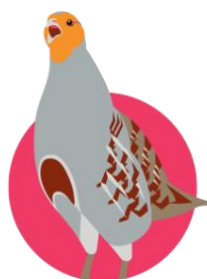




HOW TO IMPROVE AGRI-ENVIRONMENT SCHEME UPTAKE AND PROVISION

Results from an online questionnaire undertaken by
PARTRIDGE, Interreg North Sea Region



Interreg
North Sea Region
PARTRIDGE

European Regional Development Fund



EUROPEAN UNION

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'Farmers taking part in AE schemes for the first time often quickly change into enthusiast participants. As a result, they typically take up more measures, hence increasing their impact on nature recovery, especially when they can work with fellow farmers.'

*Alex Datema, Chairman of BoerenNatuur,
the organization of all farmer collectives in the Netherlands*

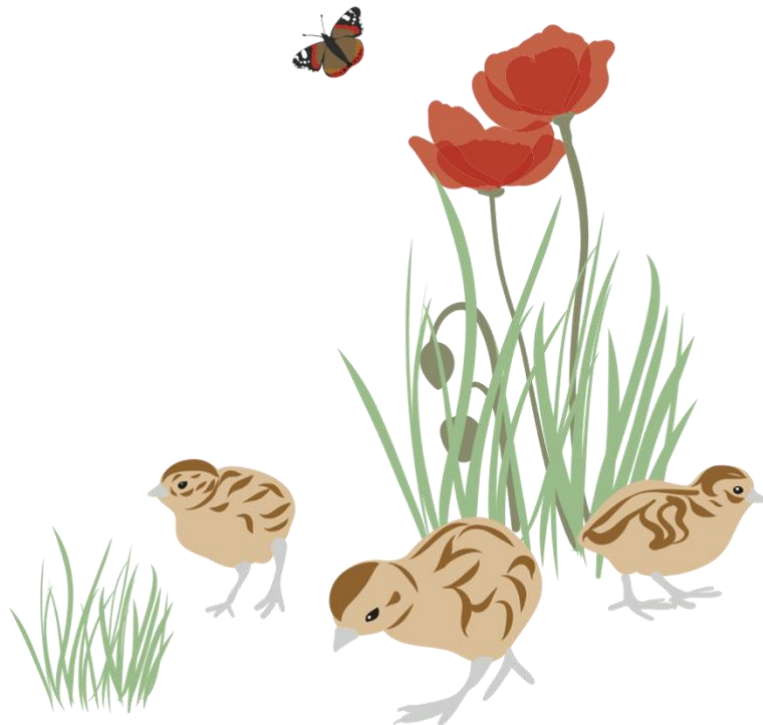
PREFACE

This report has been compiled by the PARTRIDGE project; an Interreg North Sea Region project running from mid-2016 to mid-2023, with 12 European partners in six participating countries (Belgium-Flanders, Denmark, England, the Netherlands, Germany-Lower Saxony, and Scotland). For more information about the project please visit northsearegion.eu/partridge.

PARTRIDGE seeks to provide practical solutions for the countries within the North Sea Region to help them achieve their 2030 Biodiversity Targets on arable farmland, set by the European Union, after their failure to meet the Biodiversity Targets for 2020. A key element of this is the need to improve the existing national Agri-Environment (AE) scheme systems and widen their uptake by farmers throughout the North Sea area.

This large-scale online survey explored the attitudes and experiences of farmers who have access to AE schemes and was available in the six participating project countries from March 2021 to May 2021. It was specifically designed to provide policymakers with key information to increase farmers' willingness to engage with AE schemes, single-out the current factors that are barriers to AE scheme participation and discover what might encourage farmers to do so in the future.

Note: Throughout this document we have used the term hunter to refer to those that participate in the shooting of game and likewise hunting refers to shooting.






EXECUTIVE SUMMARY

We found that, in our survey, farmers with and without arable-focused AE schemes were not that different. There were only five instances where we found a difference between them.

These were: the length of contracts they prefer, whether they are prepared to pay for advice, how often they wanted advice, who should pay for AE schemes, and how flexible AE schemes should be when considering agricultural management (herbicide use, manure spreading, etc.).

ENCOURAGE FARMERS

The key results highlight that, to encourage farmers not currently participating in Agri-Environmental (AE) schemes to join a scheme, the following points should be addressed:

-  Provide targeted government-paid advice - i.e., free to the farmer, in combination with a step-in model that allows new participants to join with only a few (or a subset of) options and shorter-term contracts (1-2 years). Advice is key, only 5% of those without AE schemes said that they did not need advice.
-  Payment levels need to be fair but are not the only concern. For 37% of respondents without AE schemes, where payment levels are an issue, increases in payments of 29% would offset this.
-  Allow some flexibility in agricultural management of options (use of herbicide, manure spreading) but do not compromise on aspects affecting the biodiversity goals of an option (for example, mowing dates that are set to protect ground-nesting birds).





EXPAND PARTICIPATION

To expand participation for those already in AE schemes the following points were most important:

- 🐜 Providing targeted government-paid advice - i.e., free to the farmer, advice would encourage farmers to adopt more AE measures, although some (22%) of those with AE schemes would be prepared to pay for advice. They also wanted advice more often. Advice was considered very important, only 3% of those with AE schemes said that they did not need any advice.
- 🐜 Farmers with AE schemes would be interested in longer contracts and in providing more options than they currently have.
- 🐜 Some farmers (30%) already in an AE scheme would be interested in schemes funded by the private sector (carbon or biodiversity offsets for example).
- 🐜 Some farmers in AE schemes (29% of our sample) thought payments should be higher, suggesting an increase of 18%.
- 🐜 Address the problems experienced by participants – find solutions, quickly allow for derogations without requiring extended bureaucracy. Ensure that these derogations do not compromise the goals of the schemes.
- 🐜 Building up experience in AE schemes encourages a desire for additional AE options and longer contracts. This is especially the case if the benefits for farmland wildlife are measured and recognized by the public and politicians, resulting in recognition for the farmers involved.

SUPPORT BIODIVERSITY

Our respondents, both with and without AE schemes, were motivated by an interest in nature and a desire to support biodiversity on the land they farm. Acknowledging this, both in scheme design and through public recognition, will help to expand scheme and option uptake. Scheme design also needs to ensure that options fit the conditions farmers encounter on their land, while guaranteeing they still provide resources for flora and fauna. There must be a compromise between what is necessary for nature recovery to be successful and what is possible and acceptable to farmers.

IMPROVE COMMUNICATIONS AND INFORMATION

Policymakers, agricultural collectives, and agricultural advisors that want to increase farmers' engagement with AE schemes should improve communications and information on options available in schemes and the expected outcomes of AE schemes. This relates to farmers already taking part in AE schemes, farmers not yet engaged, as well as the public.





'I want to live in a vivid landscape - full of animals like skylarks, hares, partridges and wild arable flowers. PARTRIDGE helps me to reach that goal.'

Verena Schenke, PARTRIDGE project organic farmer, Nesselröden demo site, Germany

FIVE EUROPEAN COUNTRIES

This report analyses the attitudes of farmers from five European countries toward Agri-Environmental (AE) schemes and aims to provide policymakers with key information to increase farmers' willingness to engage with AE schemes. The online multiple-choice survey was carried out by the North Sea Region Interreg PARTRIDGE project in spring 2021 and resulted in 890 complete answers from farmers, of which approx. 45% also had an interest in hunting (i.e., shooting). This analysis focuses on differences between respondents who participated in AE schemes and those who did not. When mentioning "farmers" below, we include hunters who were also farmers.

ADVICE ON IMPLEMENTATION

Advice on the implementation of AE schemes was key for most farmers – even more so in respondents currently in AE schemes than was the case for respondents without an AE scheme. Such advice is preferably provided by government advisors, advisors from farmer clusters and advisors from wildlife charities or farmer advisor organisations. Most respondents preferred advice that was free to them (i.e., government-paid), but farmers already taking part in AE schemes were more willing to pay for such advice themselves. Advice should focus primarily on option choice, practical management, and the financial implications of joining an AE scheme. *Results in Figures 4-7.*

POPULAR MEASURES

Farmers in AE schemes showed a clear interest in adopting more measures and/or amounts of AE measures. The most popular of these were **floristically-enhanced grass margins**, **unharvested cereals**, **wildflower blocks**, and **supplementary bird food overwinter**.

Interestingly, about half of the respondents not currently engaged in an AE scheme were also willing to consider the uptake of some AE measures and expressed interest in a range of individual measures in the schemes, including floristically-enhanced grass margins, wildflower blocks, and supplementary bird food overwinter. *Results in Figures 8, 9 and 12.*

MOTIVES FOR PARTICIPATION

Farmers currently engaged in AE schemes mentioned a wide range of motives for their participation. Helping flora and fauna on the farm, helping the environment, and feeling good about their farm were each mentioned by 50% or more of the respondents.

Farmers not (yet) taking part in AE schemes said this was mainly because they already engaged in measures for the environment for free. Interestingly, 15% of farmers not engaged in AE schemes said they had never heard of AE schemes. *Results in Figures 10 and 11.*



FLEXIBILITY

Farmers currently engaged in AE schemes, as well as those not yet in schemes, advocate a **greater flexibility** in AE schemes, to be better able to deal with **pernicious weed problems or unusual weather conditions**. Greater flexibility in the allowance of herbicide use, the re-location of measures, dates for mowing and sowing, the design of their own seed mixes and the allowance of predator control were most popular. *Results in Table 3.*

IMPROVEMENTS

In addition to the desired flexibility of AE schemes, respondents proposed a series of improvements to the schemes, the most frequent of which are listed here in order of importance: **Less administration, more flexibility in the duration of contracts**, and **exemption from long-term legal restrictions or unwanted nature designation on their farms due to participation in AE schemes**.

Other changes considered important by respondents included wanting AE schemes to count towards their greening requirements, options that were better fitted to the local conditions on their farms, self-assessment of results to replace inspections, more recognition from society for AE scheme participation, higher payments, and lower penalties when problems with their implementation of options are identified. *Results in Figures 13-16.*

PAYMENTS

Roughly a third of those with or without AE schemes wanted higher payments for the wild bird seed mix option we used as an example option. Those with an AE scheme suggested a median payment increase of 18%, while those without an AE scheme suggested a median increase of 29%. *Results in Figures 17-18.*

REPORT ON STAKEHOLDERS' ATTITUDES

The outcome of this online survey closely corresponds with the analysis from 74 stakeholder interviews in our Transnational Report on stakeholders' attitudes towards AE Schemes (Gheyselinck, 2021).





'Birds and bees should just be part of farming. I very much enjoy seeing them on my fields. That's why I plant new PARTRIDGE hedges and flower blocks on my land.'

Kobus Kolff, farmer and hunter Oude Doorn demo site, The Netherlands

INTRODUCTION

Agri-environment schemes provide funding to farmers and land managers to farm in a way that supports biodiversity, reduces greenhouse gas emissions, enhances the landscape, and improves the quality of water, air, and soil. They go beyond the support provided for nature by the enhanced conditionalities within the Common Agricultural Policy (CAP) and the new eco-schemes. AE schemes have a major role in conserving and enhancing biodiversity on farmland (e.g., Staggenborg & Anthes 2022), are thought to be crucial in the attainment of Biodiversity Targets on farmland and are supported by many EU (European Union) and national governments (Pe'er et al. 2022).

This is achieved through the provision of direct payments for agri-environmental measures and is the case in five of the six countries taking part in PARTRIDGE (Belgium – Flanders, England, Germany – Lower Saxony, the Netherlands, and Scotland). In Denmark, the situation is different, with no dedicated AE schemes, although there is indirect support for several bee and wildlife-friendly measures.

There is a desire amongst policymakers to understand farmers' attitudes towards AE schemes and other policies that support these measures, to ensure widespread uptake and encourage best practice. Farmer attitudes and decisions relating to AE schemes are complex (e.g., Mills et al. 2016, Riley 2016, Wittstock et al. 2022) and can have a significant bearing on how successfully measures are implemented (McCracken et al. 2015). We explored the rationale of the farmers' decision-making process by conducting an online survey, comparing respondents who had AE schemes with those that did not.

ONLINE SURVEY

In March 2021, we launched an online survey to better understand how stakeholders feel AE schemes may be improved to enable arable farmland wildlife recovery across the countries of the North Sea Region (NSR) that participate in the PARTRIDGE project. This multiple-choice survey set out to collate the opinions of farmers and hunters on a range of topics related to AE schemes, including the measures and management options available, payment rates, administrative control, advice, flexibility, and improvements for future schemes.

The key aim was to use the results to help improve future AE schemes by feeding the information directly to policy makers and influencers across the countries covered by the PARTRIDGE project. The survey was made available in five languages (Dutch, Danish, English, Flemish and German), reflecting the countries involved.

Providing improvements to AE schemes for arable farmland wildlife is a challenging issue involving many factors. Initially, a series of targeted qualitative stakeholder interviews were conducted in 2018/19 to ascertain the attitudes of key stakeholders to AE schemes. The results of these interviews (northsearegion.eu/partridge/output-library) were used to design the wide-scale online survey described here. Although the survey was undertaken across the six countries involved in the PARTRIDGE project, there was an effort to keep the text of the questions in the survey as similar as possible, given the translations involved and considering the differences in AE schemes between countries.



***'I built this PARTRIDGE beetle bank with my own hands.
It benefits insects that control pests in my adjacent crops and I get to
enjoy all the wildlife in and around it. Works for me!'***

Geert Goossens, PARTRIDGE project farmer, Flanders, Belgium

TARGET GROUP AND WHY?

Farmers were the main target respondents of the PARTRIDGE survey because they manage agricultural land. As key stakeholders for arable biodiversity, farmers are often blamed for the loss of farmland biodiversity, not least because current and past Common Agricultural Policy (CAP) is focused on producing high crop yields to feed the world. It may be surprising to some readers, but many farmers have an intrinsic interest in wildlife and biodiversity (MacDonald & Johnson 2000, Herzon & Mikk 2007, Mills et al. 2018, Runhaar et al. 2018).

However, they must also run a profitable business and produce food. Farmers can create and manage habitats for biodiversity on that land, supporting farmland flora and fauna such as the grey partridge, our project's key farmland species. However, nature conservation is just a tiny part of the decision-making process of the average farmer, and often falls off the list of their priorities completely. This is where adequate funding for AE schemes is extremely important as it compensates farmers for the income that is lost when they choose to use land for conservation, rather than production.

SURVEY DISSEMINATION

This online survey was targeted at farmers who could, through their active management of farmland, have the possibility of enrolling in AE schemes for arable farmland wildlife if they wished to do so and if there were options available to them. In the results that follow, we included only those respondents that had arable farmland – i.e., those that were arable farmers, and whose farms were in areas where they could take part in an AE scheme. AE schemes for arable wildlife include options such as: **beetle banks, conservation headlands, cultivated uncropped margins for rare arable flora, floristically-enhanced grass margins, permanent wildflower cover, rotational wild bird cover, stubbles with cover crops, supplementary overwinter food, and unharvested cereals** (described in greater detail in Appendix 1). Not all options are available in all countries where PARTRIDGE takes place.





BEETLE BANK

SUPPLEMENTARY
OVERWINTER FOOD



CONSERVATION
HEADLANDS



PERMANENT
WILDFLOWER
COVER



FLORISTICALLY ENHANCED GRASS MARGINS



UNHARVESTED CEREALS



CULTIVATED UNCROPPED MARGINS FOR RARE ARABLE FLORA



ROTATIONAL WILD BIRD COVER



STUBBLES WITH COVER CROPS

PARTRIDGE partners were responsible for the dissemination of the survey in their respective countries.

SCOTLAND AND ENGLAND

In Scotland and England, most of the survey promotion was organised by the Game & Wildlife Conservation Trust (GWCT), the lead partner for PARTRIDGE in the UK. This included blogs, internal and external newsletter articles, press releases, and social media posts. Social media content was targeted at specific groups, primarily farmers and gamekeepers, but also hunters. The GWCT newsletter had a circulation at that time of 58,000. In Scotland, external organizations also helped with this, including NatureScot, the Scottish Gamekeepers Association (5,300 members) and the Scottish Government's Rural Payments Division. Word of the survey was also spread by key contacts and colleagues. In England, external organisations that helped with dissemination were Natural England and The Country Land and Business Association (CLA, 33,000 members). There were also articles in the press – particularly the Farmers Guardian (fginsight.com, circulation of 28,149).

BELGIUM

In Flanders, Belgium, information about the survey that included a link directing the respondent to the survey, was emailed directly to all farmers who had one or more parcels of arable farmland in the arable bird management areas, as recorded in the databases of VLM (Flemish Land Agency). This reflected the fact that these were the only farmers that could enter into a contract for farmland bird AE schemes in that region. The survey was also advertised by the Hubertus Vereniging Vlaanderen to their 8,000 hunter members via their magazine, social media accounts, and newsletters. Boerennatuur Vlaanderen reached 10,327 farmers through their online newsletter published seasonally (spring, summer) and the weekly online Boerenbond newsletter. Inagro reached 7,000 farmers through their weekly newsletter.

