

Assessing the impact of the Sustainable Farming Incentive on farm businesses – technical note

This technical note provides further details on the economic analysis carried out using AHDB virtual farms, including the specific actions that were selected to fulfil the criteria for the SFI standards examined.

Calculation of net payments

Defra's website on the [SFI pilot scheme](#) contains information on the requirements that need to be met for each of the eight available standards. In our analysis, we looked at five of the eight SFI pilot standards as well as the [two soils standards](#) for the wider rollout of the SFI in 2022.

For the three arable AHDB virtual farms, we examined all ambition levels for the following standards:

- Arable and horticultural land (SFI pilot)
- Arable and horticultural soils (SFI pilot and SFI 2022)
- Hedgerows (SFI pilot)

For the mixed and 150 ha beef and sheep virtual AHDB farms, we examined all ambition levels for the following standards:

- Improved grassland (SFI pilot)
- Improved grassland (SFI pilot and SFI 2022)

As mentioned in the main report, the same proportion of land (25%) was entered into each of these standards for each farm. We listed the actions required for each standard and ambition level and selected the method, where applicable, to achieve this. This process is subjective as, for certain actions, you have a choice of which method you choose. For this analysis, we chose to select the cheapest and easiest method possible.

Sources used to calculate the costs involved were:

- John Nix Farm Management Pocket Book (2021)
- ABC Budgeting and Costing Book (May 2021)
- National Association of Agricultural Contractors Contracting Prices Survey (2021)
- Lead analyst in AHDB Farm Economics team, AHDB Business Resilience Manager and the AHDB Knowledge Exchange team
- Websites for major seed suppliers and other relevant businesses

Details of the actions required for the standards outlined above, and the methods chosen to fulfil the requirements, are provided in the tables below. The same methods for each standard and ambition level were applied across the corresponding AHDB virtual farms (see above) unless otherwise stated.

The actions within each ambition level are cumulative; the intermediate level, for example, includes all the actions listed under the introductory level plus some additional requirements. Similarly, the advanced level includes all the actions listed under the introductory and intermediate levels plus some additional obligations.

Arable and horticultural land

	Action	Selected method
Introductory	<i>Resources for birds and pollinators on 5% of eligible land:</i> - Sites for nesting and cover on 1% of land entered - Habitats rich in insects and flowers on 2% of land entered - Sown winter seed on 2% of eligible land	- Create an area of bare ground for invertebrates - Establish field margin containing a perennial mix of wildflowers and grasses - Sow bird food seed
	<i>Create buffers around 50% of in-field trees</i>	Calculated the area of the buffer (10 m from the edge of the trunk) and adjusted cropped area accordingly.
	<i>Use a nutrient management plan</i>	Already done on-farm so no additional cost.
	<i>Use low emission technologies</i>	Use a contractor to do this on 25% of the land entered in the standard.
Intermediate	<i>Resources for birds and pollinators on 8% of eligible land:</i> - Sites for nesting and cover on 2% of land entered - Habitats rich in insects and flowers on 3% of land entered - Sown winter seed on 3% of eligible land	Same methods as for introductory level except on a larger area.
	<i>Support a wide range of farm wildlife</i>	Provide supplementary winter feed for birds.
	<i>Complete a whole farm nutrient budget</i>	Use a consultant.
	<i>Do soil mapping</i>	Already done on-farm so no extra cost.
	<i>Manage ditches</i>	Already done on-farm so no extra cost.
Advanced	<i>Resources for birds and pollinators on 10% of eligible land:</i> - Sites for nesting and cover on 2% of land entered - Habitats rich in insects and flowers on 4% of land entered - Sown winter seed on 4% of eligible land	Same methods as for introductory level except on larger area.
	<i>Create buffers around 75% of in-field trees</i>	Calculated the area of the buffer (10 m from the edge of the trunk) and adjusted cropped area accordingly.
	<i>Maintain areas of tall vegetation, scrub and wet features</i>	Already done on-farm so no extra cost.
	<i>Support crop-pest predators</i>	Fulfilled by the establishment of a flower-rich margin (see above).
	<i>Apply fertilisers and pesticides with precision equipment</i>	Use a contractor.

