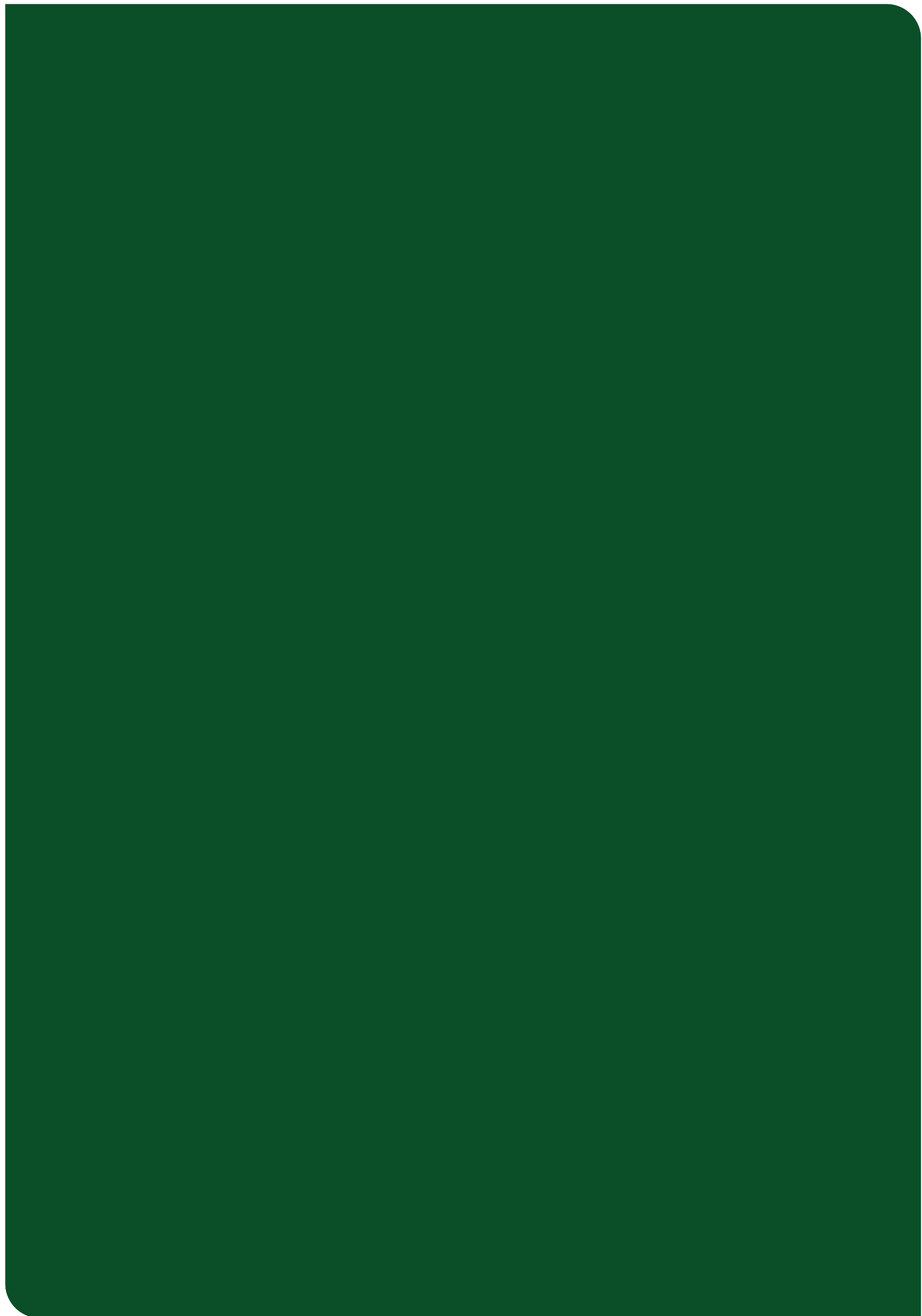




Increasing tree cover on dairy farms in England: The role of farmers' values





Increasing tree cover on dairy farms in England: The role of farmers' values

Research Report

Authors: Maddy Pearson and Stephen McConnachie

© Crown Copyright 2023



You may re-use this information (not including logos or material identified as being the copyright of a third party) free of charge in any format or medium, under the terms of the Open Government Licence.

To view this licence, visit: www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

This publication is also available on our website at: www.forestresearch.gov.uk/publications

First published by Forest Research in 2023

ISBN: 978-1-83915-025-8

Pearson, M and McConnachie, S. (2023).

Increasing tree cover on dairy farms in England: The role of farmer's values.

Research Report.

Forest Research, Farnham.

Keywords: Trees on farms; Agroforestry; Dairy farming; Values; Agriculture

Enquiries relating to this publication should be addressed to:

Forest Research

Alice Holt Lodge

Farnham

Surrey GU10 4LH

publications@forestresearch.gov.uk

Enquiries relating to this research should be addressed to:

Stephen McConnachie

Northern Research Station

Roslin

Midlothian EH25 9SY

07551 284 728

stephen.mcconnachie@forestresearch.gov.uk

Acknowledgments

Funded by the UK Government through Defra's Nature for Climate Fund programme.



Forest Research is Great Britain's principal organisation for forestry and tree-related research and is internationally renowned for the provision of evidence and scientific services in support of sustainable forestry. The work of Forest Research informs the development and delivery of UK Government and devolved administration policies for sustainable management and protection of trees, woods and forests. For more information visit: www.forestresearch.gov.uk

Forest Research will consider all requests to make the content of its publications available in alternative formats. Please send any such requests to publications@forestresearch.gov.uk

Contents

Executive summary	iv
Introduction	1
Project background	1
A map of farmers' values	1
Focus on dairy farming	2
Dairy farming in England	2
Methods	3
Sample and recruitment	4
Interview protocol and analysis	4
Survey	4
Results	5
General findings	5
A broad range of things matter to dairy farmers	5
Dairy farmers are future-oriented	5
Dairy farmers don't dislike trees	6
Opportunities to align tree cover expansion and dairy farming	6
Dairy farmers care deeply about the health of their cattle	6
Dairy farmers enjoy seeing trees in the landscape	7
Dairy farmers want to farm alongside the environment	7
Dairy farmers want to improve public perception of dairy farming	8
Barriers to tree cover expansion on dairy farms	9
The dairy farming way of life is demanding with little spare resources for activities beyond dairying	9
Producing food is a source of pride and is central to dairy farmer identity as well as being their livelihood	9
There are disconnects between tree planting incentives and dairy farming	10
Discussion	11
Key values relating to dairy farmers and trees	11
Selected important values and corresponding survey scores	11
Trees to complement the farm business	11
Livestock health and the interconnectedness of values	11
Farmers cannot always act in line with their values	12
Conclusion	12
References	13
Appendix 1 – interview guide	14

Executive summary

This Research Report explores the issues that matter to dairy farmers in England regarding trees and increasing tree cover on farms. It looks beyond financial considerations to explore the other factors which guide and shape farmer attitudes and behaviours in this area. Understanding the range of values held by farmers in relation to trees allows us to learn how, when and where farmers may embrace having trees on their land. This will better enable those working to design policies, incentives, tools, advice or other communications to do so in ways which are more likely to succeed in delivering enduring tree cover expansion on farms.

This research is informed by qualitative research conducted in 2022. The research identified 30 values that have the potential to influence farmers' behaviour in relation to trees, which were mapped across seven categories (farm business, social influence, food production, farm health, environmental values, landscape relationship and farming identity) (McConnachie *et al.*, 2022). The categories formed our values map, which provided a structure for interpreting the range of values that matter to farmers.