DENMARK

Publicity for the Danish survey was conducted by the Danmarks Jaegerforbund, with a membership of 90,018. The Danish survey needed to be altered for its respondents, as Denmark does not have the same AE scheme systems and opportunities as the rest of the partner countries. Instead, Denmark has "Bee and Wildlife Friendly measures", where the farmer is paid as if the area of the measures is included in their basic farm payment. At the time of the survey, Danish farmers could adopt a choice of habitat measures (some of which overlap with the habitat measures from other European AE schemes), with certain restrictions – on the size of the area included, as part of their basic CAP subsidies. Farmers did not have to register these areas or provide detailed information regarding these measures. Thus, the questions in the survey on administration, payments, control, and rules did not apply to the Danish situation.

GERMANY

In Germany, the partners contacted several organisations and individuals, requesting that they disseminate the survey to their members, concentrating on farmers in Lower Saxony. The University of Göttingen published the survey via their social media channels and sent the survey invitation directly to 190 farmers. Landwirtschaftskammer Niedersachsen, the chamber of Agriculture, responsible for administrative tasks in the state of agricultural subsidies, disseminated the survey through their biodiversity farm advisers. Landvolk Göttingen, the peasantry of Göttingen, advertised the survey on their homepage and emailed it to their members, about 1,500. Landschaftspflegeverband Göttingen emailed details to 350 farmers. Similarly, Kompetenzzentrum Ökolandbau Niedersachsen GmbH emailed survey details to organic farmers in Lower Saxony on their mailing lists.

THE NETHERLANDS

In The Netherlands most of the survey promotion was organized by the coordinating partner BirdLife Netherlands - Vogelbescherming Nederland, aided by the other Dutch project partners. This included blogs, newsletter articles, press releases and social media posts. In addition, BirdLife NL recruited the help of several external organizations targeted at arable farmers and hunters. The most important organizations were the largest farmers union LTO Nederland (including their website with 2.5 million pageviews per month, electronic newsletter and news magazine, Nieuwe Oogst), the largest agricultural magazine Boerderij (including their website with 2.1 million pageviews per month and electronic newsletter), the organization of farmers' collectives, BoerenNatuur (including their electronic newsletter) and two large hunters associations, Koninklijke Nederlandse Jagersvereniging and Nederlandse Organisatie voor Jacht en Grondbeheer (including their websites, magazines and electronic newsletters). This resulted in a series of articles in agricultural newspapers and magazines, in electronic newsletters and mailings and in social media posts, most with a direct link to access the online survey webpage. The survey was hence advertised among a larger group of farmers, also involving farmers who were not able to participate in AE schemes. In the analysis of survey results, data from farmers who were not able to participate in AE schemes were excluded.





'For us, the economic aspect and the effectiveness of biodiversity measures are equally important. PARTRIDGE allows us to experiment with new measures such as beetle banks and flower blocks. We like it!'

Marc and Laurent Govaert, PARTRIDGE project farmers, Isabellapolder demo site, Flanders

SURVEY STRUCTURE

The full online survey was composed of 71 general and measure-specific questions, though respondents were not presented with all questions.

First, we asked all respondents about their age and main or secondary occupation, total farm size and location, interest in hunting, and their attitude to certain environmental issues - a total of 13 questions.

This was followed by a set of 29 questions relating to AE schemes, with different copies of questions presented to those with or without AE schemes. For those with AE scheme agreements, we investigated their reasons for joining. For those not in AE schemes, we similarly explored the reasons for this, investigating the potential barriers preventing or discouraging participation, and what might encourage them to apply to AE schemes in the future. Detailed flowcharts and/or copies of the surveys for each country can be found here: <https://northsearegion.eu/partridge/output-library/>.

Although the survey was structured similarly in all countries, it was adapted to reflect how the CAP and AE schemes, or similar environmental management measures, were implemented in each country. This meant that in England and Scotland, no questions referred to EU (European Union) level government, as Brexit had already taken place by the time of the survey, and in Denmark, as detailed above, the survey was significantly reduced, reflecting the lack of a formalized AE scheme system of payments there. As this document concentrates on comparisons between those with and without involvement in AE schemes, we have not included responses from Denmark.

Most questions were 'closed', and several asked respondents to rate the degree to which they agreed or disagreed with various statements (1-5), whilst others included an 'open' section, allowing respondents the opportunity for comments or suggestions. These open questions allowed for respondents to suggest specific, detailed responses such as new measures or adaptations to existing ones. Some of the closed questions allowed the choice of more than one option.



***'It is very encouraging to see so many farmers
go the extra mile to improve biodiversity!
In many cases, all it takes is sitting down together and talk.'***

Willem Van Colen, PARTRIDGE Ramskapelle site manager, Inagro, Flanders

METHODS

We used the software [Flexmail](#) to manage and disseminate the survey. It was available online between 3 March 2021 and 31 May 2021. On the 1st of June 2021 the raw, anonymized data file was extracted from Flexmail directly into MS Excel.

The data collected was reviewed, with incomplete responses removed. As the survey structure varied between countries, we adjusted the data structure to reflect where survey questions were not presented.

Data wrangling was conducted using R (Version 4.2.0). Data preparation involved coding the responses into simpler terms, identifying similarities, and grouping the similar responses together. Data were coded using numbers to avoid potential problems due to language differences and for ease of analysis (e.g., 1=yes, 2=no).

We compared the responses from those respondents who had AE schemes with those who did not, to determine what aspects separated the two groups, using Chi-square analyses for most categorical responses. Mann-Whitney U-tests were used to test for differences in continuous data. We compared median levels of payments suggested by respondents to levels current at the time of the survey to express suggested increases in payments as a percentage of current payment levels. The results from the online survey for each country were combined to produce two datasets, one for those who had AE schemes and one for those who did not, across the five countries. Comparisons between countries on respondents' age, whether they were an organic farmer, a hunter, or undertook AE schemes can be found in Appendix 2. In the results that follow we rounded the percentage of respondents in different categories to the nearest 1%; this rounding often resulted in total percentages that did not sum to 100%.



RESULTS

AGE GROUP OF RESPONDENTS

The age structure of respondents with AE schemes did not differ from those without (Chi-square₄ = 4.85, P = 0.303, Figure 1). Over both groups, an average of only 3% were less than 30 years of age, with 11% 30-39, 21% 40-49, 44% 50-64 and 22% 65 years or older.

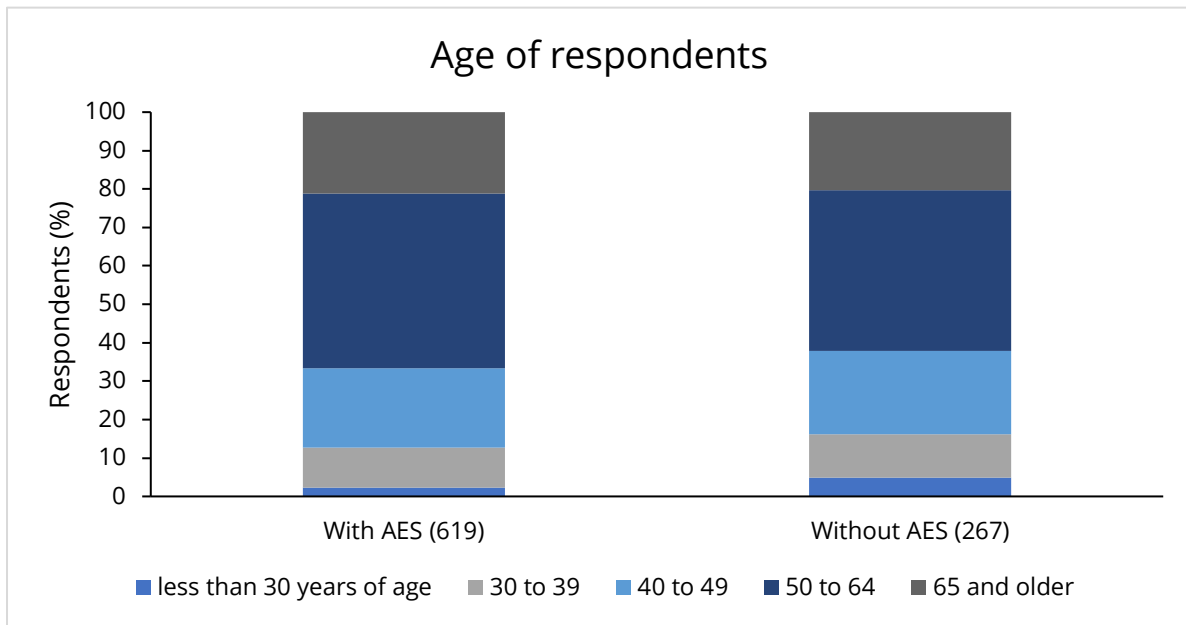


Figure 1. The age structure of the respondents with and without AE schemes did not differ.

FARMING & HUNTING STATUS OF RESPONDENTS

We compared respondents who had AE schemes with those who did not. There was no significant difference between those with or without AE schemes in the proportion that were organic farmers (Chi-square₂ = 0.70, P = 0.706, Figure 2), with an average of 8% organic, 2% in transition and 91% non-organic. There was no difference in those with or without AE schemes who reported being hunters (Chi-square₁ = 0.05, P = 0.820, Figure 3); an average of 46% were hunters.

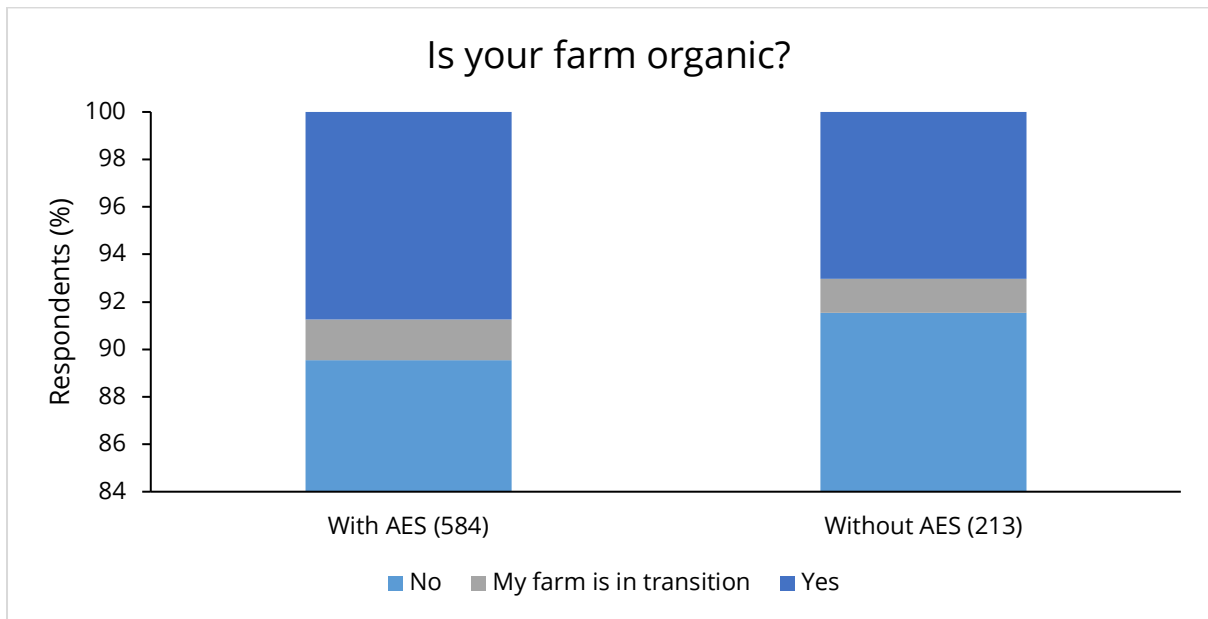


Figure 2. A similar small percentage of respondents in both groups (with or without AE schemes) reported that they were organic farmers or that their farm was in transition to becoming organic.

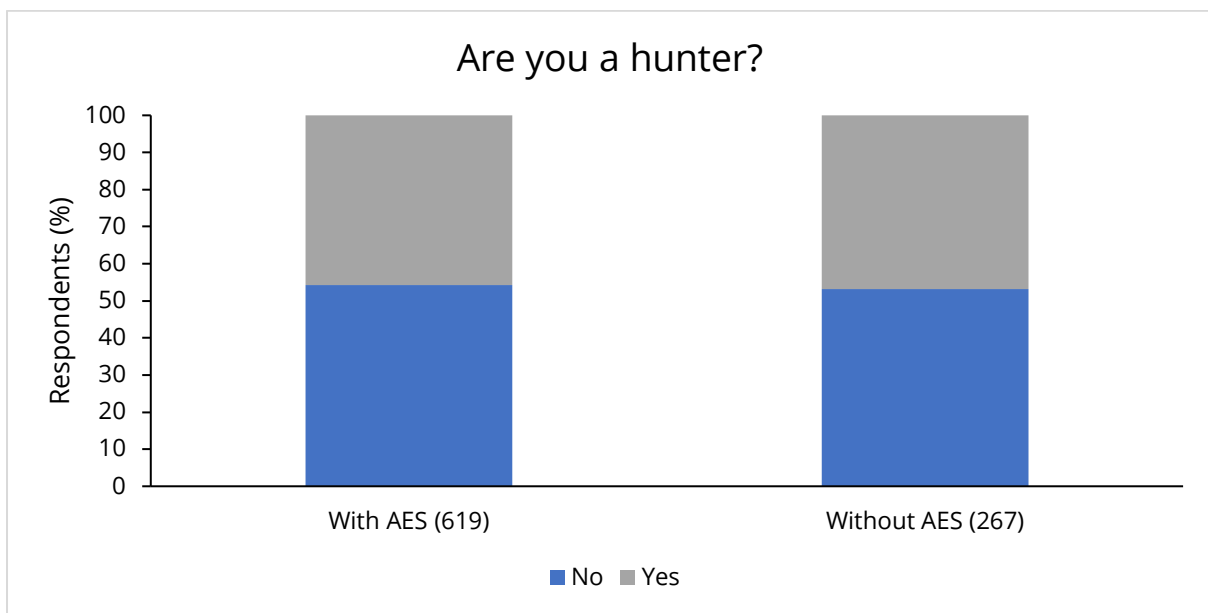
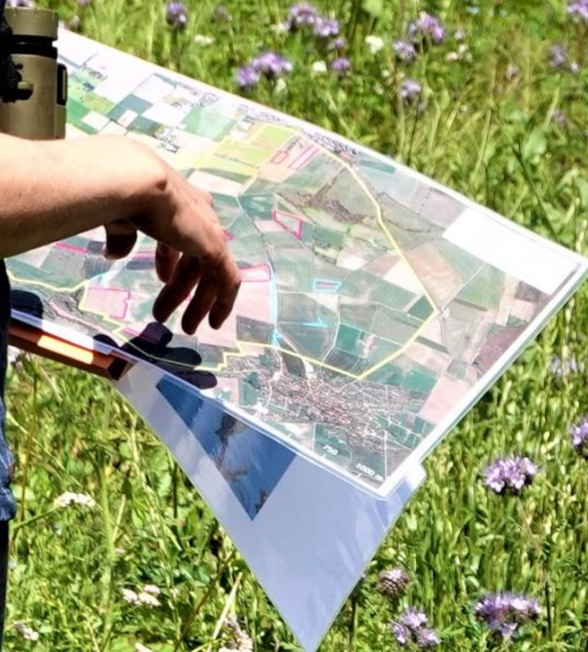


Figure 3. There was no significant difference between the percentage of respondents in each group (with or without AE schemes) who reported being a hunter.



SIEPMANN
2019 HERDECKE

ADVICE – WHO PAYS, WHO GIVES IT, AND HOW OFTEN?

Respondents with AE schemes differed from those without AE schemes when asked if they would personally pay for advice when/if entering an AE scheme (Chi-square₃ = 18.65, P < 0.001, Figure 4). Respondents with AE schemes were more likely to report they would pay for advice (29%), compared to those without AE schemes (16%), although a majority in each group (53% with AE schemes and 66% without AE schemes) would not pay for advice. The two groups differed in who they thought should pay for advice (Chi-square₅ = 18.98, P = 0.002, Table 1). In both groups most respondents thought that the government should pay, with a higher proportion of those without AE schemes choosing this option (68%) than those with AE schemes (63%). A higher proportion of those with AE schemes thought farmers (22%), or farmer clusters (16%), should pay compared to 11% and 10% respectively for those without AE schemes.

