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Training farmers in agri-environmental management: the case of Environmental Stewardship in lowland England

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ABSTRACT

Research on voluntary agri-environmental schemes (AES) typically reveals limited engagement on the part of most participants, with the majority enticed into participation by a combination of attractive payment rates and compatibility with the existing farming system. Commentators have argued that changing farmer attitudes towards environmental management should be an outcome of AES. One possible way of doing this is through the provision of educational and advisory programmes designed to help farmers understand why certain actions are required and how to undertake appropriate conservation management. Based on interviews with a sample of 24 farmers in the East and South West of England this paper explores farmer understanding and concerns regarding the management requirements of two options implemented under the Entry Level Stewardship (ELS) scheme. It considers the short and medium term impacts of participating in bespoke group training events and discusses the potential of training to improve the effective implementation of agri-environmental management at the farm level. Analysis of the impact of training reveals that participation in bespoke group training events can fill knowledge gaps, equip farmers with a range of management skills, improve confidence and engender a more professionalised approach to agri-environmental management.

KEYWORDS: Agri-environmental schemes; Entry Level Stewardship; farmer knowledge; training

1. Introduction

Since the late 1980s voluntary agri-environmental schemes (AES) have provided financial incentives for farmers to adopt management practices designed to maintain or enhance the environmental value of their land. Although participation is voluntary AES are characterised by sets of codified management prescriptions that farmers must implement. If it is assumed that these management prescriptions are appropriate for the stated objectives, the actions of the farmer become critical to the success of AES. Primdahl *et al* (2010) argue that AES management practices are often based on general beliefs about the link between specific management practices and environmental outcomes rather than on scientific evidence, although in the case of the British AES, many management prescriptions derive from rigorous ecological studies (e.g. arable reversion (Pywell *et al.*, 2002); bumblebee habitat (Pywell *et al.*, 2005); winter bird resources (Henderson *et al.*, 2004)). Recognising the important role of the farmer, early social science studies considered the success or failure of AES in terms of farmer uptake and focused largely on numbers of farmers enrolling, area enrolled, speed of uptake, and barriers to entry (e.g. Whitby *et al.*, 1994). It was often assumed that sufficient levels of uptake and removal of barriers to entry could be taken as a proxy indicator of scheme success. Early social science research on AES was often influenced by the innovation adoption model. For instance, Morris and Potter's (1995) study drew on innovation adoption theory to explore the uptake of both actual and hypothetical schemes. Despite quite high levels of uptake the research revealed high rates of 'passive adoption' whereby participants were motivated by financial gain and failed to engage with the environmental objectives of the schemes. While so-called 'traditional indicators' (Wilson and Hart, 2001) such as uptake can provide some measure of a scheme's success, research suggests that it is the level of understanding and engagement with scheme aims and objectives that often matters (e.g. Morris and Potter, 1995; Wilson, 1996; Lobley and Potter, 1998; Kaljonen, 2006). Indeed, it has become clear that AES participation cannot be viewed as a simple dichotomous decision to participate or not participate. Once the decision has been made to join a scheme, farmer engagement with the principles and objectives of the schemes varies but research has typically revealed limited engagement with the environmental principles of the schemes on the part of most participants, with the majority enticed into participation by a combination of payment rates and compatibility with the existing farming system (Lobley and Potter, 1998; Wilson and Hart, 2001).

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It has been argued therefore that a shift to a more pro-conservation attitude should be both an outcome of AES and an important indicator of scheme success (e.g. Lowe *et al*., 1999; Wilson and Hart, 2001). Riley (2011) argues that a significant gap in AES research is studies that adopt a longitudinal approach which revisit the same scheme participants and explore changes in attitudes over time. In the absence of such research the evidence that does exist suggests that AES have had limited success in promoting enduring changes in participants' attitudes and behaviour (e.g. Burton and Paragahawewa, 2011; Burton *et al*., 2008). One suggestion advanced for encouraging such a change is the provision of educational and advisory programmes designed to influence attitudes and, most importantly, help farmers understand why certain actions are required, and how to undertake appropriate conservation management (Falconer, 2000; Wilson and Hart, 2001; Juntti and Potter, 2002).