For this report, nine dairy farmers were interviewed in early 2023 using a semi-structured interview guide which was devised around the seven value categories. Participants were sampled to ensure that the pool represented a broad range in terms of farm size, tenure status, generational mix, gender, age and experience of agri-environment schemes. The farmers were predominantly based in southwest England, reflective of the geographic concentration of dairy farming in England.

We also draw on the results of an initial questionnaire survey with a sample of 393 farmers across England. Of these farmers, the findings of this report relate only to the 44 respondents who identified as primarily dairy farmers. The survey focused on 20 of the original 30 values, spread across the seven value categories, which our earlier research had suggested to be particularly important to farmers in general. The survey sought to explore the relative importance of these 20 values and the extent to which values under the seven categories might influence tree cover expansion.

Interview transcripts were analysed deductively and thematically in NVivo (data analysis software), using the values map as a guide. The values most and least aligned with increasing tree cover were identified. An Excel spreadsheet was then created which summarised insights and drew out key quotes from the preceding analysis.

We found that a broad range of issues matter to dairy farmers, including farm health, the environment and their relationship with the land. The dairy farmers we interviewed were future-oriented, demonstrating a strong concern for the sustainability of the farm and the business. They saw growing trees as complementary to dairying, not as a replacement livelihood strategy. Our research found that tree planting, establishment and maintenance is likely to have greater permanence if aligned with dairy farmers' existing values. We identified several opportunities for appealing to farmers when seeking opportunities to increase tree cover on their farms. The dairy farmers cared deeply about the health of their cattle. Appealing to this value in order to increase tree cover may be a particularly successful strategy, given the centrality of livestock both to the dairy business and to the farmers' identity and way of life. They valued supporting wildlife and being a custodian of the land and environment, and saw hedgerows and tree cover as contributing positively towards these areas. We also found that the farmers cared about how the public view dairy farming and recognised that incorporating trees could demonstrate to the public their care for the environment and their commitment to farming the 'right way'. The dairy farmers also cared about trees as part of a visually pleasing landscape. Appealing to this value may provide opportunities to enhance and expand hedgerows and trees, as well as to replace trees where they have been lost to disease.

Dairy farmers' desire to keep farming, their care for livestock and their focus on future planning offer avenues for trees to be incorporated as complementary entities. Incorporating trees in line with these interconnected values may also guarantee permanency in tree planting and maintenance as a valued part of the farm business that complements dairy farming, offering a long-term solution to the need for increased tree cover.

However, even where farmers' values align to encourage increasing tree cover, various factors limit their ability to act. Dairy farmers are operating in an increasingly uncertain landscape: many are facing financial instability and are working longer hours with less available labour. These interconnected constraints limit the available time and labour dairy farmers can devote to activities beyond their day-to-day work of dairying, which is their priority. This means that, while strategies to increase tree cover can be aligned with the values dairy farmers strongly hold, these strategies will not be successful if they do not find ways to mitigate or at least avoid adding to the challenges facing dairy farmers.

Introduction

Project background

This report forms part of a [project](#) exploring how farmers' values may impact ambitions to increase tree cover on agricultural land in England. The project seeks to understand what matters to farmers in England, looking beyond financial considerations to consider which other factors guide and shape farmer attitudes and behaviours in relation to trees. Developing an understanding of the range of values held by farmers in relation to trees enables us to learn how, when and where farmers may embrace having trees on their land. This will better enable those working to design policies, incentives, tools, advice or other communications to do so in ways which are more likely to succeed in delivering enduring tree cover expansion on farms.

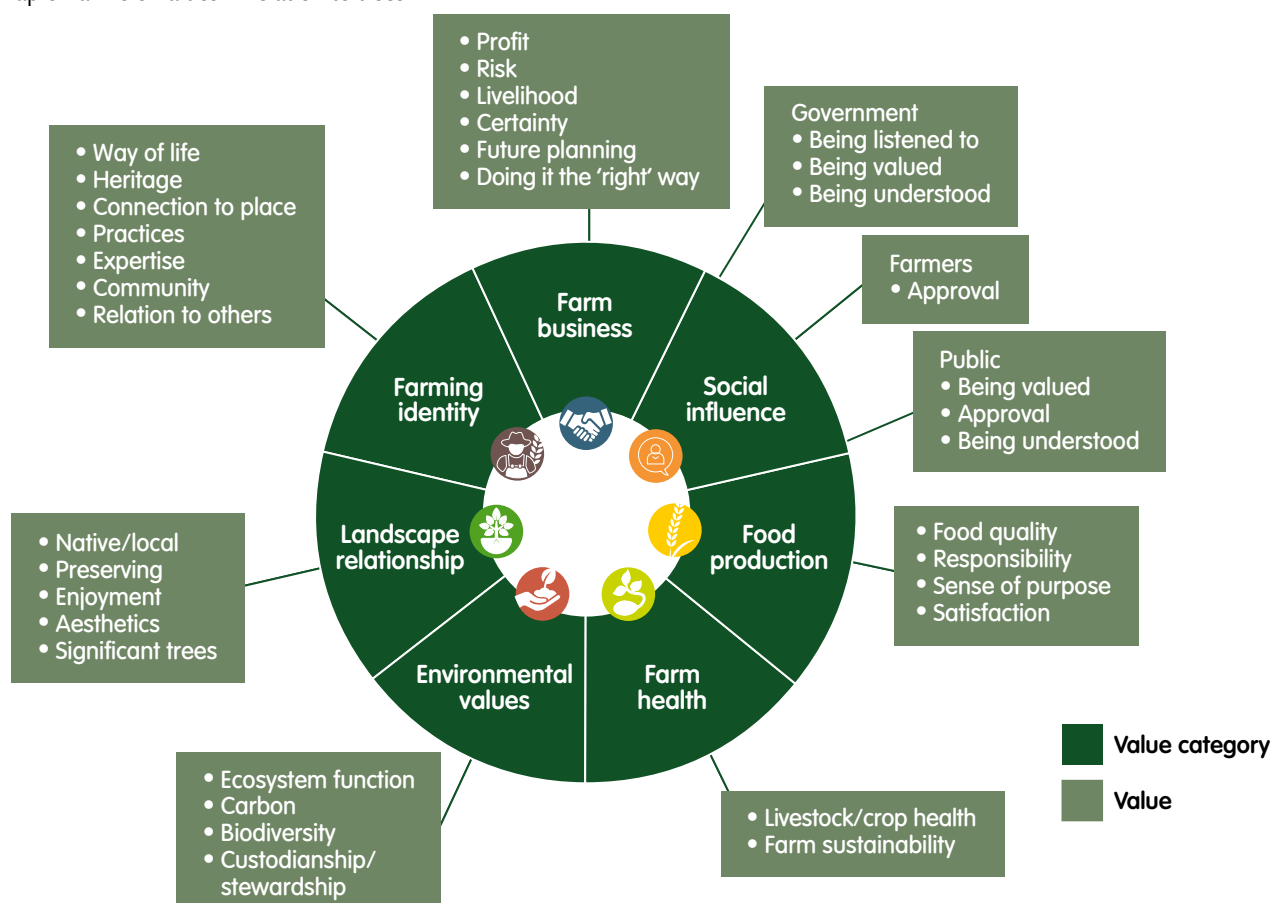
This report specifically considers the dairy farming context, focusing on outlining where dairy farmers' values present opportunities for, or barriers to, tree cover expansion. We first describe a map of farmers' values which guides and informs the research and has been developed as part of this project. We then explain the decision to focus on dairy farming and provide a brief overview of the industry in England. The methods section follows, before we turn to presenting and discussing the findings of the research.

A map of farmers' values

Through qualitative research conducted in 2022, we identified approximately 30 relevant values which may influence farmers' behaviour in relation to trees (McConnachie *et al.*, 2022). The research was based on interviews with 33 farmers from a variety of farm types, demographics and regions, with seven identifying as dairy farmers. We have grouped the values which were identified into seven categories: farm business, social influence, food production, farm health, environmental values, landscape relationship and farming identity.

