woodland establishment.

Financial calculations for payment rate:

Upfront payment: £195.45 per enclosure (small), £363.05 (medium), and £531.90 (large)

The key components of our partial budget for this option are as follows:

- Extra income: no extra income anticipated.
- Costs saved: loss of productive grassland (albeit small) will have consequential cost savings in terms of grassland operations (e.g. rolling, silaging, fertiliser applications) and also in terms of livestock (less grassland equals fewer livestock, equals lower interest on working capital tied up in the livestock).
- Income lost: loss of productive grassland will mean the farmer loses the income they would otherwise get from this grassland.
- Extra costs incurred: plants and planting costs; tubes; stakes; replacement of failed trees; weed control.

The detailed calculations can be found in Appendix 4 - Cost calculations.

3.3 Farm woodland – small scale (<0.25ha)

Aim:

To increase woodland cover throughout the farmed landscape and increase habitat diversity.

Examples of potential small scale woodland options. Photo credits (top left) Eden Rivers Trust (top right) Woodland Trust (bottom) R. Lockett

Benefits:

These areas help encourage more continuous spread of woodland habitat and resources for woodland dependent species. These woodlands are particularly valuable for nature where they connect with existing habitat. Planting will also help to increase carbon sequestration and storage. In certain locations, woodland can also help to slow hydrological flows and reduce downstream flood risks. Woodlands and tree alleys will provide shelter and shade for livestock, can help facilitate rotational / mob-grazing, and provide browse for livestock

Management prescriptions:

Woodland creation is available for areas up to 0.25 ha. Note that the minimum area for Forestry Grant Scheme applications is 0.25ha.

Trees should be planted at **an average** of 3m spacing (1,200 stems per ha). Trees should be a mix of native species appropriate to the site. Trees should be protected with 1.2 m tubes and stakes.

Trees should consist of species native to Scotland. 10% of the plants can be scrub species (hawthorn, blackthorn, hazel, holly, dog rose). Shrub species should be planted in 0.6 m guards.

The woodland should be maintained (weeding, replacing dead trees, straightening shelters) for a minimum of 10 years. Once trees are well established tubes should be removed for re-use or recycling.

Eligibility criteria:

All in-bye land. Areas of existing conservation interest (e.g. species rich grassland, wetland) should not be planted.

Planting on suitable areas of hill and rough grazing is also eligible. Soils should be suitable for tree establishment and no planting should be carried out on deep peat (peat depth >30cm).

Trees can be planted in field corners, locations that are awkward to crop, or use more innovative methods such as the creation of 'tree alleys'. Trees can also be planted beside burns and rivers where the creation of riparian woodland would provide habitat enhancement.

Trees should not be planted in (or close to) sites which support breeding wading birds (e.g. lapwing, snipe, oystercatcher, redshank and curlew).

Planted strips such as 'tree alleys' should have a minimum width of 7m.

Stock fencing would be eligible under this option (see section 5.1).

Native and locally suitable varieties should be planted. Local provenance tree stock should be used for planting.

Additional information:

It is recommended that trees are planted at a varied density to maximise conservation interest. Spacing can vary from 1m to 5m.

Trees should be planted in 1.3m biodegradable tubes.

For best establishment pit planting is recommended: https://youtu.be/GpmvjSDqEFU

The planting area should be well screefed to reduce weed competition. Weed control methods are strongly recommended to aid establishment, for example using biodegradable mulch (e.g. mulch mat, wool or woodchip), or herbicide treatment.

The Highlands and Islands Woodlands Handbook is a good source of advice on tree and woodland establishment.

Financial calculations for payment rate:

Upfront payment: £7,231.38/ha

The key components of our partial budget for this option are as follows:

- Extra income: no extra income anticipated.
- Costs saved: loss of productive grassland will have consequential cost savings in terms of grassland operations (e.g. rolling, silaging, fertiliser applications) and also

in terms of livestock (less grassland equals fewer livestock, equals lower interest on working capital tied up in the livestock).
- Income lost: loss of productive grassland will mean the farmer loses the income they would otherwise get from this grassland.
- Extra costs incurred: site preparation; plants and planting costs; tubes; stakes; replacement of failed trees; weed control.

The detailed calculations can be found in Appendix 4 - Cost calculations.

3.4 Silvoarable – alley cropping

Aim:

To encourage the creation of strips of trees / wildflower strips within the arable farmed landscape. This option will allow for the creation of lines of trees between croppable alleys.

Photo credit: Soil Association

Benefits:

Silvoarable systems can boost soil health by reducing windspeed and soil erosion. The integration of trees and wildflower strips has the potential to enhance biodiversity, particularly habitats for pollinating insects. Silvoarable also offers scope for diversifying sources of farm income derived from tree products such as fruit production.

Management prescriptions:

Trees should be planted in rows within the arable field in a north / south alignment.

Trees should be planted in 3m wide strips sown with a wildflower / grass mix.

There should be a regular width (e.g. 12m, 18m, 24m or 48m) of crop between the edges of the wildflower strips.

Trees should be planted at 3m spacing within the rows.

A headland can be left at the end of each row for turning.

Trees should be protected with (minimum) 0.6 m biodegradable guards. 1.2m tubes will be required where deer are likely to impact trees.

The woodland should be maintained (weeding, replacing dead trees) for a minimum of 10 years.

It is anticipated that there should be a planting density of approximately 100 trees per hectare.

Eligibility criteria:

This option is only suitable for land that is regularly cultivated and managed as part of an arable or horticultural crop rotation.

Where livestock will be to be present (e.g. where fields are rotational in grass) the FGS Agroforestry option is likely to be more suitable.

Additional information:

Short video introducing the silvoarable system set up by Roger Howison at Parkhill Farm, Newburgh.

The Agroforestry Handbook produced by the Soil Association contains good additional advice on silvoarable systems.

Financial calculations for payment rate:

Upfront payment: £9.33/tree (standard trees) or £13.99 per tree (fruit trees)

The key components of our partial budget for this option are as follows:

- Extra income: no extra income anticipated.
- Costs saved: loss of arable land will have consequential cost savings in terms of arable operations and also in terms of the working capital tied up in the arable production cycle
- Income lost: loss of arable land will mean the farmer loses the income they would otherwise get from this land.
- Extra costs incurred: site preparation; plants and planting costs; tubes; stakes; replacement of failed trees; weed control.

The detailed calculations can be found in Appendix 4 - Cost calculations.

3.5 Hedgerow and field boundary trees

Aim:

To increase the diversity of habitats in hedgerows and to restore tree lines along field boundaries.

Examples of planted hedgerow tree (left) and field boundary trees (right). Photo credits R. Lockett

Benefits:

Hedgerow trees and field boundary trees support a wide range of wildlife including birds, bats, lichens and insects. Creating new - or restoring old - treelines is an opportunity to improve habitat connectivity, enhance landscapes and provide shelter and shade (and over time, browsing) for livestock. Overtime, trees will also provide shelter and browse forage for livestock.

