SUMMARY REPORT:

IMPACT OF ARABLE AND GRASSLAND SOIL STANDARDS ON AGRICULTURAL PROFITABILITY AND PRODUCTION

FOR

BY

THE ANDERSONS CENTRE

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EXECUTIVE SUMMARY

The NFU commissioned The Andersons Centre (Andersons) to analyse the impact of the SFI on various farm sectors, using Andersons' model farms for the crops (combinables; general cropping), dairy, upland and lowland grazing livestock sectors. This report summarises the results of the analysis, looking at the impact of the final SFI 2022 Arable and Grassland Soils Standards published by Defra in March 2022.

The analysis encompassed nine model farms of varying sizes in the above sectors to assess the impacts of the SFI on output, productivity, and financial performance. The assessment was based on a series of general and sector-specific assumptions including;

- **BPS Support:** based on Defra's deductions as at 2023 (≥35% drop)
- **Output and key cost prices:** based on average farm model prices over 3 years
- **SFI 2022 Payments:** based on Defra's published rates and requirements for the Introductory and Intermediate Grassland and Arable Soil Standards (as at March 2022)
- **Additional Costs:** assumptions were made on the cost of complying with the prescriptions under the Standards
- **Income lost:** this did not apply to arable farms because the Arable Soils Standard required no land to be taken out of production and no changes to the rotation. However, under the Grassland Standard, the requirements for grassland management mean a lower forage output in some circumstances. This results in lower stocking and some income lost (reduced gross margin)
- **Overhead costs:** assumed constant but allowances for labour & machinery use were considered within the additional SFI costs and costs saved.

Chapters 3 to 6 summarise the results by sector. Each farm's key characteristics and financial performance is outlined before the impact of the SFI analysis is provided.

A summary of the gains (or losses) from being in the Introductory SFI Standards 2022 for each of the farm types is shown in Table A below. This also illustrates the amount of BPS that will be lost in the years to 2023. A net effect on the farm is then presented. The same details are given in Table B for the Intermediate SFI Standards 2022.

Both the Introductory and Intermediate Arable and Improved Grassland Soils Standards generally deliver a net benefit to the farms modelled. *It should be noted that the effects are very farm-specific – whilst the model farms are representative of their sectors, every farm will have a different outcome. For example, the rotation of the arable farms modelled requires no change to accommodate the SFI prescriptions. The scheme would be far less attractive on farms where rotations had to be altered.*

Generally, for the farms modelled, the Intermediate Arable Soils Standard was not as 'profitable' as the Introductory Standard. This is a result of costs incurred due to the need to establish (and then destroy) a green cover on 20% of the land in the Standard. Whilst having such a cover may have wider agronomic benefits, these are uncertain and difficult to quantify, and have not been included in the analysis. For the Grassland Soils Standard, the Intermediate level produces a larger positive outcome than the Introductory level.

Table A: Summary of the Net Impact of the Introductory Arable and Grassland Soils Standards on Model Farms (Including BPS Loss)

Farm	Arable Soils Standard	Grassland Soils Standard	Overall SFI 2022 Effect	BPS Loss	Net Effect
Large Loam	£10,967	-	£10,967	-£63,465	-£52,498
Small Loam	£3,459	-	£3,459	-£17,155	-£13,696
Root Farm	£7,082	-	£7,082	-£40,100	-£33,018
Large Friesian	£214	£1,453	£1,667	-£10,162	-£8,495
Small Friesian	-	£802	£802	-£4,049	-£3,246
Large Meadow	£549	£3,025	£3,574	-£17,232	-£13,658
Small Meadow	-	£1,731	£1,731	-£7,347	-£5,616
Large Hill	-	£3,250	£3,250	-£18,646	-£15,397
Small Hill	-	£2,323	£2,323	-£9,676	-£7,353

Source: The Andersons Centre *Totals may not sum due to rounding*

Table B: Summary of the Net Impact of the Intermediate Arable and Grassland Soils Standards on Model Farms (Including BPS Loss)

Farm	Arable Soils Standard	Grassland Soils Standard	Overall SFI 2022 Effect	BPS Loss	Net Effect
Large Loam	£8,116	-	£8,116	-£63,465	-£55,349
Small Loam	£2,509	-	£2,509	-£17,155	**-£14,647**
Root Farm	£5,183	-	£5,183	-£40,100	**-£34,917**
Large Friesian	-£125	£890	£765	-£10,162	**-£9,397**
Small Friesian	-	£1,201	£1,201	-£4,049	**-£2,848**
Large Meadow	-£321	£5,203	£4,881	-£17,232	**-£12,350**
Small Meadow	-	£2,797	£2,797	-£7,347	**-£4,550**
Large Hill	-	£8,468	£8,468	-£18,646	**-£10,179**
Small Hill	-	£6,021	£6,021	-£9,676	**-£3,655**

Source: The Andersons Centre *Totals may not sum due to rounding*

One key point is the relatively small level of overall payments – especially on the smaller farms. It must be questionable whether farmers will be tempted to enter the Standards with such small sums of money on offer. They may well wait until more Standards become available to make the scheme more attractive as a whole.

Given the extent of the BPS deductions, which the Arable and Grassland Standards only partially compensates for, the profitability of all the farms declines significantly. Whilst the reductions are largest in monetary terms on the arable farms, the greatest exposure is on livestock farms, particularly smaller units.

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1. INTRODUCTION

1.1. BACKGROUND

UK agriculture is going through a significant period of change. Farm policy and support payments form a cornerstone of these changes. The Andersons Centre was commissioned to compile a report for the NFU, identifying how the Sustainable Farming Incentive (SFI); a core component of Environmental Land Management (ELM), would impact upon the profitability and productive agricultural capacity of its model farms.

New information was released on the SFI Standards in December 2021 with updated rates and requirements. This was then supplemented by additional guidance issued in March 2022. This report analyses this latest version of the SFI Arable Soils Standard and Improved Grassland Soils Standard at the Introductory and Intermediate level.

This analysis focuses on farm level impacts using Andersons' model farms for the crops (combinable and general cropping), dairy, upland, and lowland grazing sectors. It also assesses the impacts for different farm sizes. The analysis models the impacts of Introductory and Intermediate Arable and Improved Grassland Soils Standards of the SFI on output, productivity, and financial performance.

Due to time constraints, the organic farming sector was not included in this analysis. Given the organic sector's very different income and cost structure, and the potential role it can play in public goods provision, policymakers will need to consider how this sector fits into the SFI framework.

1.2. THIS REPORT

This report comprises a summary of the project. It provides an overview of the methodology & key assumptions employed, a description of the farms modelled, and the outcomes for the different farms. It does not present the full calculations behind the model farms and analysis, but these models will be provided to the NFU as part of the project's deliverables.

Since compiling this report, the war in Ukraine has posed a significant challenge for many UK businesses, with costs rising sharply. The impact of the conflict may affect the decisions of businesses in relation to SFI, as costs rise.

2. PROJECT METHODOLOGY

2.1. GENERAL

2.1.1. The Model Farms

The analysis is based around nine notional farm models which represent each of the major (land-based) sectors of English agriculture as set-out in Table 2-1 below.

Table 2-1: Overview of Model Farms Assessed

Farm Type	Farm Model Name	Farm Size (Farmed Area)	Comments
Combinable Crops	Large Loam Farm	600 Ha *(1,483 acres)*	Includes Sugar Beet (50 Ha)
	Small Loam Farm	200 Ha *(494 acres)*	
General Cropping	Root Farm	400 Ha *(988 acres)*	Includes Potatoes (67 Ha)
Dairy	Large Friesian Farm	124 Ha *(299 acres)*	200 Cows
	Small Friesian Farm	50 Ha *(123 acres)*	80 Cows
Lowland Grazing Livestock	Large Meadow Farm	200 Ha *(494 acres)*	
	Small Meadow Farm	90 Ha *(222 acres)*	
Upland Grazing Livestock	Large Hill Farm	300 Ha *(741 acres)*	Includes 100 Ha of Moorland
	Small Hill Farm	125 Ha *(309 acres)*	

Source: The Andersons Centre

Each model farm is designed to accurately represent real life businesses, and each has detailed enterprise and whole business costings attributed to it. The model farms have been developed by The Andersons Centre over many years (as far back as the early 1990's in one case). They are regularly updated to reflect market trading conditions, policy influences and typical management trends across the industry. All of the models have been updated for the purposes of this work. Chapters 3 to 6 below summarise the characteristics and financial performance of each model farm in addition to the impact of the SFI 2022 (Soil) Standards. This includes a map to accompany each farm model and underlying assumptions for each model farm made as part of the analysis.

2.1.2. Basis of Modelling

To gauge the impact of the arable and grassland soils standards, the *status quo* situation is compared with that after the farm in question has entered the SFI. In the latter case, the positives are the SFI payments plus any savings in costs through being in the scheme. The negatives are any income lost (foregone) plus extra costs associated with being in the scheme. The positives and negative income elements are bought together to generate the net effect of being in the SFI.

As well as the effects of the SFI, the phase-down on the BPS is also considered in the analysis.

For Andersons' Farm Models, farmers' drawings are taken out 'above the line' so the resultant production margin and business surplus is a real return on capital and management.

2.2. KEY ASSUMPTIONS

There are a series of generic assumptions which were made at the outset of the study as well as a 'core' set of Standards-related assumptions which span multiple models.

2.2.1. Generic Assumptions

- **Level:** for this project both the Arable and Improved Grassland Soil Standards have been modelled, at both the Introductory and Intermediate level. Previous projects have focused on the Introductory level only.
- **Output Prices:** are based on an average of the prevailing average prices on each farm model over the past three years, 2018/19 to 2020/21. This has been done to smooth-out any peaks and troughs in prices which can occur during individual years. Whilst the support payments analysis is notionally 2023, output prices and costs are based on recent years' levels. This is because this project's focus is on the impact of the SFI, not predicting what prices and costs are likely to be in 3-4 years' time. The main price assumptions are set out in the 'Average Prices' worksheet of each model farm.
- **Cost Prices:** whilst most cost prices reflect the situation in 2020/21, as there has been minimal change in recent years in most cases, some key costs (e.g. feed) which closely reflect output prices (e.g. feed wheat) have also been averaged out over a three-year period as outlined above. Fertiliser prices have also been based on a three-year average. Again, the 'Average Prices' worksheets in each model farm provides more details. We note that there have been significant rises in input costs over the last twelve months. However, significant rises in the value of outputs have been seen too. The rise in inputs and outputs are considered to balance one another out.
- **Costs:** whilst labour is an overhead cost, any additional labour costs required to implement the SFI's requirements was costed out on a per Ha basis in this study. From there, it was treated as if it were a 'direct' (variable) cost. A similar approach was also undertaken for machinery costs (e.g. repair and operating costs). For this reason, the overhead costs in the post-SFI scenario remain the same as in the pre-SFI situation for each model farm. *It might be argued that overheads will change due to the SFI's implementation. However, given the 'lumpy' nature of labour and machinery, it is, in practice, often difficult to make savings if only marginal land-use changes are being made. The approach taken was deemed to be the most intuitive and effective to implement given the time constraints associated with this study.*
- **Agreements' Duration:** where costs incurred under an agreement span multiple years (e.g. Soil Assessments), this has been spread across the 3-year term of a SFI agreement[1].
- **Existing Agreements:** for clarity of modelling and given Defra's SFI guidance, it was assumed that the farms have no existing agri-environment agreements in place. Again, this is intended to model the broadest range of farms.
- **Support Payments Analysis:** given the phasing down of BPS payments over the next 7 years, and the simultaneous scaling up of SFI and ELM payments, 2023 has been assumed as the comparison year (post-SFI). By this point the farms will have received a full year's payment under the SFI Soils Standards but will have received little or nothing from any of the additional Standards due to be introduced in 2023. The deductions to BPS work in a similar fashion to income tax bands. All BPS claimants will see a 35% reduction in 2023, but larger claimants will see more significant reductions

based on the proportion of their payments which are in the bands greater than £30K. The BPS reductions for each model farm are set out in Chapters 3 to 6 below.

Table 2-2: BPS Deductions 2021 to 2028

Deductions	2021	2022	2023	2024	2025	2026	2027	2028
≤£30K	5%	20%	**35%**	50%	65%	80%	95%	100%
>£30 - ≤£50K	10%	25%	**40%**	55%	70%	85%	100%	100%
>£50K - ≤£150K	20%	35%	**50%**	65%	80%	95%	100%	100%
>£150K	25%	40%	**55%**	70%	85%	100%	100%	100%

Sources: Defra[2] and The Andersons Centre Note: the deductions from 2025 onwards have not been announced yet and the figures above are Andersons' estimates based on an arithmetic progression

- **BPS Exchange Rates:** exchange rate of €1 = £0.89092 has been used for the BPS calculations in this study. In effect, this was the 2019 (2019/20) exchange rate and has been assumed for 2021 onwards.

2.2.2. Arable Soils Standard

The Standard has been applied to the following farms; Loam, Root, Meadow (Large), Friesian (Large).

Payment Rates are set out as per Defra's guidance and are summarised in Table 2-3. They are similar to the payments seen in the SFI Pilot (also included in the Table for reference). However, whilst the payment rates follow those in the Pilot, the requirements of the Standard are significantly different. As a result, direct comparisons between the Pilot and 2022 Standards are not possible.

The Advanced level is due to be introduced in 2023 and payment rates are unconfirmed. As such, the Advanced rate is excluded from the below table.

Table 2-3: Arable Soils Standard Payment Rates

Level	SFI 2022 Payment Rate	*SFI Pilot Payment Rate*
Introductory	£22 per Ha	*£30 per Ha*
Intermediate	£40 per Ha	*£47 per Ha*

Source: Defra[3]

The requirements of the Introductory and Intermediate Arable and Horticultural Soils Standard are laid out in table 2-4 below.

Table 2-4: Arable Soils Standard Requirements

Requirement	Introductory	*Intermediate*
1. Test soil organic matter	Each year, participants must ensure that a soil organic matter test has been carried out upon all parcels of land in the agreement, within the last five years. Once the test results are five years old the test must be carried out again. Any parcels of land which have not been tested previously, must have a test conducted in the first year of the agreement.	
2. Undertake a soil assessment and produce a Soil Management Plan	Soils must be assessed, and a Soil Management Plan produced in the first year of the agreement. The Plan must be reviewed annually and updated with the results of any new soil assessments.	
3. 70% winter cover to protect soil	At least 70% of land in the Standard must have green cover over the winter months (Dec-Feb). This can include any kind of green cover, including autumn sown crops and weedy stubbles*.	At least 70% of land in the Standard must have green cover over the winter months (Dec-Feb). **At least 20% of this must be planted to a multi-species green cover crop.**
4. Addition of organic matter	Add organic matter to all land in the Standard at least once during the three years of the agreement. This can include any kind of organic matter, including sown green cover crops. *This action should not be completed on peaty soils.*	Add organic matter to all land in the Standard at least once during the three years of the agreement. **This will include multi-species green cover** (as above), plus any other measures as per the Introductory level. *This action should not be completed on peaty soils.*

Source: Defra[4] * it is assumed that stubbles left following harvest will constitute weedy stubbles.

The assumptions associated with the costings for the Arable Soils Standard are broken down below. Any costings, where given, exclude the cost to meet statutory requirements.

1. Test Soil Organic Matter (SOM)

A Soil Organic Matter (SOM) test must have been undertaken within the last five years on all parcels of land within the standard. It is assumed that no SOM testing is currently being undertaken (*whilst soil nutrient testing is a requirement under the Farming Rules for Water, this does not cover organic matter*). With no testing currently being undertaken, testing across all land would need to take place within the first year of the agreement.

- Assessment is based on fields (parcels) – if a parcel is over 20 Ha then it is split into two.
- The hourly rate for farmers' time engaged in the management tasks related to the standards is £35 per hour.

Initial SOM testing

- Soil Organic Matter (SOM) Test – 3 per parcel (some bulking) - £18 per test (dry kiln method).
- The cost of these tests is split over five years.

2. Undertake a Soil Assessment and produce a Soil Management Plan

A Soil Assessment has to be undertaken on all land at the start of the agreement and then reviewed/updated annually.

- Assessment is based on fields (parcels) – if a parcel is over 20 Ha then it is split into two.
- The hourly rate for farmers' time engaged in the management tasks related to the Standards is £35 per hour.

2A. Initial Soil Assessment

- 'Core time' to get maps, draw up documents etc. of 1 day presumed.
- For Soil Texture/Erosion Risk Assessment a number of trial pits are dug (assumed one per 5 parcels) - ½ hour per pit to dig and record.
- For Water Protection - ½ hour per parcel to mark-up maps etc. (somewhat like the past Soil Protection Review under cross-compliance).
- The cost of this work is spread over three years (length of SFI agreement).
- For annual review and update – 0.15 hours per parcel (10 mins).

2B. Soil Assessment and Testing

- 33% of land per year (one third of parcels).
- Biological indicators (worms) and soil structure – 1.5 hours per parcel (also includes the time to take any soil samples).

3. 70% of land under winter cover

3A. Introductory level

At the Introductory level, the degree to which this aspect of the standard affects each farm varies, depending on the level of winter cropping being undertaken. For Loam farm (large and small) there is a mix of cropping which includes winter sown cereals. The degree to which each business needs additional winter cover for the Introductory standard, is given below.

Table 2-5: Arable Soils Standard Requirements for Additional Winter Cover

Model farm	Total land in Standard (Ha)	*Winter cropping (Ha)*	*% of winter cover*	*Additional winter cover needed (ha)*
Loam Farm - Large	600.0	*375.0*	*63%*	*45.0*
Loam Farm – Small	200.0	*100.0*	*50%*	*40.0*
Root Farm	400.0	*199.8*	*49%*	*80.2*
Friesian Farm – Large	21.0	*0*	*0%*	*0**
Meadow Farm – Large	38.1	*32.9*	*86%*	*0*

Source: The Andersons Centre *Assumed that temporary grass leys meet the requirement of this Standard.

On all farms, except Large Friesian Farm, the additional winter cover required may be achieved by overwintered weedy stubble. This would not affect the cropping pattern of these farms, with the overwintered stubble used for spring cropping. If this is the adopted approach of Loam, Root and Meadow Farm, then there is no additional cost involved to comply with this aspect of the Standard. *This is key to the relatively low impact from entering the Standard on the model farms. It must be noted that,*

for farms without significant areas of spring cropping, the rotation change needed to enter into the SFI might be prohibitive.

For Large Friesian Farm it is assumed that the temporary grass ley which maize is being planted into is sufficient to meet the requirement for green cover. The rotation of fields from temporary grass leys to maize on Large Friesian Farm could pose a challenge with the number of Ha under each Standard liable to change in accordance with field sizes. As such, Large Friesian Farm will have to alter the cropping of some fields in order to comply with the requirements of the Standards. As a result, Friesian Farm would either have to plant part fields in some years of the agreement or enter less land into each Standard to allow some flexibility. For this modelling it is assumed that the land going into each Standard, each year is unchanged.

3B. Intermediate level

For farms engaging with the Intermediate Standard, 20% of the winter cover must be sown to a multispecies green cover crop. As with the Introductory Standard, this is unlikely to affect the rotation of the model arable or dairy farms. This is due to the degree of spring cropping already in the rotation. *Again, this is a specific feature of the cropping of our model farms and will not be the case for all businesses.*

Large Meadow Farm currently has winter cropping across 86% of its arable area. In order to comply with the Intermediate Standard, it would be required to plant 7.63 Ha to a mixed species cover crop. This results in the loss of 2.45 Ha of winter cropping. It is assumed that 2.45 Ha is planted to spring barley instead of winter barley, this results in income forgone, explained further in Chapter 5.

- The cost of establishing (and then destroying) green cover assumed at £114 per Ha.
- No account taken of potential benefits of cover crops (higher yields in following crops or some winter grazing). Also, no account taken of potential drawbacks such as difficulties destroying green cover and/or establishing following crop.

4. Increase Soil Organic Matter

- Loam and Root Farms are already incorporating straw, so this requirement is met and there is no financial effect. *It should be noted that any arable farm that sells its straw would face a greater financial impact.*
- Meadow and Friesian Farm use their straw. However, as livestock businesses, both are assumed to add organic matter to the fields through manure instead. Again, no financial cost as the practice is already being undertaken.

2.2.3. Improved Grassland Soils Standard

The Standards has been applied to the following farms; Friesian, Meadow, and Uplands.

Payment Rates are set out as per Defra's guidance and are summarised in Table 2-3. Unlike the Arable Soils Standard, there have been significant changes from the rates seen under the SFI Pilot, although the requirements are not directly comparable.

Table 2-6: Grassland Soils Standard Payment Rates

Level	SFI 2022 Payment Rate	*SFI Pilot Payment Rate*
Introductory	£28 per Ha	*£6 per Ha*
Intermediate	£58 per Ha	*£6 per Ha*

Source: Defra[5]

The requirements of the Introductory and Intermediate Improved Grassland Soils Standard are laid out in table 2-7 below.