The values map (Figure 1) provides a structure for considering the range of values that matter to farmers. The value categories are not discrete: values interlink and overlap extensively. Not all farmers will value every area on the map and, where they do, they may value them in different ways. For example, running the farm business in the 'right' way may mean something very different to each farmer. Refinement of the values map is ongoing. At this stage, we believe one of the most productive uses of the values map is to guide and inform further research focused on specific groups of farmers, thereby allowing for more specific insights and recommendations to be developed.

Figure 1 map of farmers' values in relation to trees



Focus on dairy farming

We elected to focus initially on dairy farmers, primarily following findings from a survey carried out as part of this project. The survey found that dairy farmers were one of two farmer types (alongside lowland grazing livestock farmers) who were most likely (68% likely or extremely likely) to plant trees in the next five years (Marshall *et al.*, 2023). This surprised our stakeholder group who, drawing on previous experience with dairy farmers, felt this farmer type were less likely to increase tree cover. Thus they felt this finding warranted further exploration.

These research questions guided our subsequent focus on dairy farmers:

1. Which of the values/value categories (from the values map) are most important to dairy farmers and why?
2. Which value categories hold more potential/less potential for targeting farmers in terms of increasing tree coverage?
3. What are the barriers to dairy farmers acting in relation to their values and how does this impact farmers' ability to increase tree cover?

Dairy farming in England

The dairy industry, and the agricultural sector more widely, is experiencing a period of uncertainty in England as it moves through the Agricultural Transition Plan (Defra, 2020). In 2022, there were 5,337 farm holdings in England classified by Defra as dairy farms, with a total farmed area on these holdings of 750,040 ha. Dairy farms are generally large in area compared to other farm types, with 54% (2,904) of holdings in 2022 over 100 ha and only 15% (811) under 50 ha. For comparison, only 10% of lowland grazing holdings, 17% of general cropping holdings and 50% of cereal holdings were over 100 ha in the same year. Of the total farmed area on dairy farms, 16,571 ha were classified as 'farm woodland', which includes woodland used for grazing but excludes orchards and short rotation coppice (Defra, 2022). This means that around 2% of the total farmed area on dairy farms is covered by farm woodland, which is the joint lowest amongst the nine farm types alongside pig farms and less favoured area (LFA) grazing (Table 1). Across dairy farms in England, average herd sizes have been increasing, from 125 head per holding in 2010 to 166 in 2021 (Agriculture and Horticulture Development Board, 2022). The majority of farms with cattle in England (87% in 2019) provide all or part of their herd with access to pasture during the summer months and house the herd indoors during the winter (Defra, 2019).

Table 1 Farm woodland areas compared to total farmed areas by farm type using Defra June Survey of Agriculture data (2022)

Farm type	Total farmed area (ha)	Farm woodland area (ha)	Farm woodland proportion
Dairy	750,040	16,571	0.02
Cereals	2,977,997	123,073	0.04
General cropping	1,615,174	109,016	0.07
Horticulture	160,350	9,115	0.06
Specialist pigs	80,866	1,999	0.02
Specialist poultry	85,106	3,426	0.04
Grazing livestock (–LFA)	1,266,889	31,037	0.02
Grazing livestock (Lowland)	1,318,392	61,771	0.05
Mixed	836,762	32,048	0.04

Note: farm woodland proportions have been calculated based on Defra data.

A breakdown of farm business income provided by Defra shows that, compared to other farm types, dairy farms have higher average income from agriculture (Figure 2). Further, as a proportion of their income, dairy farms are generally less reliant on the UK Government's Basic Payment Scheme (BPS), less engaged in agri-environment schemes and less likely to pursue diversification than other farm types (Figure 3) (Defra, 2023).

Figure 2 Cost Centre breakdown for farm business income by farm type, 2021/22 (figure reproduced from Defra, 2023)

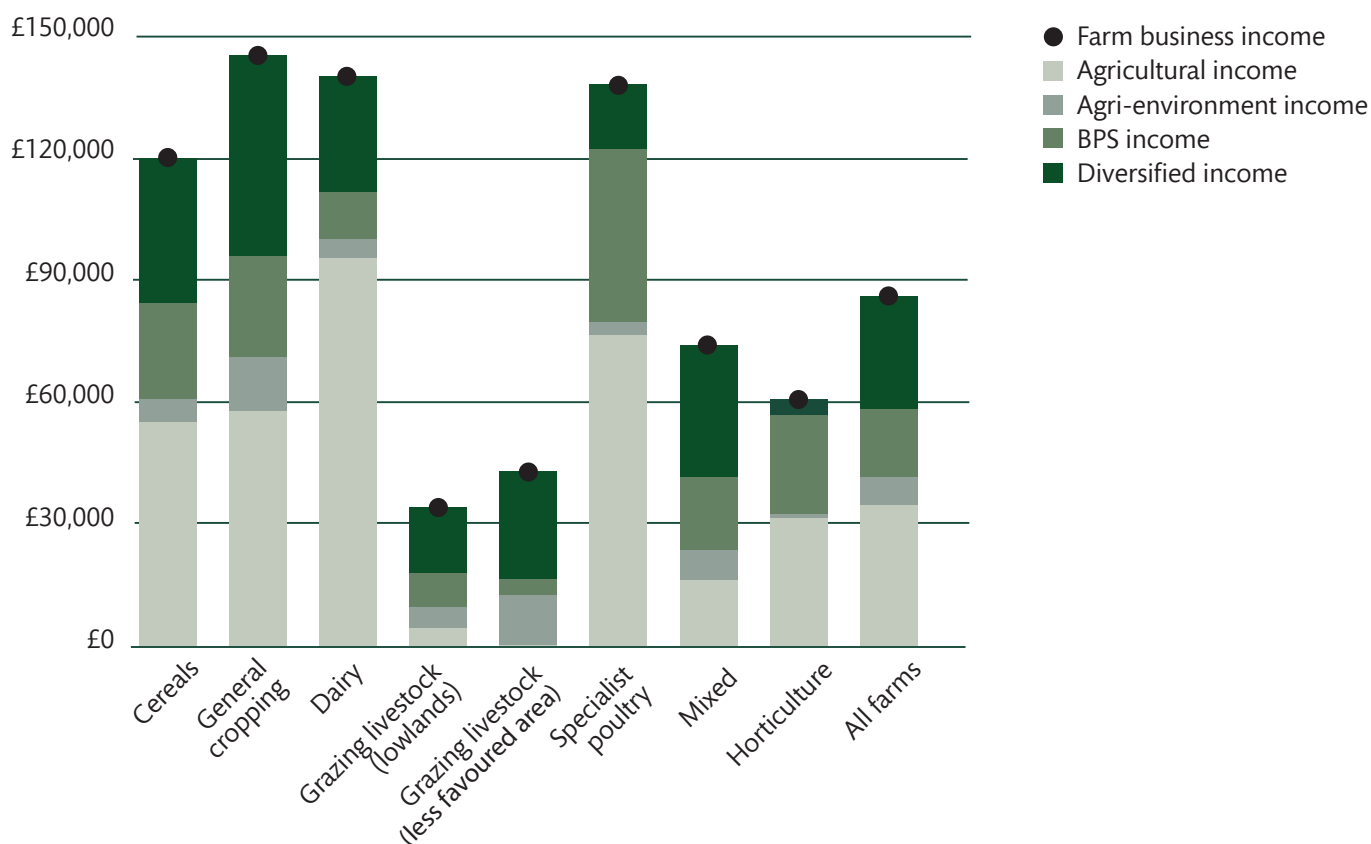
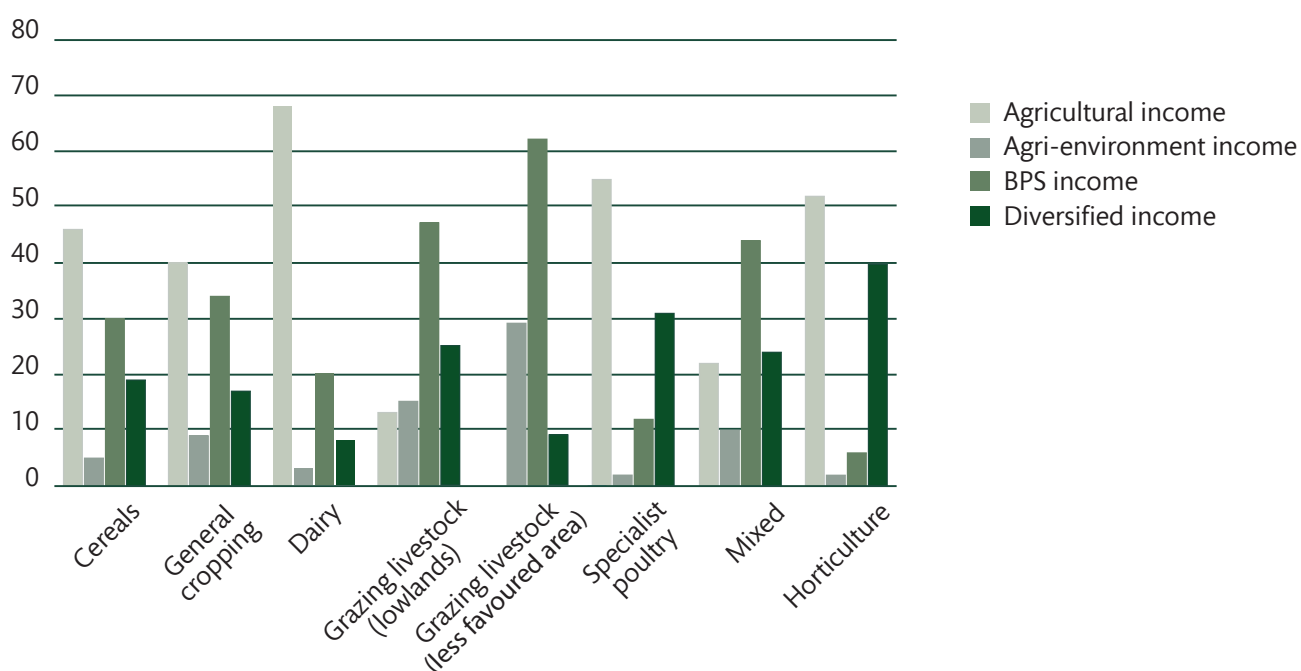