Management prescriptions:

Payment provided for single trees planted and protected within a hedgerow, former treelines, or where there is a desire to create new treelines. There are two options for planting trees in this situation:

Option 1: Trees should be protected using tree protectors as set out in the silvopasture option (see 5.1) where livestock have access to hedge or tree line.

Option 2: Where stock do not have access, or where stock are not present, trees should be protected using 1.2m tubes and stakes.

Species planted should be native species appropriate to the site. Species can include oak (sessile and pedunculate), birch, gean, rowan, and bird cherry. Where locally appropriate (for example where there are remaining trees) non-native species such as sycamore, lime or beech can be planted.

Trees should be planted at an appropriate spacing within the tree line or hedge. A maximum spacing of 20 m between trees applies.

Eligibility criteria:

This option is eligible for hedges and field boundaries on all in-bye land.

This option is suitable for establishing hedgerow trees in existing or newly planted hedges, for the restoration of old, former treelines, or for the creation of new treelines

Native and locally suitable varieties should be planted. Local provenance tree stock should be used for planting.

For option a) a minimum of 10 and a maximum of 100 trees per application should be planted. For option b) a minimum of 20 and a maximum of 200 per application should be planted.

Trees should not be planted in (or close to) sites which support breeding wading birds (e.g. lapwing, snipe, oystercatcher, redshank and curlew).

Additional information:

A spacing of 10-15m between hedgerow trees is recommended.

For best establishment pit planting is recommended: https://youtu.be/GpmvjSDqEFU

The planting area should be well screefed to reduce weed competition. Weed control methods are strongly recommended to aid establishment, for example using biodegradable mulch (e.g. mulch mat, wool or woodchip), or herbicide treatment.

The Highlands and Islands Woodlands Handbook is a good source of advice on tree and woodland establishment.

Financial calculations for payment rate:

Upfront payment: £65.26/tree with cactus guards (or £50.67/tree without cactus guards)

The key components of our partial budget for this option are as follows:

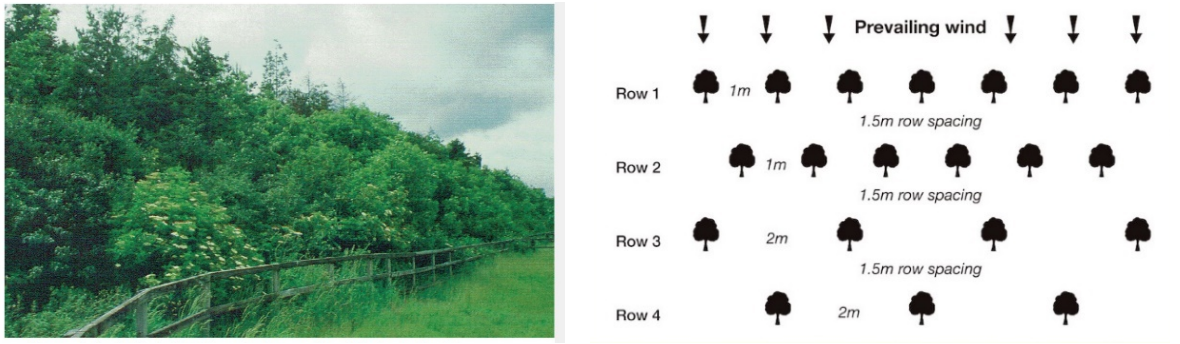
- Extra income: no extra income anticipated.
- Costs saved: no extra costs anticipated.
- Income lost: no lost income anticipated.
- Extra costs incurred: plant and planting costs; cactus guards / tubes; stakes; weed control; replacement of failed trees; the extra costs arising from slower hedge trimming; hand trimming 1m either side of the trees.

The detailed calculations can be found in Appendix 4 - Cost calculations.

3.6 Boundary – biodiverse hedgerows

Aim:

To create wide and diverse field boundary hedgerow habitats planted with carefully selected species. This option is designed to be 'over and above', and in addition to, the standard agri-environment scheme hedge option.



Biodiverse hedge with sloping profile (left) and design / planting layout (right). Photo credits J. Davis

Benefits:

These biodiverse hedges are designed to maximise shelter benefits to livestock whilst providing a rich and diverse habitat for a range of species. Over time, the hedges will provide browse for livestock.

Management prescriptions:

Enhanced hedgerows are 6.5m wide and should consist of 4 rows of trees. Rows should be 1.5m apart.

A mix of native shrubs (e.g. hawthorn, blackthorn, hazel, dog rose, guelder rose) should be planted on the two rows closest to the prevailing wind. These plants should 1m apart.

A mix of taller growing native trees (e.g. Scots pine, silver birch, rowan, bird cherry, gean, crab apple, goat willow) should be planted in the two rows furthest from the prevailing wind. These plants should be 1.5m apart.

Trees should be planted in 1.2m guards. Shrubs should be planted in 0.6m guards.

Once trees are well established tubes should be removed for re-use or recycling.

Eligibility criteria:

All in-bye land where hedgerows have been identified as suitable under the Agri-Environment and Climate Scheme (AECS).

Tree enclosures should not be created in (or close to) habitats that are important for ground nesting wading birds (lapwing, snipe, oystercatcher, redshank, curlew).

Stock fencing associated with this option is not funded. We recommend this is funded as a separate stand-alone capital item. We discuss options for funding fencing costs in more detail in section 5.1 below.

Native and locally suitable varieties should be planted. Local provenance tree stock should be used for planting.

A minimum of 50m of biodiverse hedgerow should be planted.

Additional information:

Guide to the benefits and practicalities of biodiverse hedgerows.

The Highlands and Islands Woodlands Handbook is a good source of advice on tree and woodland establishment.

Biodiverse hedges should preferably link to existing hedges and other habitats.

Financial calculations for payment rate:

Upfront payment: £2,462.78/100m

The key components of our partial budget for this option are as follows:

- Extra income: no extra income anticipated.
- Costs saved: loss of productive grassland will have consequential cost savings in terms of grassland operations (e.g. rolling, silaging, fertiliser applications) and also in terms of livestock (less grassland equals fewer livestock, equals lower interest on working capital tied up in the livestock).
- Income lost: loss of productive grassland will mean the farmer loses the income they would otherwise get from this grassland.
- Extra costs incurred: site preparation; plants and planting costs; cactus guards / tubes; stakes; replacement of failed trees; weed control.

The detailed calculations can be found in Appendix 4 - Cost calculations.

3.7 Further guidelines

More general overarching guidelines could be developed covering all the options. These include:

- Additional considerations for site location. This will help ensure the 'right tree is planted in the right place', and sensitive habitats are avoided
- Procurement and sourcing of trees. Ensuring that, in the case of native trees, plants from the appropriate local tree seed zone are used where possible.
- Tree guards (tubes) should be fully biodegradable
- BPS eligibility: it will be important to ensure that farmers who adopt agroforestry measures are not penalised. There is a risk that land would become ineligible for BPS if it ceased to be used for agriculture, or if it becomes an 'ineligible feature' – which in this context could include scrub, woodland or thick hedgerows.
- A 10-year maintenance requirement should be required for all the options. While the cost of the additional 5-year maintenance (beyond the length of the agreement) was not included in the cost calculations, consideration should be given to support for long term maintenance.
- Regulations relating to planting and felling may need to be reviewed to ensure these do not create a barrier or friction to uptake of the proposed Farm Tree Payments.