Table 2-7: Grassland Soils Standard Requirements

Requirement	Introductory	*Intermediate*
1. Test soil organic matter	Each year, participants must ensure that a soil organic matter test has been carried out upon all parcels of land in the agreement, within the last five years. Once the test results are five years old the test must be carried out again. Any parcels of land which have not been tested previously, must have a test conducted in the first year of the agreement.	
2. Undertake a soil assessment and produce a Soil Management Plan	Soils must be assessed, and a Soil Management Plan produced in the first year of the agreement. The plan must be reviewed annually and updated with the results of any new soil assessments.	
3. 95% green cover (no more than 5% bare ground over winter)	Farmers must ensure that no more than 5% of the total land area entered into the standard is either left bare or becomes bare from the start of December to the end of February. No land at high risk of erosion or runoff should be left bare over the winter months.	
4. Undertake measure to improve soil health	None	Take measures to improve soil health by establishing or maintaining a herbal ley (also referred to as a 'diverse sward') – with a mixture of grasses, legumes, herbs, and wildflowers. This must be carried out on at least 15% of the total area entered into the Standard. This can be done on a single area of land for the three years of the agreement.

Source: Defra[6]

The assumptions associated with the costings for the Improved Grassland Soils Standard are broken down below. Any costings, where given, exclude the cost to meet statutory requirements.

1. Test Soil Organic Matter (SOM)

A Soil Organic Matter (SOM) test must have been undertaken within the last five years on all parcels of land within the Standard. It is assumed that no SOM testing is currently being undertaken (*whilst soil nutrient testing is a requirement under the Farming Rules for Water, this does not cover organic matter*). With no testing currently being undertaken, testing across all land would need to take place within the first year of the agreement.

- Assessment is based on fields (parcels) – if a parcel is over 20 Ha then it is split into two.
- The hourly rate for farmers' time engaged in the management tasks related to the Standards is £35 per hour.

Initial SOM testing

- Soil Organic Matter (SOM) Test – 3 per parcel (some bulking) - £18 per test (dry kiln method)
- The cost of these tests is split over five years.

2. Undertake a soil assessment and produce a Soil Management Plan

A Soil Assessment has to be undertaken on all land at the start of the agreement and then reviewed/updated annually.

- Assessment is based on fields (parcels) – if a parcel is over 20 Ha then it is split into two.
- The hourly rate for farmers' time engaged in the management tasks related to the Standards is £35 per hour.

2A. Initial Soil Assessment

- 'Core time' to get maps, draw up documents etc. of 1 day presumed.
- For Soil Texture/Erosion Risk Assessment a number of trial pits are dug (assumed one per 5 parcels) - ½ hour per pit to dig and record.
- For Water Protection - ½ hour per parcel to mark-up maps etc. (somewhat like the past Soil Protection Review under cross-compliance).
- The cost of this work is spread over three years (length of SFI agreement).
- For annual review and update – 0.15 hours per parcel (10 mins).

2B. Soil Assessment and Testing

- 33% of land per year (one third of parcels).
- Biological indicators (worms) and soil structure – 1.5 hours per parcel (also includes the time to take any soil samples).

3. 95% Green Cover

- As part of good husbandry practice, the Model livestock farms all remove animals from fields that are waterlogged, liable to poaching, erosion, or run-off. Animals are either housed or rotated onto other fields. Therefore, there is no additional cost from this prescription.

4. Herbal Leys (Diverse Sward)

- Undertaken on 15% of grassland area as required by the Intermediate Standard.
- An initial establishment cost (spread over 3 years) to put the new sward in place is assumed.
- Then an ongoing yield drop from the mix of grasses, legumes, herbs and wildflowers as opposed to ryegrass affects the carrying capacity of the farm. This is variable depending on the farm in question – a farm with more intensive grassland leys is assumed to have a larger yield drop. The figures are;
    - Friesian Farm – 25% yield drop on the area affected
    - Meadow Farm – 15% yield drop on the area affected
    - Uplands Farm – 10% yield drop on the area affected

  This has an effect on the 'carrying capacity' of the land and reduces (marginally) stocking rates and thus gross margins. It has been assumed that the Model farms will continue to apply P and K to these swards at standard rates. However, N applications will no longer be made as it is assumed that the legumes will supply sufficient nutrients. This reduces costs and further affects the businesses' gross margin. *It should be noted that these are very broad assumptions and that actual agronomic practice under the SFI 2022 may be different.*

2.3. METHODOLOGICAL STEPS

A full description of the methodology used in this project can be found in Annex 1 to this report. In summary, the following steps were taken;

1. **Base Models for Each Farm Sector Developed:** based on adaptions of Anderson existing farm models. Built from the 'ground up' with physical parameters and financial figures
2. **Create Field Layouts for Each Farm:** to allow the calculation of income and costs based on physical factors such as length of hedges etc
3. **Apply the SFI 2022 Standards to Each Farm:** the income gained from SFI payments was calculated along with any costs saved. Against this was calculated any income lost and extra costs incurred. The total financial effect of the Soils Standard(s) was then seen.
4. **Integrate the Phased-Down BPS Payments:** this was done by taking the base year payment levels, applying reduction rates for 2023 as set-out by Defra (see Table 2-1) and setting these against the farm's overall financial performance.
5. **Break-Even Analysis:** to show how much the payment rates would have to change (increase) to make the Standards profit-neutral on the Model Farms, a break-even analysis was carried out. *For the SFI 2022, this was only required for Large Friesian Farm and the results are included within the dairying chapter.*

3. SFI IMPACT – CEREALS AND GENERAL CROPPING

3.1. INTRODUCTION

This Chapter looks at the SFI impacts in terms of both combinable cropping and general cropping. It examines each model farm in turn by setting out its key characteristics. It then looks at the financial performance pre- and post-SFI 2022 for each farm. At the end of the Chapter, some brief implications are outlined.

3.2. COMBINABLE CROPPING - LARGE LOAM FARM

The core Loam Farm Model (Large Loam Farm) has been running for 27 years. The Small Loam Farm model was developed for this study to permit an analysis of the SFI on smaller cereals businesses. The characteristics and performance of each Loam farm model are outlined below, with a similar overview provided for the general cropping farm model (Root Farm) in the next section.

As it was decided last year that oilseed rape was no longer viable as it is deemed too risky with front-loaded costs, a new rotation was introduced for Loam Farm (see below) and a similar approach was adopted for the other arable farms.

3.2.1. The Model and Base Profitability

Large Loam Farm is an arable farm based notionally in East Anglia. Its key characteristics are detailed in Figure 3-1. The cropped area covers 600 hectares (1,483 acres) with a further 13 hectares (25 acres) of land (buffer strips, minor inaccessible land parcels etc.) included within the wider field areas.

In addition, there are also 17.7 Ha of woodland and it contains 29.4km of hedgerows and nearly 4.5km of water courses. Originally only the owned land was farmed, but expansion in the early and mid-2000's resulted in additional adjoining blocks of land being rented under two formal Farm Business Tenancy (FBT) agreements. This now means that 60% of the farmed area is now rented with the balance being the owned 'home' unit. Therefore, all of the land available to the business falls within one block. The business is above average but not in the top quartile in terms of business performance when compared to cereals businesses in England.

The land is predominately loam soil which allows autumn machinery access for winter crop establishment with most parts also being suitable for spring crop establishment. Cropping consists of four combinable crops; winter wheat (feed and milling), winter oats, spring barley and spring beans. For the NFU analysis, a sugar beet enterprise (50 Ha) has also been added. The assumed yields reflect 'normal year' yields in England whilst the prices (sales values) are based on the averages seen over the past three years.

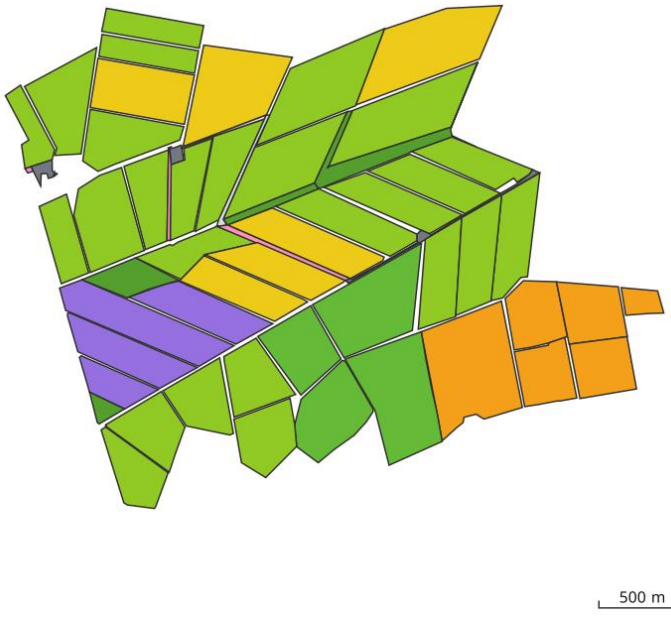
All field operations are performed by the business using owned machinery. Contractors are used for routine ditch and drainage maintenance. Labour comprises of one full time employee with casual workers at harvest time. The proprietor also performs yard and field operations as well as management and administration responsibilities.

For sugar beet, contractors are used for both seeding and for harvesting with Loam Farm staff contributing to the carting. Sugar Beet is rotated on a 1 year in 6 basis across the 300 Ha of Large Loam Farm deemed most suitable to its cultivation. Accordingly, the rotation for this proportion of Large Loam

Farm is: Winter Wheat (50) → Winter Wheat (50) → Sugar Beet (50) → Winter Wheat (50) → Spring Barley (50) → Spring Beans (25) /Winter Oats (25).

The rotation for the other 300 Ha is: Winter Wheat (50) → Winter Wheat (50) → Spring Beans (50) → Winter Wheat (50) → Spring Barley (50) → Winter Oats (50).

Figure 3-1: Large Loam Farm – Summary Overview

Farm Type:	Combinable cropping		
Location	East Anglia		
Main Soil Type:	Loam		
Land Tenure:	40% owned / 60% FBT		
Field Areas (ex. woodland)	613 Ha		
Area Cropped:	600 Ha		
Woodland	17.7 Ha		
Other Vegetation	3.0 Ha		
Yards / Laneways	5.8 Ha		
Total Area	**639.5 Ha**		
Hedgerows	29,420 m		
Watercourses	4,460 m		
Cropping	**Area (Ha):**	***Assumed Sale Price (£/ per t)***	***Yields (t per Ha)***
W. Wheat (Milling)	100	181	8.7
W. Wheat (Feed)	200	169	9.4
Winter Oats	75	136	7.7
Spring Beans	75	200	4.5
Spring Barley	100	149	7.7
Sugar Beet	50	25.9	76.0
Total:	**600**		

Source: The Andersons Centre (2021)

Table 3-1 summarises the financial performance of Large Loam Farm which incorporates the yields and prices above. Other key notes and assumptions underpinning these calculations are provided below. Large Loam Farm achieves a margin from production of over £101,420 (£169 per Ha). With the BPS included this rises to about £241,350 (£402 per Ha). Therefore, whilst the farm will still be profitable with the BPS removed, support payments still account for nearly 60% of its Business Surplus.

Overall, Large Loam Farm tends to be better than average across England, however, it is not in the top-25%. Therefore, it can be seen to be 'typical' of the conditions seen on English combinable crop farms and is ideally positioned to give a useful gauge as to how the reduction of BPS payments and the introduction of the SFI and its associated Standards will affect cereals farming in the years ahead.

Table 3-1: Large Loam Farm – Financial Performance Summary

	£ Total	£ per Ha	% Gross Output (inc. Support)
CROP OUTPUT	834,380	1,391	86%
VARIABLE COSTS	280,665	468	29%
GROSS MARGIN	**553,715**	**923**	51%
Labour	35,200	59	*8%*
Power and Machinery	171,514	286	*18%*
Admin	31,274	52	
Property	26,461	44	
Total Overheads	264,449	441	32%
Pre-Rent and Finance Surplus	**289,266**	**482**	
Rent	135,000	225	
Finance	7,845	13	
Rent and Finance	142,845	238	15%
Drawings	45,000	75	with labour
MARGIN FROM PRODUCTION	**101,421**	**169**	
Basic Payment	139,930	233	14%
CSS	0	0	
Total Other Income	139,930	233	
BUSINESS SURPLUS	**241,351**	**402**	25%

Source: The Andersons Centre

3.2.2. Introductory Arable Soils Standard Impact – Large Loam Farm

As explained in Chapter 2, the impact of the SFI was assessed in terms of the gains and losses associated with the Introductory and Intermediate Arable Soil Standards across the farm. The results for the Introductory Standard are summarised in Table 3-2.

Overall, Large Loam Farm gains nearly £11,000 as a result of the Introductory Arable Soils Standard. The positive outcome and the overall sum of money make it likely that this type of farm will find it worthwhile to enter the Standard. A number of caveats should be noted;

- The positive outcome is due to the fact that Loam Farm is already doing most of the things mandated under the Standard (i.e. high proportion of green cover, straw incorporation etc.).
- The two cost items are complying with the Soil Organic Matter (£572) and the Soil Assessment (£1,661) requirements. This is based on the farmer completing this themselves. If it were to be done by an external consultant, the cost would be higher. This might be the case if the Soil Assessment rules turn out to be complex or there is uncertainty on how to comply with them.

Table 3-2: Breakdown of Introductory SFI 2022-Related Gains and Losses on Large Loam Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*600*	-	*600*
Gains			
SFI Income (at £22 per Ha)	£13,200	-	£13,200
Costs Saved	-	-	-
Total Gains	**£13,200**	**-**	**£13,200**
Losses			
Income Foregone (GM Lost)	-	-	-
Additional SFI Costs	£2,233	-	£2,233
Total Losses	**£2,233**		**£2,233**
Net Gain / Loss	**£10,967**	**-**	**£10,967**

Source: The Andersons Centre

The overall financial impact of the Introductory Arable Soils Standard is set-out for Large Loam Farm in Table 3-3. This is done on both a whole farm and a per Ha basis.

The pre-SFI and post-SFI figures are actually unchanged down to the Margin from Production line. This is because, under the Soils Standard, there is no effect on the farmed (cropped) area, due to the inclusion of spring crops in the rotation. The inclusion of spring crops in the rotation helps meet green cover requirements. Thus, there is no impact on the output from the business or its cost structure. *It should be emphasised that this is a function of the specific cropping already being done in the Loam farm model – i.e. existing spring crops. Any farms with a predominant winter-cropping rotation will find it far more difficult (and costly) entering into the SFI 2022.*

The Introductory Arable Soils Standard makes a positive contribution to farm profits. However, it can be clearly seen that this recovers only a very small proportion of the BPS that will be lost by 2023.

Large Loam Farm is relatively fortunate, insofar that it would still make a significant business surplus (£188.9K), despite the drop in BPS income. However, these returns are predicated on the good prices seen in the arable sector over the last few seasons. Since Parts A and B of the project were completed there has also been significant inflation in arable prices and input costs.

Table 3-3: Summary of the Impact of the Introductory SFI Standard on Large Loam Farm

	Whole Farm (£)			Per Hectare (£ / Ha)	
	Pre-SFI	Post-SFI		Pre-SFI	Post-SFI
	£ Total	£ Total	% Ch.	£/Ha	£ / Ha
Crop Area Harvested	600.0	600.0	**0%**		
CROP OUTPUT	834,380	834,380	0%	1,390.6	1,390.6
VARIABLE COSTS	280,665	280,655	**0%**	467.8	467.8
GROSS MARGIN	**553,715**	**553,715**	**0%**	**922.9**	**922.9**
Labour	35,200	35,200	**0%**	58.7	58.7
Power and Machinery	171,514	171,514	**0%**	285.9	285.9
Admin	31,274	31,274	**0%**	52.1	52.1
Property	26,461	26,461	**0%**	44.1	44.1
Total Overheads	264,449	264,449	**0%**	440.7	440.7
Pre-Rent and Finance Surplus	**289,266**	**289,266**	**0%**	**482.1**	**482.1**
Rent	135,000	135,000	**0%**	225.0	225.0
Finance	7,845	7,845	**0%**	13.1	13.1
Rent and Finance	142,845	142,845	**0%**	238.1	238.1
Drawings	45,000	45,000	**0%**	75.0	75.0
MARGIN FROM PRODUCTION	**101,421**	**101,421**	**0%**	**169.0**	**169.0**
Basic Payment (Phased Down)	**139,930**	**76,465**	**-45%**	**233.2**	**127.4**
SFI Income		13,200			22.0
Cost Savings		0			0
Additional Costs		-2,233			-3.7
Net SFI Benefit (Excl. Income Foregone)*		**10,967**			**18.3**
Net 'Support' Income	**139,930**	**87,432**	**-38%**	**233.2**	**145.7**
BUSINESS SURPLUS	**241,351**	**188,853**	**-22%**	**402.3**	**314.8**
Net SFI Benefit (Incl. Income Lost)		**10,967**			

Source: The Andersons Centre * Income Foregone: is reflected in the differences between the gross margins pre- and post-SFI.

Notes: When modelling the impact of the SFI, all costs incurred under the SFI (variable and overhead costs) have been incorporated into the SFI Costs displayed at the bottom of this Summary Table. Accordingly, overhead costs are shown to remain consistent with the Pre-SFI situation.

3.2.3. Intermediate Arable Soils Standard Impact – Large Loam Farm

Overall Large Loam Farm gains £8,116, as a result of the Intermediate SFI Standards. While there is still a gain for Large Loam Farm from entering the Intermediate Arable Soils Standard, it is less than the Introductory Standard. This will likely preclude some businesses from entering the Intermediate Standard. Again, a number of caveats should be noted.

- As with the Introductory Standard, Loam Farm is already carrying out some of the practices required.
- An additional cost is borne in the Standard, with 20% of the land in the Standard needing to be under a mixed green cover, over winter, at a cost of £13,651. This may draw some benefits for the following crop, i.e., nitrogen fixing legumes. However, this is deemed to be at the advantage of the following crop and the benefits are difficult to quantify. Benefits could be drawn from either

increasing soil organic matter or reduced nutrient leaching, the financial element of these is difficult to calculate. Additionally, benefit may be derived through reduced costs; needing to apply less chemical fertiliser, again this depends on a number of factors and it has not been attempted to quantify this.

Table 3-4: Breakdown of Intermediate SFI 2022-Related Gains and Losses on Large Loam Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*600*	-	*600*
Gains			
SFI Income (at £40 per Ha)	£24,000	-	£24,000
Costs Saved	-	-	-
Total Gains	**£24,000**	**-**	**£24,000**
Losses			
Income Foregone (GM Lost)	-	-	-
Additional SFI Costs	£15,884	-	£15,884
Total Losses	**£15,884**		**£15,884**
Net Gain / Loss	**£8,116**	**-**	**£8,116**

Source: The Andersons Centre

The overall financial performance for Large Loam Farm under the Intermediate Standard is outlined in Table 3-5, on both a whole farm and a per hectare basis.

The Intermediate Arable Soils Standard still makes a positive contribution to farm profits. However, it can be clearly seen that this recovers only a very small portion of the BPS that will be lost in the years to 2023. Furthermore, the impact is less positive than that of the Introductory Standard.

Large Loam Farm would still make a significant business surplus (£186.0K), despite the drop in BPS income. However, these returns are predicated on the good prices seen in the arable sector over the last few seasons. As with the comments made under the introductory standard, the long-term impact will depend on the nature of agricultural inflation.

The addition of cover crops into the cycle may add additional benefits in the future which have not been costed here. This may help to mitigate rises in input costs, but this is not a given.