Figure 3 Proportions of income from different cost centres by farm type (Defra, 2023)



Methods

The research design for this study was informed by interview research from 2022, with particular attention paid to dairy farmers' responses in these earlier interviews (McConnachie *et al.*, 2022). The design was also guided by results from a survey of farmers in England, further details of which are given later in this section. In this paper, we report primarily on findings drawn from nine new interviews conducted with dairy farmers, supported by direct quotes from the participants, as well as results from the survey. All participants have been anonymised and pseudonyms are used throughout.

Sample and recruitment

We interviewed nine dairy farmers in early 2023 selected from the original survey participants. These nine participants were sampled to ensure that the pool represented a broad range in terms of farm size, tenure status, generational mix, gender, age and experience of agri-environment schemes. Interviewees were predominantly based in the southwest of England, which is reflective of the geographic concentration of dairy farming in England.

The dairy farms included in the sample ranged in size from 100 to 500 ha and are therefore reflective of the majority of dairy farms in England. Herd size varied from 130 to 800 head (average in England in 2021 was 166). On average, the farmers in the sample overwintered cattle for between six and seven months. One of the participants outwintered nearly 50% of their cattle and was the only farmer in the sample to overwinter only a portion of the herd.

Interviewees reported a range of feeding arrangements: some farmers were self-sufficient in feed while others also bought in feed to supplement crops grown on-site. All farmers, however, included some element of pasture feeding. Further details of the participants are provided in Table 2.

Table 2 Characteristics of dairy farmers from 2023 interviews

Pseudonym	Age	Gender	Generation	Tenure	Region
Allan	50+	M	Established	Owned	SE
Andy	35-50	M	Established	Mixed	SW
George	50+	M	Established	Mixed	SW
Henry	50+	M	Established	Rented	NW
Ian	50+	M	Established	Rented	SW
Jeff	35-50	M	New entrant	Mixed	SW
Julie	50+	F	Established	Owned	SW
Roger	50+	M	Established	Mixed	SW
Sarah	50+	F	Established	Mixed	SW

Interview protocol and analysis

Two researchers developed a semi-structured interview guide (Appendix 1) centred around the seven value categories outlined above (Figure 1). Questions were devised to validate and elicit deeper understanding of the value categories and particular values that had emerged as being important to dairy farmers in the interviews and survey in 2022. Interviews were conducted by video or telephone call with one of the two researchers and lasted between thirty and seventy minutes.

Interview transcripts were deductively and thematically analysed against the values map by one researcher using Nvivo (data analysis software). This researcher identified the values most aligned to increasing tree cover (presented as opportunities), as well as those where they did not align (presented as barriers). A spreadsheet was then created which summarised the central insights and drew out key quotes from the preceding analysis. Following this two-stage process of analysis, the research project team met to discuss the themes and insights that emerged.

Survey

In autumn 2022 we surveyed a sample of 393 farmers across England. Of these farmers, the results presented here relate only to the 44 respondents who identified as primarily dairy farmers. The research team selected 20 of the original 30 values, spread across the seven value categories, which our earlier research had suggested to be particularly important to farmers in general. The survey sought to explore: a) the relative importance of these 20 values, and b) the extent to which values under the seven categories might influence tree planting.

We asked about the values in two main ways, each using an 11-point likert scale (where 0 = 'not important at all' and 10 = 'extremely important'). One question aimed to explore the potential influence that values may have on tree planting: each value category was presented as a consideration, such as 'the ongoing sustainability and functionality of the farm', and participants were asked to rate how important they felt this would be to them when considering tree planting on their land. The wording for each value category is presented in Table 3. The other question sought to explore the relative importance of the 20 values by asking participants to score them 'in terms of how important they are to you as a farmer'. The wording for selected values is provided in Table 4. Further details regarding the survey can be found in the survey highlights report (Marshall *et al.*, 2023).

Results

In the following section, key insights from the interviews and survey are presented. Firstly, they are presented in terms of how they relate to dairy farmer values in general, followed by sections presenting findings which relate to opportunities for and barriers to increasing trees on agricultural land.

General findings

Here we report our findings relating to dairy farmer values in general. We draw together survey scores and excerpts from the nine interview participants.

A broad range of things matter to dairy farmers

A broad range of things matter to dairy farmers in addition to business concerns, including farm health, the environment and their relationship with the land. Table 3 shows the mean scores assigned to the seven value categories by the surveyed dairy farmers when considering tree planting (on a scale of 0-10).

All seven categories were shown to be important to participant dairy farmers, although farm health, farm business, environmental values and landscape relationship scored particularly highly. This suggests that it would be beneficial to explicitly consider these values when seeking opportunities to increase tree cover on dairy farms. Developing policy, mechanisms, messaging and advice which speaks to dairy farmers' existing values is likely to lead to more successful interventions.