4 Opportunities for integration

We propose these options as standalone options. Land managers may choose to apply for one, or more, of the options subject to the ceilings set for each option.

There are opportunities for integration with other schemes, including:

- Opportunities to integrate options with existing incentives and schemes
- Opportunities to integrate options in future schemes currently being developed by the Scottish Government

4.1 Opportunities for integration with existing incentives

Advice

The existing Farm Advisory Service (FAS) 'One-to-One' advisory support scheme gives farmers and crofters access to specialist advice. Land managers can request funding for a range of specialist plans including woodland and biodiversity plans. The options set out in this report would allow individual holdings to request plans that specifically built in recommendations for funded agroforestry options. Furthermore, the options described would provide advisers with additional options to build into specific farm scale plans.

As well as the 'One-to-One' advisory support, FAS also offers 'One-to-Many' advice covering farm visits and demonstrations. There is scope to integrate the incentives described in this report into farm visits as well as holding events with a specific focus on agroforestry.

Forestry Grant Scheme

The Forestry Grant Scheme Agroforestry grant (see Section 3.3) offers incentives for those who wish to develop agroforestry projects. This grant is focussed on higher density planting for biodiversity as well as incentivising more productive agroforestry projects that generate additional productive outputs.

For the most part, the potential options in this report are designed to complement the FGS incentives by incentivising the increase of tree cover on farms both in, and around, fields. Options such as low-density planting, tree enclosures, small scale woodland creation are not available under FGS. There is overlap between the FGS silvoarable option and the silvoarable – alley cropping option described in Section 4.4. There is scope to either improve the FGS agroforestry option to make it more attractive in an arable setting, or to replace it with an option as described in this report.

Other incentives

The Woodland Trust MoreWoods scheme is designed to encourage land managers to create areas of new woodland on individual holdings. The scheme incentivises the creation of new woodlands between 0.1 and 0.5 hectares. MoreWoods covers up to 75% of tree establishment costs. However, it does not include fencing costs. Discussions with Woodland Trust staff suggest that having more incentives for small scale woodland creation are welcome. The demand for funding under these schemes shows the high level of interest in small-scale woodland creation. Funding from the charitable sector should not

be required to fill this gap. The options outlined in this report have the scope to replace some Woodland Trust incentives.

There is scope for the options described to integrate with the Agri-Environment and Climate Scheme (AECS). The 'biodiverse hedgerows' option (Section 4.6) is designed to complement the existing hedgerow creation option that is available under AECS. There is also a 'Small-scale Tree Planting' option available under AECS on sites less than 0.25 ha. Whilst this is a potential overlap with the small-scale woodland option described in Section 4.3, it should be noted that the options described in this report are designed to be more widely available to land managers than the current AEC scheme.

4.2 Opportunities for integration with future schemes

Advice and support

The detail of options for future farm support in Scotland are still under development. However, the broad architecture of this support has been set out in sufficient detail to make some assumptions and suggestions about where, and how, support for increased small-scale tree planting might be integrated.

The need for advisory support came through strongly in discussions with stakeholders carried out as part of this project, particularly at the workshop with land managers. This advice could also cover opportunity mapping, for example the identification of priority areas for planting/ different options, to ensure the right trees in the right places.

Suggestions from stakeholders included the use of demonstration farms, case studies and the need to ensure that farmers and crofters had access to good advice on how best to integrate trees on farms. Particular emphasis on conveying the benefits of trees on farms to help win 'hearts and minds' was a key message from the stakeholder workshop. There are a range of possibilities for achieving this, most of which are likely to fall under 'Tier 4' of farm support which will focus on skills, knowledge and training as well as advisory support services.

In addition to structured farm support, other approaches to enabling farmers to learn more about the benefits of trees can be used. The 'Integrating Trees Network' run jointly by Scottish Forestry and Scottish Government is an excellent example of using farmer talks and farm visits to encourage engagement with these subjects.

Funding for the options and ongoing management

There is the question of where the application process and funding for the options described in this report might sit within the structure of future farm support. Our recommendation (see Section 7) is that these options should be accessible to as many land managers as possible. A simple, non-competitive application process would encourage much greater uptake without making large spending commitments, thus offering good value for money.

Ideally this would mean options for capital payments would be available under 'Tier 2 'of the future proposed support. However, at the time of writing policy development is ongoing. It may be that the type of options set out in this report sit in 'Tier 3' of future support. If this is the case, it remains essential that support for small scale tree planting is fully accessible to

as many farmers and crofters as possible. To this end, it is strongly recommended that these options are included as a separate, 'capital only' scheme. Incorporating these options into an overall agri-environment type application would result in a much lower level of uptake due to the more detailed, involved and competitive approach required for such applications.

In addition to the capital payments, there is also the potential for areas of newly created agroforestry land to be covered by Tier 2 support measures. Given the current, limited amount of agroforestry practice (e.g. silvoarable and silvopasture) currently undertaken in Scotland, a capital incentive offers the opportunity to greatly increase the amount of land eligible for ongoing agroforestry support. It also provides a further incentive for increased uptake from land managers.

Links with regenerative farming

As well as conventional incentives for increased woodland cover, there is growing appetite for measures that link with a more regenerative approach to agricultural land management. Some farmers have embarked on this already, sometimes using incentives such as those available from the Woodland Trust. This has helped them increase shelter and shade for livestock, help integrate additional production on arable land, or help establish tree alleys to create smaller fields and facilitate mob grazing. Incentives for small-scale planting on farms are likely to further encourage the wider adoption of regenerative practices.

Table 4-1 below summarises the potential for integration in Scotland's payment schemes

Table 4-1: Potential for integration in Scotland's payment schemes

Policy type	Description/examples	Potential integration with agroforestry options
Agri-environment schemes	**Future 4-tier scheme:** • Tier 1 – Base Payment, similar to Basic Payment but will be a lot lower. Includes greening, whole-farm plan, and an 'Active Farmer' test. • Tier 2 – Enhanced Payment, will provide payment for efficiency improvements, reducing GHG emissions, and improving biodiversity and nature enhancement • Tier 3 – Elective Payments, covers targeted payments for a range of topics including support for alternative forms of farming, innovation in agriculture, and supply chain support. • Tier 4 – Complementary Support, will cover areas including CPD, the agricultural transformation fund and coupled support for the beef and sheep sectors	Opportunity for areas of newly created agroforestry to contribute to conditionality requirements for Tier 1 payments. Opportunity to include agroforestry payments in Tier 2 as capital only items. Opportunity for areas of newly created agro-forestry to qualify for Tier 2 management payments. Opportunity to include agroforestry payments in Tier 3 as capital only items as a separate, stand-alone scheme Opportunity to build in support for agroforestry options within Tier 4.
Capital payments/grant schemes	**Forestry Grant Scheme**, offers £5,400/ha for planting and £126/ha for maintenance when planting 400 trees per ha or £2,790/ha for planting and £72/ha for maintenance when planting 200 trees per ha.	Opportunity to modify the FGS Agroforestry option to make 'silvo arable' planting more attractive.