This suggests that those with AE schemes are more likely to see the advantage of advice than those without; they are slightly more willing to pay for it and are more likely to say that they need it (see below). However, **both groups place the main responsibility on government to pay for advice.**

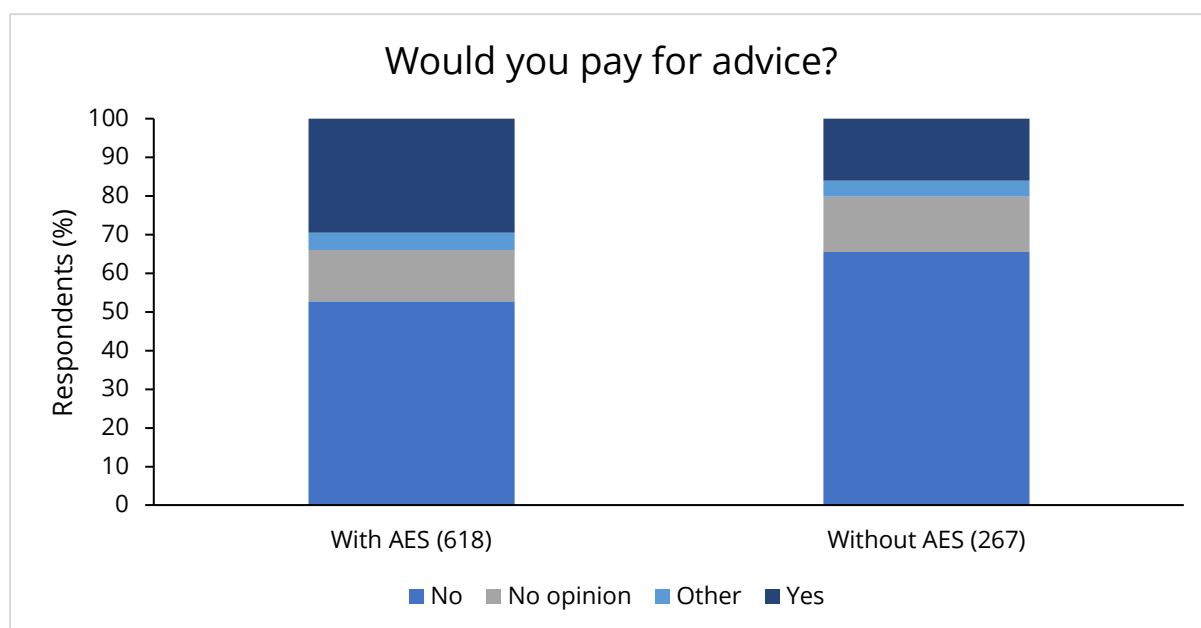


Figure 4. A smaller percentage of respondents without AE schemes (compared to those already in an AE scheme) said they would pay for advice if they were entering an AE scheme. However, for both groups a majority reported that they would not pay for advice.

Those with and without AE schemes differed in who they would prefer to get advice from (Chi-square₅ = 29.89, P < 0.001, Table 2), although **three categories covered the most preferred advisors – government advisors, advisors from farmer clusters and “other advisors”**. Respondents with AE schemes preferred farmer cluster advisors (41%) more than those without AE schemes (31%). The opposite was true when considering “other advisors”, with 47% of those without AE schemes preferring them compared to 41% of those with AE

schemes. Respondents with AE schemes slightly preferred researching their own solutions (22%) compared to 16% of those without AE schemes.

The two groups of respondents also differed in how often they wanted advice (Chi-square₅ = 30.15, P < 0.001, Figure 5). **The largest response for both groups was “When I request it.” – with 45% of both groups choosing this option.** A similar result was found for those who replied “only when starting an AE scheme” – selected by 10% of those with an AE scheme, compared to 9% of those not in an AE scheme. **Those with AE schemes reported wanting advice regularly throughout an AE scheme:** 28% wanted advice once a year, while 13% wanted advice two or three times a year. A smaller percentage of respondents without AE schemes wanted advice once a year (25%), while 9% wanted advice two or three times a year. Those without AE schemes were more likely to select “no opinion” (11%) versus those with AE schemes (2%), perhaps related to respondents from this group being less interested in receiving advice.



Table 1. Who should pay for advice when joining an AE scheme? Respondents could select “all options that applied”.

	Government	Farmer clusters	NGO*	Farmer	Other	No opinion
Have AE scheme (618)	63%	16%	12%	22%	3%	11%
No AE scheme (267)	68%	10%	15%	11%	3%	14%

*Non-governmental organisations

Table 2. Where would you prefer to get your advice for entering an AE scheme? Respondents could select “all options that applied”.

	Government advisors	Farmer cluster advisors	Other advisors	Research myself	Other	No opinion
Have AE scheme (612)	41%	41%	41%	22%	2%	3%
No AE scheme (266)	36%	31%	47%	17%	2%	11%

Table 3. Which aspects of AE scheme measures and their management did respondents tell us should be more flexible? We compared those with and without AE schemes and present the percentage of respondents who selected each management option.

Table 3a. Which aspects of agricultural management should be more flexible? Those with and without AE schemes were significantly different in what agricultural management they thought should be flexible. Respondents could select “all options that applied”.

	Herbicide use	The control of pernicious weeds (e.g., thistle)	Fertilizer use	Spreading manure	Flexibility that allows a change of location (e.g., due to weed problems)	Other
Have AE scheme	48%	78%	22%	32%	68%	9%
No AE scheme	61%	79%	34%	51%	68%	5%

Table 3b. Which aspects of the mowing should be more flexible? Responses were not significantly different between those with and without AE schemes. Respondents could select “all options that applied”.

	How many times you need to mow	The dates you are required to mow by	The use of the mown grass	How early you are allowed to mow	other
Have AE scheme	41%	76%	42%	43%	5%
No AE scheme	47%	73%	37%	54%	4%

Table 3c. Which aspects of sowing should be more flexible? Responses were not significantly different between those with and without AE schemes. Respondents could select “all options that applied”.

	Ability to control weeds chemically before sowing	Flexibility in sowing dates	The ability to use fertilisers on the option	other
Have AE scheme	54%	84%	31%	5%
No AE scheme	57%	81%	40%	5%

Table 3d. Which aspects of seed mixes should be more flexible? Responses were not significantly different between those with and without AE schemes. Respondents could select “all options that applied”.

	Designing your own mix (based on a list of species you could use)	Choosing from a set list of predefined mixes (each designed to help different wildlife)	Cost of seed mix affects the payment level, i.e., more expensive mixes, more payment	other
Have AE scheme	70%	55%	46%	3%
No AE scheme	64%	48%	49%	3%

Table 3e. Why do you want flexibility in the location of options? Responses were not significantly different between those with and without AE schemes. Respondents could select “all options that applied”.

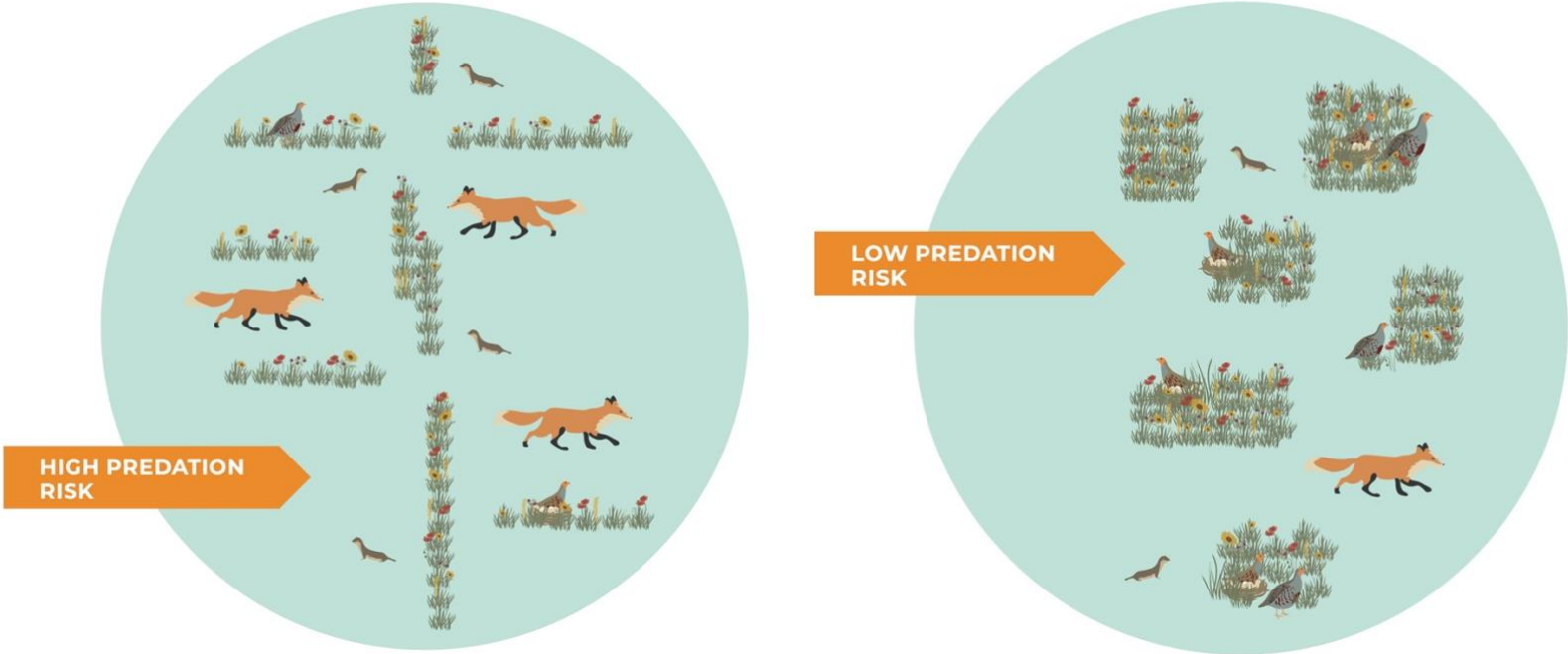
	When needed, to manage problems (e.g., weeds)	Because it will fit better with the farm management (e.g., crop rotation)	To better provide for the wildlife on my farm	other
Have AE scheme	69%	71%	65%	2%
No AE scheme	66%	73%	64%	3%

Table 3f. When should it be possible to have a derogation from the rules? Responses were not significantly different between those with and without AE schemes. Respondents could select “all options that applied”.

	To increase the wildlife value of an option	Because of a problem that becomes obvious during the period of the AE contract	To adjust sowing dates that may be affected by drought or unusually wet conditions	To mitigate effects of public access, etc. where AE measures have been damaged	other
Have AE scheme	68%	80%	82%	52%	2%
No AE scheme	59%	79%	76%	54%	2%

Table 3g. What types of predation management options should be paid for through AE scheme? Respondents with and without AE schemes differed significantly in their desired options. Respondents could select “all options that applied”.

	Fencing for nest protection.	Planting options in habitat blocks of at least 1 ha in size to minimize predation risk.	Lethal legal predator control.	An increase in the width of strips (to at least 20m)	other
Have AE scheme	43%	32%	86%	32%	5%
No AE scheme	44%	25%	82%	19%	9%



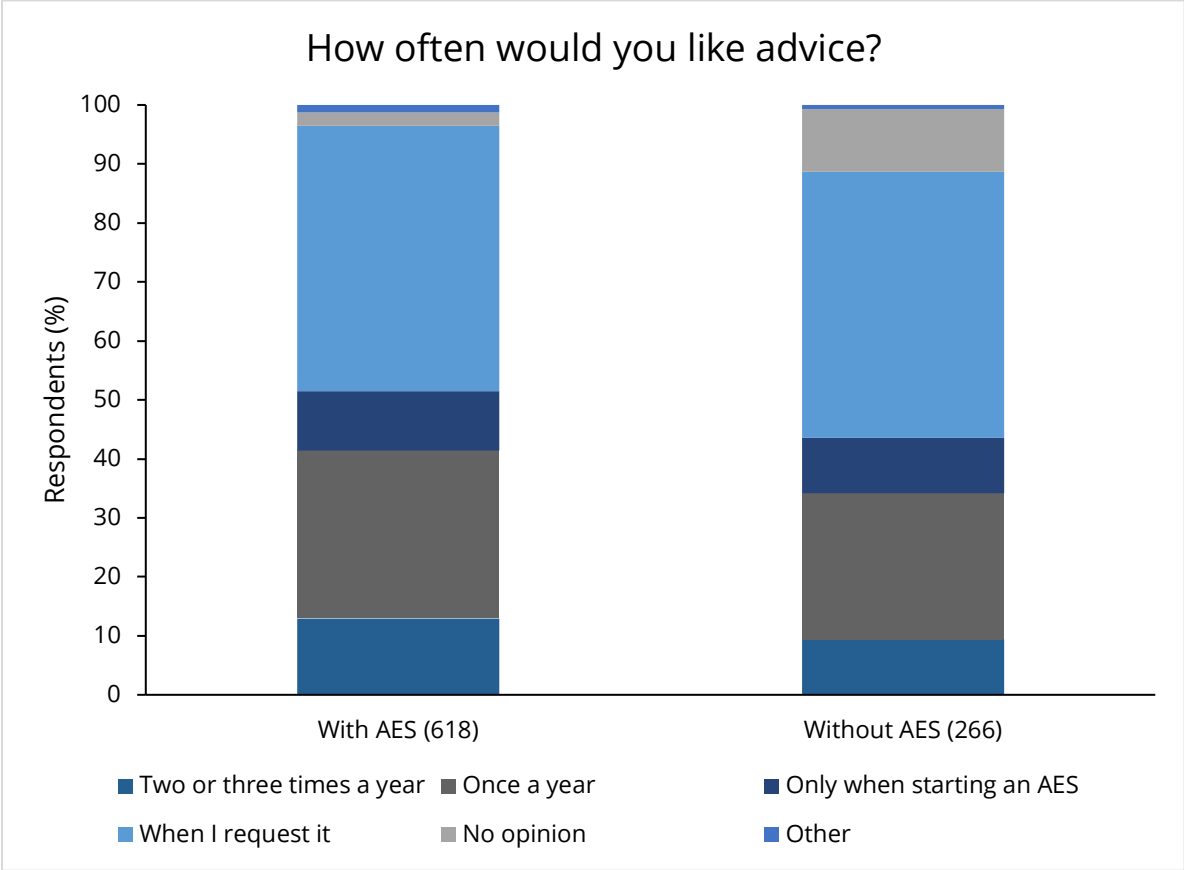


Figure 5. How often would you want advice when joining an AE scheme?

The two groups differed with a tendency for those with AE schemes to want more frequent advice, while a higher percentage of those without an AE scheme did not have an opinion on how often they would want advice.

WHAT ADVICE IS NEEDED WHEN ENTERING AE SCHEMES?

Most respondents with AE schemes considered advice on the choice of different AE options and on practical management of AE measures most important (over 80%, Figure 6). Also important was advice on financial implications, environmental and wildlife benefits, and legal aspects of AE contracts. **Only a small minority (3%) said that they do not need any advice at all.**

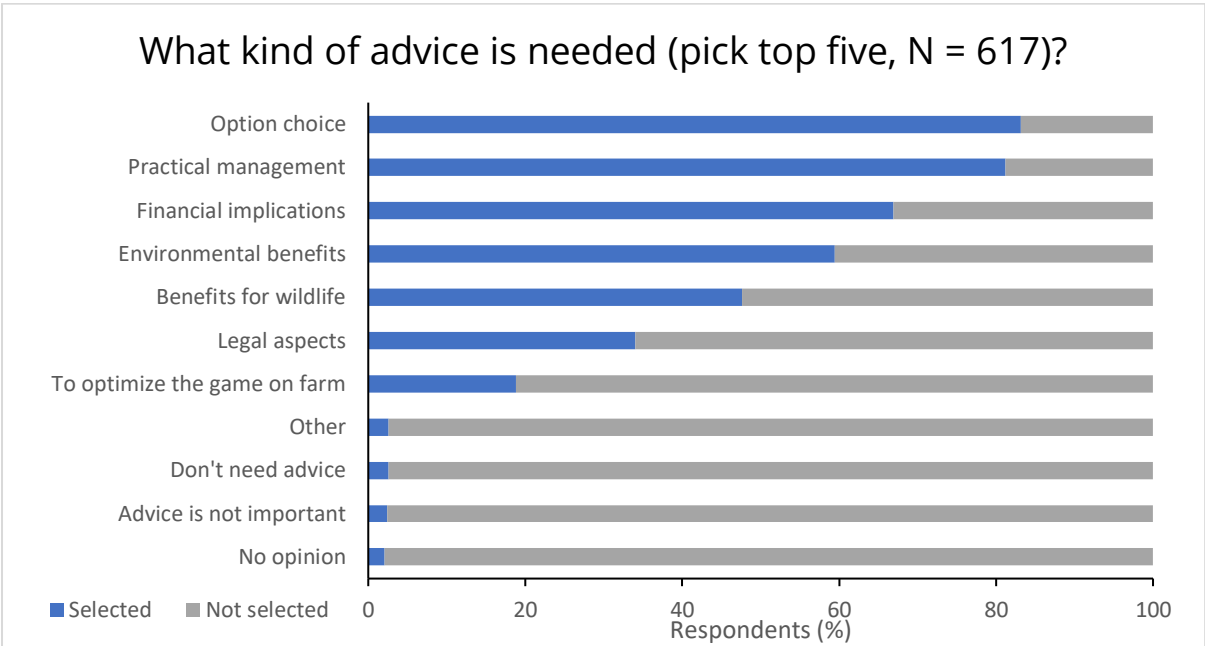


Figure 6. What advice did those in an AE scheme think was necessary when joining an AE scheme?