Table 3 Value categories and mean survey scores

Value category	Survey wording	Score
Farm health	The ongoing sustainability and functionality of the farm	8.8
Farm business	Running a good business	8.4
Environmental values	Concern for the state of the wider environment	8.3
Landscape relationship	How the landscape looks and feels and how it should look and feel	8.3
Farming identity	The farming way of life, being part of a farming community, respecting tradition and ways of doing things	7.3
Food production	Producing food	7.3
Social influence	Caring what others think, feeling valued, being listened to	7.0

Dairy farmers are future-oriented

'You're constantly thinking about it. Seasonally and also annually you review what you've done and you're looking to the future, thinking what you can do to improve things and also that you're doing the right thing.' **Ian**

The dairy farmers we interviewed were future-oriented, demonstrating a strong concern for the ongoing sustainability of the farm and the business. As Ian explains, this is something he believes dairy farmers think about 'constantly'. For Julie, sustainability is paramount and 'it means it's profitable. It also means that you've got healthy soil. It means that you actually look like you've got a future'.

Our participants' future orientations extend beyond sustainability from a farm health perspective to include succession. For Roger, 'the older I'm getting, the more I have to plan for the future'. He needs to make sure his son is happy with his decisions and investments as in ten years' time his son would be the one running the farm. Julie shared this sentiment in relation to her children: 'I'm thinking all the time about how we can accommodate both of them. So that might mean a bit of diversification in the future'.

Related values



Farm business: future planning



Farm health: farm sustainability

The dairy farmers we spoke to feel that, contrary to previous generations, familial succession is less of a given. Henry finds himself nearing retirement with a profitable business and no successor. He thinks about the future 'every day, because I don't know what the future is'. He thinks 'the decision making would be easier' if he had a son or daughter interested in the business 'because I know I'd be investing for the future'. Regardless, Henry maintains that he would like the land to remain a farm in the future. George is in a different situation to Henry but is also deeply concerned about the future: George's dairy farm is no longer financially viable. He explains, 'I did partake in a future proofing of the business through a Defra grant where a consultant came and suggested how I should move forward. A robot would milk the cows more intensively – five times a day instead of twice. I just couldn't bring myself to do that'.

Thus, while the dairy farmers we interviewed are future-oriented and concerned for the sustainability of their farms and businesses, other related considerations, such as livestock welfare and what they perceived to be the 'right' way of dairy farming, are also important. These additional values can impact and restrict what farmers may be willing to do or change about their business even in the face of financial difficulty, as was the case in George's example.

Dairy farmers don't dislike trees

The dairy farmers we interviewed enjoyed trees on their land and many plan to plant trees in the future. 68% of the surveyed dairy farmers indicated a likelihood to plant trees within the next five years (23% 'extremely likely'), with 66% having added trees in the past five years. Of those who had already planted trees, top reasons cited for having done so include 'to benefit wildlife' (57%), 'hedgerow expansion' (41%) and 'to benefit livestock' (27%). However, as illustrated below, the dairy farmers interviewed expressed a desire for trees to complement their dairy activities rather than act as a replacement livelihood strategy.

Our interviews provided the opportunity to explore the reasons why dairy farmers may value trees on their land. Additionally, they enabled us to investigate some of the trade-offs that must be made by dairy farmers when considering the benefits and disadvantages of increasing tree cover. Henry explained that he likes planting trees because 'it's good for the environment' but he doesn't view tree planting as beneficial to the farm, stating that 'it's nicking land'. He went on to say, 'but they look nice and when you die you want to have left the place better'. Julie feels that 'of all the things I've done since I started farming here, planting those trees and seeing them grow and mature is the most satisfying thing'. She enjoys walking through the trees and listening to the wildlife. The trees are also important to her in providing cover for social game shoots with friends.

Opportunities to align tree cover expansion and dairy farming

In the section that follows, we explore three notable opportunities that emerged from our research for farmers' existing values to align with attempts to increase tree cover on farmland.

Dairy farmers care deeply about the health of their cattle

'The healthier your cows are, for me it's just absolutely everything.' **Roger**

The dairy farmers we interviewed care deeply about their cattle. They told us that working with these animals is an integral part of what they do and why they do it. Of course, livestock health has clear business benefits, but our interviewees' care for their cattle's wellbeing extends beyond this. For Julie, 'health of the herd is paramount. If there's a problem going on out there, it just drags you down. And it's expensive'. Roger also feels this sense of responsibility and deep care, explaining, 'if they're not healthy I'm making phone calls to people saying, "Come over and tell me what's going on. What am I doing wrong? What can we do to improve it?"'. Sarah agrees, saying, 'to see a cow suffering because you did something wrong... or even if you didn't, you know, it affects you. It's not just about a business and making money; you've got to do it right'.

Related values



Farm business: profit; doing it the 'right' way



Social influence: what other farmers think



Food production



Farm health: livestock health



Landscape relationship: aesthetics



Farming identity

Some of the dairy farmers interviewed feel that trees can have a positive impact on the health of livestock and the farm. Andy explains, 'a tree takes 50 gallons of water a day, and you know on our land that helps to drain it'. He goes on to explain the positive impact this has on cattle: 'With the

shelterbelts we've got, if we were to cut them down, our land would be wetter and we wouldn't have the shelter outside, so at the first bit of rain we'd have to bring the cows inside'. Andy notes further positive impacts of trees for cattle health in terms of shelter and shade; talking fondly about three in-field trees, he says 'one's a double oak and the kids used to sit in the middle... the cows were sheltering under them in the summer, so they provide a practical shade under there. When the weather gets wetter and colder, they're sheltered by the trees and the hedges in between as well'.

Care for cattle and their health and farmer recognition of the part trees can play in promoting and sustaining this presents an opportunity to champion the expansion of tree cover on dairy farms. Appealing to this and demonstrating how trees are already working for some dairy farmers could help demonstrate to other farmers the benefits of trees for their animals.

While recognising this opportunity, it is important to note that not all farmers are convinced that trees have a role in promoting cattle health. For example, Allan felt trees were important as part of the environment but in terms of positive contributions to dairy farming he felt 'it's not a lot... that's sort of irrelevant really'. Henry was concerned about trees as 'flies tend to hang around trees and you want to stop your animals being bothered by flies'. It may be important to address such concerns when engaging farmers to consider tree cover expansion.

Dairy farmers enjoy seeing trees in the landscape

'It's the reason we do it. Every day we get up and think, "How lucky are we to live here?" It's very picturesque, on a nice day. The trees are important because they give everywhere character.' **Julie**

The dairy farmers we interviewed feel a strong sense of attachment to their land and they may value trees as part of the landscape for several reasons. Jeff enjoys the 'variation during the year of how trees look. It breaks up and creates the landscape we've got', while George describes trees as 'something I draw pleasure from. Outside my lounge window I can see a sycamore tree. It's massive, it's stood there for hundreds of years'.

The enjoyment that the dairy farmers we spoke to take from seeing trees in the landscape is reflected in their attitude to tree removal by previous farmers. For Allan, trees are 'all part of the bigger picture'. He said, 'The person who owned it before just ripped out every hedge there was. I've got a plan to replant some of the hedges because it just looks horrible. The hedges are there for a reason'. Henry agreed,

'it's just a case of improving the view really. They've been cleared over the years for agriculture and I think some of them can be put back'. Some dairy farmers want to replace trees lost to ash dieback and Dutch elm disease. For Ian, this is a question of 'what trees we replace those trees with and how we replace them. If you've got an existing hedge, it's more difficult to put a tree in it'.

Related values



Farm business: profit; doing it the 'right' way



Farm health



Environmental values



Landscape relationship: aesthetics



Farming identity: way of life

There are opportunities to enhance and expand tree cover on dairy farms by appealing to farmers' care for trees as part of a visually pleasing landscape aesthetic. This is especially the case with regards to hedgerows and in-hedge trees, as well as where trees have been lost to disease. The dairy farmers we engaged with appreciated trees in the landscape but, as Ian makes clear, 'they have to be in the right place. They have to work with us, and they have to be the right trees to look right'. What counts as aesthetically 'right' can vary significantly between dairy farmers as this is culturally and locally informed. Because of this, the aesthetic benefit of trees may offer more or less potential to increase tree cover depending on the geographic location. Additionally, although dairy farmers may be open to increasing tree cover, what they perceive as 'right' in relation to this may not align with the size and scope of government ambitions.