5 Payment rates, payment structure, and uptake metrics and targets

5.1 Payment rates and payment structure

Payment rates

As explained in section 2.3.2 on cost calculations, we have arrived at the proposed payment rates by followed the convention of the 'Income Forgone plus Costs' (IF+C) approach. The calculations provide the basis for consideration of appropriate payment rates, and in most cases, the appropriate payment rate can be aligned with the total net cost for each option. This approach conforms with the 'Green Box' requirement under Paragraph 12b of Annex 2 of the WTO Agreement on Agriculture, specifically that "the amount of payment shall be limited to the extra costs or loss of income involved in complying with the government programme".

However, there is scope within Annex 2 of the WTO Agreement on Agriculture for the Scottish Government to set payment rates above or below the net cost we have arrived at. The WTO rules do not specify the way costs should be calculated, the type of costs that may or may not be included, reference periods to be used, etc., thus leaving room for interpretation. The only specific guidance is that the IF+C to be used should be that involved in 'complying with the government programme'.

As a general approach, we have used the costs incurred and income forgone of a 'typical' farm. This typical farm is intended to be representative of the farming practices on the eligible land type for the action. However, there are differences between the 'typical' IF+C and the individual indifference price for each land manager participating in a scheme, due to variation in the cost of delivering environmental actions, variation in farm enterprises, variation in performance, and variation in the barriers of entry to schemes. There will therefore always be an income transfer in the form of the inframarginal rent to those farms that have production costs or generate income levels lower than those used to set the payment rate.

Equally, when looking at the 'costs incurred' component, those farmers who are able to deliver the required agroforestry actions at a lower cost than typical will find it profitable to enter their land into the scheme. This might be particularly the case if the farmer can deliver actions at their own marginal cost rate when the payment calculation assumes it is undertaken at contractors' rates. Other farmers may find that the full value of the agri-environment payment goes to third party contractors. In theory, payment rates based on the 'typical' farm will only incentivise half the eligible population.

If the Scottish Government wanted to increase the incentives to drive uptake (e.g., to achieve particular environmental/tree planting targets) the IF+C calculations could be adjusted by drawing on a higher gross margin percentile or higher point on the cost curve than those for the 'typical' farm. The higher the gross margin percentile, or the higher the point on the cost curve, the greater will be the inframarginal income transfer to those farmers with IF+C below this point. This is a permissible and defensible way of establishing the costs to farmers of participation in a WTO consistent fashion, as long as there is a clear link and

evidence/rationale between payment rate setting and achievement of specified, agreed environmental targets.

Conversely, if there is wide uptake and/or evidence of significant 'deadweight' (i.e. the tree planting might have happened anyway), then the payment rate could be set below the costs for the 'typical' farm.

Payment structures

We propose that all grants are made as one-off payments in year 1. This helps ensure simplicity for both applicants and administrators. Applicants would only have to deal with one application and claims process, minimising time spent on follow-up annual claims. Scheme administration would also be more straightforward without the need to process and pay annual payments. It should be noted that the scale of the proposed scheme is relatively small at the farm scale. This means that maintenance payments would be very small, meaning the time/cost of processing annual claims would be high relative to the actual payments.

Payments have been calculated to allow for costs year 1-5 to be incorporated into the year 1 payment. It is recommended that a 10-year maintenance requirement is attached to all the options. This follows the convention with maintenance payments under the Scottish forestry grant scheme, which pays for years 1-5 and carries a 10-year obligation. In some cases the number of trees that would be expected to have survived to year 10 have been detailed. Whilst we have proposed flat rate payments for the various options, the Scottish Government might want to consider whether payments should be varied or supplemented depending on species type/mix and/or location.

There is a risk of non-compliance with upfront payments, because there is no ongoing payment to incentivise and drive performance of the obligations. We suggest the risk of non-compliance is low with proper monitoring and inspections. It may be that ongoing maintenance / management is made a condition of other farm payments. However, an alternative approach would be to make annual payments, and we have also provided annualised payment rates in our spreadsheet.

Payments outlined for each individual option have been structured in a way that attempts to limit the size of this support at an individual farm scale. Options and payments have been developed with administrative and applicant simplicity in mind. This allows a simple per tree, per enclosure, per hectare or per metre payment to be used for all the options.

A minimum and maximum number of trees, length / area of habitat has been included for each option. These minimum and maximum figures are an attempt to ensure sufficient farm-scale change and justify the administrative burden. They are also designed to prevent excessive spend on individual holdings. Altering these minimum and maximum figures is a straightforward process.

Stock fencing is a significant consideration when it comes to structuring payments. There is scope for fencing - particularly associated with options 4.3 and 4.6 - to account for a large proportion of the spend on some options. Options for limiting spending on fencing include reducing the percentage of the actual cost of fencing that is funded, limiting the length of fencing that is funded for individual options, using degressive payments, or a combination of these. We have only incorporated fencing costs directly into the cost calculations with

option 4.2, because the size of the enclosures is stipulated and the fencing costs can be fixed. For all other options, we suggest that fencing is an additional/separate capital payment.

To prevent excessive spending on fencing we recommend a maximum length of fencing is funded and that degressive payments are used. For the small woodland option, we suggest:

- 50m of fencing at full rate.
- A further 100m fencing at half rate.
- Anything over and above is self-funded.
- This would limit fencing to a maximum of £700 per small area of woodland.

5.2 Uptake metrics and targets

Metrics

There are various metrics that could be used:

Uptake / participation:

- Number of farms and/or area of farms participating in one or more of the proposed options. This number could be expressed in absolute terms (number, area (ha)) or as a percentage of farms and/or farmland/agricultural area in Scotland and could be monitored annually. This approach would be consistent with how agri-environment scheme participation is currently monitored.

Outputs

- Number of trees, number of enclosures, area of woodland planting (ha) and length of hedgerow planted or created. These would be the optimal output metrics and could be monitored annually.

Outcomes

- Number of trees or area of woodland creation coming from the proposed options – both as a % of Scottish woodland creation targets annually, and as a % of total woodland cover in Scotland (see Targets section below). In other words, what is the contribution of the proposed options to woodland creation targets.
- Number, area or proportion of farms engaging in 'agroforestry' options, and thereby contributing to uptake of regenerative farming in Scotland.
- One or both these outcomes could be linked to carbon sequestration and storage, biodiversity and other environmental benefits as well as business/economic and social benefits. These could be monitored annually and/or every 3 or 5 years.

Targets, budgets and outputs

A number of uptake targets been generated and modelled. These draw on available agricultural holding and area statistics and take account of current budgets for scheme payments in order to ensure that they are realistic and potentially deliverable.