Table 3-5: Summary of the Impact of the Intermediate SFI Standard on Large Loam Farm

	Whole Farm (£)			Per Hectare (£ / Ha)	
	Pre-SFI	Post-SFI		Pre-SFI	Post-SFI
	£ Total	£ Total	% Ch.	£/Ha	£ / Ha
Crop Area Harvested	600.0	600.0	**0%**		
CROP OUTPUT	834,380	834,380	0%	1,390.6	1,390.6
VARIABLE COSTS	280,665	280,655	**0%**	467.8	467.8
GROSS MARGIN	**553,715**	**553,715**	**0%**	**922.9**	**922.9**
Labour	35,200	35,200	**0%**	58.7	58.7
Power and Machinery	171,514	171,514	**0%**	285.9	285.9
Admin	31,274	31,274	**0%**	52.1	52.1
Property	26,461	26,461	**0%**	44.1	44.1
Total Overheads	264,449	264,449	**0%**	440.7	440.7
Pre-Rent and Finance Surplus	**289,266**	**289,266**	**0%**	**482.1**	**482.1**
Rent	135,000	135,000	**0%**	225.0	225.0
Finance	7,845	7,845	**0%**	13.1	13.1
Rent and Finance	142,845	142,845	**0%**	238.1	238.1
Drawings	45,000	45,000	**0%**	75.0	75.0
MARGIN FROM PRODUCTION	**101,421**	**101,421**	**0%**	**169.0**	**169.0**
Basic Payment (Phased Down)	**139,930**	**76,465**	**-45%**	**233.2**	**127.4**
SFI Income		24,000			40.0
Cost Savings		0			0
Additional Costs		-15,884			-26.5
Net SFI Benefit (Excl. Income Foregone)*		**8,116**			**13.5**
Net 'Support' Income	**139,930**	**84,581**	**-40%**	**233.2**	**141.0**
BUSINESS SURPLUS	**241,351**	**186,002**	**-23%**	**402.3**	**310.0**
Net SFI Benefit (Incl. Income Lost)		**8,116**			

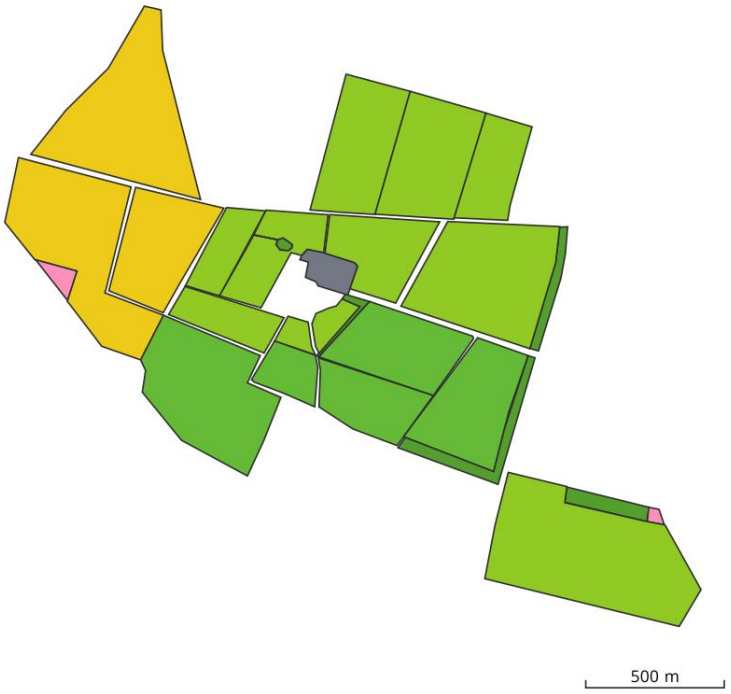
Source: The Andersons Centre * Income Foregone: is reflected in the differences between the gross margins pre- and post-SFI.

3.3. Combinable Cropping - Small Loam Farm

3.3.1. The Model and Base Profitability

The characteristics of Small Loam Farm are summarised in Figure 3-2. It consists of 200 Ha of cropped area based on a simpler 4-crop rotation (W. Wheat → Spring Barley → Spring Beans → W. Wheat). Its yields are broadly the same as Large Loam Farm except that as the feed wheat is effectively a second wheat, its yield (8.4t per Ha) is assumed to be 1t per Ha lower than 'normal yields'.

Figure 3-2: Loam Farm – Small – Summary Overview

Farm Type:	Combinable cropping		
Location:	East Anglia		
Main Soil Type:	Loam		
Land Tenure:	40% owned / 60% FBT		
Field Areas (excl. Woodland etc.)	204.4 Ha		
Cropped Areas	200.0 Ha		
Woodland	6.6 Ha (6.4 Ha claimed)		
Other Vegetation	1.1 Ha		
Yards / Laneways	2.1 Ha		
Total Area	**214.2 Ha**		
Hedgerows	14,300 m		
Watercourses	1,330 m		
Cropping	**Area (Ha):**	***Assumed Sale Values (£ per t)***	***Yields (t per Ha)***
W. Wheat (Milling)	50	181	8.7
W. Wheat (Feed)	50	169	8.4*
Spring Beans	50	200	4.5
Spring Barley	50	149	7.7
Total:	**200**		

Source: The Andersons Centre (2021)

Note: * it is a second wheat, therefore, yield is 1t per Ha below the normal yield (9.4t per Ha).

For each enterprise, its operations are broadly similar to that of Large Loam Farm. There are some exceptions which are noted in the assumptions underneath Table 3-6 which summarises Small Loam Farm's financial performance.

Table 3-6: Small Loam Farm – Financial Performance Summary

	£ Total	£ per Ha	% Gross Output (inc. Support)
CROP OUTPUT	252,080	1,260	84%
VARIABLE COSTS	74,743	374	25%
GROSS MARGIN	**177,337**	**887**	75%
Labour	12,400	62	*13%*
Power and Machinery	63,428	317	*21%*
Admin	15,637	78	
Property	13,539	68	
Total Overheads	105,004	525	44%
Pre-Rent and Finance Surplus	**72,334**	**362**	
Rent	45,000	225	
Finance	2,600	13	
Rent and Finance	47,600	238	16%
Drawings	25,000	125	with labour
MARGIN FROM PRODUCTION	**-266**	**-1**	
Basic Payment	46,639	233	16%
Entry Level Scheme	0	0	
Total Other Income	46,639	233	
BUSINESS SURPLUS	**46,372**	**232**	16%

Source: The Andersons Centre

Other Key Notes and Assumptions:

- **Fertiliser, Seed and Spray:** costs and application rates are broadly the same as Large Loam Farm for each enterprise on a per Hectare basis.
- **Overheads:** costs are generally 33.3% of the Large Loam Farm model. Some exceptions;
  - **Regular labour:** at 36% to generate a £10k per year salary which is P/T.
  - **Fuel:** set at 35% of Large Loam Farm as fuel usage on Large Loam Farm is down slightly as some Sugar Beet operations are contracted out.
  - **Administration costs:** set at 50% of main Loam Farm to take account of higher overhead costs in this category (e.g. insurance, subscriptions).
- **Capital schedule:** some items which appear on the Large Loam Farm are removed for the smaller loam farm (e.g. 1 grain trailer, 1 tractor has been removed).
  - **Depreciation rates:** have been decreased for machinery in many cases to reflect lower hours worked.
  - **Combine purchase:** has been delayed on Small Loam Farm (was purchased in 2019 on Large Loam Farm), again reflecting fewer hours worked (longer projected life).

3.3.2. Introductory Arable Soils Standard Impact – Small Loam Farm

This analysis was undertaken following the same approach as that for Large Loam Farm. Table 3-7 provides an overview of the gains and losses associated with the Introductory SFI Standard deployed on Small Loam Farm.

Table 3-7: Breakdown of Introductory SFI 2022-Related Gains and Losses on Small Loam Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*200*	-	*200*
Gains			
SFI Income (at £22 per Ha)	£4,400	-	£4,400
Costs Saved	-	-	-
Total Gains	**£4,400**	**-**	**£4,400**
Losses			
Income Foregone (GM Lost)	-	-	-
Additional SFI Costs	£941	-	£941
Total Losses	**£3,459**	**-**	**£3,459**
Net Gain / Loss	**£3,459**	**-**	**£3,459**

Source: The Andersons Centre

Overall, Small Loam Farm gains £3,459 as a result of the Introductory Arable Soils Standard. Whilst the outcome is positive, there would be a question over whether a farm would go to the trouble of engaging with the scheme given the relatively small amount of money on offer.

The same points can be made regarding Small Loam Farm as related to the larger combinable cropping business; namely;

- The positive outcome is due to the fact that Small Loam Farm is already doing some of the things mandated under the Standard (i.e. subsoiling, straw incorporation etc.).
- The two cost items are complying with the Soil Organic Matter test (£227) and the Soil Assessment (£714) requirements. This is, again, based on the farmer completing this themselves.

Looking at the farm's financial performance as a whole, Table 3-8 shows that Small Loam Farm's Margin from Production is unaffected by the Arable Soils Standard as no land needs to be taken out of production.

As with the Large Loam Farm, whilst the contribution from the Introductory Arable Soils Standard is positive, the sum involved is small compared to the loss seen in the BPS over the next few years.

Table 3-8: Summary of the Impact of the Introductory SFI Standard on Small Loam Farm

Parameter	Whole Farm (£)			Per Hectare (£)		
	Pre-SFI £ Total	Post-SFI £ Total	Pre-SFI % Ch.	Pre-SFI £ / Ha (Cropped)	Post-SFI £ / Ha (Harvested)	% Ch.
Crop Area Harvested	**200**	**200**	**0%**			
CROP OUTPUT	252,080	252,080	**0%**	**1,260**	1,260	0%
VARIABLE COSTS	74,743	74,743	**0%**	**374**	374	0%
GROSS MARGIN	**177,337**	**177,337**	**0%**	**887**	**887**	**0%**
Labour	12,400	12,400	0%	**62**	62	0%
Power and Machinery	63,428	63,428	0%	**317**	317	0%
Admin	15,637	15,637	0%	**78**	78	0%
Property	13,539	13,539	0%	**68**	68	0%
Total Overheads	**105,004**	**105,004**	**0%**	**525**	**525**	**0%**
Pre-Rent and Finance Surplus	**72,334**	**72,334**	**0%**	**362**	**362**	**-0%**
Rent	45,000	45,000	0%	**225**	225	0%
Finance	2,600	2,600	0%	**13**	13	0%
Rent and Finance	47,600	47,600	0%	**238**	238	0%
Drawings	25,000	25,000	0%	**125**	125	0%
MARGIN FROM PRODUCTION	**-266**	**-266**	**0%**	**-1**	**-1**	**0%**
Basic Payment	**46,639**	**29,483**	**-36.8%**	**233**	**147**	**-36.8%**
SFI Income		4,400			22	
Cost Savings		0			0	
Additional Costs		-941			-5	
Net SFI Benefit (Excl. Income Foregone)*		**3,459**			17	
Net 'Support' Income	46,639	32,942	**-29.4%**	**233**	165	-29.4%
BUSINESS SURPLUS	**46,372**	**32,676**	**-29.5%**	**232**	**163**	**-29.5%**
Net SFI Benefit (Incl. Income Lost)		**3,459**				

Source: The Andersons Centre * Income Foregone: is reflected in the differences between the gross margins pre- and post-SFI.

Notes: When modelling the impact of the SFI, all costs incurred under the SFI (variable and overhead costs) have been incorporated into the SFI Costs displayed at the bottom of this Summary Table. Accordingly, overhead costs are shown to remain consistent with the Pre-SFI situation.

3.3.3. Intermediate Arable Soils Standard Impact – Small Loam Farm

Table 3-9 provides an overview of the gains and losses associated with the Intermediate SFI Standard deployed on Small Loam Farm.

Table 3-9: Breakdown of Intermediate SFI 2022-Related Gains and Losses on Small Loam Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*200*	-	*200*
Gains			
SFI Income (at £40 per Ha)	£8,000	-	£8,000
Costs Saved	-	-	-
Total Gains	**£8,000**	**-**	**£8,000**
Losses			
Income Foregone (GM Lost)	-	-	-
Additional SFI Costs	£5,491	-	£5,491
Total Losses	**£5,491**	**-**	**£5,491**
Net Gain / Loss	**£2,509**	**-**	**£2,509**

Source: The Andersons Centre

Overall Small Loam Farm gains £2,509, as a result of the Intermediate SFI Standards. Whilst there is still a gain for entering the Intermediate Arable Soils Standard, it is less than the Introductory Standard. This will likely preclude some businesses from entering the Intermediate Standard. Again, a number of caveats should be noted.

- As with the Introductory Standard, Small Loam Farm is already carrying out some of the practices required by the Intermediate Standard.
- An additional cost is borne in the Standard, with 20% of the land in the Standard needing to be under a mixed green cover over winter at a cost of £4,550. This may draw some benefits for the following crop, i.e., nitrogen fixing crops or improved soil structure. However, this is deemed to be at the advantage of the following crop and the benefits are difficult to quantify.

Looking at the farm's financial performance as a whole, Table 3-8 shows that Small Loam Farm's Margin from Production is unaffected by the Arable Soils Standard as no land needs to be taken out of production. *Again, this is a specific result of the cropping being undertaken on Small Loam Farm and would not be the case on all combinable cropping farms.*

Table 3-10: Summary of the Impact of the Intermediate SFI Standard on Small Loam Farm

Parameter	Whole Farm (£)			Per Hectare (£)		
	Pre-SFI £ Total	Post-SFI £ Total	Pre-SFI % Ch.	Pre-SFI £ / Ha (Cropped)	Post-SFI £ / Ha (Harvested)	% Ch.
Crop Area Harvested	**200**	**200**	**0%**			
CROP OUTPUT	252,080	252,080	**0%**	**1,260**	1,260	0%
VARIABLE COSTS	74,743	74,743	**0%**	**374**	374	0%
GROSS MARGIN	**177,337**	**177,337**	**0%**	**887**	**887**	**0%**
Labour	12,400	12,400	0%	**62**	62	0%
Power and Machinery	63,428	63,428	0%	**317**	317	0%
Admin	15,637	15,637	0%	**78**	78	0%
Property	13,539	13,539	0%	**68**	68	0%
Total Overheads	**105,004**	**105,004**	**0%**	**525**	**525**	**0%**
Pre-Rent and Finance Surplus	**72,334**	**72,334**	**0%**	**362**	**362**	**-0%**
Rent	45,000	45,000	0%	**225**	225	0%
Finance	2,600	2,600	0%	**13**	13	0%
Rent and Finance	47,600	47,600	0%	**238**	238	0%
Drawings	25,000	25,000	0%	**125**	125	0%
MARGIN FROM PRODUCTION	**-266**	**-266**	**0%**	**-1**	**-1**	**0%**
Basic Payment	**46,639**	**29,483**	**-36.8%**	**233**	**147**	**-36.8%**
SFI Income		8,000			40	
Cost Savings		0			0	
Additional Costs		-5,491			-28	
Net SFI Benefit (Excl. Income Foregone)*		**2,509**			13	
Net 'Support' Income	46,639	31,992	**-31.4%**	**233**	160	-31.4%
BUSINESS SURPLUS	**46,372**	**31,726**	**-31.6%**	**232**	**159**	**-31.6%**
Net SFI Benefit (Incl. Income Lost)		**2'509**				

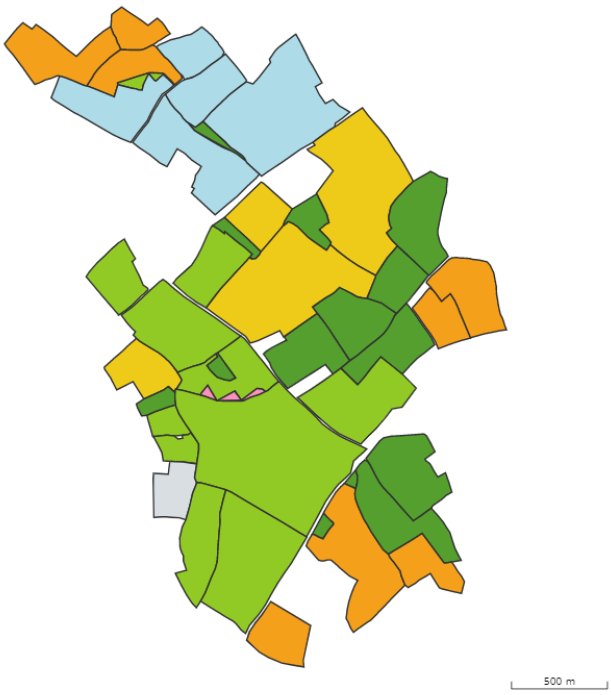
3.4. General Cropping - Root Farm Model

3.4.1. The Model and Base Profitability

For the purposes of this project, a general cropping farm model was also developed as there was a particular interest in modelling the SFI's impact on potatoes. Root Farm's key characteristics are summarised in Figure 3-3. This farm has a cropped area of 400 Ha, split evenly across a six-course rotation of Potatoes→ W. Wheat → S. Barley → S. Beans → W. Wheat → W Barley.

As Figure 3-3 also depicts, there is an additional 13.4 Ha of woodland with another 1.7 Ha of other vegetation, mostly corners and other hard to reach areas of fields which are deemed unsuitable for cropping.

Figure 3-2: Root Farm – Summary Overview

Farm Type:	General Cropping		
Location	East Anglia		
Main Soil Type:	Loam		
Land Tenure:	40% owned / 60% FBT		
Field Areas (ex. woodland)	409 Ha		
Area Cropped:	400 Ha		
Woodland	13.4 Ha		
Other Vegetation	1.7 Ha		
Yards / Laneways	5.5 Ha		
Total Area	**429.5 Ha**		
Hedgerows	39,380 m		
Watercourses	5,380 m		
Cropping	**Area (Ha):**	***Assumed Sale Price (£ per t)***	***Yields (t per Ha)***
W. Wheat (Milling)	66.6	181	8.7
W. Wheat (Feed)	66.6	169	9.4
Winter Barley	66.6	149	6.8
Spring Barley	66.6	149	7.7
Spring Beans	66.6	200	4.5
Potatoes (Ware)	66.6	138	43.0
Total:	**400**		

Source: The Andersons Centre (2021)

Table 3-11 summarises Root Farm's current financial performance. Given the high value of the potato crop, it is unsurprising that its output is significantly higher than the Loam Farms on a per hectare basis. Also, like Large Loam Farm, Root Farm is considered to be slightly above average although by no means in the top-25%. For the combinable crops, the key assumptions are aligned closely with the Loam Farms. The additional assumptions associated with the potatoes enterprise are outlined beneath Table 3-7.

Relative to Large Loam Farm, Root Farm has significantly higher costs due to a combination of the expensive equipment required for potatoes as well as its smaller scale. For instance, power and machinery costs are £182 per Ha higher on Root Farm versus Large Loam Farm. Labour costs are also £86 per Ha higher. Property costs on Root Farm (£222 per Ha) are more than six-times that of Large Loam Farm. This is essentially due to potato storage infrastructure. Private drawings are £38 per Ha higher but remain the same as Large Loam Farm on a whole-farm basis (£45,000).

Taking all of these additional costs, it is unsurprising that Root Farm's production margin (£111 per Ha) although positive, is about one-third lower than Large Loam Farm. The BPS augments this to £344 per Ha meaning that the farm's business surplus is just short of £137,500.

Table 3-11: Root Farm – Financial Performance Summary

	£ Total	£ per Ha	% Gross Output (inc. Support)
CROP OUTPUT	**848,425**	**2,123**	**90%**
VARIABLE COSTS	**262,440**	**657**	**28%**
GROSS MARGIN	**585,985**	**1,466**	72%
Labour	58,000	145	*11%*
Power and Machinery	187,145	468	*20%*
Admin	29,386	74	
Property	106,312	266	
Total Overheads	**380,843**	**953**	**45%**
Pre-Rent and Finance Surplus	**205,142**	**513**	
Rent	94,896	237	
Finance	20,972	52	
Rent and Finance	115,868	290	12%
Drawings	45,000	113	
MARGIN FROM PRODUCTION	**44,274**	**111**	
Basic Payment (BPS)	93,200	233	10%
BUSINESS SURPLUS	**137,474**	**344.0**	15%

Source: The Andersons Centre

Key Assumptions associated with the Potatoes Enterprise:

- The potato yield is an 'out the field' yield, not 'out the store yield'. The storage charge in overhead costs takes into account any weight loss.
- Grading specifications required by factories are dependent upon the markets. High spec means harder grading, meaning less store yield but higher prices. Therefore, 2.5t per Ha have been put down at £25 per t for stock feed rejects.
- The potato Gross Margin is reflective of a ware maincrop, with a growing season of up to 120 days.
- For potato fertiliser calculations, soil nutrient indices were assumed to be between, 1 & 2.
- Spray costs include the assumption that 50% of the cropped area has a nematicide application.
- The Potato enterprise sundry costs include the AHDB potato levy and agronomy etc.
- Appropriate machinery has been added into the capital schedule. The depreciation rate for the sprayer has been increased to account for increased usage due to blight spraying etc.
- Labour has been calculated as 1 full time member of staff and additional casual labour between March and October.
- It was assumed that an additional 39,000 litres of fuel was to be used by the potato enterprise.
- The farm is borderline in terms of tractors needed for harvest/planting times, so additional contract and hire has been allowed for to cover an extra sub-contractor (tractor and driver) at harvest/planting; 150 hours @ £35 per hr including fuel.
- Machinery repairs for the potato enterprise are equal to £250 per Ha.

- Water and drainage rates were increased to allow for some irrigation and the associated abstraction license.
- Potato Storage has been allocated in overhead costs on a £ per t basis. This takes into account depreciation, repairs, gas, electric, finance and weight loss. The storage period was assumed to be between 3 to 6 months, and costs on average £25 per t.
- Rent has been increased to £395 per Ha to take into account the land's ability to grow potatoes. The rented area has proportionally remained the same as Loam Farm.
- Additional bank interest has been calculated on £290,000 at 3.5% for an average of 8 months, to account for an increase in OD demand in the summer months.
- Private drawings (£45,000) have remained the same as Large Loam Farm.

3.4.2. Introductory Arable Soils Standard Impact – Root Farm

Table 3-12 shows a breakdown of the SFI gains and losses for Root Farm.

Overall, Root Farm gains just over £7,000 as a result of the Introductory Arable Soils Standard. However, potato production is a management-intensive business and the proprietors of the farm may not wish to devote time to a relatively minor income-earning activity. The gains from the Introductory Arable Soils standard are equivalent to a 0.75t/ha increase in yield across the potato enterprise of Root Farm.

Root Farm has a higher output than the Loam Farms due to its potato enterprise. This makes income from the SFI relatively less important to the overall business.

Like Loam Farm, Root Farm is undertaking a number of the Soil Standard prescriptions already, which lower its costs (and means a positive margin).