Respondents without AE schemes followed a similar pattern to those with an AE scheme in what type of advice they would need if they joined an AE scheme (Figure 7). They considered option choice as the most important type of advice – selected by 70% of those without AE schemes. Financial implications were relatively more important – though a similar proportion selected them (67% of those without an AE scheme versus 66% of those with an AE scheme). Practical management, environmental and wildlife benefits were similarly selected. Advice on the ability to optimise game on the farm was selected by 32% of those without an AE scheme but by only 19% of those with an AE scheme. **Again, only a small minority (5%) said that they did not need advice.**

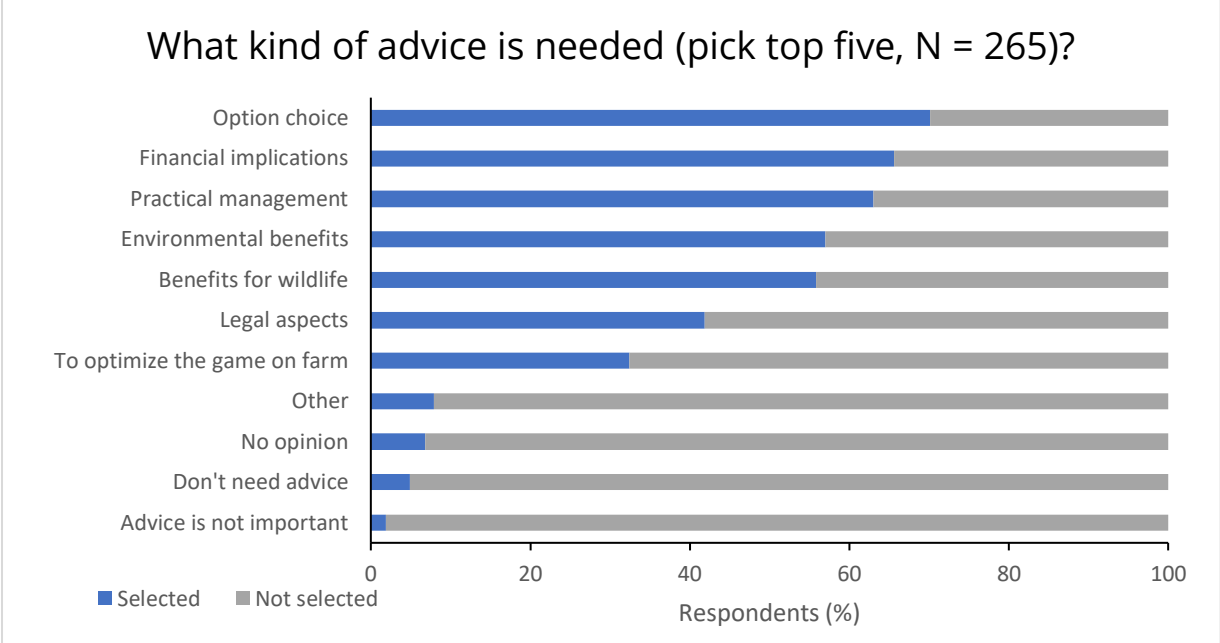


Figure 7. What advice did those without an AE scheme think would be necessary when joining an AE scheme?

WHAT KIND OF AE OPTIONS DO YOU HAVE?

We asked respondents with AE schemes for arable wildlife what options they had (Figure 8). The most common were floristically-enhanced grass margins (51% of respondents), followed by unharvested cereals, permanent wild-flower cover, rotational wild bird cover, and supplementary overwinter food for birds (between 28-40% of respondents). The remaining options were reported by 20% or fewer of respondents.

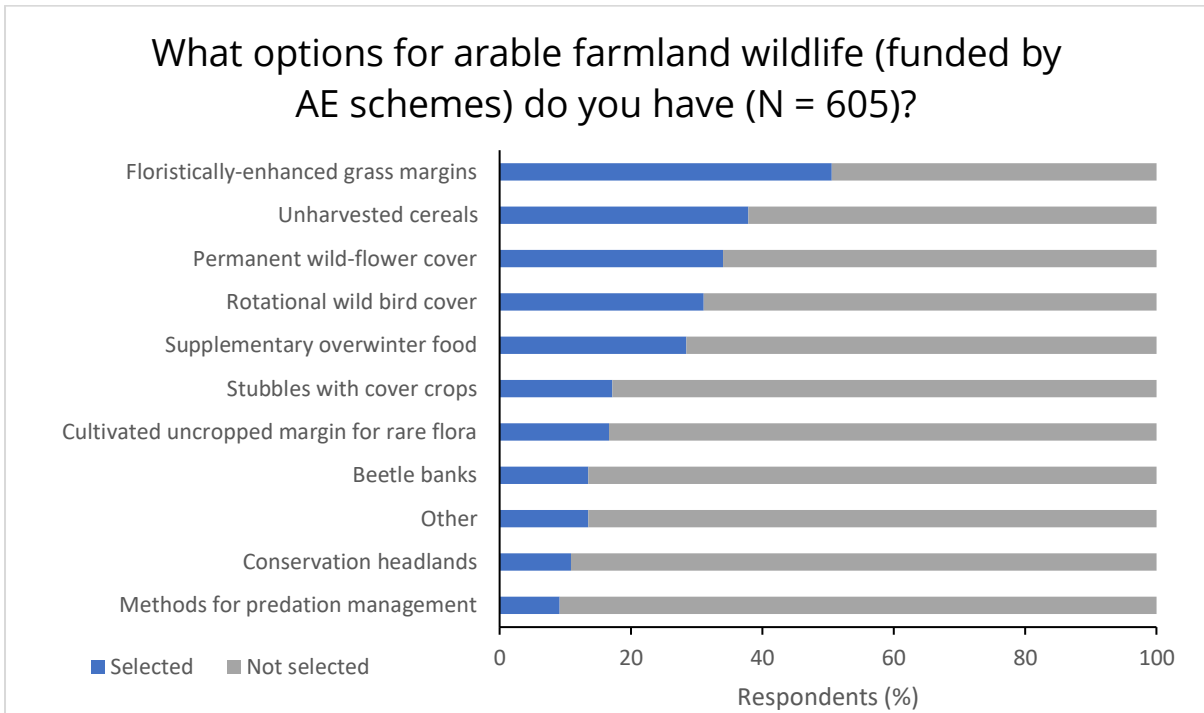


Figure 8. AE scheme options respondents reported having.



WHAT OTHER OPTIONS WOULD THOSE IN AE SCHEMES LIKE TO TAKE UP?

We asked those respondents that were in AE schemes what other measures they would be interested in taking up, offering them a suite of choices. We offered the same list to all respondents – we did not distinguish whether these options were currently available to them or whether they already had a measure. **Only 8% of the respondents to this question did not have an interest in any of the other AE measures proposed (Figure 9), which shows that there is scope for the provision of more AE measures amongst those who participate in AE schemes.**

The AE measures that respondents would be most interested in implementing in addition to the ones they already had were permanent wildflower cover, floristically-enhanced grass margins, unharvested cereals, and supplementary overwintering food (all selected by over 30% of the respondents).

The first three of these were the three most common measures that those with AE schemes had at the time, underscoring how popular they are. Measures for predation management (28%) and conservation headlands (26%) were also popular, although they were the measures least reported as being undertaken by those in AE schemes. Less commonly selected AE options included: stubble with cover crops (23%), cultivated uncropped margins for rare arable flora (21%), rotational wild bird cover (20%) and beetle banks (17%). Rotational wild bird cover was the fourth most common measure being undertaken by those in AE schemes (Figure 11), perhaps many who were interested in it have it already.

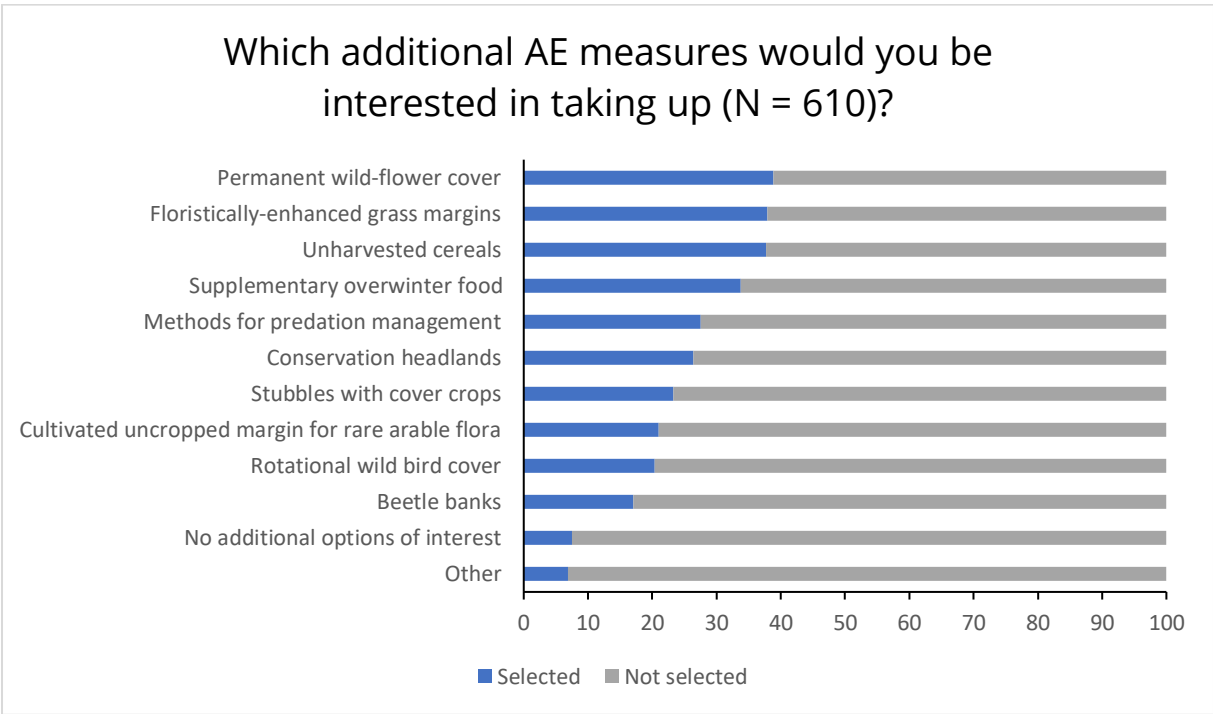


Figure 9. What other AE measures would those already in AE schemes be interested in taking up?

REASONS FOR UPTAKE

We asked respondents in AE schemes to tell us about their main reasons for taking up those schemes (Figure 10). **The most important reason given was 'to help biodiversity' (67%), followed by 'to help the environment, i.e., water, air, climate' (56%) and 'it makes me feel good' (48%).** Slightly fewer respondents reported the following: 'to improve the image of the farm', 'value for money', 'solution for less productive areas', 'because measures were easy to fit in', and 'for hunting interest' which were each mentioned by 30-40% of the respondents. Other motives ('to improve the soil, fixed basic income, little work for money, pest control, added value for produce, input from advisor' and other answers) were selected much less often.

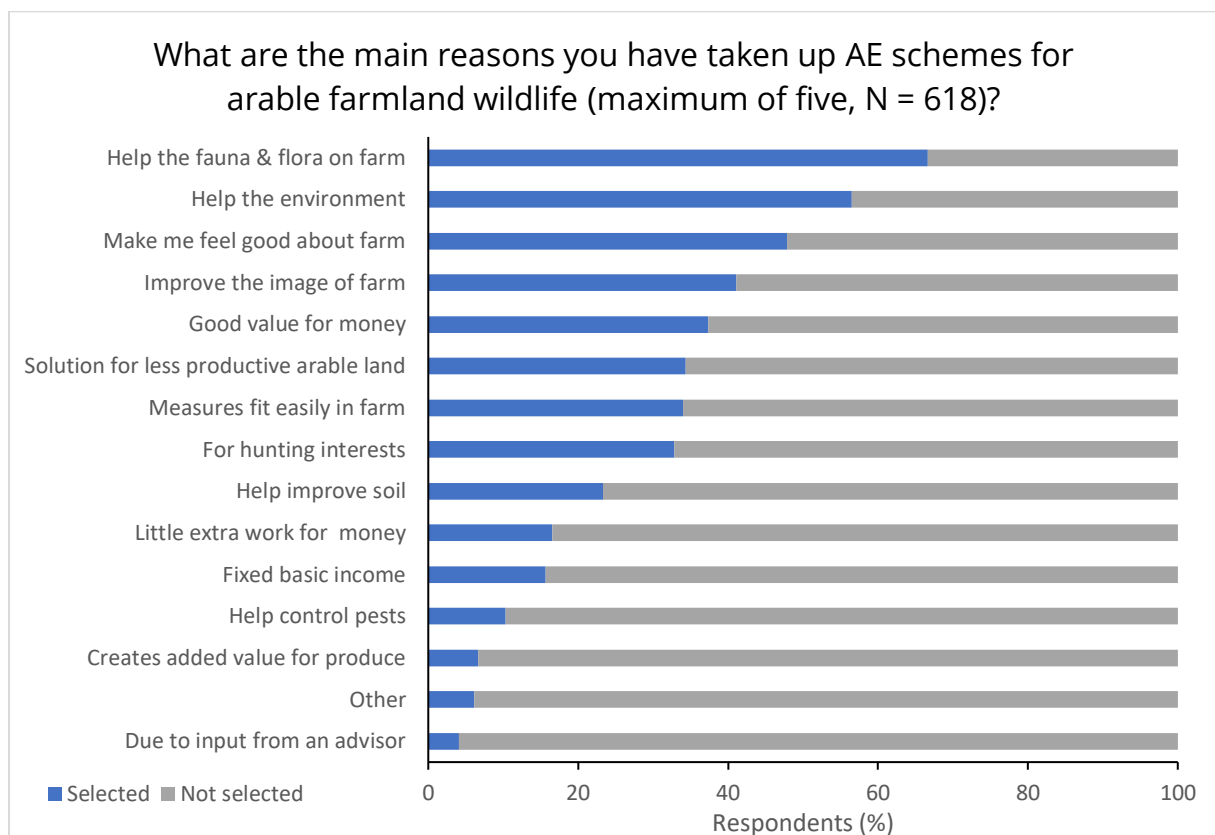


Figure 10. Why did respondents in AE schemes take part in them?

REASONS FOR NOT JOINING AN AE SCHEME

We asked those respondents who were not in an AE scheme why they had not joined one. Half of them reported that they had already established measures for the environment for free (Figure 11). Worryingly, fifteen percent of the respondents said they had not heard of AE schemes. Ten percent of these respondents said that they had been in an AE scheme in the past, but it had not worked out for them, while 9% were not interested and 7% had applied but had not been successful in that application. Over a fifth of respondents gave “other” as a reason, with varied responses here - some mentioned they were considering joining, were waiting for the application window to open, or felt that they already undertake conservation work without being in an AE scheme.

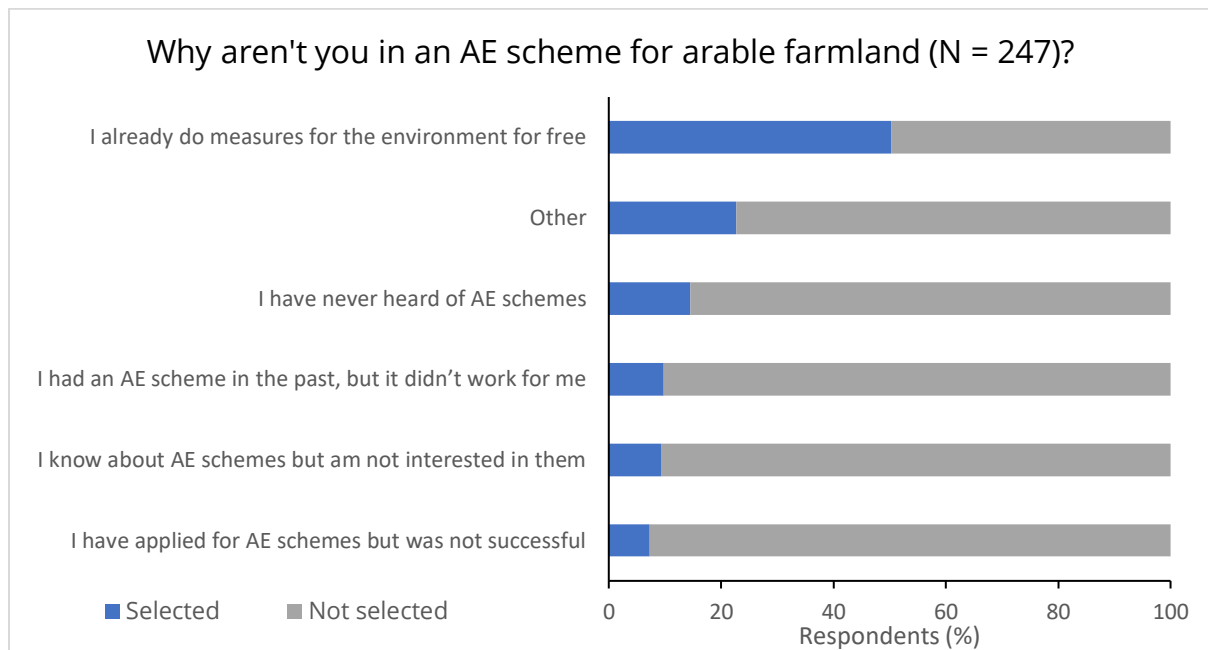


Figure 11. Why haven't those who were not in an AE scheme joined one.

WHAT OPTIONS WOULD THOSE NOT IN AN AE SCHEME CHOOSE?