Table 5-1 sets out three levels of participation – 5, 10 and 15% of agricultural holdings/area participating in an option. It is worth noting that the 10% of agricultural holdings/area participation scenario would equate to a total area of 530,000 ha of farmland involved with the proposed options. This compares with the 546,000 ha of woodland on farm currently in

Scotland[4]. In other words, it would result in a near doubling of land in agroforestry and woodland in Scotland.

Table 5-1: Number and area of farms by participation scenario

% of agricultural holdings /area participating in an option	No. of participating farms	Area of farms participating (ha)
5%	2,497	266,498
10%	4,994	532,996
15%	7,490	799,494

Table 5-2 sets out the estimated annual budget required for the different levels of participation, assuming three potential levels of ambition based on indicative annual payment per farm – a minimum payment of £500 p.a., an intermediate payment of £2,000 p.a., and a more ambitious payment of £5,000 p.a. The budget rises with the percentage level of participation and the indicative level of payment, but the outputs do too. The budget range indicated is from £1.25 million to £37 million. For reference, in 2022, the Scottish BPS budget was £420 million, the agri-environment scheme budget was £24 million and the LFASS budget was £117 million[5]. Note, for the purposes of simplicity, the budget modelling assumes the use of annualised payments as opposed to capital payments.

Table 5-2: Annual budget by participation scenario and indicative annual payment per farm (£ m)

	Indicative annual payment per farm		
% of agricultural holdings/area participating in an option	£500	£2,000	£5,000
5%	£1.25 m	£4.99 m	£12.48 m
10%	£2.50 m	£9.99 m	£24.97 m
15%	£3.75 m	£14.98 m	£37.45 m

Table 5-3 shows for three selected participation and budget scenarios, the potential outputs in terms of trees, or enclosures, or area of woodland, or length of hedgerow. Note, the outputs shown are alternative maximum individual outputs – i.e. we calculate the outputs assuming that the entire budget indicated at the top of the column (£1.25 m, £9.99 or 37.45

[4] https://www.soilassociation.org/media/24209/trees-and-woodland-in-the-farmed-landscape-scotland-rev-1.pdf

[5] Agriculture in the United Kingdom data sets - GOV.UK (www.gov.uk)

m) is allocated to the option described to the left in the same row. The outputs shown are therefore mutually exclusive not additive. In practice, of course, a mix of outputs would be delivered based on selection by participating farmers. As we are using annualised payments, the selected budget would need to be maintained for five years to deliver the outputs shown.

Table 5-3: Alternative maximum individual option outputs by participation and budget scenario

				£1.25 m p.a.	£9.99 m p.a.	£37.45m p.a.
Opt.	Description	Annual'd payment	Unit / output	5% of agricultural holdings/area participating in an option and £500 indicative annual payment per farm	10% of agricultural holdings/area participating in an option and £2000 indicative annual payment per farm	15% of agricultural holdings/area participating in an option and £5000 indicative annual payment per farm
1	Silvopastoral – single tree	£7.20	tree	173,389	1,387,111	5,201,667
2a	Silvopastoral – enclosed trees (small enclosure)	£45.14	enclosure	27,656	221,249	829,685
2b	Silvopastoral – enclosed trees (medium enclosure)	£83.86	enclosure	14,887	119,094	446,601
2c	Silvopastoral – enclosed trees (large enclosure)	£122.86	enclosure	10,161	81,289	304,835
3	Farm woodland – small-scale (incl. riparian woodland planting)	£1,670.27	ha	747	5,979	22,423
4a	Silvoarable – alley cropping (standard trees)	£2.15	tree	580,651	4,645,209	17,419,535
4b	Silvoarable – alley cropping (fruit trees)	£3.32	tree	376,024	3,008,193	11,280,723

5a	Hedgerow and field boundary trees (with cactus guards)	£15.07	tree	82,840	662,721	2,485,202
5b	Hedgerow and field boundary trees (without cactus guards)	£11.70	tree	106,701	853,607	3,201,026
6	Boundary – biodiverse hedgerows	£568.84	100m hedgerow	2,195	17,557	65,839

These estimated outputs – particularly those resulting from the larger budgets - could make a significant contribution to national goals including:

- Scottish woodland creation targets:
  - Woodland to cover 21% of Scotland by 2032
  - 16,500ha of new woodlands in 2023/24, and 18,000 ha by 2024/25.
- Scottish Biodiversity Strategy's commitment to protect at least 30% of our land and sea for nature by 2030 (30x30 Target).
- Scottish sustainable and regenerative farming ambitions.

With regard to the latter, the proposed outputs would make a contribution to farmers' regenerative farming transitions and farm economics and resilience, as well as contributing to farmland biodiversity and connectivity, and farm carbon reductions. It is important to note that while the trees planted or area of new woodland from agroforestry might be modest compared to 'mainstream' woodland creation, these trees would be located on productive farmland that will continue to produce food, and would not otherwise be available for tree planting.

6 Recommendations

The following recommendations in relation to new Farm Tree Payments are made for the consideration of the Scottish Government:

1. **New options for small-scale tree planting could be offered to farmers and crofters in Scotland**

   The following options for tree planting could be offered to incentivise the increase of tree cover on farms and crofts. These options have the potential provide a wide range of biodiversity and landscape benefits, as well as helping farms and crofts become more resilient to climate change.

   - Silvopastoral – low density single trees
   - Silvopastoral – enclosed trees
   - Farm woodland – small-scale (<0.25ha planting)
   - Silvoarable – alley cropping
   - Hedgerow and field boundary trees
   - Boundary – biodiverse hedgerows

   These options would complement the existing FGS incentives. The silvoarable option (Section 4.4) is presented as an alternative to the current FGS silvoarable option. Alternatively, some changes could be made to the FGS silvoarable option to make it more attractive to farmers.

   These options complement the higher density, larger-scale options offered under the FGS. The silvoarable option (Section 4.4) is presented as a possible alternative to the FGS silvoarable option, which could also be changed to make it more attractive.

2. **These options should be accessible to as many land managers as possible and integrated into existing and future schemes.** A simple, non-competitive application process would encourage much greater uptake without making large spending commitments, thus offering good value for money.

3. It is strongly **recommended that these options are included as a separate, 'capital only' scheme in either 'Tier 2' or 'Tier 3' of future farm support.** Ideally, options for capital payments would be available under 'Tier 2 'of the future proposed support. However, if they are likely to sit in 'Tier 3' of future payments, it remains essential that support for small scale tree planting is fully accessible to as many farmers and crofters as possible. In addition to the capital payments, there is also the potential for areas of newly created agroforestry land to be covered by Tier 2 support measures.

4. **Budgets of £10 million p.a. or more would double the land involved with agroforestry and woodland in Scotland** with significant outputs in terms of trees, enclosures, area of woodland planting and/or length of hedgerow planted. This would contribute to woodland creation, biodiversity and regenerative farming ambitions and targets, with associated benefits in terms of farm resilience, farmland biodiversity and connectivity, and farm carbon reductions.