Table 3-12: Breakdown of Introductory SFI 2022-Related Gains and Losses on Root Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*400*	-	
Gains			
SFI Income (at £22 per Ha)	£8,791	-	£8,791
Costs Saved	-	-	-
Total Gains	**£8,791**	**-**	**£8,791**
Losses			
Income Foregone (GM Lost)	-	-	-
Additional SFI Costs	£1,710	-	£1,710
Total Losses	**£1,710**	**-**	**£1,710**
Net Gain / Loss	**£7,082**	**-**	**£7,082**

Source: The Andersons Centre

The overall financial impact of the Introductory Arable Soils Standard is set-out for Roots Farm in Table 3-13. Similar to the Loam Farms, whilst the Introductory Standard margin is positive this does not offset the substantial reduction in the BPS.

Table 3-13: Summary of the Impact of the Introductory SFI Standard on Root Farm

Parameter	Whole Farm (£)			Per Hectare (£)		
	Pre-SFI	Post-SFI	% Ch.	Pre-SFI	Post-SFI	% Ch.
Crop Area Harvested	**400**	**400**	**0%**			
CROP OUTPUT	848,425	848.425	0%	2,123	2,123	0%
VARIABLE COSTS	262,440	262,440	0%	657	657	0%
GROSS MARGIN	**585,985**	**585,985**	**0%**	**1,466**	**1,466**	**0%**
Labour	58,000	58,000	0%	145	145	0%
Power and Machinery	187,145	187,145	0%	468	468	0%
Admin	29,386	29,386	0%	74	74	0%
Property	106,312	106,312	0%	266	266	0%
Total Overheads	**380,843**	**380,843**	**0%**	**953**	**953**	**0%**
Pre-Rent and Finance Surplus	**205,142**	**205,142**	**-0%**	**513**	**513**	**0%**
Rent	94,896	94,896	0%	237	237	0%
Finance	20,972	20,972	-0%	52	52	0%
Rent and Finance	115,868	115,868	0%	290	290	0%
Drawings	45,000	45,000	0%	113	113	0%
MARGIN FROM PRODUCTION	**44,274**	**44,274**	**0%**	**111**	**111**	**0%**
Basic Payment	93,200	53,100	-43%	233	133	-43%
SFI Income		8,791			22	
Cost Savings		0			0	
Additional Costs		-1,710			-4	
Net SFI Benefit (excl. Income Foregone)		7,082			18	
Net 'Support' Income	**93,200**	**60,182**	**-35%**	**233**	**151**	**-35%**
BUSINESS SURPLUS	**137,474**	**104,455**	**-24%**	**344**	**261**	**-24%**
Net 'SFI Benefit' (incl. Income Lost)		**7,082**				

Source: The Andersons Centre * Income Foregone: is reflected in the differences between the gross margins pre- and post-SFI.

Notes: When modelling the impact of the SFI, all costs incurred under the SFI (variable and overhead costs) have been incorporated into the SFI Costs displayed at the bottom of this Summary Table. Accordingly, overhead costs are shown to remain consistent with the Pre-SFI situation.

3.4.3. Intermediate Arable Soils Standard Impact – Root Farm

Table 3-14 shows a breakdown of the Intermediate Arable Soils Standard gains and losses for Root Farm.

Overall, Root Farm gains £5,183 as a result of the Intermediate Arable Soils Standard. As with Loam Farm the gain from the Intermediate Standard is less than the Introductory Standard. This will likely preclude some businesses from entering the Intermediate Standard. Again, a number of caveats should be noted.

- As with the introductory standard, Root Farm is already carrying-out some of the practices required by the Intermediate Standard.
- An additional cost is borne in the Standard, with 20% of the land in the standard needing to be under a mixed green cover over winter at a cost of £9,091. This may draw some benefits for the following

crop, i.e., nitrogen fixing crops or improved soil structure. However, this is deemed to be at the advantage of the following crop and the benefits are difficult to quantify.

Table 3-14: Breakdown of Intermediate SFI 2022-Related Gains and Losses on Root Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*400*	-	
Gains			
SFI Income (at £40 per Ha)	£15,984	-	£15,984
Costs Saved	-	-	-
Total Gains	**£15,984**	**-**	**£15,984**
Losses			
Income Foregone (GM Lost)	-	-	-
Additional SFI Costs	£10,801	-	£10,801
Total Losses	**£10,801**	**-**	**£10,801**
Net Gain / Loss	**£5,183**	**-**	**£5,183**

Source: The Andersons Centre

The overall financial impact of the Intermediate Arable Soils Standard is set-out for Root Farm in Table 3-15. Similar to the Loam Farms, whilst the SFI 2022 margin is positive this does not offset the substantial reductions in the BPS.

Table 3-15: Summary of the Impact of the Intermediate SFI Standard on Root Farm

Parameter	Whole Farm (£)			Per Hectare (£)		
	Pre-SFI	Post-SFI	% Ch.	Pre-SFI	Post-SFI	% Ch.
Crop Area Harvested	**400**	**400**	**0%**			
CROP OUTPUT	848,425	848.425	0%	2,123	2,123	0%
VARIABLE COSTS	262,440	262,440	0%	657	657	0%
GROSS MARGIN	**585,985**	**585,985**	**0%**	**1,466**	**1,466**	**0%**
Labour	58,000	58,000	0%	145	145	0%
Power and Machinery	187,145	187,145	0%	468	468	0%
Admin	29,386	29,386	0%	74	74	0%
Property	106,312	106,312	0%	266	266	0%
Total Overheads	**380,843**	**380,843**	**0%**	**953**	**953**	**0%**
Pre-Rent and Finance Surplus	**205,142**	**205,142**	**-0%**	**513**	**513**	**0%**
Rent	94,896	94,896	0%	237	237	0%
Finance	20,972	20,972	-0%	52	52	0%
Rent and Finance	115,868	115,868	0%	290	290	0%
Drawings	45,000	45,000	0%	113	113	0%
MARGIN FROM PRODUCTION	**44,274**	**44,274**	**0%**	**111**	**111**	**0%**
Basic Payment	93,200	53,100	-43%	233	133	-43%
SFI Income		15,984			40	
Cost Savings		0			0	
Additional Costs		-10,801			-27	
Net SFI Benefit (excl. Income Foregone)		5,183			13	
Net 'Support' Income	**93,200**	**58,283**	**-37%**	**233**	**146**	**-37%**
BUSINESS SURPLUS	**137,474**	**102,557**	**-25%**	**344**	**257**	**-25%**
Net 'SFI Benefit' (incl. Income Lost)		**5,183**				

Source: The Andersons Centre * Income Foregone: is reflected in the differences between the gross margins pre- and post-SFI.

Notes: When modelling the impact of the SFI, all costs incurred under the SFI (variable and overhead costs) have been incorporated into the SFI Costs displayed at the bottom of this Summary Table. Accordingly, overhead costs are shown to remain consistent with the Pre-SFI situation.

It should be noted that the Root farm model shows potato production being undertaken purely on the farmer's own land. In practice, a large amount of potatoes (and other vegetables) are grown on 'clean' land taken from other farmers on short-term lets. The interaction of the SFI with this important land trade needs to be considered.

3.5. Implications for English Arable Farming

Both the Introductory and Intermediate Arable Soils Standards produce positive outcome on the three farms we have modelled. This is, in part, due to the fact that the three cropping farms are already undertaking some of the practices mandated as part of their normal agricultural operations.

At the Introductory level the key cost centre is the Soil Assessment. More details were given into the requirements of both Standards, when they were published in December. The Soil Organic Matter tests are now a separate requirement of the Introductory Standard.

The costs required to comply with the Introductory Standard are dramatically reduced from the Part B report carried out in 2021. This is primarily due to the requirements for increasing organic matter and having over winter cover being met by the model farms already, through chopping straw, and through leaving overwinter stubble.

The reduced complexity and cost of the Introductory Arable Soils Standard may make it more attractive to arable farmers in England.

The rise in costs from the Introductory to Intermediate Standard is seen outweighing the rise in income for the model farms. This is due to the cost required to establish green, multi-species cover crops on 20% of the land entered into the Standard. Due to the complexities of estimating the benefit of cover cropping; with benefits depending on a multitude of factors, no financial benefit has been included in estimating the Standard's impact.

The net benefit of the Intermediate Standard being below that of the Introductory Standard, is likely to result in reduced uptake. There is however one key caveat, a business that is either already using a multi-species green cover or one that is confident of the financial benefit of such cover crops may be enticed by the standard.

As with our conclusions to the "Part B" report, there may be a delay in businesses entering the scheme until other Standards become available so that the entire 'SFI package' becomes more attractive. There may also be a temptation to wait, so that others' experience can be seen in terms of the practical application and enforcement of the Standard's rules.

4. SFI IMPACT - DAIRYING

4.1. INTRODUCTION

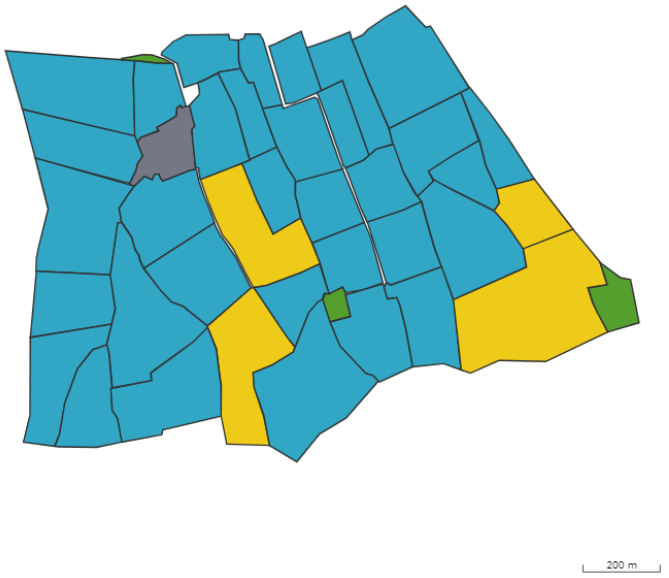
Andersons' Friesian Farm Models are notional dairy businesses, both based in the English Midlands. As with the Loam Farm equivalents, the 'Large' Friesian Farm Model constitutes the core dairy farm model which Andersons have been using for many years. The 'Small' Friesian Farm has been developed for this study. Both models are explained in further detail below.

4.2. LARGE FRIESIAN FARM

4.2.1. The Model and Base Profitability

This model farm consists of 124 hectares (306 acres), the majority of which is owned (67 Ha) with the remainder (57 Ha; 141 acres) rented on a Farm Business Tenancy. The soils across the farm are consistently medium loam resulting in above average grass growth. Its key characteristics are set-out in Figure 4-1 below.

Figure 4-1: Andersons' Large Friesian Farm Model – Key Characteristics

Farm Type:	Dairying		
Location:	East Midlands		
Main Soil Type:	Medium Loam		
Land Tenure:	54% owned / 46% FBT		
No. Milking Cows	200 Head		
Ave. Milk Yield	7,640 litres/cow		
Replacement Rate	24%		
Field Areas (excl. Woodland etc.)	124 Ha		
Woodland	1.9 Ha		
Yards / Laneways	2.1 Ha		
Total Area	**128 Ha**		
Hedgerows	18,920 m		
Watercourses	3,300 m		
Cropping	**Area (Ha):**	***Assumed Output Values***	***Assumed Prices***
Grazed Grassland	61	Milk Price (1.528m litres)	28.4ppl
Grassland Silage	42	Angus Heifer Calves (28 Head) Angus Bull Calves (28 Head)	£120 per Head £160 per Head
Forage Maize	21	Continental X Heifer Calves (19) Continental X Bull Calves (19)	£175 per Head £215 per Head
Total:	**200**	Friesian Bull Calves (51)	£45 per Head

The farm carries 200 cows on a twice-a-day milking system with a herd average annual yield of 7,640 litres per cow. Cows are housed in cubicle sheds in the winter months and grazed in the summer months. Calving takes place all year round. Herd replacements are bred, and reared meaning 47 heifers are also

present on the farm. The business supplies a large milk processor on a constituent contract. Improved grassland makes up 83% of the land holding with an annual crop of forage maize (21 Ha) grown across the remaining area. The forage maize area is rotated between temporary grass leys.

Labour is provided through unpaid family work, one full time employee and casual support during peak times. All silage operations for both the grassland and maize crops are performed by contractors.

Table 4-1 summaries the financial performance of Large Friesian Farm with key assumptions set out underneath. The margin from production is 1.1ppl, equating to nearly £17,000 across the farm. When the BPS (£29,035) is added, the total business surplus is just over of £46,000. It should be noted that this is a return on the capital invested in the business (and for management and entrepreneurial risk) as the farmer has already taken drawings of £39,500 out of the business.

As set out in Chapter 2, prices and costs are based on averages. The milk price is a key determinant of profitability on dairy farms and the price over the past three years used within the modelling has been reasonably robust. A key concern for this farm would be that, if the BPS income is removed and is insufficiently replaced, then its ability to withstand prolonged periods of deflated milk prices (such as seen in 2015 and 2016) reduces substantially.

Table 4-1: Large Friesian Farm – Financial Performance Summary

	£ Total	£ per Ha	Pence per Litre	% Gross Output (inc. Support)
MILK OUTPUT	433,952	3,500	28.4	86%
TOTAL OUTPUT	473,911	3,822	31.0	94%
VARIABLE COSTS	195,486	1,577	12.8	39%
GROSS MARGIN	**278,425**	**2,245**	**18.2**	55%
Labour	29,150	235	1.9	*5%*
Power and Machinery	89,162	719	5.8	*18%*
Admin	16,200	131	1.1	
Property	26,394	213	1.7	
Total Overheads	160,906	1,298	10.5	32%
Pre-Rent and Finance Surplus	117,518	948	10.5	
Rent	24,090	194	1.6	
Finance	36,940	298	2.4	
Rent and Finance	61,030	492	4.0	12%
Drawings	39,500	319	2.6	
TOTAL COST OF PRODUCT'N	**456,922**	**3,685**	**29.9**	
MARGIN FROM PRODUCTION	**16,988**	**137**	**1.1**	
Basic Payment	29,035	234	1.9	
BUSINESS SURPLUS	**46,023**	**371**	**3.0**	9%

Source: The Andersons Centre

4.2.2. Soils Standards Impacts – Large Friesian Farm – General

As with the arable models, the impact of the Introductory and Intermediate Soils Standards is assessed in terms of the gains and losses across the farm. These are summarised in tables below. It assumed that the farm enters its maize land into the Arable Soils Standard and all the leys are entered into the Grassland Standard.

It might be questioned whether the farm would actually enter the Arable Soils Standard given the relatively small maize area involved (21 Ha). However, it is assumed that the provisions of the Arable and Grassland Standards will be aligned – i.e., the process required will be the same and a single 'farm plan' will be acceptable. In effect, for the Soil Assessment, all the land, both crops and grass, can be treated the same. The costs in the analysis may, therefore, be overstated as both the Crops and Grassland Standards have an allocation for 'core time' (effectively, getting the paperwork together). However, this is thought to be a relatively minor issue and could be negated if there are any differences between the operations of the standards.

One key question for Large Friesian Farm is how entering both the Arable and Grassland Soils Standards will work? The rotation of fields from temporary grass leys to maize on Large Friesian Farm means the number of hectares under each Standard would be liable to change in accordance with field sizes.

As such, Large Friesian Farm will have to alter the cropping of some fields in order to comply with the requirements of the Standards. As a result, Friesian Farm would either have to plant part fields in some years of the agreement or enter less land into each Standard to allow some flexibility. For this modelling it is assumed that Friesian Farm will leave some small excess parcels of land as grassland when planting to maize, this would incur minimal extra cost.

In publishing its updated SFI 2022 information in March 2022, Defra raised more questions as to the viability of farms such as Friesian Farm entering both the Arable and Grassland Soil Standards. Specifically, you are unable to enter land parcels into SFI which have multiple land covers. Furthermore, parcels of land cannot be used for multiple standards. This makes it highly unlikely that Friesian Farm would look to enter the Arable Soils Standard on such a small arable area[7].

4.2.3. Introductory Soils Standards Impacts – Large Friesian Farm

Table 4-2 below, lays out the breakdown of gains and losses associated with Large Friesian Farm entering the Introductory Arable and Grassland Soils Standards.

Table 4-2: Breakdown of Introductory SFI 2022-Related Gains and Losses on Large Friesian Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*21*	*103*	***124***
Gains			
SFI Income (£22/£28 per Ha)	£462	£2,884	**£3,346**
Costs Saved	-	-	**-**
Total Gains	**£462**	**£2,884**	**£3,346**
Losses			
Income Foregone (GM Lost)	-	-	-
Additional SFI Costs	£248	£1,431	**£1,679**
Total Losses	**£248**	**£1,431**	**£1,679**
Net Gain / Loss	**£214**	**£1,453**	**£1,667**

Source: The Andersons Centre

For Large Friesian Farm, entering the Introductory Arable and Grassland Standards results in a net gain. This in in contrast to the Part B analysis where there was a requirement to have land in either mixed leys or to establish a cover crop. This requirement has been moved to the Intermediate standard. It is assumed

that the requirement for over winter green cover, for the Arable Standard, is met by the fields in question being in a temporary grass ley prior to the establishment of forage maize. Further, the establishment of maize following temporary grass is assumed to meet the requirements for the addition of organic matter.

The overall financial impact of entering the SFI is set-out for Large Friesian Farm in Table 4-3 below. Figures are shown on both a whole-farm and per Ha basis. The model spreadsheets also have pence per litre figures; a brief summary of these are given in section 4.2.5 below.

The net gain for large Friesian Farm from participation in the Introductory Arable and Grassland Soils Standards goes only a small way towards mitigating the loss in income from reductions to BPS payments.

Table 4-3: Summary of the Impact of the Introductory SFI Standards on Large Friesian Farm

PARAMETER	Whole Farm (£)			Per Hectare (£ / Ha)	
	Pre- SFI	Post-SFI	% Ch.	Pre- SFI	Post-SFI
MILK OUTPUT	433,952	433,952	-	3,500	3,500
TOTAL OUTPUT	473,911	473,911	-	3,822	3,822
VARIABLE COSTS	195,486	195,486	-	1,577	1,577
GROSS MARGIN	**278,425**	**278,425**	-	**2,245**	**2,245**
Labour	29,150	29,150	-	235	235
Power and Machinery	89,162	89,162	-	719	719
Admin	16,200	16,200	-	131	131
Property	26,394	26,394	-	213	213
Total Overheads	160,906	160,906	-	1,298	1,298
Pre-Rent and Finance Surplus	117,518	117,518	-	948	948
Rent	24,090	24,090	-	194	194
Finance	36,940	36,940	-	298	298
Rent and Finance	61,030	61,030	-	492	492
Drawings	39,500	39,500	-	319	319
TOTAL COST OF PRODUCT'N	**456,922**	**456,922**	**-**	3,685	3,685
MARGIN FROM PRODUCTION	**16,988**	**16,988**	**-**	**137**	**137**
Basic Payment	29,035	18,873	-35.0%	234	152
SFI Income		3,346			27
Cost Savings		0			0
Additional Costs		-1,679			-14
Net SFI Benefit *(excl Income Lost)*		*1,667*			*13*
Net 'Support' Income	29,035	20,540	-29.3%		166
BUSINESS SURPLUS	**46,023**	**37,528**	-29.3%	**371**	**303**
Net SFI Benefit (inc. Income Lost)		**1,667**			**13**

Source: The Andersons Centre * Income Lost/Foregone: has been incorporated into the Gross Margin figures under SFI, and therefore, is included within the post-SFI Business Surplus. Income Lost is also shown underneath the Business Surplus as is the Net SFI Benefit including Income Lost.

Notes: When modelling the impact of the SFI, all costs incurred under the SFI (variable and overhead costs) have been incorporated into the SFI Costs displayed at the bottom of this Summary Table. Accordingly, overhead costs are shown to remain consistent with the Pre-SFI situation.

4.2.4. Intermediate Soils Standards Impacts – Large Friesian Farm

Table 4-4 below, lays out the breakdown of gains and losses associated with Large Friesian Farm entering the Intermediate Arable and Grassland Soils Standards.

Table 4-4: Breakdown of Intermediate SFI 2022-Related Gains and Losses on Large Friesian Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*21*	*103*	***124***
Gains			
SFI Income (£40/£58 per Ha)	£840	£5,974	**£6,814**
Costs Saved	-	£2,791	**£2,791**
Total Gains	**£840**	**£8,765**	**£9,605**
Losses			
Income Foregone (GM Lost)	-	£5,393	**£5,393**
Additional SFI Costs	£965	£2,482	**£3,447**
Total Losses	**£965**	**£7,875**	**£8,840**
Net Gain / Loss	-£125	**£890**	**£765**

Source: The Andersons Centre

Large Friesian Farm stands to gain from entering the Intermediate Standards. However, the income gained from entering the Intermediate Standard is less than that gained from entering the Introductory standard. This is due to the costs involved with establishing green multi-species cover as part of the Arable Soils Standard, and the cost and income foregone in establishing a herbal ley (diverse sward) in the Grassland Standard.