Over half of respondents not in AE schemes reported they would take up floristically-enhanced grass margins, with 48% reporting they would install permanent wild-flower cover, and 45% wanting to provide supplementary overwinter food (Figure 12). Between 30 to 40% reported wanting to take up stubbles with cover crops, unharvested cereals, rotational wild bird cover, methods for predation management, and conservation headlands. Twenty-seven percent said they would take up cultivated uncropped margins for rare arable flora and 21% beetle banks. **This is interesting, suggesting that most non-AE scheme respondents have a clear interest in many individual measures in the schemes.**

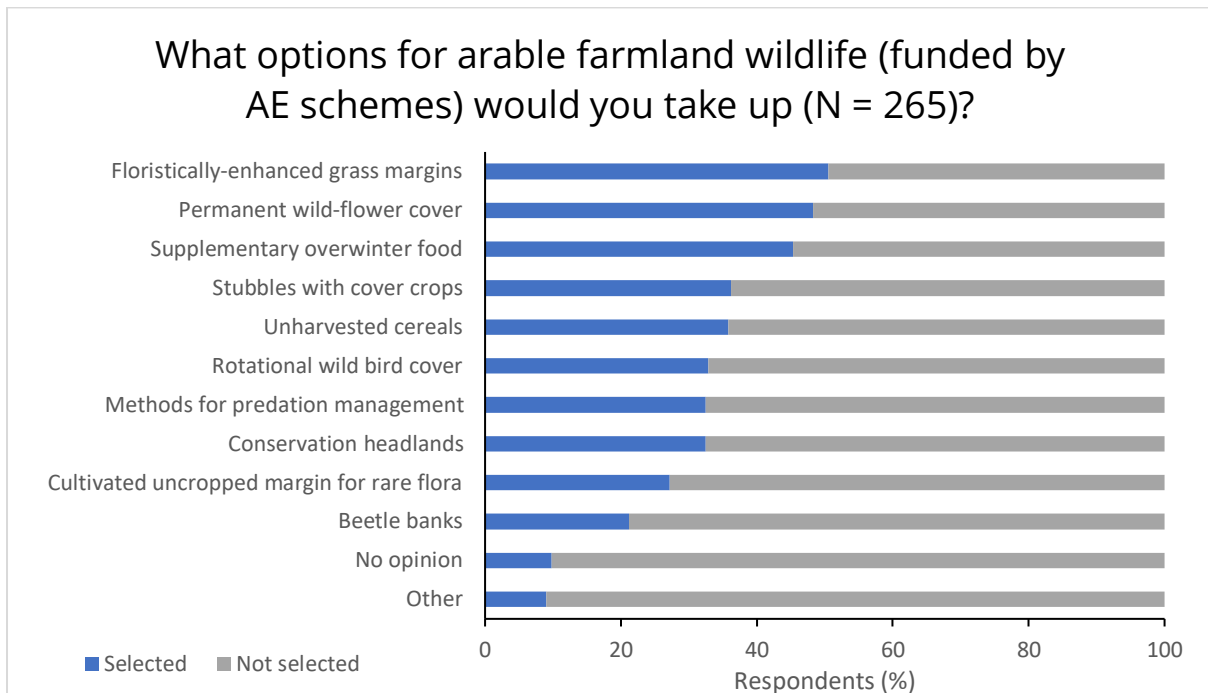


Figure 12. What options would those not in an AE scheme take up if they were going to enter an AE scheme?

WHAT CHANGES WOULD ENCOURAGE YOU TO TAKE UP AE SCHEMES?

We asked respondents without AE schemes to tell us what changes to various aspects of AE schemes would encourage them to change their mind and join one (Figure 13). **Most popular (measured as the percentage of respondents who indicated that a change would encourage them to go into an AE scheme) was flexibility in management options (80%), with 78% of respondents telling us they wanted less administration and more flexible contracts.** This was followed by changes associated with possible (note not certain) long-term administrative land changes – respondents seem concerned that their participation in AE schemes could lead to long-term restrictions on how their land could be managed (77% concerned with unwanted nature designation and 73% with long-term legal restrictions). It is possible that this belief is based on experience they may have had or heard about.

Sixty-eight percent of respondents said that allowing land in AE schemes to count towards greening requirements would encourage them to take up a scheme. Two thirds of respondents said that having options that better fit their farm conditions, more trust in government, changing inspections to self-assessment, and recognition from society for having AE options would help persuade them to join an AE scheme. **Over 60% of respondents reported that higher payments, lower penalties, and better face-to-face advice would encourage them to take up an AE scheme.**

Between half and 60% of respondents reported that more reliable payments, fewer inspections, options that would increase the value of farm products, better written information, payments for results and evidence that AE schemes deliver more wildlife would

encourage them to join an AE scheme. Less than half of respondents reported that increasing the flexibility of spreading fertilizers, allowing hunting in AE measures, the ability to collaborate with other farmers and the permission of the landowner that owns the land would encourage them to enter an AE scheme.

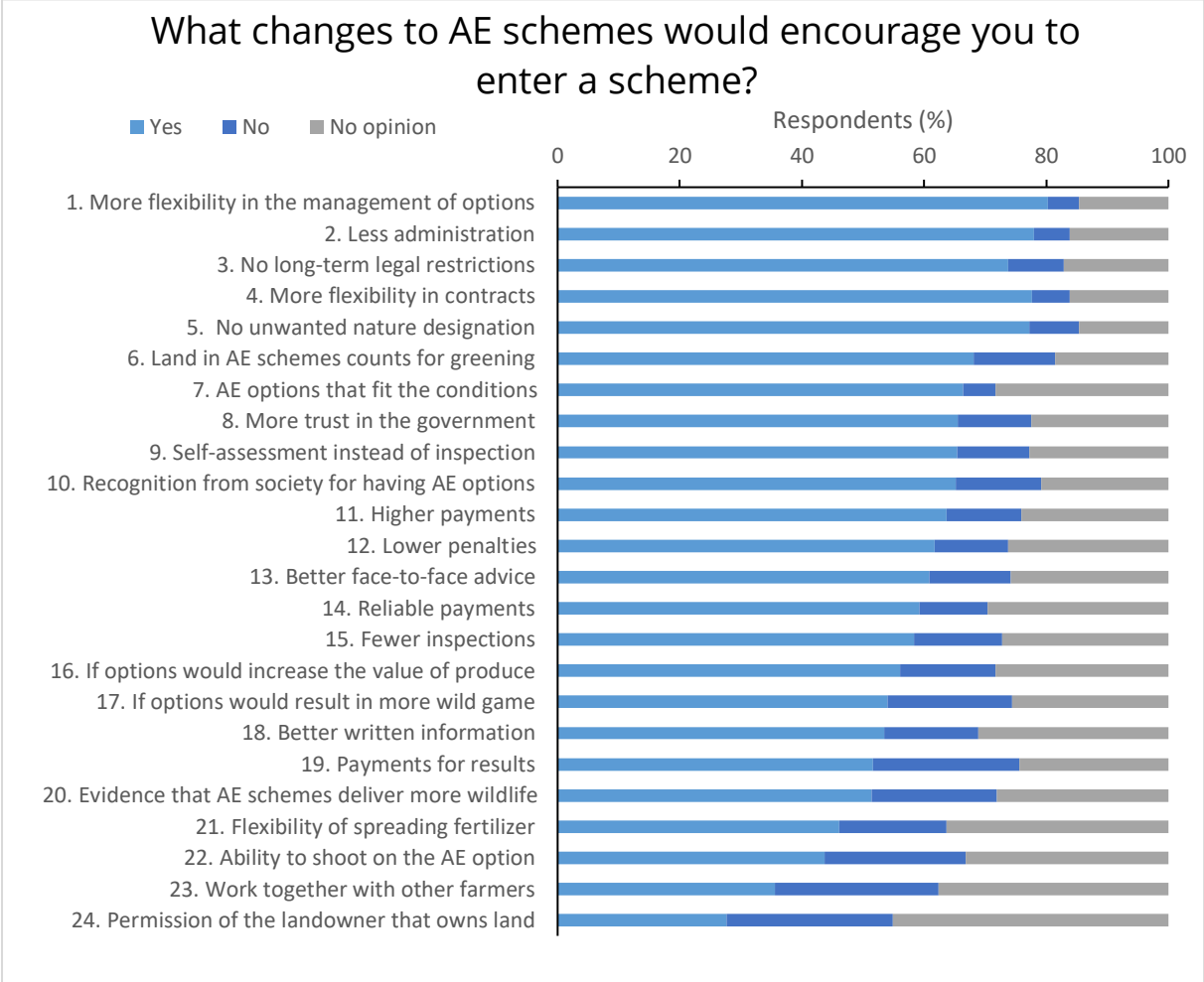


Figure 13. Results from respondents without AE scheme involvement, ordered according to the proportion of respondents that said a change would encourage them to join a scheme.



'Access to high-quality research focused on practical measures that farmers can implement across their farms, is vital to restore species abundance across the farmed landscape.'

Harold Makant, Senior Land Management Advisor, Natural England

FLEXIBILITY – HOW TO IMPROVE SCHEME OPTIONS

One of the main findings from our survey was the overwhelming desire for greater flexibility in the management of the measures, expressed by those with and without AE schemes. We compared responses from those with and without AE schemes on which aspects of the different measures they most wanted flexibility in and collated the results for each.

ASPECTS OF AGRICULTURAL MANAGEMENT

There was a significant difference between respondents with or without AE schemes in what aspects of agricultural management should be more flexible (Table 3a, page 33, Chi-square₅ = 16.48, P = 0.005), with a greater percentage of respondents without AE schemes more interested in flexibility on spreading of manure, fertilizer, and herbicide use than respondents already in AE schemes. **Both types of respondents rated the control of pernicious weeds of more interest, followed by flexibility in location.**

MOWING ASPECTS

There was no significant difference between respondents with or without AE schemes in what aspects of mowing should be more flexible (Table 3b, Chi-square₄ = 3.89, P = 0.421). **Respondents considered more flexibility in the timing of mowing AE habitats to have the highest priority** (when it should be completed by, followed by how early you are allowed to mow). Slightly less important was flexibility in the frequency of mowing and the use of mown grass.

SOWING ASPECTS

There was no significant difference between respondents with or without AE schemes in what aspects of sowing of measures should be more flexible (Table 3c, Chi-square₃ = 2.40, P = 0.494). **Flexibility in the dates for sowing AE measures was the most mentioned option**, followed by more flexibility in the allowance to control weeds chemically before sowing. The possibility to use fertilizers on AE measures was considered less important.

SEED MIX ASPECTS

There was no significant difference between respondents with or without AE schemes on what aspects of seed mixes should be more flexible (Table 3d, Chi-square₃ = 1.59, P = 0.662). **Respondents gave the highest priority to more flexibility in designing their own seed mixes for AE habitats, based on a list of species for inclusion in their mix.** The next most important options preferred by our respondents was more flexibility in choosing from a set of predefined seed mixes, followed by flexibility in the cost of seed mixes.

LOCATION OF OPTIONS

There was no significant difference between respondents with or without AE schemes on flexibility in the location of options (Table 3e, Chi-square₃ = 0.29, P = 0.961). **The respondents considered the importance of fitting around farm rotations slightly more important than managing problems** (for example weeds), followed by providing for wildlife.

DEROGATION FROM THE RULES

There was no significant difference between respondents with or without AE schemes in when a derogation from the rules governing AE schemes should be allowed (Table 3f, Chi-square₃ = 1.64, P = 0.801). **Of equal importance were consideration for weather conditions or when a problem became obvious during the period of the AE contract.** This was followed by an interest in increasing the wildlife value of an option and finally to mitigate effects of public access – addressing damage to measures.

SHOULD PREDATION MANAGEMENT BE AN OPTION?

There was no difference in the proportion of respondents with or without an AE scheme who thought that more predation management should be available in AE schemes (Chi-square₂ = 0.87, P = 0.648). There was a significant difference between respondents with or without AE schemes in what predation management options should be paid for through AE schemes (Table 3g, Chi-square₄ = 10.29, P = 0.036). **Legal lethal control of predators was the option most selected by both groups of respondents for inclusion in AE schemes,** followed by fencing for nest protection. A higher percentage of respondents with AE schemes chose increasing the width of strips to at least 20m (32%), compared to those without AE schemes (19%), with slightly more respondents with AE schemes choosing planting options in blocks (32%) compared to those without AE schemes (25%).

PAYMENTS AND CONTRACTS

Respondents differed in the length of AE scheme contract they preferred, depending on whether they currently had AE schemes (Chi-square₄ = 53.70, P < 0.001, Figure 14). **The most preferred length of contract was “Short contracts”** (less than five years), with similar proportions of respondents selecting this option (with AE schemes – 42%, without AE schemes – 41%). Medium (five to ten years) and long-term contracts (over ten years) were more likely to be selected by those with AE schemes, 30% and 10%, respectively, compared to 13% and 1% respectively for those without. Thirty six percent of respondents without AE schemes preferred annual contracts compared to 13% of those with schemes.

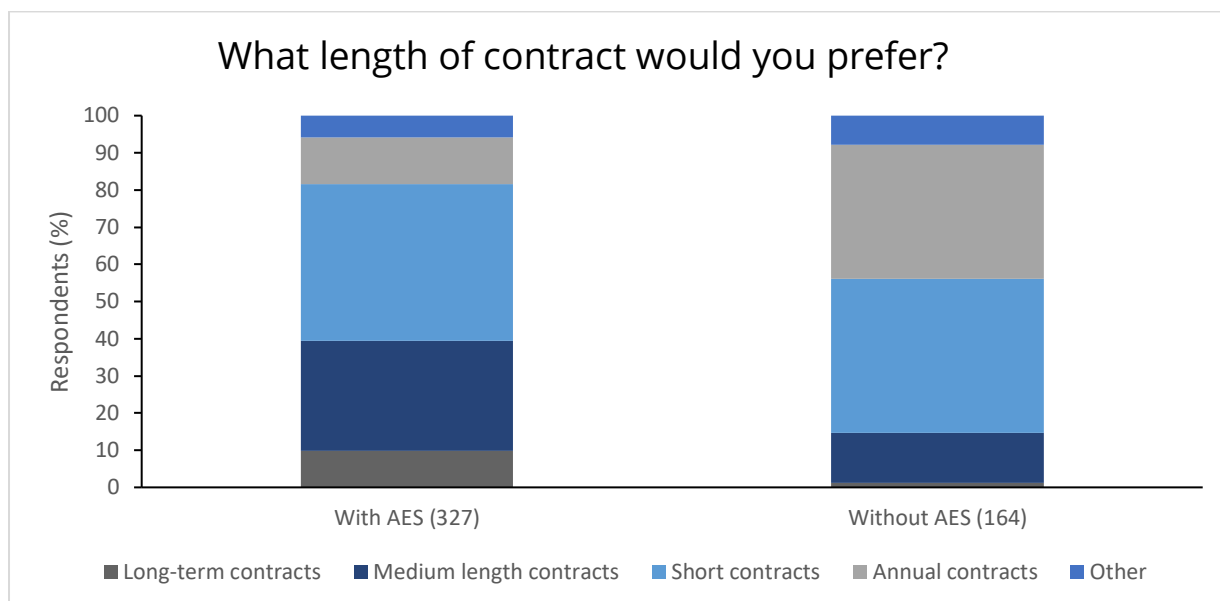


Figure 14. What is the preferred length of contract?

In general, shorter contracts were preferred by those that are not in an AE scheme. In both groups, the most popular length of contract was between one and five years.

For respondents from those countries in the EU (Belgium, the Netherlands and Germany), there was no difference between those with and without AE schemes in the proportion reporting that funding for AE schemes should come from either the EU (average 24%) or a combination of the EU and national governments (average of 65%, Chi-square₁ = 1.66, P = 0.198, Table 4a). For respondents from countries outside the EU (England and Scotland), a greater proportion of respondents reported that funding should come from the UK (United Kingdom) government, 81% of those with AE schemes versus 55% of those without AE schemes (Chi-square₁ = 17.32, P < 0.001, Table 4b).

We combined responses across all countries to examine the remaining proposed funders. Those with and without AE schemes differed in their preference of where the funding should come from to support AE schemes (Chi-square₈ = 15.38, P = 0.017, Table 4c). There was a higher preference for private sector funding from those with AE schemes (30% of respondents), compared to 19% of those without AE schemes.

ASPECTS INCLUDED IN THE CALCULATION OF PAYMENT FOR AE OPTIONS

Over 70% of respondents in an AE scheme thought that the effort needed for establishing and maintaining AE habitats should be considered in the calculation of payments and that income foregone should be used to calculate payments (Figure 15).

Note – income foregone is the current, main system of payment calculation. Between twenty and forty-five percent of respondents with an AE scheme thought that a bonus for extra biodiversity, habitat quality or result-based payments should be included. Far fewer thought that rent, the type of farm, land prices, regional differences or soil should be considered.