Dairy farmers want to farm alongside the environment

'I suppose we are custodians of the countryside. We want to keep it in as fine fettle as we possibly can.' **Julie**

The dairy farmers we spoke to see themselves as custodians of the land, which means 'farming alongside the environment' (Jeff). However, farming alongside the environment means different things to different farmers. For some, it means ensuring space for wildlife alongside running a productive, commercial farm or ensuring existing wildlife is not diminished by farming practices. Some of the dairy farmers have tried to address this through enlisting in

agri-environment schemes, while Sarah has become more engaged with the environment by joining her local Farming and Wildlife Advisory Group. She finds it exciting to be made aware of priority species on the farm, saying, 'you start to say "okay, I will consciously manage for that"'. Allan has joined a group who are 'farming in conjunction with the environment as good as we can'. For other dairy farmers, custodianship has always been integral to practice in that environmental and farm business values go hand-in-hand. As Roger explains:

My cows are first. After that, at what point is it environmental and at what point is it me farming? If I've got crops growing well with less spraying or artificial fertiliser, that's good for the farming but it's also good for nature.

Some of the dairy farmers we spoke to were concerned about pollution. George feels that his 'number one interaction with the environment' is spending 'most of the time battling to keep slurry out of the water courses and on the fields'. Allan farms 'to make a profit'. He has a stream at the back of the farm and is 'very careful' to keep slurry out, explaining that he does not want to profit at the expense of the environment. George is similarly minded, recognising that when it comes to the 'environmental aspects of dairy farming now, slurry storage is of paramount importance'. Trees and hedges can reduce nutrient run-off from fields, which can reduce the likelihood of water course pollution; discussing this benefit with farmers who are concerned about pollution could encourage more such planting.

Some of the dairy farmers we interviewed recognised a central role for trees in supporting wild animals and their related ecosystems. Andy feels that working with the environment is 'how we farm. The shelterbelts, that's where the herons nest, and you've got smaller birds nesting. They're getting the berries and that, getting their feed from the shelterbelts rather than eating the crops'. George similarly explains, 'an owl can't feed without a hedgerow to hunt from. You know, I would rather do that, and improve my landscape that way, than I would take out 20 acres and put in an oak wood'. Thus, there may be opportunities to increase tree cover on agricultural land where it aligns with environmental values around wildlife and biodiversity or interest in specific species, for example.

Although our interviews suggest that many dairy farmers are keen to farm with the environment, what this means for dairy farmers may not align with what other stakeholders, such as policy makers or ecologists, understand by this term. For example, to some of the dairy farmers we interviewed, farming with the environment meant keeping slurry out of rivers and reducing chemical pollution and did not cause them to reflect on trees and hedgerows at all.

Dairy farmers want to improve public perception of dairy farming

'We manage so much of the landscape that we have to take responsibility for what people think of what we do.' Sarah

A number of the farmers we spoke to mentioned engaging directly with the public (in person and on social media) and spoke of the benefits that doing so brought themselves and those they engaged with. However, our interviews (supported by the survey data) illustrated that public opinion of the farmers as individuals appeared to be of less importance to them than other factors.

The dairy farmers we interviewed were concerned about the broader public perception of dairy farming. They believe that the public image of dairy farming has deteriorated and want to enhance its reputation. They recognise that the public constitute their end customer and that those customers were becoming increasingly concerned about the environmental impact of farming practices. The majority of the interviewed dairy farmers were aware that they can improve public perception of dairy farming by putting their environmental values into practice and employing publicly visible strategies that demonstrate their care for the environment. Roger is 'always delighted to show people around', while Julie takes part in 'Open Farm Sundays' on their farm, educating the public about their practices. She particularly enjoys showing children 'what it's all about, hoping that maybe they'll go away and think, "Oh yeah, I'd like to work on a farm"'. Andy is part of a programme providing milk to the first carbon neutral cheese factory. He recognises that the public want to see products that are '100% green' and 'taste great too'.

Related values



Farm business: livelihood; doing it the 'right' way



Social influence: what the public think



Environmental values



Farming identity

Some of the dairy farmers are aware that tree planting, as an example of environmental stewardship, has the potential to foster a more positive public opinion of dairy farming in general. Allan has had a good response on social media to the photos of his newly planted hedgerows and trees:

'You get quite a strong reaction from it, sort of like, "How wonderful is that?" A really good environment, that's what they like to see'. Ian also recognises the importance of a good public image, 'to see that we're looking after the countryside'. However, Allan's and Ian's positive experiences regarding public opinion of tree planting was not shared by all of the farmers. Henry feels that he cannot win when it comes to the public and his trees: he is frustrated that 'nobody notices when you plant a hedge, which we've planted quite a lot of. But if you rip one out, everyone notices'. If farmers can see the positive impact that tree planting can have on public perceptions, as was the case in Allan's example, this could be an excellent opportunity to align farmer values with increasing tree cover on dairy farms.

Barriers to tree cover expansion on dairy farms

Having outlined opportunities for tree cover expansion to align with dairy farmers' values, we now turn to some barriers to tree cover expansion on dairy farm land. These include instances where dairy farmers' strongly held values do not align with tree cover expansion. Additionally, we explore some of the structural determinants that may limit dairy farmers' ability to increase tree cover, even where they might wish to do so.

The dairy farming way of life is demanding with little spare resources for activities beyond dairying

'So, when I've got two things: A, time and B, money, I plant trees and look after them. When I don't have money and I don't have time, I don't. You have to look after them and that's time you haven't got. There's lots of barriers to planting trees.' **Henry**

Related values



Farm business: livelihood; profit



Farming identity: way of life

The dairy farming way of life is particularly demanding: dairy farmers commonly work 365 days a year, which is considered part and parcel of the way of life. Despite this, our interviewees indicated that the intensity has increased even further in recent years. George, for example, said that

he is 'having to do more and more of the hands-on stuff' and now works '14-hour days with the livestock'. As well as this, his farm is 'having labour issues in not being able to attract young people into the business'. Jeff feels similarly, saying that 'there's only so much you can get done in a day'.

Some of the dairy farmers we interviewed were explicit that there are not enough spare resources to make tree planting a viable activity alongside their other day-to-day work, particularly in the current economic climate. Henry is unable to plant trees and look after them properly when he does not have spare time or money, a situation he has found himself in more often in recent years. Ian explained that even if he did have the money to hire help to establish trees, labour is short: 'You just can't get hold of people to do it when they need doing, because obviously tree planting – there's only a certain period you can do it in'. Because of this, it is important to note that even where some dairy farmers would like to increase or are not against increasing tree cover on their land, limited time, money and labour-power makes it difficult to realise their tree cover expansion aims.

Producing food is a source of pride and is central to dairy farmer identity as well as being their livelihood

'You're producing a product. And obviously milk is a healthy product and without milk we wouldn't have a world as such. Everything is nurtured on milk.' **Andy**

Producing a nourishing, healthy product is important to the dairy farmers we spoke to. They see this as part of their identity and get a sense of purpose and enjoyment from it. Ian feels strongly that 'we still need to produce food. Particularly in the last few years we've seen how important it is to have quality, affordable food for people. I think that's critical'.

Related values



Farm business: livelihood



Food production: food quality; sense of purpose; satisfaction



Farming identity: way of life

While trees on farms may align with aspects of dairy farmers' identity, for example in terms of their strong ties to the landscape, trees may not interest dairy farmers as a potential contribution to the business in the same way that dairying as a livelihood does. Sarah reflected:

I think there are quite a lot of us, we wouldn't be so engaged if our land was being used for carbon farming rather than dairy farming. We wouldn't be so inspired by it. I think most of us, are doing this because of the cows. We're choosing to make our income by doing something we enjoy.