There is an income foregone element associated with the Intermediate Grassland Standard. This is due to the need to establish a herbal ley, containing a diverse mix of grasses, legumes, herbs, and wildflowers on 15% of the land in the Standard. This is assumed to reduce the carrying capacity of the farm compared to high-output leys. This means slightly less stock can be carried – affecting the gross margin.

The negative affect on margins as a result of reduced carrying capacity is somewhat mitigated by a reduction in the fertiliser spend. Friesian Farm would continue to apply P and K fertiliser but no N on the diverse sward, reducing the overall fertiliser cost.

Given the loss involved in the Intermediate Arable Soils Standard, and the modest increase in margin from the Grassland Standard, it is difficult to foresee a situation where Large Friesian Farm would engage with either Intermediate Standard. This is likely to hold true for many large dairy businesses.

There will of course be some exceptions to this, where a business already establishes a qualifying herbal ley, the costs would already be factored in. Further, businesses with lower stocking rates than Large Friesian Farm would see a lower income foregone.

Table 4-5, below, outlines the overall financial impact of entering the Intermediate Standards.

Table 4-5: Summary of the Impact of the Intermediate SFI Standard on Large Friesian Farm

PARAMETER	Whole Farm (£)			Per Hectare (£ / Ha)	
	Pre- SFI	Post-SFI	% Ch.	Pre- SFI	Post-SFI
MILK OUTPUT	433,952	424,950	-2.1%	3,500	3,427
TOTAL OUTPUT	473,911	464,079	-2.1%	3,822	3,743
VARIABLE COSTS	195,486	188,257	-3.7%	1,577	1,518
GROSS MARGIN	**278,425**	**275,823**	-0.9%	**2,245**	**2,224**
Labour	29,150	29,150	-	235	235
Power and Machinery	89,162	89,162	-	719	719
Admin	16,200	16,200	-	131	131
Property	26,394	26,394	-	213	213
Total Overheads	160,906	160,906	-	1,298	1,298
Pre-Rent and Finance Surplus	117,518	114,916	-2.2%	948	927
Rent	24,090	24,090	-	194	194
Finance	36,940	36,940	-	298	298
Rent and Finance	61,030	61,030	-	492	492
Drawings	39,500	39,500	-	319	319
TOTAL COST OF PRODUCT'N	**456,922**	**449,693**	**-1.6%**	3,685	3,627
MARGIN FROM PRODUCTION	**16,988**	**14,386**	**-15.3%**	**137**	**116**
Basic Payment	29,035	18,873	-35.0%	234	152
SFI Income		6,814			55
Cost Savings		2,791			23
Additional Costs		-3,447			-28
Net SFI Benefit *(excl Income Lost)*		*6,158*			*50*
Net 'Support' Income	29,035	22,240	-23.4%		179
BUSINESS SURPLUS	**46,023**	**37,777**	-18.2%	**371**	**305**
Net SFI Benefit (inc. Income Lost)		**765**			**6**

Source: The Andersons Centre * Income Lost/Foregone: has been incorporated into the Gross Margin figures under SFI, and therefore, is included within the post-SFI Business Surplus. Income Lost is also shown underneath the Business Surplus as is the Net SFI Benefit including Income Lost.

Notes: When modelling the impact of the SFI, all costs incurred under the SFI (variable and overhead costs) have been incorporated into the SFI Costs displayed at the bottom of this Summary Table. Accordingly, overhead costs are shown to remain consistent with the Pre-SFI situation.

There is only a very small net SFI benefit of Large Friesian Farm entering the Intermediate Arable and Grassland Soils Standards.

4.2.5. Large Friesian Farm gains from Introductory and Intermediate Standards, Pence Per Litre

The net SFI benefit of Large Friesian Farm entering the Introductory Arable and Grassland Soils Standards is 0.1 pence per litre (ppl). This, combined with the Basic Payment in 2023, gives a net 'support' income of 1.3 ppl.

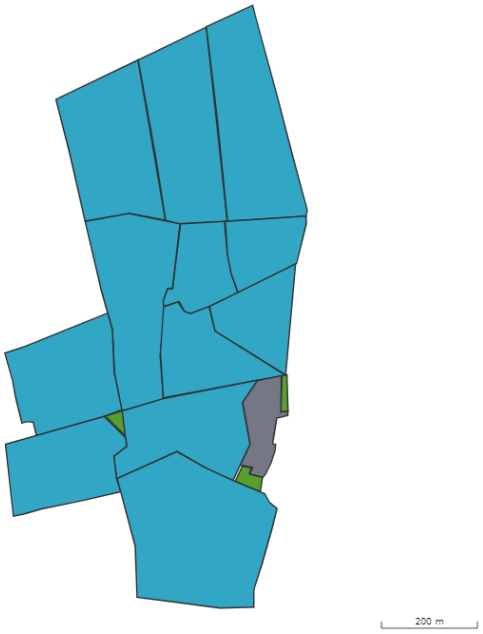
4.3. Small Friesian Farm

4.3.1. The Model and Base Profitability

Figure 4-2 summarises the key characteristics of Small Friesian Farm. It is a business, representative of smaller dairy farm sizes. The underlying assumptions are largely the same as the larger Friesian Farm. It has 80 milking cows with the same yields and replacement rates as its larger counterpart. However, it has a slightly lower proportion of its land rented under FBT and there is not as much woodland.

This farm is assumed not to grow maize. This means its purchased concentrate cost is slightly higher.

Figure 4-2: Andersons' Small Friesian Farm Model – Key Characteristics

Farm Type:	Dairying		
Location:	East Midlands		
Main Soil Type:	Medium Loam		
Land Tenure:	60% owned / 40% FBT		
No. Milking Cows	80 Head		
Ave. Milk Yield	7,640 l per cow		
Replacement Rate	24%		
Field Areas (excl. Woodland etc.)	49.6 Ha		
Woodland	0.4 Ha		
Yards / Laneways	1.2 Ha		
Total Area	**51.2 Ha**		
Hedgerows	7,450 m		
Watercourses	710 m		
Cropping	**Area (Ha):**	***Assumed Output Values***	***Assumed Prices***
Grazed Grassland	25.2	Milk (611,200 litres; 7,640 l per cow)	28.4ppl
Grassland Silage	24.4	Angus Heifer Calves (11 Head Angus Bull Calves (11 Head) Continental X Heifer Calves (8) Continental X Bull Calves (8)	£120 per Head £160 per Head £175 per Head £215 per Head
Total:	**49.6**	Friesian Bull Calves (20)	£45 per Head

Source: The Andersons Centre

Given the differences in scale between the Large and Small Friesian Farms, it is unsurprising that the financial performance differs in terms of costs and margins, as depicted in Table 4-6. Gross margin is slightly lower on a pence per litre basis due to the need for more purchased feed to balance the ration in the absence of maize.

Power and machinery and admin costs are slightly higher on a ppl basis – due to many of these costs being 'lumpy' and not falling proportionally with farm size. The biggest difference is in terms of property costs (2.5ppl versus 1.7ppl) - this is due to depreciation on infrastructure such as the milking parlour and associated equipment which was constructed in 2017. Drawings (3.3ppl) are also higher. Therefore, with a total cost of production on Small Friesian Farm of 32.1ppl, the farm generates a 1.0ppl loss. The BPS (1.9ppl) currently returns the farm to profit with a business surplus of 0.9ppl (£5,600 across the farm). Note, this return is after the proprietor's drawings have been taken out. These figures reveal the exposure that many small dairy farms have to volatile milk prices and a declining BPS.

Table 4-6: Small Friesian Farm – Financial Performance Summary

	£ Total	£ per Ha	Pence per Litre
MILK OUTPUT	173,581	3,499	28.4
TOTAL OUTPUT	190,152	3,833	31.1
VARIABLE COSTS	81,550	1,644	13.3
GROSS MARGIN	**108,602**	**2,189**	**17.8**
Labour	12,400	250	2.0
Power and Machinery	36,414	734	6.0
Admin	8,100	163	1.3
Property	15,506	313	2.5
Total Overheads	72,421	1,460	11.8
Pre-Rent and Finance Surplus	**36,182**	**729**	**5.9**
Rent	7,252	146	1.2
Finance	14,776	298	2.4
Rent and Finance	22,028	444	3.6
Drawings	20,145	406	3.3
TOTAL COST OF PRODUCT'N	**196,144**	**3,954**	**32.1**
MARGIN FROM PRODUCTION	**-5,991**	**-121**	**-1.0**
Basic Payment	11,568	233	1.9
BUSINESS SURPLUS	**5,577**	**112**	**0.9**

Source: The Andersons Centre

4.3.2. Introductory Soils Standards Impacts – Small Friesian Farm

With no maize (or any other arable crops) the Arable Soils Standard is not relevant to this farm.

Table 4-7 below outlines the gains and losses for Small Friesian Farm, as a result of entering the Introductory Grassland Soils Standard.

Table 4-7: Breakdown of Introductory SFI 2022-Related Gains and Losses on Small Friesian Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*0*	*50*	*50*
Gains			
SFI Income (at £28 per Ha)	-	£1,389	**£1,389**
Costs Saved	-	-	-
Total Gains	-	**£1,389**	**£1,389**
Losses			
Income Foregone (GM Lost)	-	-	-
Additional SFI Costs	-	£586	**£586**
Total Losses	-	**£586**	**£586**
Net Gain / Loss	-	**£802**	**£802**

Source: The Andersons Centre

The Grassland Soils Standard produces a small positive return. Interestingly, this is better than seen on the Large dairy farm, on a per hectare basis. The reason for this is the smaller farm is less productive / profitable per hectare. This means, in turn, that the land required to be taken out of production has a lower opportunity cost and the economics of the SFI are more favourable. This demonstrates a wider

point that, with fixed payment rates, more productive farms will tend to find the SFI less attractive than those with lower outputs.

The Introductory Grassland Soils Standard does make a reasonable contribution to the small profits of Small Friesian Farm. That said, the return is still small and may not be enough to engage some farmers. This is particularly so on smaller businesses as the 'fixed costs' in undertaking any assessment are spread across fewer hectares. There is also a desire among a number of farmers to minimise the bureaucracy and inspections they have to deal with. A small payment will not overcome this barrier.

The overall financial impact on the Small Friesian Farm is set out in Table 4-8 below.

Table 4-8: Summary of the Impact of the Introductory SFI Standard on Small Friesian Farm

	Whole Farm (£)			Per Ha (£ / Ha)	
	Pre- SFI	**Post-SFI**	**% Change**	**Pre- SFI**	**Post-SFI**
MILK OUTPUT	173,581	173,581		3,499	3,499
TOTAL OUTPUT	190,152	190,152		3,833	3,834
VARIABLE COSTS	81,550	81,550		1,644	1,644
GROSS MARGIN	**108,602**	**108,602**		**2,189**	**2,189**
Labour	12,400	12,400		250	250
Power and Machinery	36,414	36,414		734	734
Admin	8,100	8,100		163	163
Property	15,506	15,506		313	313
Total Overheads	72,421	72,421		1,460	1,460
Pre-Rent and Finance Surplus	36,182	36,182		729	729
Rent	7,252	7,252		146	146
Finance	14,776	14,776		298	298
Rent and Finance	22,028	22,028		444	444
Drawings	20,145	20,145		406	406
TOTAL COST OF PRODUCT'N	**196,144**	**196,144**		3,954	3,947
MARGIN FROM PRODUCTION	**-5,991**	**-5,991**		**-121**	**-121**
Basic Payment	11,568	7,519	-35.0%	233	146
SFI Income		1,389			28
Cost Savings		0			0
Additional Costs		-586			-12
Net SFI Benefit *(excl Income Lost)*		*802*			16
Net 'Support' Income	11,568	8,322	-28.1%		168
BUSINESS SURPLUS	**5,577**	**2,330**	-58.2%	**112**	**47**
Net SFI Benefit (inc. Income Lost)		**802**			**16**

Source: The Andersons Centre * Income Lost/Foregone: has been incorporated into the Gross Margin figures under SFI, and therefore, is included within the post-SFI Business Surplus. Income Lost is also shown underneath the Business Surplus as is the Net SFI Benefit including Income Lost.

Notes: When modelling the impact of the SFI, all costs incurred under the SFI (variable and overhead costs) have been incorporated into the SFI Costs displayed at the bottom of this Summary Table. Accordingly, overhead costs are shown to remain consistent with the Pre-SFI situation.

4.3.3. Intermediate Soils Standards Impacts – Small Friesian Farm

Table 4-9 below outlines the gains and losses for Small Friesian Farm, as a result of entering the Intermediate Grassland Soils Standard.

Table 4-9: Breakdown of Intermediate SFI 2022-Related Gains and Losses on Small Friesian Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*0*	*50*	*50*
Gains			
SFI Income (at £58 per Ha)	-	£2,877	**£2,877**
Costs Saved	-	£1,386	**£1,386**
Total Gains	**-**	**£4,263**	**£4,263**
Losses			
Income Foregone (GM Lost)	-	£1,969	**£1,969**
Additional SFI Costs	-	£1,093	**£1,093**
Total Losses	**-**	**£3,062**	**£3,062**
Net Gain / Loss	**-**	**£1,201**	**£1,201**

Source: The Andersons Centre

Small Friesian Farm stands to make a reasonable return from the Intermediate Grassland Soils Standard. The income forgone as a result of introducing a herbal ley (diverse sward) and subsequently reducing stocking rate is largely mitigated by cost savings driven by reduced fertiliser usage.

The overall financial impact on the Small Friesian Farm is set out in Table 4-10 below.

Table 4-10: Summary of the Impact of the Intermediate SFI Standard on Small Friesian Farm

	Whole Farm (£)			Per Ha (£ / Ha)	
	Pre- SFI	Post-SFI	% Change	Pre- SFI	Post-SFI
MILK OUTPUT	173,581	169,980	-2.1%	3,499	3,427
TOTAL OUTPUT	190,152	186,208	-2.1%	3,833	3,754
VARIABLE COSTS	81,550	78,188	-4.1%	1,644	1,576
GROSS MARGIN	**108,602**	**108,019**	**-0.5%**	**2,189**	**2,178**
Labour	12,400	12,400		250	250
Power and Machinery	36,414	36,414		734	734
Admin	8,100	8,100		163	163
Property	15,506	15,506		313	313
Total Overheads	72,421	72,421		1,460	1,460
Pre-Rent and Finance Surplus	36,182	35,599	-1.6%	729	718
Rent	7,252	7,252		146	146
Finance	14,776	14,776		298	298
Rent and Finance	22,028	22,028		444	444
Drawings	20,145	20,145		406	406
TOTAL COST OF PRODUCT'N	**196,144**	**192,782**	-1.7%	3,954	3,887
MARGIN FROM PRODUCTION	**-5,991**	**-6,574**	**-9.7%**	**-121**	**-133**
Basic Payment	11,568	7,519	-35.0%	233	152
SFI Income		2,877			58
Cost Savings		1,386			28
Additional Costs		-1,093			-22
Net SFI Benefit *(excl Income Lost)*		*3,171*			64
Net 'Support' Income	11,568	9,303	-19.6%		188
BUSINESS SURPLUS	**5,577**	**2,729**	-51.1%	**112**	**55**
Net SFI Benefit (inc. Income Lost)		**1,201**			**24**

Source: The Andersons Centre * Income Lost/Foregone: has been incorporated into the Gross Margin figures under SFI, and therefore, is included within the post-SFI Business Surplus. Income Lost is also shown underneath the Business Surplus as is the Net SFI Benefit including Income Lost.

Notes: When modelling the impact of the SFI, all costs incurred under the SFI (variable and overhead costs) have been incorporated into the SFI Costs displayed at the bottom of this Summary Table. Accordingly, overhead costs are shown to remain consistent with the Pre-SFI situation.

For Small Friesian Farm, the gains from the Intermediate Grassland Soils Standard are relatively small. When considering the Intermediate Grassland Soils Standard, it is difficult to see small dairy farms, like Small Friesian Farm, engaging. The costs of complying with the Standards are likely to deter uptake, particularly for businesses operating with a minimal surplus.

4.3.4. Small Friesian Farm gains from Introductory and Intermediate Standards, Pence Per Litre

The net SFI benefit of Small Friesian Farm entering the Introductory Arable and Grassland Soils Standards is 0.1 pence per litre (ppl). This, combined with the Basic Payment in 2023, gives a net 'support' income of 1.4 ppl.

4.4. Implications for English Dairy Farming

The figures for Large and Small Friesian Farm highlight the difficulties of developing an attractive area-based payment system for dairy farming. The Sustainable Farming Incentive is based on area payments, this is likely to be less attractive for systems which have a high output per hectare of land occupied, such as dairy, horticulture, pigs, and poultry.

The high output (and gross margin) of dairying makes any prescriptions where land has to be taken out of production (or reduced in intensity of production) costly in terms of income foregone. Whilst the Soils Standards do not mandate the removal of land from production, the need to introduce specific leys does reduce the effective stocked area.

The high output per hectare has an inverse impact that farm sizes in the sector tend to be smaller than, for example, arable farms. An area-based payment thus simply produces a lower income figure.

In the livestock sector, and dairying in particular, it may make more sense to focus more on actions and prescriptions at the overall herd or 'per cow' level rather than on a land basis.

5. SFI IMPACT – LOWLAND GRAZING LIVESTOCK

5.1. INTRODUCTION

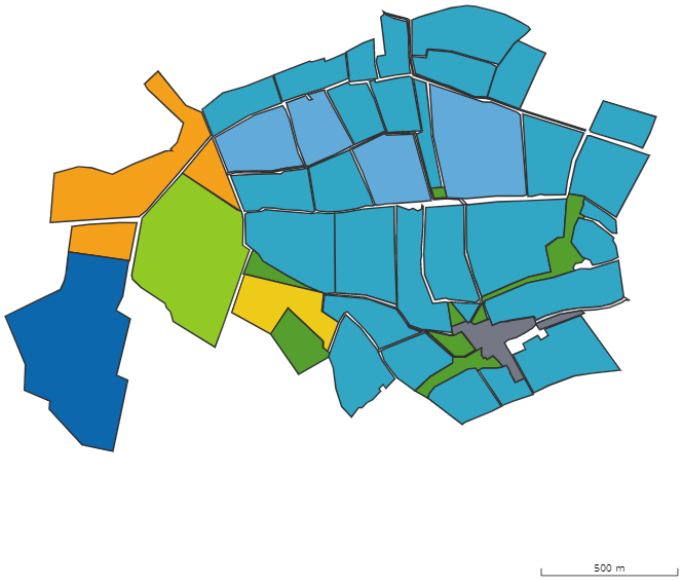
As with the previous chapter, the key characteristics of Andersons' Lowland Grazing Livestock Model Farms, called 'Large Meadow Farm' and 'Small Meadow Farm' are set-out before examining how the implementation of the SFI would affect both farms. Thereafter, the implications for English lowland livestock farming more generally are commented on.

5.2. LARGE MEADOW FARM

5.2.1. The Model and Base Profitability

Large Meadow Farm is a notional 200-hectare (494 acres) lowland farm and its key characteristics are summarised in Figure 5-1.

Figure 5-1: Andersons' Large Meadow Farm Model – Key Characteristics

Farm Type:	Lowland Livestock		
Location:	East Midlands		
Land Tenure:	74% owned / 26% FBT		
No. Suckler Cows	78 Head		
Bull Beef	45 Head		
Ewes	648 Head		
Field Areas (excl. Woodland etc.)	201 Ha		
Cropped Area	38.1 Ha		
Grassland Area	161.9 Ha		
Woodland	9.4 Ha		
Yards / Laneways	5.7 Ha		
Total Area	**215 Ha**		
Hedgerows	24,920 m		
Watercourses	2,960 m		
Cropping	**Area (Ha):**	***Assumed Output Values***	***Assumed Prices***
Permanent Pasture	135.9	Finished Steers (38 Head)	361 ppkg
Grassland Silage	26	Finished Heifers (27 Head)	362 ppkg
Winter Wheat	17.1	Finished Dairy Bulls (45)	342 ppkg
Winter Barley	15.8	Finished Lambs (1134)	426 ppkg
Spring Barley	5.2	Cull Cows (10)	130 ppkg
Total:	**200**	Cull Ewes (123)	£55.33 per Head

Source: The Andersons Centre

The farm is part owned (74%) and part rented (26%) on a Farm Business Tenancy. The unit consists of 78 South Devon suckler cows spring calving in March and April and a 648 head mule sheep flock finishing all lambs. All of the suckler progeny is finished on the farm as steers and heifers, with only some heifers

retained for herd replacements. A further 45 black and white bulls are purchased and finished on the farm each year as 'bull beef'. All livestock is sold directly on a deadweight basis to two different processor companies.

As the map in Figure 5-1 depicts, the bulk of the land is present as grassland consisting of permanent pasture with some improved grass leys. Crops include 17 hectares (42 acres) of winter wheat, nearly 16 Ha (39.5 acres) of winter barley and just over 5 Ha of spring barley (12.8 acres). Most of the grain is fed to the livestock (some is kept as Home Saved Seed).