5. **Training and advice are critical for a successful roll-out.** Advisors of the existing Farm Advisory Service (FAS) 'One-to-One' advisory support scheme could advise farmers and crofters on these options and how small-scale woodland planting could best be integrated on their farms. This could be combined with demonstrations farms, farm talks, videos, and case studies. In future, this could fall under 'Tier 4' of farm support which will focus on skills, knowledge and training as well as advisory support services.

6. **Some overarching guidelines could be developed** covering all the options, including

    - **Site location**: to help ensure the 'right tree is planted in the right place'.
    - **Procurement and sourcing of trees**: to ensure that native trees, plants from the appropriate local tree seed zone are used where possible, and tree guards (tubes) are fully biodegradable.
    - **BPS eligibility**: to ensure that farmers who adopt agroforestry measures are not penalised (i.e. land would not become ineligible for BPS.
    - **Maintenance requirement**: to emphasise the importance of long term maintenance
    - Review of regulations relating to planting and felling: to ensure these do not create a barrier or friction to uptake of the proposed Farm Tree Payments.

7. **These new tree planting options could be implemented quickly,** as these options have already been tested by farmers in Scotland, they are relatively simple, and could easily be rolled out more widely across Scotland.

8. **The new options will need some further refinement to options and payment rates before roll out.** New tree planting options will need further refinement before they are rolled out more widely across Scotland. This will ensure the options are as well designed and targeted as possible. More detailed management prescriptions may be required, and costings and payment rates would need to be validated and adjusted. Payment rates could be set higher to increase the incentives to drive uptake, provided there is a clear link and evidence/rationale between payment rate setting and achievement of specified, agreed environmental targets. Conversely, payment rates could be set below the costs of the 'typical' farm if wide uptake is expected.

The proposed options in this report will contribute to the overall targets for total woodland creation. They would also make a contribution to farmers' regenerative farming transition and farm economics and resilience, as well as contribute to farmland biodiversity and connectivity, and farm carbon reductions.

Appendices

Appendix 1 – References literature review

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Soil Association (2019) *Agroforestry Handbook for the UK*.

Woodland Trust Scotland and Soil Association Scotland (2022). *Integrating Trees on Farms and Crofts in Scotland, Benefits, Barriers and Opportunities*.

Appendix 2 - List of stakeholders

Steering Group members:

David McKay	Soil Association
Alistair Seaman	Woodland Trust
Helen Cheshire	Woodland Trust
Simon Ritchie	Woodland Trust
Sarah Madden	Woodland Trust

Workshop and interview participants:

Andrew Barbour	Farmer
Roger Howison	Farmer
Mike Hyatt	Crofter
Phil Knott	Crofter
Dee Ward	Rottal Estate / Scottish Land and Estates
Alasdair Peppe	Farmer
Doug Christie	Farmer
Sarah Cowie	NFUS
Peter Douglas	Farmer / NFUS
Debbie Playfair	Farmer
Freda Scott-Park	Farmer
Tim Nicholson	Farmer / Cactus Tree Guards
Lyn White	Scottish Forestry
Davy McCraken	SRUC
Poppy Frater	SAC Consulting
Ana Allamand	Soil Association
Collen McCulloch	Soil Association
Iain Moss	Woodland Trust
Pete Leeson	Woodland Trust
Jon Haines	Woodland Trust

Appendix 3 – Summary tables England and Wales

England

Policy type	Description/examples

Agri-environment schemes	• **Sustainable Farming Incentive** (SFI) - Defra is introducing 2 new agroforestry actions this summer, to create and maintain in-field silvoarable and silvopastoral systems.
	• **Countryside Stewardship (CS) and CS Plus** – second tier of ELM, payments to undertake actions that support local nature recovery and delivering local environmental outcomes.
	  ○ Mid-Tier
	  ▪ funding is available for planting new hedges, management of existing hedges, hedgerow gapping up and planting hedgerow trees
	  ○ Woodland Creation and Maintenance Grant
	  ▪ Maximum 3 years, £1.72 per tree, maximum £6,800 per ha
	  ▪ Minimum of 3ha created in blocks of 0.5ha or more or 1ha creation in blocks of 1.2ha if addressing water quality or flood risk
	  ○ Higher Tier, previously HLS
	• **Landscape Recovery Scheme** – "bespoke agreements to deliver landscape and ecosystem recovery through long-term, land use change projects," across a minimum area of 500ha.

Capital payments/grant schemes	CS capital payments for fencing **English Woodland Creation Offer** • support for the capital items / activities to establish new woodland; • 15 years of annual maintenance payments; • Contribution towards the actual cost of installing infrastructure; • Optional 'Additional Contributions' for delivery of public goods • Optional low sensitivity land payment where the proposal falls within a low sensitivity area for woodland creation

Wales

Policy type	Description/examples
Agri-environment schemes	**Habitat Wales Scheme** – interim habitat scheme starting 2024 Payment rates for habitat management for individual farm business are: • Habitat land, £69/ha • Woodland habitat, £62/ha **Sustainable Farming Scheme**, to be introduced in 2025, replacing BPS, will have 3 layers; Universal, Optional and Collaborative each containing a set of options. Universal actions are required for a baseline payment. These actions include managing/ enhancing habitats across > 10% of the farm and having >10% tree cover on

	the farm, although this had been adjusted for 10% of appropriate land. Universal actions also include completing an annual benchmark.
Capital payments/grant schemes	**Woodland creation**, payment range of £2,100 t £4,500 dependent on planting location. Includes payment for fencing (£5.56 per m) and management (£60/ha).

Appendix 4 - Cost calculations

Number	Option	Upfront one-off payment	Unit of measure
1	Silvopastoral – low density single trees	£31.15	£/tree
2a	Silvopastoral – enclosed trees (small enclosure)	£195.45	£/enclosure
2b	Silvopastoral – enclosed trees (medium enclosure)	£363.05	£/enclosure
2c	Silvopastoral – enclosed trees (large enclosure)	£531.90	£/enclosure
3	Farm woodland – small-scale (<0.25ha)	£7,231.38	£/ha
4a	Silvoarable – alley cropping (standard trees)	£9.33	£/tree
4b	Silvoarable – alley cropping (fruit trees)	£13.99	£/tree
5a	Hedgerow and field boundary trees (with cactus guards)	£65.26	£/tree
5b	Hedgerow and field boundary trees (without cactus guards)	£50.67	£/tree
6	Boundary – biodiverse hedgerows	£2,462.78	£/100m

Silvopastoral - single tree

Aim

To increase the presence of scattered native trees within the farmed landscape.

Management prescriptions (what participants must do)

Individual trees should be planted at a low density within specific fields. Trees should be planted at a minimum of 10 trees per hectare and maximum of 30 trees per hectare. Trees can be spaced / planted according to individual preference but with the aim of being reasonably evenly spaced throughout the planted area.