Arable and Horticultural soils (SFI pilot)

	Action	Selected method
Introductory	<i>Complete a soil assessment on at least 20% of land entered</i>	As this involves testing for soil organic matter, it is considered as an additional cost.
	<i>Alleviate soil compaction</i>	Assess soil compaction around land entered using a penetrometer and take necessary action if required.
	<i>Establish green cover on at least 5% of land entered</i>	See below
	<i>Increase soil organic matter on at least 10% of land entered</i>	Sow a winter cover crop – this also fulfils the requirement of establishing green cover.
Intermediate	<i>Establish green cover on at least 10% of land entered</i>	See below
	<i>Increase soil organic matter on at least 15% of land entered</i>	Sow a winter cover crop – this also fulfils the requirement of establishing green cover.
	<i>Use minimum tillage or no tillage</i>	Already done on-farm so no extra cost.
Advanced	<i>Establish green cover on at least 15% of land entered</i>	See below
	<i>Increase soil organic matter on at least 20% of land entered</i>	Sow a winter cover crop – this also fulfils the requirement of establishing green cover.
	<i>Create a soil management plan</i>	Farm already has most of this in place, but requires an agronomist to pull together various aspects.

Arable and Horticultural soils (SFI 2022)

	Action	Selected method
Introductory	<i>Test soil organic matter</i>	An additional cost, as not part of standard soil tests done on-farm.
	<i>Undertake a soil assessment and produce a soil management plan</i>	Farm already has most of this in place, but requires an agronomist to pull together various aspects.
	<i>70% of winter cover to protect soil</i>	Winter crops are part of the rotation and cover the required area so no extra cost.
	<i>Addition of organic matter to soil on all of the land entered, at least once during three-year agreement</i>	Sow winter cover crop on 8% of land entered each year as organic matter already added to 25% of land annually
Intermediate	<p><i>Same as for introductory except:</i></p> <ul style="list-style-type: none"> - <i>winter cover requirement must include at least 20% multi-species green cover</i> - <i>addition of soil organic matter must include multi-species green cover</i> 	Sow winter cover crop on 20% of land each year to fulfil both winter cover and addition of soil organic matter requirements.

Hedgerows

	Action	Selected method
Introductory	<i>Leave at least 50% of the hedgerow uncut</i>	No additional cost.
	<i>Maintain hedgerow trees, or plant or tag new ones (average of one tree per 400m of hedgerow)</i>	Assumed that already had 85% of the required number of hedgerow trees so only needed to plant the remaining 15%. Oak trees to be planted. Ash trees would be cheaper but there have been supply issues due to ash dieback disease.
Intermediate	<i>Leave more hedgerows uncut</i>	No additional cost.
	<i>Leave the tops to grow uncut on short hedgerows</i>	No additional cost.
	<i>Maintain hedgerow trees or plant or tag new ones (average of one tree per 200m of hedgerow)</i>	Assumed that already had 80% of the required number of hedgerow trees so only needed to plant the remaining 20%. Oak trees to be planted. Ash trees would be cheaper but there have been supply issues due to ash dieback disease.
	<i>Create buffer strips on both sides of the hedgerow (at least 50%)</i>	Establish buffer strip grass margin. Assumed that this does not affect cropped areas.
Advanced	<i>Maintain hedgerow trees or plant or tag new ones (average of one tree per 100m of hedgerow)</i>	Assumed that already had 75% of the required number of hedgerow trees so only needed to plant the remaining 25%. Oak trees to be planted. Ash trees would be cheaper but there have been supply issues due to ash dieback disease.
	<i>Create buffer strips on both sides of the hedgerow (at least 75%)</i>	Establish buffer strip grass margin. Assumed that this does not affect cropped areas.

Improved grassland

	Action	Selected method
Introductory	<i>Manage fields for grazing</i>	Measure sward height with platometer to help maintain average sward height of at least 5 cm over at least 75% of the area of grazed pasture during the growing season.
	<i>Manage historic features</i>	Already done on-farm so no extra cost.
	<i>Leave margins uncut on at least 33% of hay/silage fields to encourage flowers and seed*</i>	Calculated cost of purchasing silage to offset the loss in yield caused by allowing 33% of silage field going to seed.
	<i>Create buffers around in-field trees</i>	Calculated the area of the buffer (2 m from the edge of the canopy). No extra cost was incurred.
	<i>Use a nutrient management plan</i>	Use a consultant.
	<i>Allow tall vegetation and scrub to develop on 2% of grassland</i>	Already present, so no extra cost.
Intermediate	<i>Allow tall vegetation and scrub to develop on 5% of grassland</i>	Already present, so no extra cost.
	<i>Control cutting on silage fields*</i>	Calculated cost of purchasing silage to offset the loss in yield caused by delayed cutting.
	<i>Manage ditches</i>	Already done on-farm, so no extra cost.
	<i>Test your manures and soils</i>	Cost of manure testing, plus soil tests on 30% of land entered into standard tested each year.
	<i>Complete a whole farm nutrient budget</i>	Use a consultant.
	<i>Limit inputs of liquid manures</i>	n/a
	<i>Use low emission technologies to apply organic manures to grassland</i>	Use a contractor to do this on 50% of the land entered in the standard.
	<i>Introduce clover and other legumes on 15% of improved grassland</i>	Sow herb and legume-rich sward.
Advanced	<i>Introduce diverse grass, herb and legumes on 20% of improved grassland</i>	Sow herb and legume-rich sward.
	<i>Manage grazing on improved grassland (includes delayed cutting in fields cut for forage)</i>	Calculated cost of purchasing silage to offset the loss in yield caused by delayed cutting.
	<i>Allow at least 2% of ryegrass to bear seed</i>	Already done on-farm so no extra cost.
	<i>Reduce nutrient inputs over at least 5% of improved grassland</i>	No additional cost.
	<i>Do soil mapping</i>	Carried out on at least 20% of the farmed area each year, so includes extra cost of soil testing.
	<i>Use efficient precision application equipment to apply fertilisers and organic manures</i>	Use a contractor to apply to 75% of land entered in standard.