All livestock work and baling operations are performed in-house, whilst all arable operations are performed by a local farmer/contractor on a stubble-to-stubble basis. Grassland improvements are also undertaken by a third party. Labour consists of the proprietor (1 FTE) and family labour (a further 1 FTE) and casual labour during peak times (lambing, calving, silage making etc). The farm is considered 'typical' of many grazing livestock farms in England and would have 'average' performance levels (i.e. neither in bottom nor top quartiles).

Table 5-1 shows Large Meadow Farm's financial performance both on a whole farm and on a per Ha basis. The key issue is that without BPS support, this farm is generating a production loss of £121 per Ha. It epitomises the situation on many English beef and sheep farms.

Table 5-1: Large Meadow Farm – Financial Performance Summary

	£ Total	£ per Ha	% Gross Output (inc. Support)
LIVESTOCK OUTPUT	*197,546*	*1,220.6*	*85%*
LIVESTOCK VC'S	*96,149*	*594.1*	*41%*
LIVESTOCK GROSS MARGIN	*101,398*	*626.5*	*43%*
CROP GROSS MARGIN	*28,797*	*755.1*	*52%*
TOTAL OUTPUT	241,796	1,209.1	*84%*
TOTAL VARIABLE COSTS	111,601	558.0	39%
GROSS MARGIN	**130,194**	**651.0**	61%
Labour	11,232	56.2	*17%*
Power and Machinery	59,426	297.2	*21%*
Admin	14,685	73.4	
Property	15,030	75.2	
Total Overheads	**100,373**	**501.9**	48%
Pre-Rent and Finance Surplus	29,821	149.1	
Rent	12,240	61.2	
Finance	4,235	21.2	
Rent and Finance	16,475	82.4	6%
Drawings (and Tax)	37,500	187.5	
TOTAL COST OF PRODUCT'N	**265,949**	**1,330**	
MARGIN FROM PRODUCTION	**-24,154**	**-120.8**	
Basic Payment	46,830	234.2	
BUSINESS SURPLUS	**22,676**	**113.4**	8%

Source: The Andersons Centre

5.2.2. Introductory Soils Standards Impacts – Large Meadow Farm

Table 5-2 shows the effect of the two Soils Standards on Large Meadow Farm. Like the Large Friesian Farm it has a mix of both Arable and Grassland Standards. The same comments apply that, in practice, costs might not be as high as shown because there would be the chance to combine some of the paperwork elements of the Soil Assessment.

Table 5-2: Breakdown of Introductory SFI 2022-Related Gains and Losses on Large Meadow Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*38*	*162*	***200***
Gains			
SFI Income (£22/£28 per Ha)	£839	£4,532	**£5,371**
Costs Saved	-	-	-
Total Gains	**£839**	**£4,532**	**£5,371**
Losses			
Income Foregone (GM Lost)	-	-	-
Additional SFI Costs	£290	£1,507	**£1,797**
Total Losses	**£290**	**£1,507**	**£1,797**
Net Gain / Loss	**£549**	**£3,025**	**£3,574**

Source: The Andersons Centre

Overall, there is a net gain from being in the SFI 2022 for the farm. The margin from the grassland soils standard is likely to attract interest from the proprietor. There is also a small positive gain from the Arable Soils Standard. While it may be questioned whether the proprietor of the farm would consider it worthwhile entering the Arable Soils Standard, for such low return, the overall gain may be increased further if efficiencies are made when completing paperwork, as mentioned above.

Looking at the financial performance as a whole, Table 5-3 shows the impact of the SFI on Large Meadow Farm under both a pre- and post-SFI scenario.

Of all the farm models, Meadow Farm is the most reliant on BPS for profit. With the BPS dropping by almost 37%, the farm moves from a position of making a reasonable business surplus to one facing a much narrower surplus. The relatively small amounts of funding available under the SFI 2022 Soil prescriptions does little to bridge the gap.

Table 5-3: Summary of the Impact of the Introductory SFI Standards on Large Meadow Farm

Parameter	Whole Farm (£)			Per Hectare (£)	
	Pre- SFI	Post-SFI	% Change	Pre- SFI	Post-SFI
LIVESTOCK OUTPUT	197,546	197,546		1,221	1,221
LIVESTOCK VC'S	96,149	96,149		594	594
LIVESTOCK GROSS MARGIN	**101,398**	**101,398**		**626**	**626**
CROPS OUTPUT	44,249	44,248		1,160	1,160
CROP VC'S	15,453	15,435		405	405
CROP GROSS MARGIN	28,797	28,797		755	755
TOTAL OUTPUT	241,796	241,796		1,209	1,209
TOTAL VARIABLE COSTS	111,601	111,601		558	558
GROSS MARGIN	**130,194**	**130,194**		**651**	**651**
Labour	11,232	11,232		56	56
Power and Machinery	59,426	59,426		297	297
Admin	14,685	14,685		73	73
Property	15,030	15,030		75	75
Total Overheads	100,373	100,373		502	502
Pre-Rent and Finance Surplus	**29,821**	**29,821**		**149**	**149**
Rent	12,240	12,240		61	61
Finance	4,235	4,235		21	21
Rent and Finance	16,475	16,475		82	82
Drawings	37,500	37,500		188	188
TOTAL COST OF PRODUCT'N	**265,949**	**265,949**		**1,330**	**1,330**
MARGIN FROM PRODUCTION	**-24,154**	**-24,154**		**-121**	**-121**
Basic Payment	46,830	29,598	-36.8%	**234**	148
SFI Income		5,371			27
Cost Savings		0			0
Additional Costs		-1,797			-9
Net SFI Benefit *(excl. Income Lost)*		*3,574*			18
Net 'Support' Income	46,830	33,172	-29.2%	**234**	**166**
BUSINESS SURPLUS	**22,676**	**9,018**	-60.2%	**113**	**45**
Net SFI Benefit (inc. Income Lost)		**3,574**			**18**

Source: The Andersons Centre * Income Lost/Foregone: has been incorporated into the Gross Margin figures under SFI, and therefore, is included within the post-SFI Business Surplus. Income Lost is also shown underneath the Business Surplus as is the Net SFI Benefit including Income Lost.

5.2.3. Intermediate Soils Standards Impacts – Large Meadow Farm

Table 5-4 shows the effect of the two Intermediate Soils Standards on Large Meadow Farm.

Table 5-4: Breakdown of Intermediate SFI 2022-Related Gains and Losses on Large Meadow Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*38*	*162*	***200***
Gains			
SFI Income (£40/£58 per Ha)	£1,525	£9,387	**£10,913**
Costs Saved	-	£1,153	**£1,153**
Total Gains	**£1,525**	**£10,540**	**£12,066**
Losses			
Income Foregone (GM Lost)	£255	£1,912	**£2,167**
Additional SFI Costs	£1,592	£3,425	**£5,017**
Total Losses	**£1,847**	**£5,337**	**£7,184**
Net Gain / Loss	**-£321**	**£5,203**	**£4,881**

Source: The Andersons Centre

For Large Meadow Farm the cost of complying with the additional requirements of the Intermediate Arable Soils Standard, over the requirements of the Introductory Standard, results in a loss. This is due to additional costs driven by the need to have 20% of the land entered into the Intermediate Arable Soils Standard under multi-species green cover over winter, as well as an element of income forgone. In order to enable this, 2.45 Ha of the winter barley is planted to spring barley. This is done as it has the minimum rotational and financial impact on Large Meadow Farm.

For the Intermediate Grassland Standard, the reduction in fertiliser application on 15% of the grassland following the introduction of a herbal ley (diverse sward) results in a loss of income, which marginally offsets the reduction in fertiliser spend.

Looking at the financial performance as a whole, Table 5-5 shows the impact of the SFI on Large Meadow Farm under both a pre- and post-SFI scenario.

Table 5-5: Summary of the Impact of the Intermediate SFI Standards on Large Meadow Farm

Parameter	Whole Farm (£)			Per Hectare (£)	
	Pre- SFI	Post-SFI	% Change	Pre- SFI	Post-SFI
LIVESTOCK OUTPUT	197,546	194,173	-1.7%	1,221	1,200
LIVESTOCK VC'S	96,149	93,534	-2.7%	594	578
LIVESTOCK GROSS MARGIN	**101,398**	**100,639**	**-0.7%**	**626**	**622**
CROPS OUTPUT	44,249	43,886	-0.8%	1,160	1,151
CROP VC'S	15,453	15,343	-0.7%	405	402
CROP GROSS MARGIN	28,797	28,542	-0.9%	755	748
TOTAL OUTPUT	241,796	238,058	-1.5%	1,209	1,190
TOTAL VARIABLE COSTS	111,601	108,877	-2.4%	558	544
GROSS MARGIN	**130,194**	**129,181**	**-0.8%**	**651**	**646**
Labour	11,232	11,232		56	56
Power and Machinery	59,426	59,426		297	297
Admin	14,685	14,685		73	73
Property	15,030	15,030		75	75
Total Overheads	100,373	100,373		502	502
Pre-Rent and Finance Surplus	**29,821**	**28,808**	**-3.4%**	**149**	**144**
Rent	12,240	12,240		61	61
Finance	4,235	4,235		21	21
Rent and Finance	16,475	16,475		82	82
Drawings	37,500	37,500		188	188
TOTAL COST OF PRODUCT'N	**265,949**	**263,225**	-1.0%	**1,330**	**1,316**
MARGIN FROM PRODUCTION	**-24,154**	**-25,167**	-4.2%	**-121**	**-126**
Basic Payment	46,830	29,598	-36.8%	**234**	148
SFI Income		10,913			55
Cost Savings		1,153			6
Additional Costs		-5,017			-25
Net SFI Benefit *(excl. Income Lost)*		*7,048*			35
Net 'Support' Income	46,830	35,496	-24.2%	**234**	**177**
BUSINESS SURPLUS	**22,676**	**10,327**	-54.5%	**113**	**52**
Net SFI Benefit (inc. Income Lost)		**4,881**			**30**

Source: The Andersons Centre * Income Lost/Foregone: has been incorporated into the Gross Margin figures under SFI, and therefore, is included within the post-SFI Business Surplus. Income Lost is also shown underneath the Business Surplus as is the Net SFI Benefit including Income Lost.

Notes: When modelling the impact of the SFI, all costs incurred under the SFI (variable and overhead costs) have been incorporated into the SFI Costs displayed at the bottom of this Summary Table. Accordingly, overhead costs are shown to remain consistent with the Pre-SFI situation.

5.2.4. Large Meadow Farm Break-Even Calculation

Large Meadow Farm stands to make a loss from entering the Intermediate Arable Soils Standard. This is due to the need for Large Meadow Farm to alter its rotation and bring in more spring cropping to comply with the requirement for multi-species green cover. In order to break-even on the Intermediate Arable Soils Standard, Large Meadow Farm would require a payment rate of £48.48 per hectare.

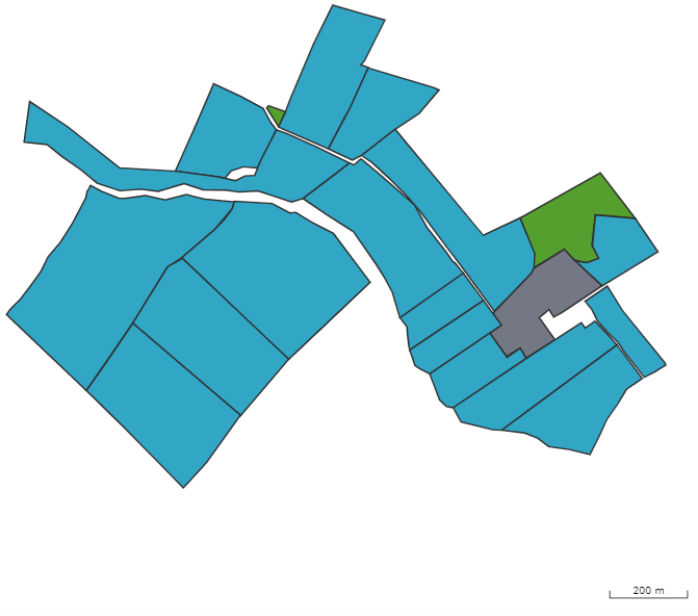
5.3. Small Meadow Farm

5.3.1. The Model and Base Profitability

Small Meadow Farm's key characteristics are summarised in Figure 5-2. Unlike its larger counterpart, Small Meadow Farm is entirely pasture-based and contains a Suckler Cow enterprise (52 Head) and a 30-head Bull Beef enterprise as well as a 432-head Spring Lambing Ewe flock producing 756 lambs per annum.

Figure 5-2: Andersons' Small Meadow Farm Model – Key Characteristics

Farm Type:	Lowland Grazing Livestock
Location:	East Midlands
Land Tenure:	74% owned/26% FBT
No. Suckler Cows	52 Head
Bull Beef	30 Head
Ewes	432 Head
Grassland Area	90 Ha
Woodland	3.6 Ha
Yards / Laneways	3.7 Ha
Total Area	**97.3 Ha**
Hedgerows	14,210 m
Watercourses	1,820 m
Livestock Output	***Assumed Prices***
Finished Steers (25 Hd)	361 ppkg
Finished Heifers (19 Hd)	362 ppkg
Finished Dairy Bulls (30)	342 ppkg
Finished Lambs (756)	426 ppkg
Cull Cows (7)	130 ppkg
Cull Ewes (82)	£55.33 per Head



Source: The Andersons Centre

As the data in Table 5-6 show, it achieves a higher output per hectare (£1,472) than Large Meadow Farm (£1,221 per Ha) by virtue of its higher stocking rate and greater focus on meat production. Due to its poorer economies of scale, particularly power & machinery and drawings, its production costs are higher (£1,570 per Ha versus £1,330 per Ha). However, from a profitability perspective, Small Meadow Farm still

fares slightly better, with an agricultural production loss of £98 per Ha (versus £121 per Ha). When the BPS is factored in, Small Meadow Farm generates a surplus of just over £134 per Ha (£12,150 across the farm).

Table 5-6: Small Meadow Farm – Financial Performance Summary

PARAMETER	£ Total	£ per Ha	% Gross Output (inc. Support)
LIVESTOCK OUTPUT	*132,443*	*1,472*	*86%*
LIVESTOCK VC'S	*62,715*	*697*	*41%*
LIVESTOCK GROSS MARGIN	***69,728***	***775***	***45%***
TOTAL OUTPUT	132,443	1,471	*86%*
TOTAL VARIABLE COSTS	62,715	697	41%
GROSS MARGIN	**69,728**	**775**	**59%**
Labour	5,500	61	*17%*
Power and Machinery	31,496	350	*21%*
Admin	7,342	82	
Property	6,586	73	
Total Overheads	50,924	566	46%
Pre-Rent and Finance Surplus	**18,804**	**209**	
Rent	5,520	61	
Finance	2,118	24	
Rent and Finance	7,638	85	5%
Drawings	20,000	222	
TOTAL COST OF PRODUCT'N	**141,277**	**1,570**	
MARGIN FROM PRODUCTION	**-8,834**	**-98**	
Basic Payment	20,989	233	
BUSINESS SURPLUS	**12,155**	**135**	8%

Source: The Andersons Centre

Key Notes and Assumptions

- Output and variable input prices essentially follow those of Large Meadow Farm.
- Depreciation rates have been lowered in several instances (e.g. from 20% to 15%) to take account of less intensive usage on some equipment.

5.3.2. Introductory Soils Standards Impacts – Small Meadow Farm

Table 5-7 provides a breakdown of the gains and losses associated with the deployment of the Introductory Grassland Soils Standard on Small Meadow Farm. There is a positive outcome from the Grassland Soils Standard.

The costs of complying with the Introductory Grassland Standard are greatly reduced from those modelled in the Part B report. This is due to both changes in the requirements and existing practices on Meadow Farm; such as the removal of stock before land becomes poached.

Table 5-7: Breakdown of Introductory SFI 2022-Related Gains and Losses on Small Meadow Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*0*	*90*	***90***
Gains			
SFI Income (at £28 per Ha)	-	£2,520	**£2,520**
Costs Saved	-	-	-
Total Gains	-	**£2,520**	**£2,520**
Losses			
Income Foregone (GM Lost)	-	-	-
Additional SFI Costs	-	£789	**£789**
Total Losses	-	**£789**	**£789**
Net Gain / Loss	-	**£1,731**	**£1,731**

Source: The Andersons Centre

Table 5-8 summarises the overall financial impact of the SFI and BPS deductions on Small Meadow Farm. This farm was already generating a production loss (£8,834) pre-SFI. Under the Introductory Standard there is no change in the margin from production.

Table 5-8: Summary of the Impact of the Introductory SFI Standards on Small Meadow Farm

Parameter	Whole Farm (£)			Per Hectare (£)	
	Pre- SFI	Post-SFI	% Change	Pre- SFI	Post-SFI
TOTAL OUTPUT	132,443	132,443	-	1,472	1,472
TOTAL VARIABLE COSTS	62,715	63,040	-	697	697
GROSS MARGIN	**69,728**	69,728	-	**775**	775
Labour	5,500	5,500		61	61
Power and Machinery	31,496	31,496		350	350
Admin	7,342	7,342		82	82
Property	6,586	6,586		73	73
Total Overheads	50,924	50,924		566	566
Pre-Rent and Finance Surplus	**18,804**	**18,804**	-	**209**	**61**
Rent	5,520	5,520		61	24
Finance	2,118	2,118		24	85
Rent and Finance	7,638	7,638		85	222
Drawings	20,000	20,000		222	307
TOTAL COST OF PRODUCT'N	**141,277**	**141,277**	-	1,570	1,570
MARGIN FROM PRODUCTION	**-8,834**	**-8,834**	-	**-98**	**-98**
Basic Payment	20,989	13,642	-35.0%	233	152
SFI Income		2,520			28
Cost Savings		0			0
Additional Costs		-789			-9
Net SFI Benefit *(excl Income Lost)*		*1,731*			*19*
Net 'Support' Income	20,989	15,373	-26.8%	**233**	171
BUSINESS SURPLUS	**12,155**	**6,539**	-46.2%	**135**	73
Net SFI Benefit (inc. Income Lost)		**1,731**			**19**

Source: The Andersons Centre

Even with improved figures versus the Part B report, the value of support from SFI, is doing little to offset a £7,347 loss in BPS through to 2023. Once more, this illustrates the precarious financial position of

small grazing livestock farms such as Small Meadow Farm. This is especially true when you consider there are further BPS declines to come and volatile output prices.

5.3.3. Intermediate Soils Standards Impacts – Small Meadow Farm

Table 5-9 provides a breakdown of the gains and losses associated with the deployment of the Intermediate Grassland Soils Standard on Small Meadow Farm. The is a positive outcome from the Grassland Soils Standard.

Table 5-9: Breakdown of Intermediate SFI 2022-Related Gains and Losses on Small Meadow Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*0*	*90*	***90***
Gains			
SFI Income (at £58 per Ha)	-	£5,220	**£5,220**
Costs Saved	-	£676	**£676**
Total Gains	-	**£5,896**	**£5,896**
Losses			
Income Foregone (GM Lost)	-	£1,161	**£1,161**
Additional SFI Costs	-	£1,938	**£1,938**
Total Losses	-	**£3,099**	**£3,099**
Net Gain / Loss	-	**£2,797**	**£2,797**

Source: The Andersons Centre

Table 5-10 summarises the overall financial impact of the SFI and BPS deductions on Small Meadow Farm.

Table 5-10: Summary of the Impact of the Intermediate SFI Standard on Small Meadow Farm

Parameter	Whole Farm (£)			Per Hectare (£)	
	Pre- SFI	Post-SFI	% Change	Pre- SFI	Post-SFI
TOTAL OUTPUT	132,443	130,294	-1.6%	1,472	1,448
TOTAL VARIABLE COSTS	62,715	61,052	-2.7%	697	678
GROSS MARGIN	**69,728**	69,243	-0.7%	**775**	769
Labour	5,500	5,500		61	61
Power and Machinery	31,496	31,496		350	350
Admin	7,342	7,342		82	82
Property	6,586	6,586		73	73
Total Overheads	50,924	50,924		566	566
Pre-Rent and Finance Surplus	**18,804**	**18,319**	-2.6%	**209**	**203**
Rent	5,520	5,520		61	24
Finance	2,118	2,118		24	85
Rent and Finance	7,638	7,638		85	222
Drawings	20,000	20,000		222	307
TOTAL COST OF PRODUCT'N	**141,277**	**139,613**	-1.2%	1,570	1,551
MARGIN FROM PRODUCTION	**-8,834**	**-9,319**	-5.5%	**-98**	**-104**
Basic Payment	20,989	13,642	-35.0%	233	152
SFI Income		5,220			58
Cost Savings		676			8
Additional Costs		-1,938			-22
Net SFI Benefit *(excl Income Lost)*		*3,957*			*44*
Net 'Support' Income	20,989	16,924	-19.4%	**233**	188
BUSINESS SURPLUS	**12,155**	**7,605**	-37.4%	**135**	84
Net SFI Benefit (inc. Income Lost)		**2,797**			**31**

Source: The Andersons Centre

The Intermediate Standard generates £2,797 of net benefit, including income foregone. This goes someway to offset the reduction in the BPS payment and could be an attractive option for lowland grazing farms. However, with a negative margin from production the cost of complying with the Standard could put off some farmers, particularly if payments for delivering the benefit are not prompt.