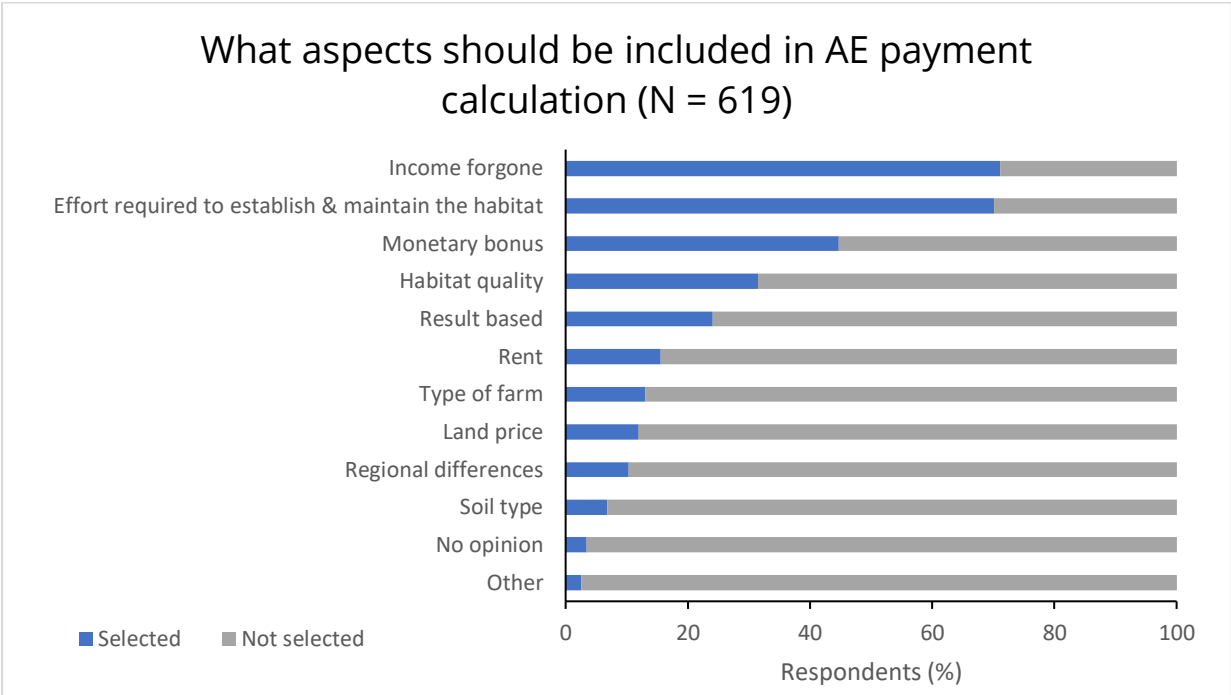


Figure 15. What did respondents, in an AE scheme, think should be considered in AE payments?

Sixty percent of those respondents who were not in an AE scheme selected both income foregone, and the effort required to establish and maintain the habitats in a scheme as aspects that should be included in payment calculations (Figure 16). The same was true for having an additional payment for increased biodiversity and habitat quality. A higher proportion of respondents without AE schemes than those with selected the type of farm, rent paid and land price as important components of payment calculations. These were selected at a higher rate than the option of payment by results. Regional differences were slightly more important as an aspect for calculating payments for those not in an AE scheme. Soil type and “other” were selected by fewer than 10% of the respondents without AE schemes.



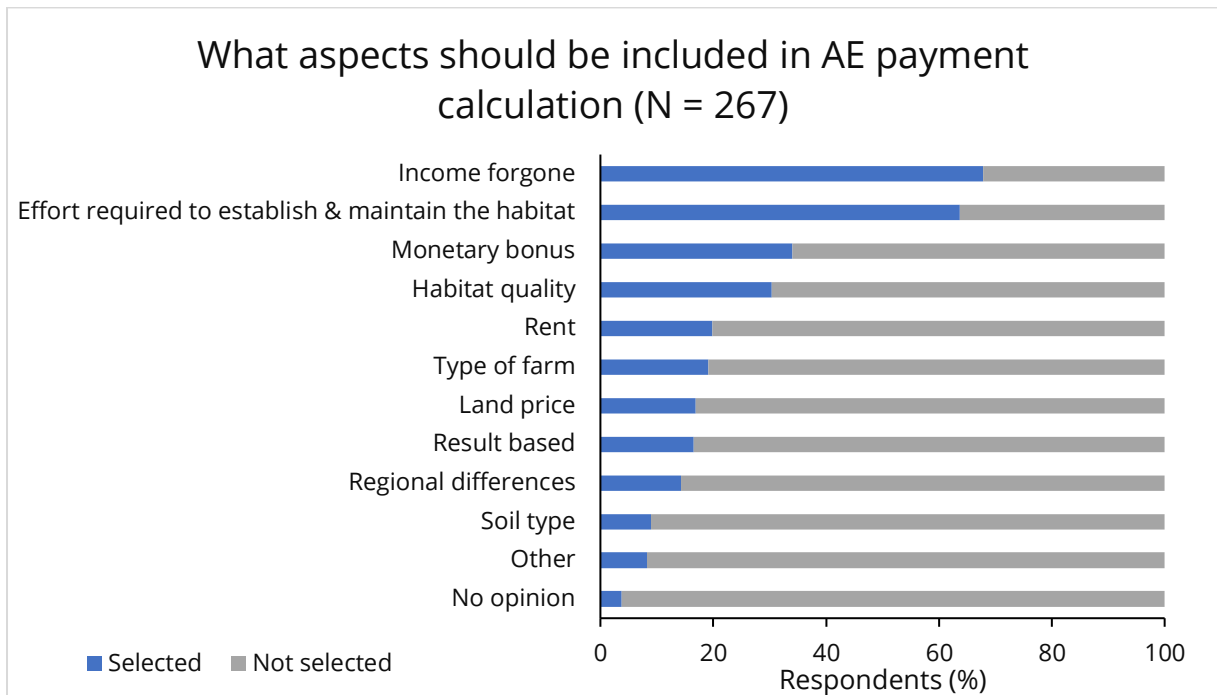


Figure 16. What did respondents, who were not in an AE scheme, think should be considered in AE payments?

PAYMENT LEVELS

We asked respondents to tell us if the payment level, available in their country, for the wild bird seed mix option, was adequate. Payment levels at the time of the survey (provided in the survey) were: Belgium €1931/ha, England £550-£650/ha (€638 - €754), Germany €700 - €875/ ha, the Netherlands €2025 - €2550/ha and Scotland £550-£650/ha (€638 - €754). There was no significant difference between those with or without an AE scheme (Chi-square₁ = 5.28, P = 0.071). **On average, 67% of respondents reported that the payment level was adequate** (Figure 17).

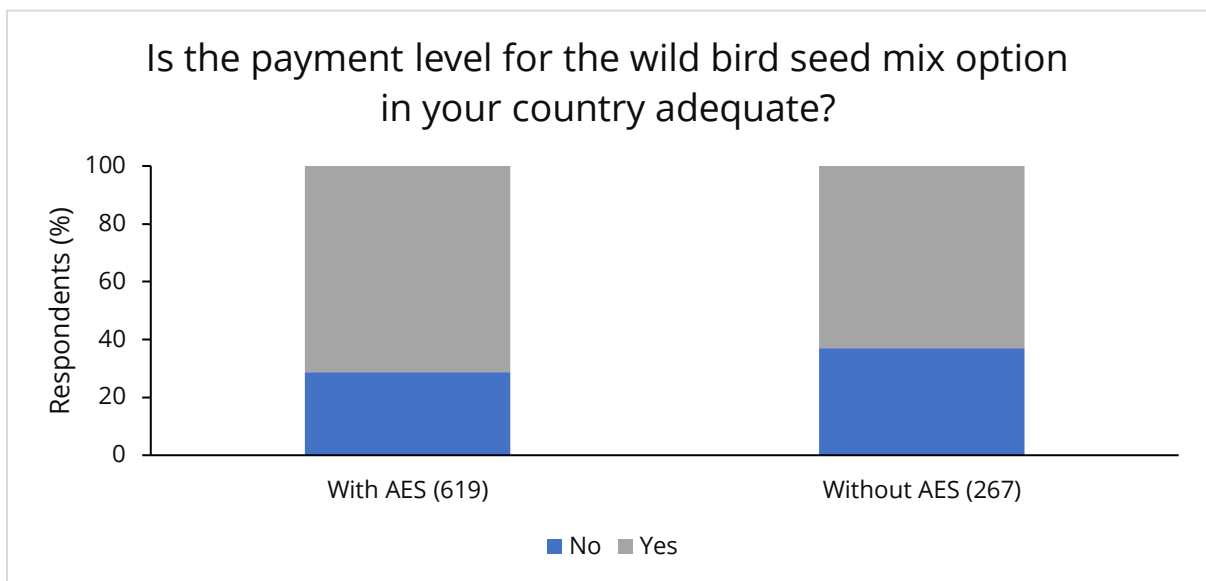


Figure 17. There was no significant difference between the percentage of respondents in each group (with or without AE schemes) that thought the payment level available to them for wild bird seed mix option was adequate.

We asked those who considered the payment level as inadequate to suggest a level they would consider adequate. This required us to analyse the results individually for each country as payment levels differed between the countries surveyed, testing to see whether this level differed between those with or without an AE scheme (Figure 18).

Those respondents not in AE schemes suggested significantly higher payment levels in Belgium (Mann-Whitney U = 307.0, P = 0.002), Germany (Mann-Whitney U = 61.5, P = 0.038), and the Netherlands (Mann-Whitney U = 113.0, P = 0.005), with no significant difference in England (Mann-Whitney U = 336.5, P = 0.115) or Scotland (Mann-Whitney U = 3.0, P = 0.933). The sample size (4 without AE schemes, 2 with AE schemes) was very small in Scotland. We compared the level of payment currently available to the suggested levels of payment (Figure 18).

Across all countries, those with an AE scheme suggested a median payment increase of 18% (14-29% interquartile range), while those without an AE scheme suggested a median increase of 29% (17-55% interquartile range).

Table 4. Where should the money come from to finance AE schemes for arable farmland?

Table 4a. Comparing those countries that are within the EU, there was no difference between those with or without an AE scheme in the percentage that thought funding should come from the EU or a combination of the EU and national government.

	EU*	EU & National government
Have AE scheme (430)	22%	69%
No AE scheme 193	26%	61%

*Not offered to respondents in England or Scotland.

Table 4b. In England and Scotland, those in an AE scheme were more likely to respond that funding should come from the UK government.

	UK level government
Have AE scheme (188)	81%
No AE scheme (74)	55%

Table 4c. A higher proportion of those in AE schemes were more likely to indicate private interests as providing funding for AE schemes.

	National government	Regional government	Agri-business	Private interests	Consumers	Other	No opinion
Have AE scheme (618)	29%	15%	9%	30%	32%	2%	6%
No AE scheme (267)	36%	18%	8%	19%	32%	4%	8%

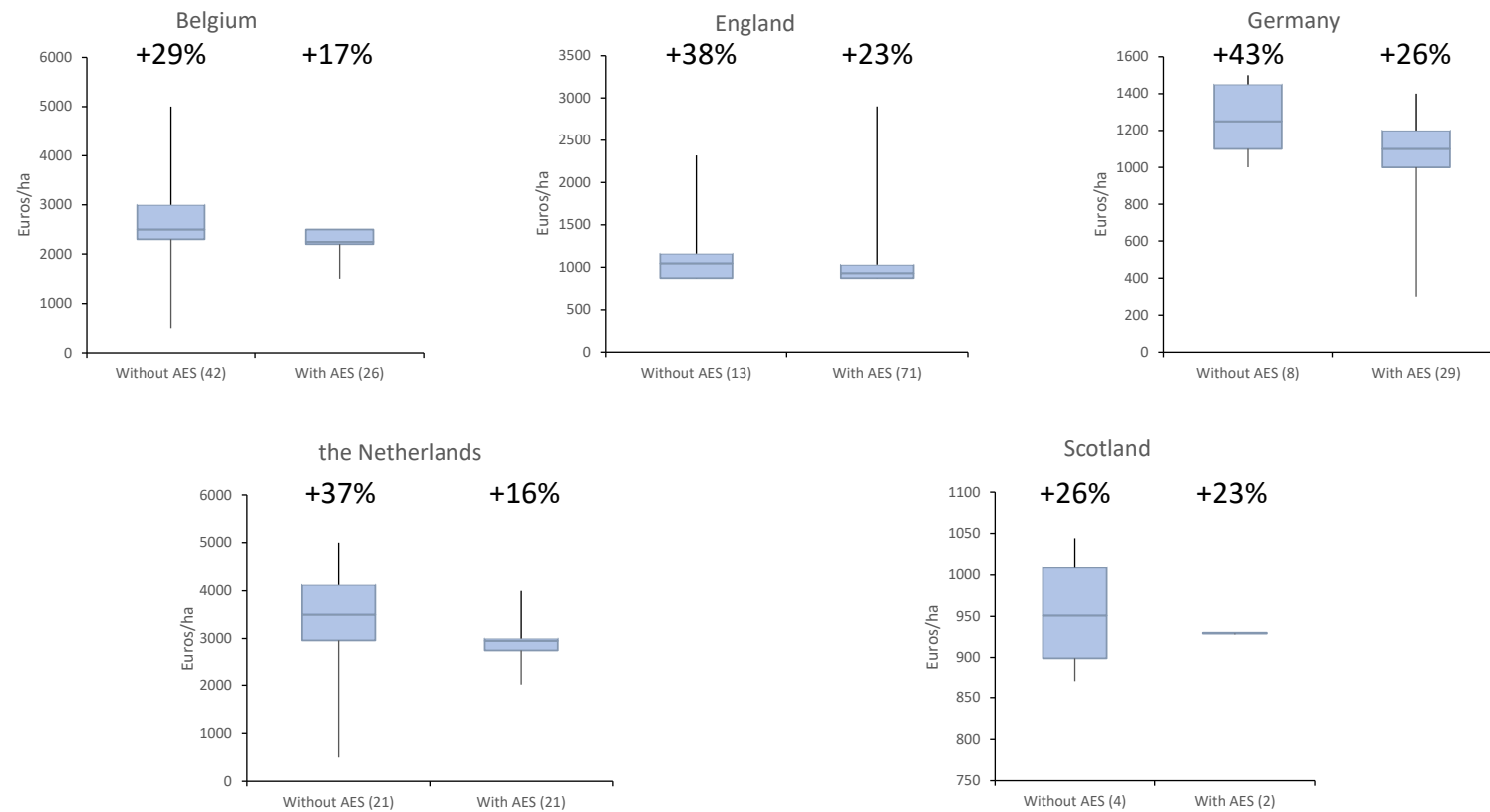


Figure 18. Suggested payment levels for the wild bird seed mix option in each country, for those respondents who said the current payment level was inadequate. Median payment levels suggested by respondents were compared to the levels in each country at the time of the survey (provided in the survey) and are expressed as a percentage of the level available in the text labels. Payment levels for England and Scotland are expressed in euros, based on an average exchange rate for the three months the survey was available. Please note the different scales on the y-axis and the number of respondents in some groups is low.



DISCUSSION

There is a large body of published work comparing the characteristics of farmers that take up AE schemes, the farm-related characteristics that influence uptake and the scheme designs that are associated with higher uptake of AE schemes (reviewed by Hasler et al. 2022, Lastra-Bravo et al. 2015; relevant publications include: Bartkowski and Bartke 2018, Brown et al. 2019; 2021, Dessart et al. 2019, Pavlis et al. 2016, Zimmermann & Britz 2016).

The most easily quantified farmer-related characteristic that we report here is the age of our respondents. We found no difference in the age profile of those who had an AE scheme and those who did not. Other researchers had tended to find that younger farmers were more likely to take up AE schemes – and that is what our original survey of stakeholders had suggested would be the case (Brown et al. 2019, 2021, Ghyselinck 2021).

We found that our respondents did not differ in the proportion of organic farmers in an AE scheme versus those not in a scheme, with some indications that our sample had a higher proportion of organic farmers than would be expected through random selection (Appendix 2).

Our respondents without AE schemes fell in the conditional non-adopter range (those who have decided not to participate under existing circumstances but are persuadable), rather than the resistant non-adopter category (would not participate under any circumstances, Morris & Potter 1995), providing hope that they can be convinced to join a scheme.

Research has found that farmers in Northern Europe are more inclined to join AE schemes than farmers in other parts of Europe (Pavlis et al. 2016) and our respondents may reflect this, as even those without AE schemes seemed reasonably disposed to them.

All these point to our respondents, even those who were not taking part in AE schemes, as having more of an interest in environmental concerns than what may be considered average for arable farmers in northwest Europe. Many of those taking part in our survey have an interest in hunting (46%) and that might influence their interest in the environment, with some AE scheme options arising out of management to support quarry species (Brewin & Dimbleby 2018, Brewin et al. 2020).

Another consideration may be that policy initiatives such as the Farm to Fork Strategy, including increased political and social support for reduced pesticide use and organic farming through the Green Deal, as well as international proposals such as the 30 by 30 initiative, have affected the outlook of arable farmers in general, leading to greater acceptance of more nature-friendly practices.

We considered farmer motivation and scheme design (Hasler et al. 2022) to address behavioural and supportive aspects of AE scheme design that have received less attention from policymakers (Brown et al. 2021, Dessart et al. 2019). We focused here on those results on the effects of advice to support AE scheme involvement, what changes to schemes would increase uptake, considering what other researchers have found – regarding aspects of

flexibility, reflecting the goodness of fit with a farmer's activities (Bartkowski and Bartke 2018), and how contract length and payment levels were viewed by respondents (Brown et al. 2021, Kuhfuss et al. 2019, Wąs et al. 2021).