This sentiment was shared by Henry as he weighed up his options for the future: 'I could just sell the dairy cows and plant trees, but I would prefer it to be a farm'.

Nevertheless, some interviewees were willing to experiment with tree planting as a supplementary livelihood strategy. Julie grows cricket bat willow (*Salix alba* 'Caerulea') as a crop and grazes cattle underneath, demonstrating the role some dairy farmers see for trees as a complementary income stream to their dairying. However, none of the interviewees were prepared to solely 'farm trees': the production of foodstuffs was integral to their reason for farming.

There are disconnects between tree planting incentives and dairy farming

'There are some specific [grants] for woods, but they tend to kick in when you plant a hectare, which is two and a half acres. For me it's quite a chunk of work and it's quite a chunk of my land to find somewhere.' Henry

The dairy farmers we interviewed were aware of tree planting grants and some of those we spoke to had used them. One such farmer was Allan, who does 'quite a bit of work with FWAG (the Farming and Wildlife Advice Group), and I've just got a grant to plant 420 trees, plus some new oak trees, because we've had some that have died'. However, most of the dairy farmers we spoke to found that tree planting incentives did not fit with the size and scope of their tree planting aims. Some dairy farmers feel grants are too complex and time consuming. Henry, for example, feels like you have to 'jump through quite a lot of hoops, do quite a lot of paperwork, and spend a lot of time on it'. He would like to plant half an acre of trees, an area smaller than he believes a grant would cover, 'so I've got to put my hand in my pocket for a grant to do it, which seems a bit unfortunate'.

Some farmers with experience using grants found that, once tree planting was underway, additional costs emerged which were not covered and needed to be paid for out of pocket. Sarah decided to continue with her tree planting despite the unexpected costs. This was a big decision and one she was adamant not many dairy farmers would have the spare cash to make. Some dairy farmers were disappointed that grants did not cover any trees they had already planted. For example, Julie has 'taken out any non-productive ground already and put it to trees, so it's a bit galling, now, that the only way you can get a carbon offsetting thing is if you're planting new trees'. Additionally, some dairy farmers reported that they needed more guidance on grants in relation to replacing trees lost to disease. As Ian made clear:

The big problem at the moment is the choice of trees.

We have a lot of ash trees in hedgerows which are having to be felled or they've blown down because of ash dieback. It's what trees we replace those trees with and how we replace them. If you've got an existing hedge, it's more difficult to put a tree in it.

Finally, some of the dairy farmers we spoke to are unable to plant or engage with larger-scope planting incentives due to their tenancy status. Ian is not only losing trees to ash dieback and struggling to know what to replace them with, but is also limited in his legal ability to plant: 'We can't plant trees on the land because of the landlord. It's very much their decision. As a tenant we can put them in the hedgerows and gap up'.

While the dairy farmers in our sample overall indicated a willingness to plant more trees, it is unclear whether their ambitions align with the government's aims and scope for tree cover expansion. Additionally, current incentive schemes may not be workable for all farmers, whether this is due to unexpected additional costs or restrictions due to their tenancy status.

Related values



Farm business: livelihood



Landscape relationship

Discussion

Key values relating to dairy farmers and trees

Through the evidence presented above, several values emerge as being particularly important when looking to increase tree cover on dairy farms. Table 4 lists the values that appear, from the interviews, to be most important to dairy farmers. Also included are the values' respective survey scores, which generally support their inclusion as important values. The survey asked participants to rate the importance of these values (as worded in the table) to them 'as a farmer'.

Table 4 Selected important values and corresponding survey scores

Value	Value category	Survey wording	Score
Livestock health	Farm health	The health of my livestock or crops	9.8
Profit	Farm business	Making a profit	9.5
Farm sustainability	Farm health	The sustainability of the farm	9.3
Food production	Food production	Producing food	9.1
Doing it the 'right way'	Farm business	Running the farm business in the way that I believe is right and proper	9.1
Future planning	Farm business	Planning for the future, either for myself or for future generations	9.1
Aesthetics	Landscape relationship	What the landscape looks like	8.7
Custodianship/ stewardship	Environmental values	Being a steward or custodian of the land and environment	8.6
Biodiversity	Environmental values	Supporting wildlife and biodiversity	8.5
Way of life	Farming identity	The farming way of life	8.2
Public	Social influence	What the public think of me	7.3

Each value typically holds the potential to both provide opportunities for and pose barriers against increasing tree cover on dairy farms. For example, farmers' care for livestock may encourage them to plant trees if they believe doing so will benefit their cattle. On the other hand, farmers may be dissuaded from planting trees if they do not expect this to benefit the herd. Values relating to farm health, the farm business, the environment and farmers' relationship with the

landscape appear to be most prominent. Because of this, appealing to these values can offer the most promising opportunities for those looking to expand tree cover on dairy farms. However, despite the importance of food production evident in the survey score, this value is more likely to hinder tree cover expansion efforts due to farmers' desire to maintain dairying as their main business.

Trees to complement the farm business

It is unsurprising that the dairy farmers we spoke to care deeply about their farm business. However, our interviews suggest that some feel concerned by the prospect of additional trees on their land, fearing that planting too many trees would threaten the nature of the farm and their ability to continue dairy farming. For example, Henry said that he could solely plant trees on his land, but would rather it be a dairy farm.

Recognising that some dairy farmers feel this way is crucial for successful policy or messaging strategies. It is important that increasing tree cover is framed as a complement to dairy farming, thereby dispelling concerns that it is being encouraged as an alternative livelihood to food production. One way to achieve this, and to ensure its sustainability, is to tap into the ways dairy farmers already value trees. This was demonstrated through the survey results where a little over half of respondents said they have increased tree cover within the past five years 'to benefit wildlife' with a quarter having done so 'to benefit livestock'.

Livestock health and the interconnectedness of values

Throughout our interactions with dairy farmers, and strongly mirrored in the survey scores, livestock health emerged as being of central importance to dairy farmers. We have suggested that recognising and appealing to this value may provide one of the strongest opportunities for increasing tree cover on dairy farms.

As with most of the values, the importance of livestock health is multifaceted. Within our values map, livestock health is situated in the farm health category but it closely relates to many of the other values discussed here: livestock health is important for the farm business, as well as food production, and cattle are central to dairy farmers' sense of identity and way of life. This value interconnectedness

makes livestock health a particularly powerful value, because in appealing to this value we are also appealing to other things dairy farmers care about. Where it is possible to simultaneously appeal to multiple intertwined values, it is likely that tree planting and maintenance will become a valued part of the farm business and an enduring endeavour for the farmer. This offers a long-term solution to the need for increased tree cover. It should, however, be noted that some interviewees view trees as potentially having a negative impact on livestock health. This may be important to consider when seeking to appeal to this value.

Farmers cannot always act in line with their values

Even in cases where farmers value trees and would like to increase tree cover, various factors may limit their ability to act. Dairy farmers are operating in an increasingly uncertain landscape: many are facing financial instability and find themselves working longer hours while relying on less labour-power. These interconnected constraints limit the excess time and resources dairy farmers can devote to activities beyond their day-to-day work of dairying, which is of utmost value to them. Although we have argued that strategies to increase tree cover should complement the values dairy farmers already hold, they will not be successful without addressing these issues. This means that such strategies must mitigate the additional time and maintenance costs, alongside the perceived long-term financial risk, that increasing tree cover is likely to place on already over-stretched farmers.