5.4. Implications For English Lowland Grazing Livestock Farming

The lowland grazing sector is the sector at highest risk as BPS payments taper. In 2023, BPS deductions will be in excess of 35%. Both the Introductory and Intermediate Soil Standards offer benefits for grazing farms, however, this net benefit of SFI is small relative to the income from BPS.

Where farms have arable land and establishing a multi-species green cover crop is required, for the Intermediate Arable Soils Standard, there is an increased cost and income forgone, which leads to a loss from the Standard for Large Meadow Farm.

The Grassland Standards offer more opportunities for lowland grazing farmers, and those with more extensive production are likely to see the greatest benefits, with a cost base spread over more land. This will minimise any income foregone from the Intermediate Standard.

One key thing to consider for grazing farms is the cost of implementing the Standards. With both the small and large Meadow Farm running at a loss from production, any scheme which requires upfront costs to be covered would be unattractive if payments are not prompt.

The BPS payments will continue to decline in increasing proportions after 2023. Any additional Standards introduced in that time are highly unlikely to make up the shortfall in BPS. Therefore, lowland grazing livestock farms are set to be in a poorer financial position. It must also be noted that, with the relatively low level of initial payments, many farms may not sign-up for the early years of the SFI – waiting for a more 'rounded' and lucrative scheme later.

The implications previously set-out for the dairying sector are also applicable to grazing livestock in that area-based payments pose difficulties for farm profitability. Again, it may make more sense to focus on actions and prescriptions delivered on a per animal basis (cow, steer, or ewe) rather than on a land basis.

6. SFI IMPACT – UPLAND FARMING

6.1. INTRODUCTION

As with the other livestock sectors, two model farms were also developed for the uplands to provide an assessment of how the SFI would affect larger and smaller upland farms.

It should be noted that the Large Hill Farm has an area of moorland which will be eligible for the Moorland and Rough Grazing Standard. However, these standards were not finalised at the time the analysis was undertaken and so was not included.

6.2. LARGE HILL FARM

6.2.1. The Model and Base Profitability

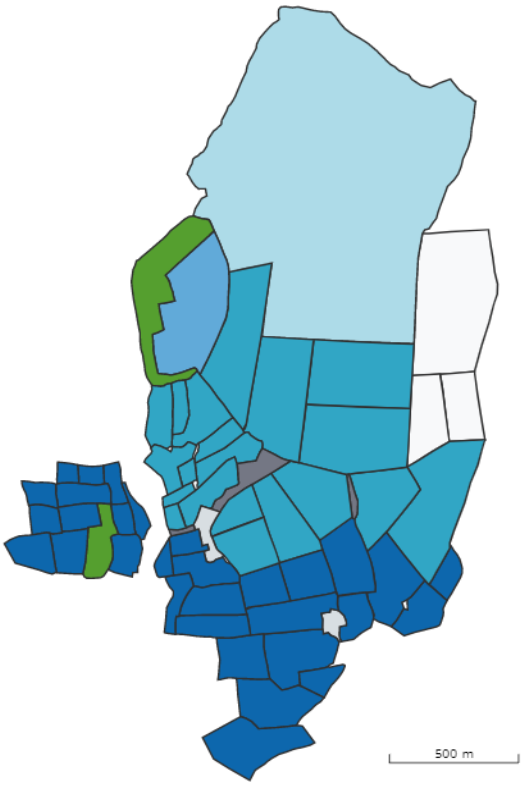
Andersons' Large Hill Farm has a farmed area of 300 Ha and is located in Northern England. It also has some additional woodland (10.5 Ha). Its key characteristics are summarised in Figure 6-1 below.

One-third of its farmed area (100 Ha) is Moorland and of the remaining 200 Ha, 50 Ha is categorised as being in a Severely Disadvantaged Area (SDA) with the remaining 150 Ha in non-SDA. Given its relatively high altitude, it has just 4.2Km of hedgerows and the majority of its field boundaries are stone walls (23.3 Km) which is typical of upland farms with significant areas of moorland.

It runs a suckler beef enterprise with 88 cows and aside from replacements (11 heifers per annum), all other progeny is finished. Its 808-ewe breeding flock produces 1,207 live lambs per annum. 153 ewe lambs are kept as replacements, an additional 95 ewe lambs are sold for breeding and the remaining 946 lambs are sold as finished.

Figure 6-1: Andersons' Large Hill Farm Model – Key Characteristics (pre-SFI)

Farm Type:	Upland Grazing Livestock
Location:	North West England
Land Tenure:	83% owned/17% FBT
No. Suckler Cows	88 Head
Ewes	808 Head
Permanent Pasture	102 Ha
Silaged Area	74 Ha
Semi-Improved Pasture	24 Ha
Moorland	100 Ha
Total Field Area	**300 Ha**
Woodland	10.5 Ha
Yards / Laneways	4.8 Ha
Total Area	**315.3 Ha**
Hedgerows	4,160 m
Stonewalls	23,250 m
Watercourses	4,290 m
Livestock Output	***Assumed Prices***
Finished Steers (38 Hd)	361 ppkg
Finished Heifers (14 Hd)	362 ppkg
Breeding Ewe Lambs (95)	£77.50 per Head
Finished Lambs (898)	426 ppkg
Cull Cows (11)	130 ppkg
Cull Ewes (153)	£55.33 per Head



Source: The Andersons Centre

Large Hill Farm's financial performance is summarised in Table 6-1. Unsurprisingly, its livestock output (£710 per Ha) is significantly below that of the Meadow Farms, as is its Gross Margin. Given that one-third of Large Hill Farm's area is Moorland, overhead costs are also substantially lower and equate to 42% of the corresponding costs on Large Meadow Farm. When Rent, Finance and Drawings are factored into consideration, this farm's total cost of production is £707 per Ha meaning that there is a production margin of just £3 per Ha.

When the BPS is added (note that the Moorlands have a significantly lower payment rate per Ha), the business surplus equates to £171 per Ha or almost £51,200 on a whole farm basis. Whilst better than both Meadow Farms insofar that a positive production margin has just about been achieved, it is very small and would quickly be reversed by a decline in prices.

Table 6-1: Andersons' Large Hill Farm Model – Financial Performance

PARAMETER	£ Total	£ per Ha	% Gross Output (inc. Support)
TOTAL OUTPUT	**213,001**	**710**	***81%***
TOTAL VARIABLE COSTS	107,471	358	41%
GROSS MARGIN	**105,530**	**352**	43%
Labour	8,670	29	*3%*
Power and Machinery	33,291	111	*11%*
Admin	11,335	38	
Property	10,491	35	
Total Overheads	**63,788**	**213**	**24%**
Pre-Rent and Finance Surplus	41,472	139	
Rent	7,550	25	
Finance	3,300	11	
Rent and Finance	10,850	36	4%
Drawings (and Tax)	30,000	100	
Rent, Finance and Drawings	40,850	136	
TOTAL COST OF PRODUCT'N	**212,109**	**707**	
MARGIN FROM PRODUCTION	**892**	**3**	
Basic Payment (BPS)	50,292	168	
BUSINESS SURPLUS	**51,184**	**171**	19%

Source: The Andersons Centre

6.2.2. Introductory Soils Standards Impacts – Large Hill Farm

A breakdown of the gains and losses from the Introductory Grassland Standard for Large Hill Farm is provided in Table 6-2.

Table 6-2: Breakdown of Introductory SFI 2022-Related Gains and Losses on Large Hill Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*0*	*176*	***176***
Gains			
SFI Income (at £28 per Ha)	-	£4,917	**£4,917**
Costs Saved	-	-	-
Total Gains	**-**	**£4,917**	**£4,917**
Losses			
Income Foregone (GM Lost)	-	-	-
Additional SFI Costs	-	£1,667	**£1,667**
Total Losses	**-**	**£1,667**	**£1,667**
Net Gain / Loss	**-**	**£3,250**	**£3,250**

Source: The Andersons Centre

A small gain is seen from Large Hill Farm entering the Introductory Grassland Soils Standard. The main cost associated with the Introductory Standard is the cost of soil assessment and management.

Table 6-3 summarises the combined impacts of the SFI and BPS deductions on Large Hill Farm.

BPS payments which are set to fall by 37% (over £18,600) by 2023 will also have a major impact on the bottom line. As is the case elsewhere, the SFI soils standards only compensates this to a minor extent.

Table 6-3: Summary of the Impact of the Introductory SFI Standard on Large Hill Farm

PARAMETER	Whole Farm (£)			Per Hectare (£)		
	Pre-SFI	Post-SFI	% Change	Pre-SFI	Post-SFI	% Change
TOTAL OUTPUT	213,001	213,001	0%	710	710	0%
TOTAL VARIABLE COSTS	107,471	107,471	0%	358	358	0%
GROSS MARGIN	**105,530**	**105,530**	**0%**	**352**	**352**	**0%**
Labour	8,670	8,670		29	29	
Power and Machinery	33,291	33,291		111	111	
Admin	11,335	11,335		38	38	
Property	10,491	10,491		35	35	
Total Overheads	63,788	63,788		213	213	
Pre-Rent and Finance Surplus	**41,472**	**41,472**	**0%**	**139**	**139**	**0%**
Rent	7,550	7,550	0%	25	25	0%
Finance	3,300	3,300		11	11	
Rent and Finance	10,850	10,850		36	36	
Drawings (and Tax)	30,000	30,000		100	100	
TOTAL COST OF PRODUCT'N	212,109	212,109	0%	707	707	0%
MARGIN FROM PRODUCTION	**892**	**892**	**0%**	**3**	**3**	**0%**
Basic Payment	50,292	31,646	-37%	168	105	-37%
SFI Income		4,917			16	
Cost Savings		0			0	
Additional Costs		-1,667			-6	
SFI Benefit *(excl Income Lost*)*		3,250			11	
'Support' Income (excl. Income Lost*)	50,292	34,896	-31%	168	116	-31%
BUSINESS SURPLUS	**51,184**	**35,788**	-30%	**171**	**119**	-30%
Net SFI Benefit (inc. Income Lost)		**3,250**			**11**	

Source: The Andersons Centre * Income Lost is reflected in the differences in Gross Margins (GM) between the Pre-SFI and Post-SFI situations. Note: when modelling the impact of the SFI, all costs incurred under the SFI (variable and overhead costs) have been incorporated into the SFI Costs displayed at the bottom of this Summary Table. Accordingly, overhead costs are shown to remain consistent with the Pre-SFI situation.

6.2.3. Intermediate Soils Standards Impacts – Large Hill Farm

A breakdown of the gains and losses from the Intermediate Grassland Standard for Large Hill Farm is provided in Table 6-4.

Table 6-4: Breakdown of Intermediate SFI 2022-Related Gains and Losses on Large Hill Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*0*	*176*	***176***
Gains			
SFI Income (at £58 per Ha)	-	£10,185	**£10,185**
Costs Saved	-	£3,447	**£3,447**
Total Gains	**-**	**£13,632**	**£13,632**
Losses			
Income Foregone (GM Lost)	-	£1,704	**£1,704**
Additional SFI Costs	-	£3,461	**£3,461**
Total Losses	**-**	**£5,165**	**£5,165**
Net Gain / Loss	**-**	**£8,468**	**£8,468**

Source: The Andersons Centre

As with the Introductory Standard, the Intermediate Standard provides a net gain for Large Hill Farm. The benefit is greater than that from the Introductory Standard and offsets some of the BPS losses as a result of the Agricultural Transition.

There is a smaller loss in output as a result of introducing a herbal ley (diverse sward) on Large Hill Farm than there is on the other farms in entering the Grassland Standard. However, this is considerably offset, by a reduction in the amount of fertiliser being applied. By not applying nitrogen fertiliser to the diverse sward, Large Hill Farm makes a cost saving of £1,744, including the income foregone as a result of reduced carrying capacity.

Table 6-5 below outlines the overall SFI and BPS impacts on Large Hill Farm.

Table 6-5: Summary of the Impact of the Intermediate SFI Standard on Large Hill Farm

PARAMETER	Whole Farm (£)			Per Hectare (£)		
	Pre-SFI	Post-SFI	% Change	Pre-SFI	Post-SFI	% Change
TOTAL OUTPUT	213,001	209,796	-1.5%	710	699	-1.5%
TOTAL VARIABLE COSTS	107,471	102,498	-4.6%	358	342	-4.6%
GROSS MARGIN	**105,530**	**110,469**	**1.7%**	**352**	**358**	**1.7%**
Labour	8,670	8,670		29	29	
Power and Machinery	33,291	33,291		111	111	
Admin	11,335	11,335		38	38	
Property	10,491	10,491		35	35	
Total Overheads	63,788	63,788		213	213	
Pre-Rent and Finance Surplus	**41,472**	**43,486**	**4.2%**	**139**	**145**	**4.2%**
Rent	7,550	7,550	0%	25	25	0%
Finance	3,300	3,300		11	11	
Rent and Finance	10,850	10,850		36	36	
Drawings (and Tax)	30,000	30,000		100	100	
TOTAL COST OF PRODUCT'N	212,109	207,136	-2.3%	707	690	-2.3%
MARGIN FROM PRODUCTION	**892**	**2,636**	**195.5%**	**3**	**9**	**195.5%**
Basic Payment	50,292	31,646	-37.1%	168	105	-37.1%
SFI Income		10,185			34	
Cost Savings		3,447			11	
Additional Costs		-3,461			-12	
SFI Benefit *(excl Income Lost*)*		10,171			34	
'Support' Income (excl. Income Lost*)	50,292	38,370	-23.7%	168	128	-23.7%
BUSINESS SURPLUS	**51,184**	**41,006**	-19.9%	**171**	**137**	-19.9%
Net SFI Benefit (incl. Inc. Lost)		**8,468**			**28**	

Source: The Andersons Centre * Income Lost is reflected in the differences in Gross Margins (GM) between the Pre-SFI and Post-SFI situations. Note: when modelling the impact of the SFI, all costs incurred under the SFI (variable and overhead costs) have been incorporated into the SFI Costs displayed at the bottom of this Summary Table. Accordingly, overhead costs are shown to remain consistent with the Pre-SFI situation.

6.3. Small Hill Farm

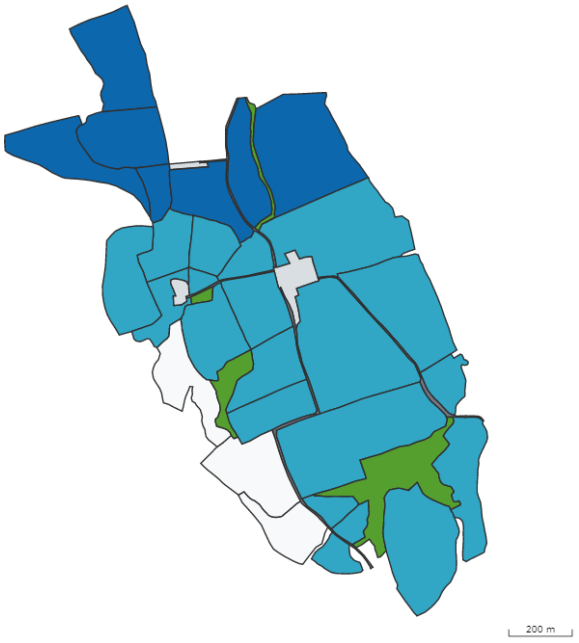
6.3.1. The Model and Base Profitability

Small Hill Farm is a 125 Ha holding but does not have any Moorland (as depicted in Figure 6-2). About 25% of its farmed area (31.3 Ha) is SDA land. There is also 7.6 Ha of woodland and nearly 14.5km of hedgerows.

As with its larger counterpart, all of its suckler progeny is finished (aside from replacements for the suckler herd). It also breeds all of its ewe replacements (76 Head) and each year 445 lambs are sold as finished with another 47 ewe lambs sold for breeding.

Figure 6-2: Andersons' Small Hill View Farm Model – Key Characteristics

Farm Type:	Upland Grazing Livestock
Location:	North West England
Land Tenure:	75% owned/25% FBT
No. Suckler Cows	57 Head
Ewes	400 Head
Permanent Pasture	82.6 Ha
Silage Leys	31.0 Ha
Low Input Pasture	11.4 Ha
Total Field Area	**125 Ha**
Woodland	7.6 Ha (7.4 Ha claimed)
Yards / Laneways	3.7 Ha
Total Area	**136.3 Ha**
Hedgerows	14,450 m
Watercourses	1,465 m
Livestock Output	***Assumed Prices***
Finished Steers (25 Hd)	361 ppkg
Finished Heifers (17 Hd)	362 ppkg
Breeding Lambs (47)	£77.50 per Head
Finished Lambs (445)	426 ppkg
Cull Cows (76)	130 ppkg
Cull Ewes (8)	£55.33 per Head



Source: The Andersons Centre

The farm's financial performance is summarised in able 6-4. Being smaller than its large counterpart, the overall output (and business surplus) is lower. However, without the area of moorland seen on the Large farm, the smaller unit is a more intensive enterprise and its output per Ha is higher. Being a smaller unit, it does not generate the same levels of economies of scale and its costs are higher on a per Ha basis. This results in Small Uplands farm having a lower Business Surplus. As with Large Hill Farm, the business is heavily reliant on the BPS to make its Business Surplus.

Table 6-6: Small Hill Farm – Financial Performance

	£ Total	£ per Ha	% Gross Output (inc. Support)
TOTAL OUTPUT	**123,209**	**986**	*82%*
TOTAL VARIABLE COSTS	69,018	552	46%
GROSS MARGIN	**54,182**	**434**	36%
Labour	5,375	43	*18%*
Power and Machinery	25,302	202	*17%*
Admin	9,087	73	
Property	7,183	57	
Total Overheads	46,947	376	31%
Pre-Rent and Finance Surplus	7,245	58	
Rent	4,681	37	
Finance	2,046	16	
Rent and Finance	6,727	54	4%
Drawings	22,200	178	
TOTAL COST OF PRODUCT'N	**144,892**	**1,159**	
MARGIN FROM PRODUCTION	**-21,682**	**-173**	
Basic Payment	27,646	221	
BUSINESS SURPLUS	**5,964**	**48**	4%

Source: The Andersons Centre

6.3.2. Introductory Soils Standards Impacts – Small Hill Farm

The effect of the Introductory SFI gains and losses are shown in Table 6-7.

Table 6-7: Breakdown of Introductory SFI 2022-Related Gains and Losses on Small Hill Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*0*	*125*	***125***
Gains			
SFI Income (at £28 per Ha)	-	£3,500	**£3,500**
Costs Saved	-	-	-
Total Gains	-	**£3,500**	**£3,500**
Losses			
Income Foregone (GM Lost)	-	-	-
Additional SFI Costs	-	£1,177	**£1,177**
Total Losses	-	**£1,177**	**£1,177**
Net Gain / Loss	-	**£2,323**	**£2,323**

Source: The Andersons Centre

Small Hill Farm generates a small gain from the Introductory Soil Standard. However, as outlined on the other farms, the sum of money is relatively small. It must be questionable whether farms will go to the bother of entering the scheme.

Table 6-8 shows the combined impact of the SFI and BPS reductions on overall farm performance.

Table 6-8: Summary of the Impact of the Introductory SFI Standard on Small Hill Farm

PARAMETER	Whole Farm (£)			Per Ha (£)		
	Pre-SFI	Post-SFI	% Change	Pre-SFI	Post-SFI	% Change
TOTAL OUTPUT	123,209	123,209	0%	986	986	0%
TOTAL VARIABLE COSTS	65,074	65,074	0%	521	521	0%
GROSS MARGIN	**58,136**	**58,136**	0%	**465**	**465**	0%
Labour	5,375	5,375		43	43	
Power & Machinery	25,302	25,302		202	202	
Admin	9,087	9,087		73	73	
Property	7,183	7,183		57	57	
Total Overheads	46,947	46,947		376	376	
Pre-Rent and Finance Surplus	**11,189**	**11,189**	**0%**	**90**	**90**	**0%**
Rent	4,681	4,681	0%	37	37	0%
Finance	2,046	2,046		16	16	
Rent and Finance	6,727	6,727		54	54	
Drawings	22,200	22,200		178	178	
TOTAL COST OF PRODUCT'N	**140,848**	**140,848**	0%	**1,128**	**1,128**	0%
MARGIN FROM PRODUCTION	**-17,738**	**-17,738**	0%	**-142**	**-142**	0%
Basic Payment	27,646	17,970	-35%	221	144	-35%
SFI Income		3,500			28	
Cost Savings		0			0	
Additional Costs		-1,177			-9	
Net SFI Benefit (excl Income Lost)		*2,323*			*19*	
Net 'Support' Income	27,646	20,293		221	162	
BUSINESS SURPLUS	**9,908**	**2,555**	-74%	**79**	**20**	-74%
Net SFI Benefit (incl. Inc. Lost)		**2,323**			**19**	

Source: The Andersons Centre * Income Lost is reflected in the Gross Margins (GM) differences between Pre- and Post-SFI. When modelling the impact of the SFI, all costs incurred under the SFI (variable and overhead costs) have been incorporated into the SFI Costs displayed towards the bottom of this Summary Table. Accordingly, overhead costs are shown to remain consistent with the Pre-SFI situation.