Trees should be protected using (minimum) 160 cm high, barbed, cattle proof guard (eg Cactus Guard) supported either by 3 x150 cm x 10 mm rebar rods or two wooden posts. In addition, trees should be protected with 60 cm (or taller) tree guard. Note that if cattle grazing is present the guard should be raised 20 cm off the ground to prevent the tops of trees being browsed.

Trees should be comprised of native species appropriate to the site. Species can include oak (sessile and pedunculate), birch, rowan, gean, aspen, bird cherry and Scots pine.

Trees that fail to establish should be replanted and protective guards should be maintained for a minimum of 10 years.

Financial calculations / payment rate

	trees/ha	Years		
	1	5		
			Losses	**Gains**
	Unit	*Value*	**£/ha**	**£/ha**
Extra Income				
No Extra Income				0
Sub-total				***£0.00***
Costs Saved				
No Cost saved				0
Sub-total				**£0.00**
Income Lost				
No Income Lost			£0	
Sub-total			**£0.00**	
Extra costs incurred				
Plant and planting	year 1	£6.92	£1.60	
Cactus guard	year 1	£17.55	£4.05	
Tubes	year 1	£2.20	£0.51	
Stake	year 1	£1.30	£0.30	
Replacement of failed trees		£1.73	£0.35	
Weed control			£0.39	
Sub-total			**£7.20**	
Total			**£7.20**	**£0.00**
Income change				**£7.20**
Annualised payment				**£7.20**
Upfront payment				**£31.15**

Silvopastoral - trees in enclosures

Aim

To establish small patches of trees and scrub within the farmed landscape. Options for tree enclosures include creating areas of trees and scrub in open areas of hill / rough grazing habitats, as well as the potential for enhancing riparian tree cover next to burns and rivers.

Management prescriptions (what participants must do)

Plant small fenced enclosures of trees and scrub. Three size options are available: 3.6 m x 3.6 m, 5.4 m x 5.4 m, 7.2 m x 7.2 m enclosures.

Enclosures must have top rail at stock fence height. Below the top rail can either be rylock net or 4 evenly spaced rails.

3.6m enclosures should contain a minimum of 10 trees and shrubs, 5.4 m enclosures a minimum of 20 trees and scrubs, 7.2 m enclosures a minimum of 30 trees and shrubs.

A mix of native trees and shrubs appropriate to the site should be used. A minimum of 50% should be trees. Trees can include oak, birch, rowan, gean, aspen, bird cherry, Scots pine, and alder. Native shrubs can include willow, hawthorn, blackthorn, hazel, juniper, and holly. Ideally the trees should be in the centre of the enclosure with scrub around the edges.

Trees should be protected with 0.6 m guards. Scrub can be planted without protective guards.

Enclosures should be maintained in a stock proof condition for a minimum of 10 years. It is anticipated that at least 50% of planted trees/scrub should be well established by year 10.

Financial calculations / payment rates

Small enclosure	3.6	3.6	12.96	0.001296
Medium enclosure	5.4	5.4	29.16	0.002916
Large enclosure	7.2	7.2	51.84	0.005184
Small enclosure	10	trees		
	0.8	trees per sq m		
	0.77	sq m per tree		
Medium enclosure	20	trees		
	0.7	trees per sq m		
	1.46	sq m per tree		
Large enclosure	30	trees		
	0.6	trees per sq m		
	1.73	sq m per tree		

Small enclosure				
			Losses	**Gains**
	Unit	*Value*	**£/ha**	**£/ha**
Extra income				
None				£ -
Sub-total				**£ -**
Costs saved				
IOWC livestock	0.13%	135		£ 0.17
Savings grassland operations (rolling, silage, fert)	0.13%	268		£ 0.35
Sub-total				**£ 0.52**
Income lost				
grassland gross margin	0.13%	845	£ 1.10	
Sub-total			**£ 1.10**	
Extra costs incurred	£/item	£/enclosure		
Plant and planting	6.92	69.17	15.98	
Tubes	2.20	22.00	5.08	
Stakes	1.30	13.00	3.00	
Replacement of failed trees (beating up)	1.73	17.29	3.46	
Weed control	0.39	3.90	3.90	
Fencing costs	7.05	101.52	13.15	
Sub-total			**£ 44.57**	
Total			£ 45.67	£ 0.52
Income Change			**£ 45.14**	
Annualised payment				**£45.14**
Upfront payment				**£195.45**

Medium enclosure				
			Losses	**Gains**
	Unit	*Value*	**£/ha**	**£/ha**
Extra income				
None				£ -
Sub-total				**£ -**
Costs saved				
IOWC livestock	0.29%	135		£ 0.39
Savings grassland operations (rolling, silage, fert)	0.29%	268		£ 0.78
Sub-total				**£ 1.18**
Income lost				
grassland gross margin	0.29%	845	£ 2.46	
Sub-total			**£ 2.46**	
Extra costs incurred	£/item	£/enclosure		
Plant and planting	6.92	138.34	31.95	
Tubes	2.20	44.00	10.16	
Stakes	1.30	26.00	6.01	
Replacement of failed trees (beating up)	1.73	34.59	6.92	
Weed control	0.39	7.81	7.81	
Maintenance of fencing	7.05	152.28	19.72	
Sub-total			**£ 82.57**	
Total			£ 85.03	£ 1.18
Income Change			**£ 83.86**	
Annualised payment				**£83.86**
Upfront payment				**£363.05**

Large enclosure				
			Losses	**Gains**
	Unit	*Value*	**£/ha**	**£/ha**
Extra income				
None				£ -
				£ -
Costs saved				
IOWC livestock	0.52%	135		£ 0.70
Savings grassland operations (rolling, silage, fert)	0.52%	268		£ 1.39
				£ 2.09
Income lost				
grassland gross margin	0.52%	845	£ 4.38	
			£ 4.38	
Extra costs incurred	£/item	£/enclosure		
Plant and planting	6.92	207.51	47.93	
Tubes	2.20	66.00	15.24	
Stakes	1.30	39.00	9.01	
Replacement of failed trees (beating up)	1.73	51.88	10.38	
Weed control	0.39	11.71	11.71	
Maintenance of fencing	7.05	203.04	26.29	
			£ 120.56	
Total			£ 124.95	£ 2.09
Income Change			**£ 122.86**	
Annualised payment				**£122.86**
Upfront payment				**£531.90**

Farm woodland - small-scale planting (<0.25 ha)

Aim

To increase woodland cover throughout the farmed landscape and increase habitat diversity.

Management prescriptions (what you should do)

Woodland creation is available for areas up to 0.25 ha.

Trees should be planted at an average of 3m spacing (1,200 stems per ha). Trees should be a mix of native species appropriate to the site. Trees should be protected with 1.2 m tubes and stakes.

Trees should consist of species native to Scotland. 10% of the plants can be scrub species (hawthorn, blackthorn, hazel, holly, dog rose). Scrub species should be planted in 0.6 m guards.

The woodland should be maintained for a minimum of 10 years. Once trees are well established tubes should be removed for re-use or recycling.