Advice to aid in the implementation of an AE scheme was considered useful by a majority of our respondents (~90%), with help on option choice, practical management, and the financial implications of joining an AE scheme the most usual reasons for both respondents with and without AE schemes, similar to the review of Lastra-Bravo et al. (2015). Those with an AE scheme were more likely to report that they would pay for advice – although free advisors from the government were the most popular type for both those with and without an AE scheme.

Those in an AE scheme reported wanting advice more often. Considering this and a greater willingness to pay personally for advice may indicate that those farmers already in an AE scheme consider advice of more value than those who are not in an AE scheme. Three types of advisors were most popular amongst our respondents - government advisors, advisors from farmer clusters and advisors from wildlife charities or farmer organisations. The most popular were governmental advisors – perhaps reflecting the thinking that the government should be responsible for footing the bill for advice.

Farmers without an AE scheme reported a desire for greater flexibility in AE schemes – for both option management and contracts, combined with light touch administration. Our interviews of stakeholders highlighted this, as did other researchers (Lastra-Bravo et al. 2015). There are some concerns over allowing greater flexibility – both in option management and in contracts. There is a need to avoid providing support for “business as usual” farming; however, on the other hand, farmers are more likely to take up (and need less compensation for) schemes where management is aligned with their current farming practice (Lastra-Bravo et al. 2015, Pavlis et al. 2016, Bartkowski and Bartke 2018).

Our results noted that it was only regarding agricultural management where those in an AE scheme differed from those not in a scheme – with a greater desire for inputs (herbicide and fertiliser use) and the use of manure on land managed under an AE scheme by those not currently in a scheme. In some, perhaps most, cases these aspects of agricultural management would be detrimental to the goals of AE scheme options that seek to increase farmland biodiversity through increases in floral diversity.

Concerns regarding serious weed pressure (i.e., thistles) have been highlighted in many of the demonstration areas in PARTRIDGE (pers. comm. PARTRIDGE demo managers). The most serious was when herbicide use was banned in wild bird cover blocks. The result was that half of the contracts for wild bird cover in the affected area were terminated by the farmers. Weed management needs to be the focus of future research into ways to alleviate these issues and encourage AE scheme uptake.

Regarding other aspects of flexibility highlighted by respondents, there were minor differences between the respondents based on their AE scheme status. Some of the issues

with flexibility due to mowing might have adverse consequences for nesting farmland birds, with earlier mowing in particular increasing the chances of nest destruction. Of less concern is flexibility in sowing dates – though ensuring that any habitat is established in good time to provide the resources it is being grown for is of utmost concern. Derogations to deal with problems that arise during a contract or to address issues with droughts or wet periods would seem to be sensible and are supported by a large majority of our respondents. The support for predator control measures amongst most respondents shows that these options – either habitat modification to minimise the effect of predators, lethal legal means, or a combination of the two - would likely be widely adopted, though an interest in hunting by our respondents may have influenced this.

Two-thirds of those surveyed, regardless of whether they were in an AE scheme, thought the current payments for wild bird cover were adequate. This would suggest that, for the majority of those not in an AE scheme, payment level was not what prevented them from joining – this contradicts our finding that, when asked to select amongst suggested changes in AE schemes that would encourage them to join, two-thirds of those without AE schemes selected higher payments (Figure 13). This may indicate a general desire for higher payments, which, when faced with a concrete example, is harder to pin down to specifics. Having said that, for the one-third of respondents who did want higher payments for wild bird cover, in three of the five countries surveyed, those without AE schemes suggested significantly higher levels of payments than respondents with current AE schemes. This indicates that, for a minority of our respondents, financial considerations are part of the reason that they are not currently in an AE scheme.

The upshot is that a significant subset of our respondents seems to be sensitive to the payment levels provided in schemes, with higher payments in specifically Belgium, Germany and the Netherlands required to get them involved in schemes. Interestingly, the countries with the highest current payment rates for wild bird cover in our sample are Belgium and the Netherlands. These findings back up that of other researchers – who have found that payment level matters, although it is not the only factor influencing scheme uptake (Brown et al. 2019, 2021, Lastra-Bravo et al. 2015).

In general, most respondents thought central governments (either the EU, national governments or – where appropriate – a combination of the two) are best placed to provide funding for AE schemes. It does appear that those currently in AE schemes are more willing to consider the involvement of the private sector (for example, by off-setting of carbon or biodiversity) in paying for schemes – something that may form part of future monetary support to rural landowners. Those without AE scheme involvement tended to favour contracts of shorter length. These considerations may suggest a way to encourage those who do not currently have an AE scheme to join one. Governments should therefore offer new adoptees shorter contracts, perhaps slightly more flexible in terms of agricultural management, but with lower payments. If participants wished to continue in the AE scheme, payments could then increase, as they adopt more, less flexible, options, which should

deliver greater wildlife benefits. Once farmers get involved in AE schemes both our results and other research (Lastra-Bravo et al. 2015, Riley 2016) indicate that they would be more likely to sign up to longer contracts and more willing to undertake options that have additional restrictions, with higher payment levels for not just income foregone but also the greater effort they will put in.

COMPARISON TO STAKEHOLDER INTERVIEWS

What can our results from this survey tell us about the general themes of our original stakeholder interviews (Ghyselinck, 2021)?

Scheme organisation and design

Overall, this aspect was of less concern to respondents from the online survey than it was to the stakeholders we interviewed. Respondents seemed satisfied with the reliability of payments - even in England and Scotland, where there had been extremely critical attitudes expressed in the stakeholder interviews. One consideration that stood out was the possibility of initial shorter contracts to get those not in AE schemes to join one.

Ease of implementation

Flexibility was key here and was also a major theme of our online responses. However, there is a need to ensure that this does not result in payment for “farming as usual” or that added flexibility interferes with the goals of increased farmland biodiversity. Some flexibility is sensible – particularly in response to weather conditions and to ensure that habitats (such as wildflower blocks, strips, and meadows) are established according to the farmer’s best knowledge and capabilities. However, flexibility that endangers wildlife relying on habitats provided by AE schemes – such as early mowing and its effects on ground nesting birds would go against the goals of increasing biodiversity.

Payments

The level of funding provided is important, but only up to a point. It is not the only factor determining whether a farmer takes up an AE scheme or not. Therefore, it is crucial for those designing AE schemes to pay attention to other aspects as well. Interestingly, those farmers in schemes suggested lower levels of payment than those not in schemes – particularly in those countries where stakeholders had emphasised payments – namely Belgium, Germany, and the Netherlands. This may indicate that farmers not currently in schemes, rate payment levels more highly and there will have to be higher levels of money offered to induce them to join a scheme. Looking at the levels suggested by our respondents for wildflower blocks, this would be in the order of 29% higher payments for those not in an AE scheme; 18% for those already in a scheme.

Communication & knowledge

Professional advice is important and is valued, particularly by those already in AE schemes. Although, for those already in AE schemes, there is some willingness to pay for advice

themselves, the majority of both types of respondents (with or without AE schemes) feel advice should be provided for free through governmental support, i.e., government paid.






Motivation & trust

Farmers report being motivated to do something positive for the environment; for those in schemes the most important reason for taking up an AE scheme was to help flora & fauna on their farm and to help the environment on their farm. And there are indications – such as the finding that those already involved in AE schemes appreciated longer contracts – that those in AE schemes had built up more trust in the AE system.



RECOMMENDATIONS ON HOW TO IMPROVE UPTAKE OF AE SCHEMES

All arable farmers

-  There were many instances where those with and without AE schemes did not differ in what would increase their involvement with AE schemes. Addressing these would result in expanding the number of farmers in AE schemes and expanding the uptake of relevant options by those already in AE schemes. Our respondents (both those in and not yet in schemes) were motivated by an interest in nature – acknowledging this will go a long way to encouraging involvement in AE schemes.
-  Provision of paid advice when joining a scheme was popular amongst our respondents, as was allowing flexibility in the management of options (mowing and sowing dates, siting of habitat provision, the choice of seed mixes, etc.). Management flexibility can raise concerns however as this shouldn't weaken the biodiversity impacts of AE options. Examples of this would be earlier mowing that destroys nests of ground-nesting birds, or the planting of seed mixtures chosen by the farmers themselves, resulting in measures that do not maximise the habitat needs for the targeted wildlife. Seed mixtures should therefore be designed by experts, based on the results of research.
-  Flexibility could be provided through a sensible system of derogations from rules when necessary (drought conditions, problems with pernicious weeds - i.e., thistles, etc.) and tailored advice would help avoid problems with where habitats are sited.
-  We asked respondents with AE schemes what other options they were interested in undertaking and asked those without AE schemes what options they would select if they were to join an AE scheme. These lists were similar, with floristically-enhanced grass margins, permanent wildflower cover, and supplementary overwintering food the most selected by both groups. Most of our respondents expressed an interest in predation control as a possible option, whether through habitat changes or through lethal, legal means.
-  And finally, for a subset of around a third of farmers, payment levels seem to be too low, with increases of 18% to 29% needed to address this. Further research should look into any other characteristics of this subset that might help determine how best to address this.

THOSE THAT DO NOT CURRENTLY HAVE AE SCHEMES

We can suggest two main ways to improve the uptake of arable AE schemes highlighted by those that do not currently have one.

- There should be an option for shorter contracts – of one or two years in duration, which allow farmers to experience being in an AE scheme. These schemes could include options that have slightly less onerous requirements in terms of agricultural management conditions (restrictions on herbicides, manure, fertilizer use). Our results and others (Lastra-Bravo et al. 2015) indicate that once farmers are in a scheme, they are more likely to enter into another one. Targeted, individual advice paid for by the government to help with option selection and management is needed alongside these contracts.
- Farmers not currently in an AE scheme showed a greater desire for considering more structural aspects of a farm business (rent, type of farm, etc.) in AE payments, with a slightly lower interest in payment by results amongst those who have not joined AE schemes. Considering the details of the responses we recorded here should help policy makers better design schemes and avoid pitfalls that would constrain farmer involvement.



AUTHOR CONTRIBUTION

Julie Ewald, Jules Bos, Francis Buner, Lisa Dumpe, Nel Ghyselinck, Lene Midtgaard, Frank Stubbe, Fiona Torrance, and Frans van Alebeek – helped to design the survey; Julie Ewald led the writing of the document; Milli Amena and Cameron Hubbard collated the data; Milli Amena, Cameron Hubbard and Julie Ewald analysed the data. All authors contributed critically to the writing of the report.

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Photography

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-  Page 13, 21, 51 – Jochem Sloothaak
-  Page 46 – Kevin Milner
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APPENDIX 1 AGRI-ENVIRONMENTAL OPTIONS

Appendix 1, Table 1. Agri-environmental options presented to farmers to find out which were most attractive to them.

Option	Description
Beetle banks	Beetle banks are elongated grass mounds, about 2 metres wide and 0.5 metre in height, which can be used to divide large arable fields. This division does not extend to the edges of the field boundary – this allows the farmer to still farm the field as one and helps to limit their use by mammalian predators. They provide habitats for predatory insects (beetles & spiders) and can provide nesting habitats for red-listed ground nesting birds, such as grey partridge and mammals such as the harvest mouse.
Conservation headlands	Conservation headlands are created by selectively (not) spraying the edges of crops (usually cereals). Traditionally, both herbicides and insecticide treatments are avoided, allowing arable flora and insects to thrive. They provide high levels of insect food for the chicks of red-listed farmland birds (such as yellowhammer, corn bunting and grey partridge chicks), nectar resources for insects such as wild bees and help to conserve rare arable flora.
Cultivated uncropped margin for rare arable flora/weeds	Cultivated uncropped margins are field edges that are cultivated annually but not sown with a crop nor treated with pesticides. This allows dormant rare arable plants in the natural seed bank to germinate and set seed. They also provide grey partridge chick-food insects and ideal foraging habitat for various other red-listed farmland birds.
Floristically-enhanced grass margins	Floristically-enhanced grass margins are field margins planted with a grass-rich seed mixture that includes a high diversity of wildflowers. Fertilisers and herbicides are usually highly restricted and annual mowing and removal for hay is highly recommended. They are particularly attractive and important for the conservation of wild bees, butterflies, and other insects.
Methods for predation management	Several methods are available for predation management. Habitat measures to reduce predation risks include increasing the widths of nest habitats (strips > 20m or in blocks) and fencing of nests. Legal lethal predator control includes the use of approved humane traps and shooting. Predation management is particularly effective in the conservation of red-listed ground-nesting birds in areas where their habitat has been restored.

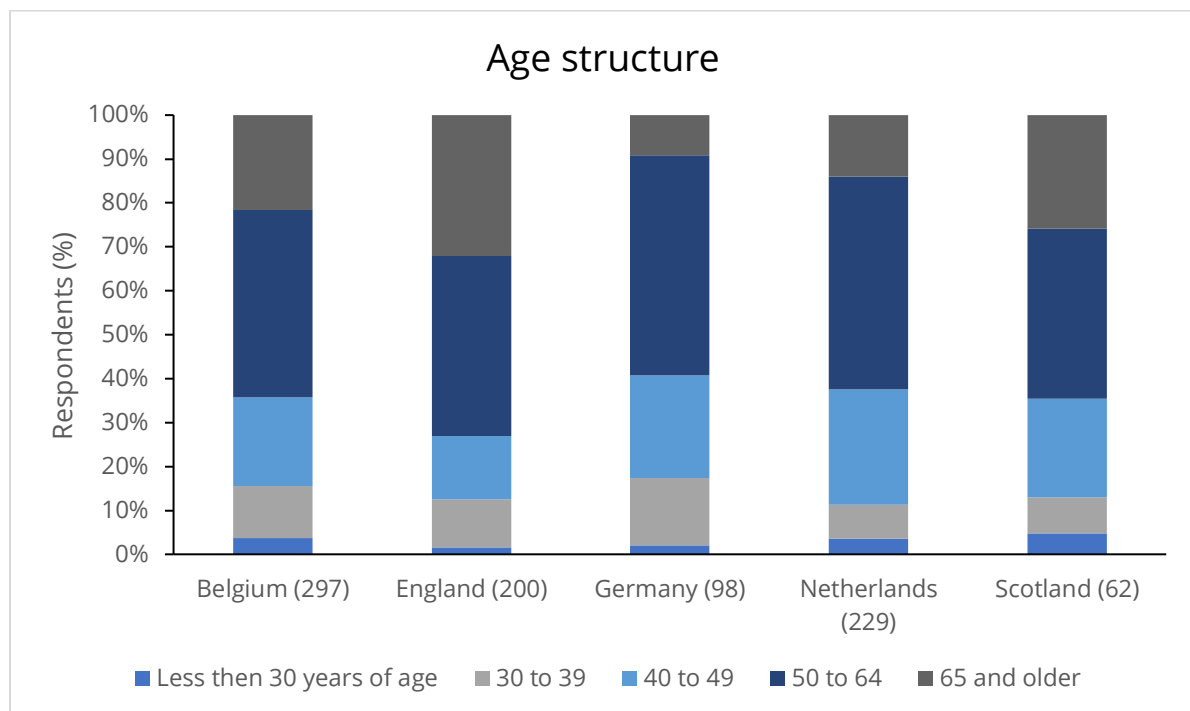
Permanent wild-flower cover	Areas of permanent wildflower habitats are established either through natural regeneration or through planting an appropriate mixture of perennial wildflower seeds – which should be of native origin. This habitat will need to be managed in sections through cutting and/or grazing, on a rotational basis. In summer, this provides for insects, including chick-food, with the unmanaged sections providing nesting cover for grey partridges and many other farmland birds. They also attract rodents and shrews which in turn serve as important food source for raptors and owls, especially during winter. A high abundance of seeds feed flocks of seed-eating birds, often several 100 individuals strong, during the hungry winter gap.
Rotational wild bird cover	Rotational wild bird cover is replanted annually and can be re-sited at the time of sowing. It usually consists of plants that provide seed food and cover overwinter. It can also be sown in the autumn or early in the spring, usually using a cereal mix, to support chick-food insects. Although this option is similar to the permanent wild-flower cover, it delivers less biodiversity net gains owing to its shorter lifespan,
Stubbles with cover crops	Overwinter stubbles, where crops have not had a pre-harvest desiccant, sown with cover crops (plants that are planted to cover the soil rather than for the purpose of being harvested – ex. fodder radish, mustard, etc.) can provide both overwinter cover and food resources for red-listed farmland wildlife, including grey partridges, yellowhammers, skylarks, and brown hares. They are also key components of regenerative farming, helping to improve soil structure and increase water infiltration.
Supplementary overwinter food for wintering birds	Supplementary overwinter food provision involves providing seeds of cereals, oilseed, or other grain through the hungry gap – late winter and early spring – when seed is in short supply on modern farmland. Seed is usually provided through feeders, which allows better control of rats and mice, which can be a problem. This provides food for red-listed seed-eating farmland birds such as yellowhammer, corn bunting, and for grey partridges overwinter.
Unharvested cereals	Unharvested cereals are left in place until the following spring. They are usually provided as strips or blocks, and the cereal is grown without the use of fertiliser, insecticide, or broad-leaved herbicide. They provide seeds for birds and other wildlife overwinter, insect-rich food resources for nesting red-listed farmland birds – such as skylark, corn bunting, and grey partridge, support insects (both pollinators and natural enemies of pests) and provide space for rare arable flora.