* Based calculations on the land entered into the standard having one silage field for the 220 ha mixed farm and three silage fields on 150 ha beef and sheep farm.

Improved grassland soils (SFI pilot)

	Action	Selected method
Introductory	<i>Do a soil assessment each year on 20% of land entered (including measuring soil organic matter)</i>	Additional cost
	<i>Alleviate soil compaction</i>	Assess soil compaction around land entered using a penetrometer and take necessary action if required.
	<i>Add or retain a mix of legumes, herbs and grasses on at least 5% of land entered</i>	Sow a legume and herb-rich sward.
	<i>Maintain permanent grassland on land at risk of erosion or surface run-off (on at least 5% of land entered)</i>	Already present on-farm so no extra cost
	<i>Manage livestock density on grassland at risk of erosion or surface run-off (on at least 5% of land entered)</i>	Already done on-farm and farm has lower than average stocking density so no extra cost.
Intermediate	<i>Add or retain a mix of legumes, herbs and grasses on at least 10% of land entered</i>	Sow a legume and herb-rich sward.
	<i>Maintain permanent grassland on land at risk of erosion or surface run-off (on at least 10% of land entered)</i>	Already present on-farm so no extra cost.
	<i>Manage livestock density on grassland at risk of erosion or surface run-off (on at least 10% of land entered)</i>	Already done on-farm and farm has lower than average stocking density so no extra cost.
Advanced	<i>Add or retain a mix of legumes, herbs and grasses on at least 15% of land entered</i>	Sow a legume and herb-rich sward.
	<i>Maintain permanent grassland on land at risk of erosion or surface run-off (on at least 15% of land entered)</i>	Already present on-farm so no extra cost.
	<i>Manage livestock density on grassland at risk of erosion or surface run-off (on at least 10% of land entered)</i>	Already done on-farm and farm has lower than average stocking density so no extra cost.
	<i>Create a soil management plan</i>	Farm already has most of this in place but requires an agronomist to pull together various aspects.

Improved grassland soils (SFI 2022)

	Action	Selected method
Introductory	<i>Test soil organic matter</i>	Additional cost
	<i>Undertake a soil assessment and produce a soil management plan</i>	Farm already has most of this in place but requires an agronomist to pull together various aspects.
	<i>Minimise bare ground over winter so that there is no more than 5% bare ground</i>	Already present on-farm so no extra cost.
Intermediate	<i>Establish or maintain herbal leys* on at least 15% of land entered</i>	Sow a legume and herb rich sward (also contains grasses and wildflowers)

**involves establishing a diverse sward with a mixture of grasses, legumes, herbs and wildflowers*

The total costs for each ambition level of the SFI standards examined were calculated for each of the three years of the agreement. These were subtracted from the gross payment rate, published by Defra, to arrive at a net payment figure in £/ha.

The net payment figures, along with any financial consequences of area adjustments were incorporated into the virtual farms' balance sheets.

Calculating the effect of SFI participation on the farm's net profit level

In the economic analysis, we compare the effect of taking part in a particular SFI standard on a virtual farm's net profit level. The 'Before SFI' column, in graphs showing the change in a particular virtual farm's net profit, illustrates the net profit of the farm after reductions in direct payments have taken place. These were calculated using the [AHDB BPS Impact Calculator](#). All other variables (e.g. prices, yields) were kept constant so that we could only see the effect of taking part in the SFI on the farm's net profit level.

The 'After SFI net payment' column shows how the net profit of the farm varies with the addition of the net payment received once SFI actions have been undertaken on farm.

In some graphs, there is also a column which shows the effect of taking land out of production, if that was required for a certain standard.