Financial calculations / payment rate

	trees/ha	Option area	Years	
	1100	per ha	5	
			Losses	**Gains**
	Unit	*Value*	**£/ha**	**£/ha**
Extra Income				
No Extra Income				£0.00
Extra income sub-total				***£0.00***
Costs Saved				
Savings Grassland operations; fertiliser and maintenance				£303.00
Costs saved sub-total				**£303.00**
Income Lost				
Income lost from the area removed from Forage production			£562.50	
Income lost sub-total			**£562.50**	
Extra costs incurred				
Site preparation - subsoiling	£/ha	£120.00	£27.72	
Plant and planting	£/ha	£1,558.33	£359.94	
Plastic tubes and stakes	£/ha	£3,666.67	£846.91	
Replacement of failed trees (beating up)	£/ha		£36.21	
Weed control	£/ha		£140.00	
Extra costs incurred sub- total			***£1,410.77***	
Total			**£1,973.27**	**£303.00**
Income Change			**£1,670.27**	
Annualised payment				**£1,670.27**
Upfront payment				**£7,231.38**

Silvoarable - alley cropping

Aim

To encourage the creation of strips of trees / wildflower strips within the arable farmed landscape. This option will allow for the creation of lines of trees between croppable alleys.

Management prescriptions (what you should do)

Trees should be planted in rows within the arable field.

Trees should be planted in 3m wide strips sown with a wildflower / grass mix.

There should be 24m of crop between the edges of the wildflower strips.

Trees should be planted at 3m spacing within the rows.

A 5m headland can be left at the end of each row for turning.

Trees should be protected with (minimum) 0.6 m guards.

It is anticipated that there should be a planting density of approximately 100 trees per hectare.

Financial calculations / payment rate

	trees/ha	Years		
	123	5		
			Losses	**Gains**
	Unit	*Value*	**£/ha**	**£/ha**
Extra Income				
No Extra Income				
Extra income sub-total				***£0.00***
Costs Saved				
Arable interest on working capital	11.10%	19.4	2.1534	
Arable crop mechanisation saved	11.10%	340	37.74	
Costs saved sub-total				**£39.89**
Income Lost				
Lost arable Gross Margin	11.10%	1031	114.441	
Income lost sub-total			**£114.44**	
Extra costs incurred				
Plant and planting	£/ha	174.25	£40.25	
Tubes	£/ha	270.60	£62.50	
Stake	£/ha	159.90	£36.93	
Site preparation	£/ha	120.00	£27.72	
Weed control	£/ha	35.88	£14.35	
Replacement of failed trees	£/ha		£8.71	
Extra costs incurred sub- total			***£190.46***	
Total			**£304.90**	**£39.89**
Income Change			**£265.01**	
Annualised payment				**£265.01**
Upfront payment				**£1,147.35**
Annualised payment per standard tree				**£2.15**
Upfront payment per standard tree				**£9.33**
Annualised payment per fruit tree				**£3.23**
Upfront payment per fruit tree				**£13.99**

Hedgerow and Field Boundary Trees

Aim

To increase the diversity of habitats in hedgerows and to restore tree lines along field boundaries.

Management prescriptions (what you should do)

Payment provided for single trees planted and protected within a hedgerow or former treeline. There are two options for planting trees in this situation:

Option 1: Trees should be protected using tree protectors as set out in the silvopasture option (see 5.1) where livestock have access to hedge or tree line.

Option 2: Where stock do not have access, or where stock are not present, trees should be protected using 1.2m tubes and stakes.

Species planted should be native species appropriate to the site. Species can include oak (sessile and pedunculate), birch, gean, rowan, and bird cherry. Where locally appropriate (for example where there are remaining trees) non-native species such as sycamore, lime or beech can be planted.

Trees should be planted at an appropriate spacing within the tree line or hedge. A maximum spacing of 20 m between trees applies.

Financial calculations / payment rate

	trees/100m	Years		
	1	5		
			Losses	**Gains**
	Unit	*Value*	**£/100m**	**£/100m**
Extra Income				
None				£0
Extra income sub-total				**£0.00**
Costs Saved				
None				£0
Costs saved sub-total				**£0.00**
Income Lost				
None			£0	
Income lost sub-total			**£0.00**	
Extra costs incurred				
Plant and planting	£6.92	£6.92	£1.60	
Cactus guard	£17.55	£17.55	£4.05	
Tubes	£2.20	£2.20	£0.51	
Stake	£1.30	£1.30	£0.30	
Weed control	£0.40	£0.40	£0.40	
Slower hedge trimming	4.00	£4.00	4.00	
Hand trim either side 1m	3.876634667	£3.88	3.876634667	
Replacement of failed trees	£1.73	£1.73	£0.35	
Extra costs incurred sub-total			***£15.07***	
Total			**£15.07**	**£0.00**
Income Change			**£15.07**	
Annualised payment				**£15.07**
Upfront payment				**£65.26**

Boundary - enhanced hedgerows

Aim

To widen field boundaries and planting with carefully selected species for both shelter and biodiversity benefit.

Management prescriptions (what you should do)

Enhanced hedgerows should consist of 4 rows of trees. Rows should be 1.5m apart.

A mix of native shrubs (eg hawthorn, blackthorn, hazel, dog rose, guelder rose) should be planted on the two rows closest to the prevailing wind. These plants should 1m apart.

A mix of taller growing native trees (eg Scots pine, silver birch, rowan, bird cherry, gean, crab apple, goat willow) should be planted in the two rows furthest from the prevailing wind. These plants should be 1.5m apart.

Trees should be planted in 1.2m guards. Shrubs should be planted in 0.6m guards.

Once trees are well established tubes should be removed for re-use or recycling.

Financial calculations / payment rate

	hundred meters	Years		
	1	5	**Losses**	**Gains**
	Unit	*Value*	**£/100m**	**£/100m**
Extra Income				
No Extra Income				
Extra income sub-total				***£0.00***
Costs Saved				
Savings grassland operations (rolling, silage, fert)	6.50%	303		£ 19.70
Costs saved sub-total				**£19.70**
Income Lost				
grassland gross margin	6.50%	562.5	£ 36.56	
Income lost sub-total			**£36.56**	
Extra costs incurred				
Plant and planting	£1.42	£ 472.22	£109.07	
Tubes	£ 2.20	£ 733.33	£169.38	
Stake	£ 1.30	£ 433.33	£100.09	
Weed control	£ 0.39	£ 130.13	£130.13	
Gapping up	£ 0.35	£ 118.06	£23.61	
Extra costs incurred sub-total			***£532.28***	
Total			**£568.84**	**£19.70**
Income Change			**£549.15**	
Annualised payment				**£568.84**
Upfront payment				**£2,462.78**

Glossary

AECS	Agri-Environment and Climate Scheme
BPS	Basic Payment Scheme
ESS	Ecosystem services
EWCO	English Woodland Creation Offer scheme
FAS	Farm Advisory Service
FGS	Forestry Grant Scheme
IF+C	'Income Forgone plus Costs' (IF+C) approach. Convention for calculating payment rates.
SFS	Sustainable Farming Scheme

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