APPENDIX 2 SAMPLE REPRESENTATIVENESS

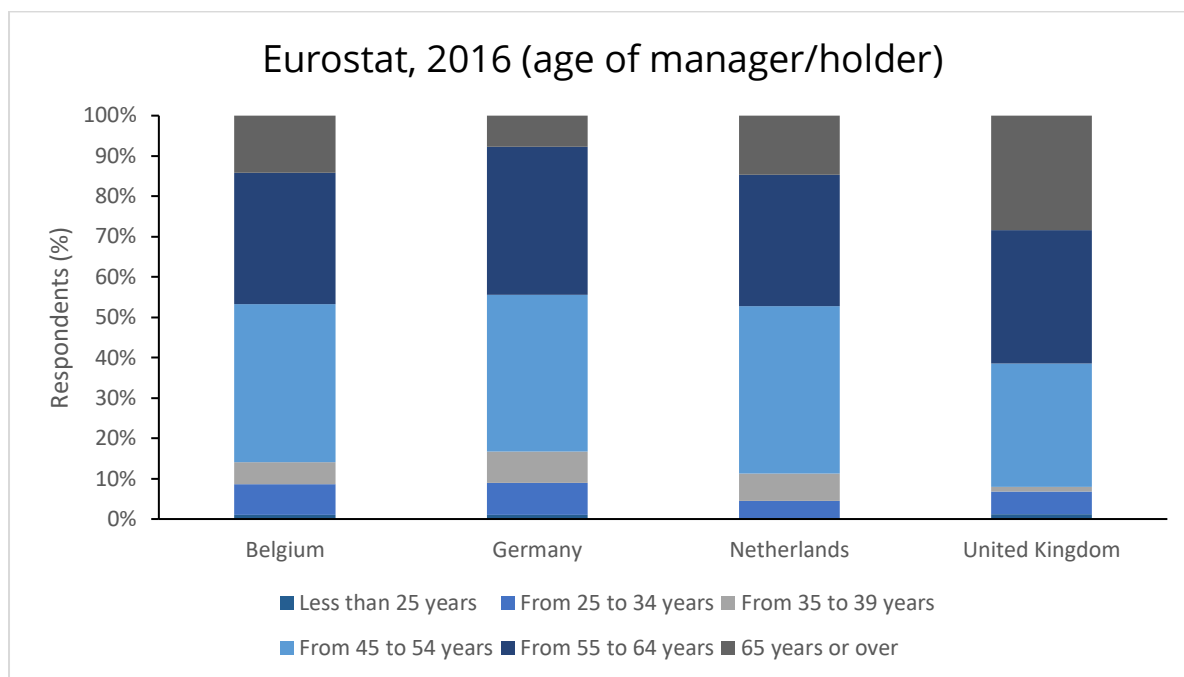
AGE OF RESPONDENTS

The age structure of the respondents differed between the five countries (Chi-square₁₆ = 41.93, P < 0.001, Figure 1). There was a lower percentage of English respondents in the 40 to 49 age group (15% compared to 20-26% in the other countries). Most strikingly there was a higher percentage of English respondents who were 65 years and older (32%) and a lower percentage of German (9%) and Dutch (14%) respondents in this age group compared to the other countries (22-26%).

The latest comparative Eurostat figures for age of farm manager/holders come from 2016 (ec.europa.eu), with values for England and Scotland included as the United Kingdom. This shows a similar result in terms of the larger share of older farmers in the United Kingdom and a smaller share in Germany. What it does not show is a larger share of younger farmers in the UK (or Scotland – as per our data, Figure 1a).



Appendix 2, Figure 1. The age structure of respondents in the different countries.

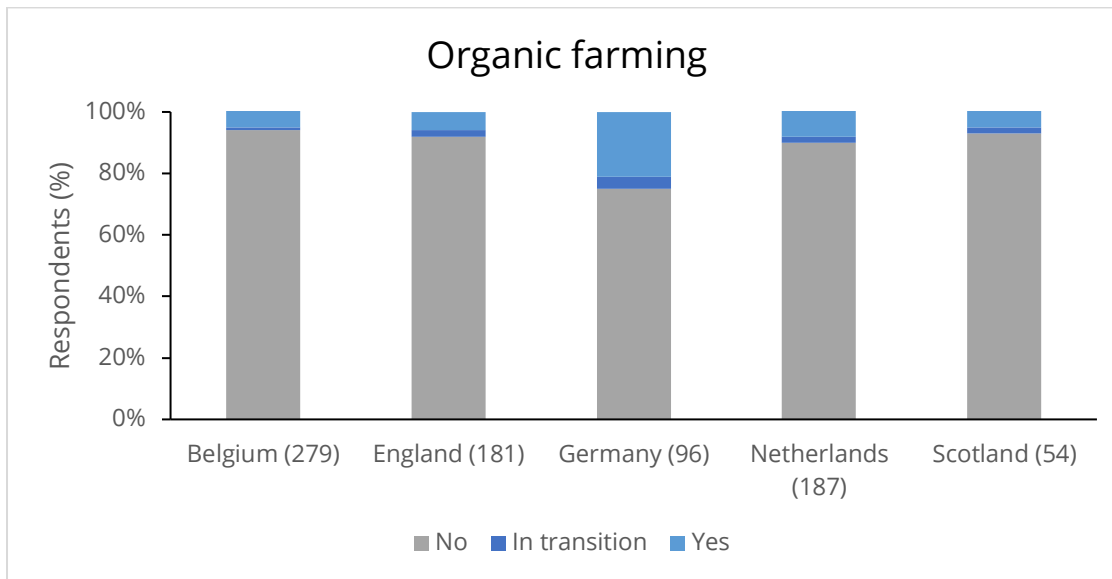


Appendix 2, Figure 1a. Eurostat, 2016 age structure of farm manager/holder. Please note that age classes differ from Figure 1.

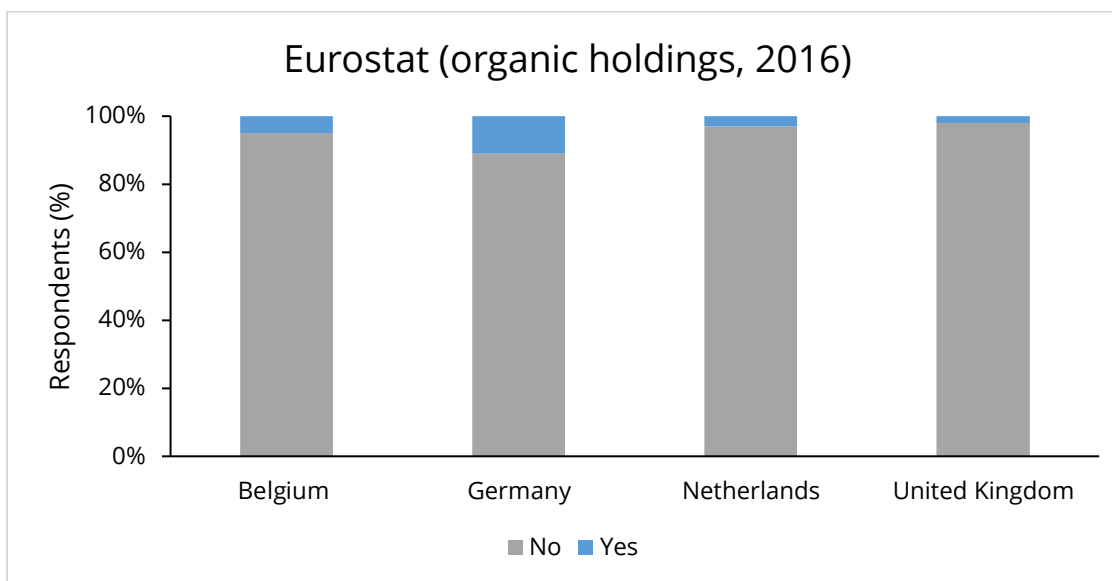
ORGANIC FARMING

The proportion of respondents that were organic farmers differed between the countries (Chi-square₈ = 30.17, P < 0.001). There was a higher proportion of organic farmers in Germany than in the other countries, with 21% of the respondents from Germany farming organically, compared to an average of 7% in the other countries (Figure 2).

Eurostat holds data on the number of organic producers at the end of the calendar year. Statistics for the end of 2016 can be found here (ec.europa.eu). These can be compared to the number of agricultural holdings (ec.europa.eu). Germany has high levels of organic farming – 10% but our sample has a higher percentage. Our sample also has a higher percentage of organic farmers in the Netherlands and the United Kingdom. Only in the case of Belgium did our sample reflect the Eurostat figures, with both reporting 5% of farmers being organic (Figure 2a).



Appendix 2, Figure 2. The percentage of organic farming represented in the respondents.

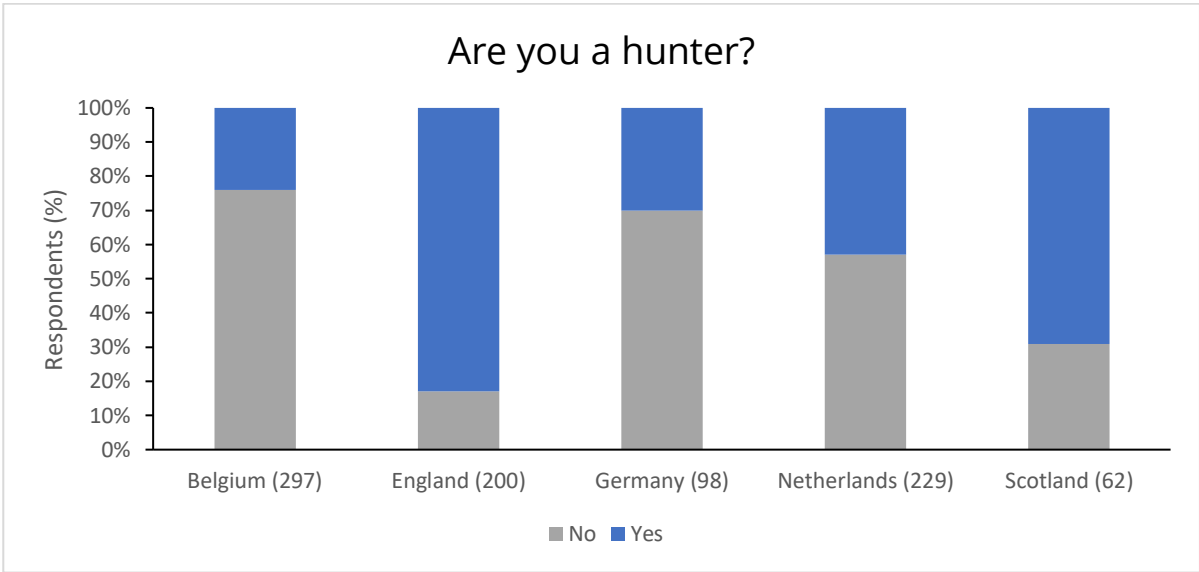


Appendix 2, Figure 2a. The percentage of agricultural holdings that were organic at the end of 2016, Eurostat.

HUNTING

The proportion of respondents that were hunters differed between the countries (Chi-square₈ = 191.98, P < 0.001). Eighty-three percent of the English respondents were hunters, compared to 24% of respondents from Belgium and 30% from Germany. The proportion of hunters in respondents from Scotland and the Netherlands was midway between these two extremes, 69% and 43%, respectively (Figure 3).

No statistics are available on the proportion of farmers that are hunters from Eurostat. There are published statistics on the number of hunters per 1000 inhabitants across the countries we surveyed available from the German Hunting Association e. V. (DJV) (jagdverband.de/zahlen-fakten/zahlen-zu-jagd-und-jaegern). The UK has the highest number of hunters per one thousand inhabitants at 6.1, Germany at 4.6, the Netherlands at 1.6 and finally Belgium at 1.1 hunters per 1000 inhabitants. Considering our samples sizes across the countries – we can see that our sample has a larger proportion of hunters than might be expected by chance. This is not surprising as many of the organisations that helped disseminate our survey had members who were hunters. We surveyed farmers, who will represent a rural population, more likely to have hunting interests. Our results indicate a higher interest in hunting in the UK – perhaps reflecting the fact that the UK has more hunters per inhabitant than the other countries surveyed.

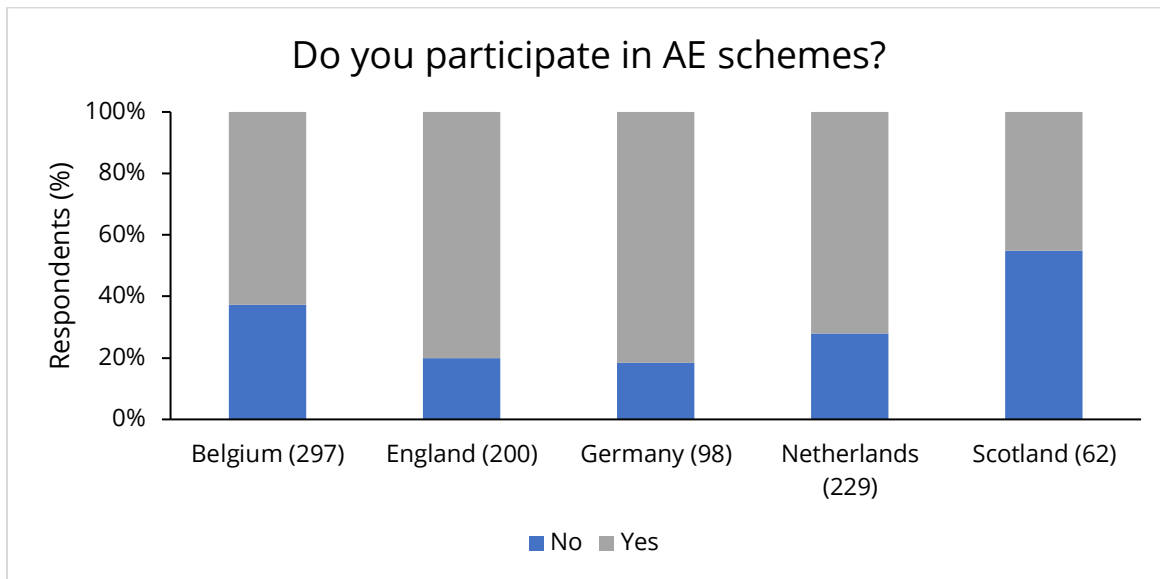


Appendix 2, Figure 3. The percentage of hunters in the respondents.

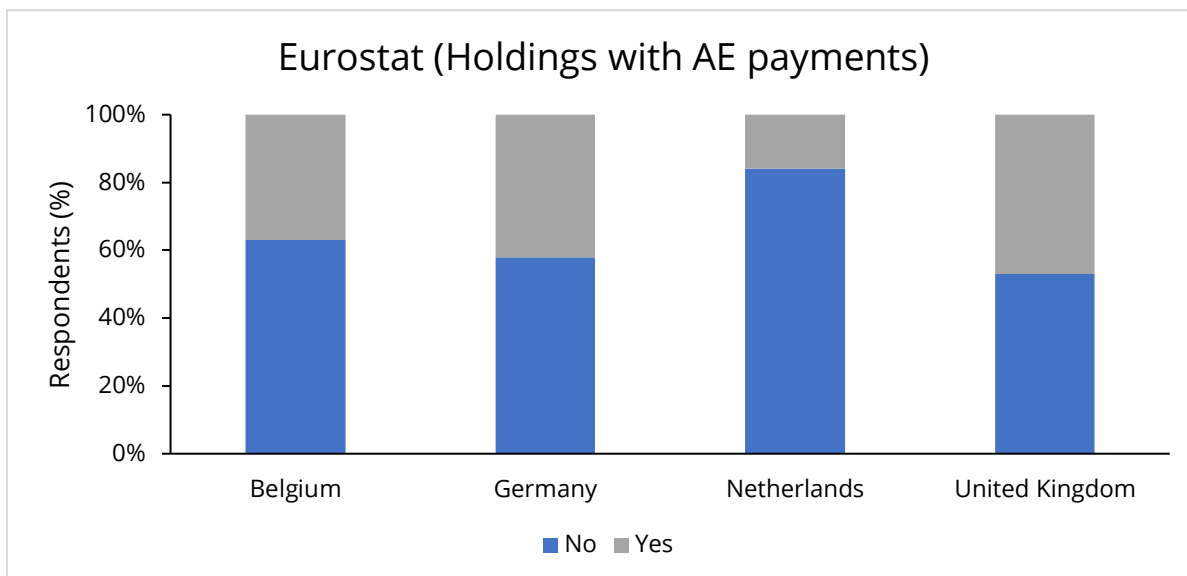
AE SCHEMES PARTICIPATION

The proportion of respondents that participated in AE schemes differed between the countries (Chi-square₈ = 42.09, P < 0.001). Germany and England had the highest level of respondents with AE schemes (80% and 82%, respectively), followed by the Netherlands (72%) and Belgium (63%), and finally Scotland, with just over 45% of respondents having AE schemes (Figure 4).

Data is available from Eurostat for 2013 on the proportion of holdings that benefit from AE payments (ec.europa.eu). Although this data comes from seven years earlier it does indicate that our sample has a higher proportion of respondents with AE schemes, except for the Scottish sample – which is close (42%) to that of the Eurostat figure for the United Kingdom (47%, Figure 4a).



Appendix 2, Figure 4. The percentage of respondents that participate in AE schemes.



Appendix 2, Figure 4a. Eurostat, the percentage of holdings receiving Agri-environment payments.