Small Hill Farm was already making a negative Margin from Production. With the sizeable reduction in the BPS, the overall business surplus before SFI would be just £232. The changes to support payments with the inclusion of SFI would keep Small Hill Farm in Surplus in 2023. However, with BPS payments continuing decline beyond 2023, Small Hill Farm will be severely tested by the changes going forward. In 2024 assuming no additional standards are entered Small Hill Farm would stand to make a total loss of £1,592.

6.3.3. Intermediate Soils Standards Impacts – Small Hill Farm

The effect of the Intermediate SFI gains and losses are shown in Table 6-9.

Table 6-9: Breakdown of Intermediate SFI 2022-Related Gains and Losses on Small Hill Farm

	Arable Soils Standard	Grassland Soils Standard	Overall
Area (hectares)	*0*	*125*	***125***
Gains			
SFI Income (at £58 per Ha)	-	£7,250	**£7,250**
Costs Saved	-	£2,233	**£2,233**
Total Gains	**-**	**£9,483**	**£9,483**
Losses			
Income Foregone (GM Lost)	-	£1,008	**£1,008**
Additional SFI Costs	-	£2,454	**£2,454**
Total Losses	**-**	**£3,462**	**£3,462**
Net Gain / Loss	**-**	**£6,021**	**£6,021**

Source: The Andersons Centre

Small Hill Farm generates a larger income from the Intermediate Grassland Standard than it does from the Introductory Grassland Standard. As with Large Hill Farm, there is a cost saving, driven by reduced nitrogen fertiliser application, following the introduction of the herbal ley.

The gain from entering the Intermediate Grassland Standard goes someway to offsetting the loss in BPS, in 2023. However, going forward this payment will not offset future falls in the BPS payment.

Table 6-10 shows the combined impact of the SFI and BPS reductions on overall farm performance.

Table 6-10: Summary of the Impact of the Intermediate SFI Standard on Small Hill Farm

PARAMETER	Whole Farm (£)			Per Ha (£)		
	Pre-SFI	Post-SFI	% Change	Pre-SFI	Post-SFI	% Change
TOTAL OUTPUT	123,209	121,152	-1.7%	986	969	-1.7%
TOTAL VARIABLE COSTS	65,074	61,792	-5.0%	521	494	-5.0%
GROSS MARGIN	**58,136**	**59,360**	2.1%	**465**	**475**	2.1%
Labour	5,375	5,375		43	43	
Power & Machinery	25,302	25,302		202	202	
Admin	9,087	9,087		73	73	
Property	7,183	7,183		57	57	
Total Overheads	46,947	46,947		376	376	
Pre-Rent and Finance Surplus	**11,189**	**12,413**	**10.9%**	**90**	**99**	**10.9%**
Rent	4,681	4,681	0%	37	37	0%
Finance	2,046	2,046		16	16	
Rent and Finance	6,727	6,727		54	54	
Drawings	22,200	22,200		178	178	
TOTAL COST OF PRODUCT'N	**140,848**	**137,666**	-2.3%	**1,128**	**1,101**	-2.3%
MARGIN FROM PRODUCTION	**-17,738**	**-16,514**	6.9%	**-142**	**-132**	6.9%
Basic Payment	27,646	17,970	-35.0%	221	144	-35.0%
SFI Income		7,250			58	
Cost Savings		2,233			18	
Additional Costs		-2,454			-20	
Net SFI Benefit (excl Income Lost)		*7,029*			*56*	
Net 'Support' Income	27,646	22,766		221	182	
BUSINESS SURPLUS	**9,908**	**6,253**	-36.9%	**79**	**50**	-36.9%
Net SFI Benefit (incl. Inc. Lost)		**6,021**			**48**	

Source: The Andersons Centre * Income Lost is reflected in the Gross Margins (GM) differences between Pre- and Post-SFI. When modelling the impact of the SFI, all costs incurred under the SFI (variable and overhead costs) have been incorporated into the SFI Costs displayed towards the bottom of this Summary Table. Accordingly, overhead costs are shown to remain consistent with the Pre-SFI situation.

As with the Introductory Standard, it is clear that the Intermediate Standard, while improving the situation for Small Hill Farm, is not sufficient to offset the declines in BPS. This is not surprising given it is the first of a raft of Standards to be published. However, the situation is starker for uplands farm who will see a negative balance over time as BPS is removed.

6.4. Implications for English Upland Farming

Small Hill Farm's situation is typical of many upland farms in England, making a loss from agricultural production, and relying heavily on support payments to remain viable. With BPS payments declining by 35% in 2023, and halving in 2024, without higher payment rates, upland farms are going to struggle.

As with the dairy and grazing livestock sectors, the above analysis highlights the difficulties posed by solely relying on area-based payments for the livestock sector. The livestock sector will face further challenges going forward, the Free Trade Agreement with Australia and pending FTA with New Zealand will test the viability of UK uplands farming to compete.

7. COMPARISON OF COMPLIANCE COSTS

The focus of this report has been on the costs of complying with the requirements of the Arable and Grassland Soil Standards as the SFI gradually replaces BPS. One area that also needs to be considered is the cost of compliance with BPS.

7.1. BPS COMPLIANCE COSTS

The costs of complying with the BPS are considered to be minimal. In order to receive area payments farmers in England must abide by the rules laid out in the Cross Compliance documentation, published by Defra[8].

Cross-compliance is made up of Statutory Management Requirements (SMRs) and Good Agricultural and Environmental Conditions (GAECs). SMRs are part of legislation and as such they have to be complied with whether the farmer is claiming BPS, SFI or no support. Therefore, the additional compliance costs for this element can be considered to be zero.

In terms of GAECs, eleven are set out in the cross-compliance rules;

- GAEC 1: Establish Buffer Strips Along Water Courses
- GAEC 2: Water Abstraction
- GAEC 3: Protect Groundwater
- GAEC 4: Provide Minimum Soil Cover
- GAEC 5: Minimise Soil Erosion
- GAEC 6: Maintain Soil Organic Matter
- GAEC 7a: Boundary Features
- GAEC 7b: Public Rights of Way
- GAEC 7c: Trees
- GAEC 7d: Sites of Special Scientific Interest
- GAEC 7e: Scheduled Monument

For the most part, complying with the GAECs comes at little to no additional cost. The main exception to this is GAEC 1. Establishing a two-metre buffer strip from the centre of water course will result in an element of income forgone, where land is taken out of production to facilitate this. However, the vast majority of farms will have margins wider than 2m in any case. Even in cases where wider margins have needed to be left, the fact that this land is at the margins of fields with lowest yields means that income foregone is considered to be only minimal.

The Agricultural Holding (Units of Production) (England) Order 2016, which prescribes units of production in order to assess the productive capacity of agricultural land in England, gives the cost of Cross-compliance at 2% of the BPS rate[9].

7.2. ADMINISTRATION COSTS

As well as compliance costs, there are administration cost for the BPS. This is the cost of making the annual application plus any inspections that result. These costs have not been quantified in this report – they would be included in the 'Admin' costs under Overheads in the Model Farms. There will be equivalent costs in applying for the SFI so the comparisons outlined in the previous section are believed to be 'fair'. Indeed, as a more complex scheme, it could be argued that the administration costs for the SFI will be higher than those for the BPS. Also, for a period of years, the two schemes will run in parallel

– for those farms that enter the SFI there will be effectively two sets of administrations costs. This has not been specifically accounted for in this analysis.

8. CONCLUSIONS AND FINAL REMARKS

Overall, the analysis of each farming sector shows that the Introductory and Intermediate Arable and Grassland Soils Standards combined with the BPS deductions result in a deteriorating financial position in all the model farms. This is summarised in Table 8-1 and 8-2.

Table 8-1: Summary of the Net Impact of the Introductory Arable and Grassland Soils Standards on Model Farms (Including BPS Loss)

Farm	Arable Soils Standard	Grassland Soils Standard	Overall SFI 2022 Effect	BPS Loss	Net Effect
Large Loam	£10,967	-	£10,967	-£63,465	-£52,498
Small Loam	£3,459	-	£3,459	-£17,155	-£13,696
Root Farm	£7,082	-	£7,082	-£40,100	-£33,018
Large Friesian	£214	£1,453	£1,667	-£10,162	-£8,495
Small Friesian	-	£802	£802	-£4,049	-£3,246
Large Meadow	£549	£3,025	£3,574	-£17,232	-£13,658
Small Meadow	-	£1,731	£1,731	-£7,347	-£5,616
Large Hill	-	£3,250	£3,250	-£18,646	-£15,397
Small Hill	-	£2,323	£2,323	-£9,676	-£7,353

Source: The Andersons Centre

Table 8-2: Summary of the Net Impact of the Intermediate Arable and Grassland Soils Standards on Model Farms (Including BPS Loss)

Farm	Arable Soils Standard	Grassland Soils Standard	Overall SFI 2022 Effect	BPS Loss	Net Effect
Large Loam	£8,116	-	£8,116	-£63,465	-£55,349
Small Loam	£2,509	-	£2,509	-£17,155	**-£14,647**
Root Farm	£5,183	-	£5,183	-£40,100	**-£34,917**
Large Friesian	-£125	£890	£765	-£10,162	**-£9,397**
Small Friesian	-	£1,201	£1,201	-£4,049	**-£2,848**
Large Meadow	-£321	£5,203	£4,881	-£17,232	**-£12,350**
Small Meadow	-	£2,797	£2,797	-£7,347	**-£4,550**
Large Hill	-	£8,468	£8,468	-£18,646	**-£10,179**
Small Hill	-	£6,021	£6,021	-£9,676	**-£3,655**

Source: The Andersons Centre

The combined impact of the Introductory and Intermediate Grassland and Arable Soils Standards generally deliver a net benefit to the farms modelled. It should be noted, that the Arable Soils Standard generally delivers a loss for livestock farms entering the Standard. This is primarily due to the cost of delivering multi-species green cover.

A key challenge for all farms will be the relatively low amount of money available under the Standards, in comparison to the declines being seen in the BPS payments. For larger businesses, payment rates on per hectare basis can build to deliver reasonable sums of money. However, smaller farms, particularly in the livestock sector, will receive quite small payments. This may be mitigated if the Standard incentivises a change to wider farming practices that improve business profitability. This is the case for the Small and Large Hill Farm, were reducing fertiliser used on grassland, due to the establishment of a herbal ley leads to a marginal benefit for the businesses.

It is worth pointing out that often, it is not the farms generating the greatest losses which will exit the industry. Such unprofitable farms have continued to operate for decades and due to lifestyle reasons, will continue to do so. More often, it is the farms that are quite productive, although still loss-making which are the first to exit. In some cases, these farms could potentially be turned around, if support is provided to help them to become more productive whilst transitioning to the new policy environment.

With payment rates at present low, relative to the loss in BPS in the same time frame, it has to be questioned whether the Arable and Grassland Soils Standards will be enough to incentivise a significant level of uptake. As with previous reports, it is suggested that farmers may well wish to wait to see how the 'early adopters' fare and for more Standards to be added to make the SFI, in the round, more worthwhile.

The Government's stated ambition for the uptake of SFI is 70% by 2028[10]. Whilst more Standards will be introduced as the BPS payment rate tapers to zero, the returns for the Introductory and Intermediate Arable and Grassland Soils Standards will pose a challenge for many businesses and challenge this ambition.

The grazing livestock sector, both lowland and upland, will be most severely affected by the loss of the BPS, due to inherent lack of profit from the farming activity. Businesses in this sector will be under significant financial pressure, likely amplified by the challenges posed by competition bought about by new Free Trade Agreements. It remains questionable whether large enough productivity improvements can be made to make businesses in these sectors financially sustainable.

ANNEX 1 – PROJECT METHODOLOGY

This project follows a similar methodology to that used in a previous project for the NFU in 2012, which looked at the effect of the Greening rules on English farming. For this project, the following methodological steps have been used;

1. **Develop 'base models' for each model farm in each farm sector.** This consisted of adapting the four existing core farm models which Andersons has developed over many years to account for three-year average prices. From there, additional model farms were developed for each sector. For example, from the core Loam Farm Model (i.e. Large Loam Farm) a smaller offshoot model farm (i.e. Small Loam Farm) was developed and a new model farm ('Root Farm') was constructed for general cropping.
    - Each model is built up as an actual farm business from physical parameters (yields, stocking rates etc). Financial costs are attached and a whole-farm budget is produced. This is done on spreadsheets so individual components can be easily changed.
    - Each model farm (including 'core' models and accompanying offshoots) was then reviewed, with input from consultants who have expertise in each sector to ensure that the costings and capital schedules etc. were appropriate and reflect the situation on English farms.
2. **Develop representative field layouts for each model farm:** as this was not a feature of the model farms before this project, representative farm maps encompassing field layouts, woodland, hedgerows and water courses were developed for each farm using specialist mapping software. These are shown in Chapters 3 to 6.
3. **Apply the SFI Soils Standards to each model farm:** with the base-year set up on the model farms with accompanying maps in place, the SFI Standards were then applied to the farms using the payment rates set-out in Defra's guidance. In addition, any changes in each model farm's physical attributes (e.g. areas lost to production due to reduced stocking rates etc.) were integrated into each model as were other key costs associating with implementing each Standard. The Standards applied to each model farm were the ones relevant to that particular sector.

    The combined effects of these changes on financial performance were then modelled. This was done on the basis of estimated gains and losses. In addition to the SFI payment rates (gain), this analysis included the following;
    - **Costs saved (gain):** covered operational costs which no longer need to be undertaken where each Standard (SFI Option) was deployed. This includes items such as fertiliser applications. Where applicable, the labour and machinery costs associated with these operations were also factored into consideration. Therefore, both variable and fixed costs were considered.
    - **Income foregone (loss):** the requirements of Standard could potentially require a change in farming practice – for example lower stocking rates, a change in rotation etc. An estimate of the lost Gross Margin as a result of this was compiled. This then contributed to the differences in the Gross Margins under the Pre and Post-SFI scenarios set out in Chapters 3 to 6.
    - **Additional costs (loss):** associated with the implementation of each Standard (e.g. soil sampling, planting cover crops etc.) were also compiled for each model farm.

Taken together, these gains and losses were integrated into 'SFI Overview' and 'Summary' worksheets for each model farm to show the impact that the SFI had on performance.

4. **Integrate the Phased-Down BPS payment levels into each model farm:** this was done by taking the base year payment levels (2020 BPS year) and applying reduction rates for 2023 as set-out by Defra for the Agricultural Transition. These reductions were then set against the farm's overall financial performance as outlined in the 'Summary' worksheets for each model farm.

Whilst the data required for the modelling exercise was provided by The Andersons Centre, the NFU provided input and commentary. Once the base models and maps were established, these were shared with the NFU and (where possible given the time constraints involved), feedback on the farm models being used and the associated assumptions were factored into consideration and refinements were made where necessary.

ANNEX 2 – SUMMARY OF COSTS AND INCOME FOREGONE FOR INTRODUCTORY STANDARDS

Element	Large Loam Farm	Small Loam Farm	Root Farm	Large Friesian Farm	Small Friesian Farm	Large Meadow Farm	Small Meadow Farm	Large Upland Farm	Small Upland Farm
Arable Soils Standard - Costs									
1. Soil Organic Matter Test	£572	£227	£432	£43	-	£54	-	-	-
2. Soils Assessment	£1,661	£714	£1,278	£205	-	£236	-	-	-
3. Green Cover	-	-	-	-	-	-	-	-	-
4. Organic Matter	-	-	-	-	-	-	-	-	-
Total Arable Costs	**£2,233**	**£941**	**£1,710**	**£248**	**-**	**£290**	**-**	**-**	**-**
Grassland Soils Standard - Costs									
1. Soil Organic Matter Test	-	-	-	£356	£130	£378	£184	£421	£292
2. Soil Assessment	-	-	-	£1,075	£457	£1,129	£606	£1,246	£886
3. Green Cover	-	-	-	-	-	-	-	-	-
4. Diverse Sward (Establishment)	-	-	-	-	-	-	-	-	-
Total Grassland Costs	**-**	**-**	**-**	**£1,431**	**£586**	**£1,507**	**£789**	**£1,667**	**£1,177**
Grassland Soils – Income Foregone									
1. Soil Assessment	-	-	-	-	-	-	-	-	-
2. Soil Structure	-	-	-	-	-	-	-	-	-
3. Green Cover	-	-	-	-	-	-	-	-	-
4. Diverse Sward (Yield Loss)	-	-	-	-	-	-	-	-	-
Total Grass Income Foregone	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
TOTAL COSTS & INCOME FOREGONE	**£2,233**	**£941**	**£1,710**	**£1,667**	**£586**	**£1,797**	**£789**	**£1,667**	**£1,177**

ANNEX 3 – SUMMARY OF COSTS AND INCOME FOREGONE FOR INTERMEDIATE STANDARDS

Element	Large Loam Farm	Small Loam Farm	Root Farm	Large Friesian Farm	Small Friesian Farm	Large Meadow Farm	Small Meadow Farm	Large Upland Farm	Small Upland Farm
Arable Soils Standard - Costs									
1. Soil Organic Matter Test	£572	£227	£432	£43	-	£54	-	-	-
2. Soils Assessment	£1,661	£714	£1,278	£205	-	£236	-	-	-
3. Green Cover	£13,651	£4,550	£9,091	£717	-	£1,302	-	-	-
4. Organic Matter	-	-	-	-	-	-	-	-	-
Total Arable Costs	**£15,884**	**£5,491**	**£10,801**	**£965**	**-**	**£1,592**		**-**	**-**
Grassland Soils Standard - Costs									
1. Soil Organic Matter Test	-	-	-	£356	£130	£378	£184	£421	£292
2. Soil Assessment	-	-	-	£1,075	£457	£1,129	£606	£1,246	£886
3. Green Cover	-	-	-	-	-	-	-	-	-
4. Diverse Sward (Establishment)	-	-	-	£1,051	£506	£1,919	£1,149	£1,794	£1,277
Total Grassland Costs	**-**	**-**	**-**	**£2,482**	**£1,093**	**£3,425**	**£1,938**	**£3,461**	**£2,454**
Arable Soils – Income Foregone									
1. Soil Organic Matter Test				**-**	**-**	**-**	**-**	**-**	**-**
2. Soil Assessment				**-**	**-**	**-**	**-**	**-**	**-**
3. Green Cover				**-**	**-**	£255	**-**	**-**	**-**
4. Organic Matter				**-**	**-**	**-**	**-**	**-**	**-**
Total Arable Income Foregone				**-**	**-**	**£255**	**-**	**-**	**-**
Grassland Soils – Income Foregone									
1. Soil Assessment	-	-	-	-	-	-	-	-	-
2. Soil Structure	-	-	-	-	-	-	-	-	-
3. Green Cover	-	-	-	-	-	-	-	-	-
4. Diverse Sward (Yield Loss)	-	-	-	**£5,393**	**£1,969**	**£1,912**	**£1,161**	**£1,704**	**£1,008**
Total Grass Income Foregone	**-**	**-**	**-**	**£5,393**	**£1,969**	**£1,912**	**£1,161**	**£1,704**	**£1,008**
TOTAL COSTS & INCOME FOREGONE	**£15,884**	**£5,491**	**£10,801**	**£7,875**	**£3,062**	**£7,184**	**£3,099**	**£5,165**	**£3,462**

ANNEX 4 – REFERENCES

[1] See: https://www.gov.uk/government/publications/sustainable-farming-incentive-how-the-scheme-will-work-in-2022/sustainable-farming-incentive-how-the-scheme-will-work-in-2022
[2] See: https://www.gov.uk/government/publications/agricultural-transition-plan-2021-to-2024
[3] See: https://www.gov.uk/government/publications/sustainable-farming-incentive-scheme-pilot-launch-overview/sustainable-farming-incentive-defras-plans-for-piloting-and-launching-the-scheme
And: https://www.gov.uk/government/publications/sustainable-farming-incentive-how-the-scheme-will-work-in-2022/sustainable-farming-incentive-how-the-scheme-will-work-in-2022#standards
[4] See: https://www.gov.uk/government/publications/sustainable-farming-incentive-how-the-scheme-will-work-in-2022/sustainable-farming-incentive-how-the-scheme-will-work-in-2022#standards
[5] See: https://www.gov.uk/government/publications/sustainable-farming-incentive-scheme-pilot-launch-overview/sustainable-farming-incentive-defras-plans-for-piloting-and-launching-the-scheme
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[7] See: https://www.gov.uk/guidance/the-sfi-improved-grassland-soils-standard#eligible-land-for-the-improved-grassland-soils-standard
[8] See: https://www.gov.uk/guidance/guide-to-cross-compliance-in-england-2022/print-or-download-this-guidance
[9] See: https://www.legislation.gov.uk/uksi/2016/1002/made#text%3D%28EC%20OR%20EU%29%20-%22European%20Communities%20Act%22
[10] See: https://www.gov.uk/government/publications/sustainable-farming-incentive-how-the-scheme-will-work-in-2022/sustainable-farming-incentive-how-the-scheme-will-work-in-2022