Conclusion

This research has demonstrated the range of values which are important to dairy farmers. We have argued that attending to these values is important when seeking to expand tree cover on dairy farms over the long term. The research has highlighted values which are more likely to be met positively in such conversations with dairy farmers, including livestock health, environmental values and farmers' relationship with the land. These values are closely intertwined and understanding this is important. The interconnections can both amplify the power of a given value (e.g. livestock health is valued for several reasons) and help us to understand where values may be in tension or may compete.

Dairy farmers are not a homogenous group: while this research presents some broad opportunities and barriers that emerged from our sample, this should not be taken to represent the views of all dairy farmers. Our research indicates that there is an opportunity to work with some dairy farmers to explore their openness to adding trees to their farms. However, the conversations and communications should focus on how this will complement their dairying activities, rather than offer an alternative livelihood strategy.

Finally, holding values does not necessarily mean they will be acted upon. Recognising and understanding the things that matter to farmers is important and it appears that several of these values would align well with expanding tree cover. However, dairy farmers may need help to ensure they are able to act upon these values.

References

AGRICULTURE AND HORTICULTURE DEVELOPMENT

BOARD (2022) UK and EU cow numbers: Average size of dairy herd in UK by country. Available at: www.ahdb.org.uk/dairy/uk-and-eu-cow-numbers (Accessed: 13 June 2023).

DEFRA (2019) CATTLE FARM PRACTICES SURVEY 2019.

Available at: www.gov.uk/government/statistics/cattle-farm-practices-survey-april-2019

DEFRA (2020) THE PATH TO SUSTAINABLE FARMING:

An Agricultural Transition Plan 2021 to 2024.

Available at: www.gov.uk/government/publications/agricultural-transition-plan-2021-to-2024

DEFRA (2022) Farm type and farm size: Results by type of farm in England, Structure of the agricultural industry in England and the UK at June. Available at: www.gov.uk/government/statistical-data-sets/structure-of-the-agricultural-industry-in-england-and-the-uk-at-june (Accessed: 15 May 2023).

DEFRA (2023) Farm Business Income by Cost Centre, Farm Business Income by type of farm in England 2021/22.

Available at: www.gov.uk/government/statistics/farm-business-income/farm-business-income-by-type-of-farm-in-england-202122#farm-business-income-by-cost-centre (Accessed: 15 May 2023).

MARSHALL, H., MCCONNACHIE, S., AMBROSE-OJI, B., BROCKETT, B., CLARKE, T.-K., SPENCER, K. AND PEARSON, M. (2023) Trees and farmers' social and cultural values: Initial highlights from a survey of agricultural land managers in England. Forest Research. Available at: www.forestresearch.gov.uk/research/social-and-cultural-values-and-trees-on-farms-in-england/

MCCONNACHIE, S., FITZGERALD, O., SPENCER, K. AND AMBROSE-OJI, B. (2022) Trees and farmers' social and cultural values in England: A scoping study. Forest Research (Unpublished). Available at: www.forestresearch.gov.uk/research/social-and-cultural-values-and-trees-on-farms-in-england/

Appendix 1 – interview guide

Preamble

- Project overview – aims, funder, scope
 - Defra funded – want to understand how farmers value trees on their land and scope for increasing tree cover. Governments ambitions to increase tree cover likely to need agricultural land
 - Ensure to clarify focus on trees outside of woodland (but not only. We added this because it seemed people would tend to assume we were talking about forestry/woodland creation only.)
- Our neutrality – no agenda
 - Review and reconfirm informed consent
 - Check they have read the information sheet
 - Check they are happy for recording
 - Encourage to speak as openly and honestly as feel comfortable. No obligation to answer anything.
- Explain interview
 - Up to 60 minutes
 - Overview of sections/structure
 - Any questions?

Introduction

This interview is going to help us build upon existing work completed for our project on farmers' values. We have, through conducting surveys and interviews over the last year, explored what matters to farmers in terms of their practices, relationships, and the landscapes where they farm. In this interview we want to find out more about what matters to dairy farmers in specific relation to trees.

The questions we will ask you today are based on what farmers have already told us matters to them. You might agree that certain things matter to you, or you might disagree. It is important for us to know this so please talk freely. There are no right or wrong answers. If we want to know more about your response or have a follow-up in relation to trees we will ask. You may or may not have anything to add so please, again, answer freely and honestly and we can move on to the next question. Your insights will help us to further refine the framework we are working with as well as bettering our understanding of how trees figure in relation to what matters to you as a dairy farmer.

Questions

Section 1 – Introduction	
Farming system	Please can you tell me a bit about your farming system? Follow ups if necessary: How many cattle do you have? How long roughly do you overwinter your cattle?

Section 2 – Value framework	
Landscape relationship/aesthetics	Can you tell me about the landscape where your farm is?
	Follow ups/trees: What about this landscape matters to you? How do you see your role as a farmer in this landscape? Do trees in the landscape matter to you? Why/Why not?
Farm business	What are the most important considerations to you in terms of your farm business?
Doing it the right way	Is there a right way to do dairy farming? Is there a wrong way to do dairy farming? Follow ups: How can you tell that it's right or wrong? Can you give me an example?
Future planning	To what extent are you thinking of the future (either of your own or subsequent generations) when making decisions about how to run the farm? Can you give an example of this?
	Follow ups/trees: Do trees figure in how you run your farm business?

Section 2 – Value framework

Farming identity	What does it mean to be a dairy farmer? Do you think there are differences between dairy farmers and other farmers?
Way of life	If needed: Is there anything distinct about the dairy farming way of life? What do you value about the dairy farming way of life?
	Follow ups/trees: Do trees matter as part of the dairy farming way of life?
Social influence	
What the public thinks of me	Does the public have an influence on your farming? Can you give an example of how?
What other farmers think of me	Do other farmers have an influence on your farming? Can you give an example of how?
	Does anyone or anything else outside other farmers and the public influence the decisions you make?
	Follow ups/trees: Has anyone or anything influenced how you feel about trees in relation to your farming? Probe: has this changed in anyway over time?
Environmental values	Where does the environment sit in relation to your farming practices?
Biodiversity	Does biodiversity figure in your thinking or decision making/behaviour around the farm?
Custodianship/Stewardship	How do you see your role in relation to the environment?
	Follow ups/trees: Are trees a part of the environment that has any bearing on your farming practices?
Food production	Producing food is a central element of farming. Does food production have a bearing on how you feel about trees on your land?
Farm health	Does it mean anything to you to talk about the health of the farm? If respondents answer no, ask the two following questions, and then explain that we consider livestock/crop health/sustainability as part of farm health – does this make sense to them? Do they agree they are important parts of what makes up a healthy farm?
Livestock/crop health	How does livestock health impact your decision making on the farm?
Sustainability	How, if at all, does sustainability impact your decision making on the farm?
	Follow ups/trees: Do trees have any bearing on your decision making in terms of livestock health and the sustainability of your farm?

Section 3 – Barriers

Opening dialogue from interviewer:	We have talked so far about a number of things that matter to you as a dairy farmer and with specific regard to trees. That being said, we all know that sometimes we are prevented from acting in line with the things that matter to us the most. Time, space, money, legalities and so forth can impact this. Can you think of anything that prevents you from farming in the way you want to – or in line with the things that matter most to you? Probe further depending on answers/relevance to trees.
------------------------------------	--

This Research Report explores the issues that matter to dairy farmers in England regarding trees and increasing tree cover on farms. It draws on nine interviews with dairy farmers and a farmer survey which included 44 dairy farmers, to build on a map of values developed in prior research. The report looks beyond financial considerations to explore the other factors which guide and shape farmer attitudes and behaviours in this area. Understanding the range of values held by farmers in relation to trees allows us to learn how, when and where farmers may embrace having trees on their land. This will better enable those working to design policies, incentives, tools, advice or other communications to do so in ways which are more likely to succeed in delivering enduring tree cover expansion on farms.