In contrast to the large number of studies exploring the motivation for the farm level adoption of AES, the aim of this paper is to consider the extent to which farmers are confident in their ability to implement AES management prescriptions and how training and advice might influence farmers' understanding and implementation of AES management prescriptions. Adopting a qualitative case study approach, the paper explores farmer understanding and concerns regarding the management requirements of two specific options implemented under the Entry Level Stewardship (ELS) scheme in England. It then goes on to consider the short and medium term impacts of participating in bespoke group training events and discusses the potential of training to improve the effective implementation of agri-environmental management at the farm level. Our concern is with the potential of training to influence the performance of agri-environmental management rather than the environmental outcomes of agri-environmental management.

2. Development and implementation of AES

The development of voluntary AES in the UK is typically traced back to the late 1980s, following the 1986 Agriculture Act and the introduction of Environmentally Sensitive Areas (ESA) in 1987 (see Potter, 1998 for an analysis of the evolution of agri-environmental policy in the EU and USA). The original ESA programme was complemented by the Countryside Stewardship Scheme (CSS) in 1991 which, unlike the ESA approach, was focused on the so-called wider countryside outside of specially designated areas. Various other smaller scale and shorter lived agri-environmental schemes have been implemented but during the 1990s, in England, ESAs and CSS were the main AES (with similar schemes in the other parts of the UK).

Following the 2003 CAP reforms and a review of AES the ESA programme and CSS were closed to new entrants and a new scheme, Environmental Stewardship (ES) was launched in March 2005 (Defra and Natural England 2008). ES consists of four elements: Entry Level Stewardship (ELS), Organic Entry Level Stewardship (OELS), Uplands Entry Level Stewardship (Uplands ELS) and Higher Level Stewardship (HLS). Overall ES has similar objectives to the previous schemes and in addition aims to have a much wider impact by bringing the majority of farms under at least the most basic level of agri-environmental management represented by ELS. By February 2013 there were over 42,000 ELS agreements covering close to six million hectares (or 62% of England's Utilized Agricultural Area). If the now closed, 'legacy' schemes are included 70% of England's UAA is under some form of agri-environmental agreement, with an annual budget of £414m[4] (NE 2013). In terms of design, ELS employs similar prescriptions to those developed under the previous schemes, but with a simpler and more inclusive framework. ELS is voluntary and non-competitive and is available to all farmers. Farmers can choose their management options from a list of over 60 that are available. Each option is associated with a specific number of points per hectare or linear metre. In order to qualify for a flat rate payment, participants must select management options to reach the target of 30 points per hectare (where 30 points=£30) for each hectare of the farm. ELS options range from those providing a basic level of management such as less frequent hedgerow cutting and extensive grassland management, through to the creation of new habitats such as flower-rich field margins.

Although generally hailed as a success due to the considerable uptake achieved, it has been argued that the wide range of management options available gives participants the opportunity to select options requiring little or no management change and that consequently ELS may buy little additional environmental benefit (Hodge and Reader, 2010). In addition, a significant body of research suggests that although farmers may be willing to implement AES management prescriptions, such participation tends not to be associated with enduring attitudinal and behavioural change (de Snoo 2013; Burton *et al*., 2008). Studies suggest that there is a spectrum of participation in AES reflecting different levels of engagement with scheme aims and objectives (Lobley and Potter, 1998; Wilson, 1996; Morris and Potter, 1995). Typically, research has revealed limited engagement on the part of most participants (Wilson and Hart, 2001) with the majority enticed into participation by a combination of payment rates and compatibility with the existing farming system (Schenk *et al*., 2007; Defrancesco *et al*., 2008; Lobley and Potter, 1998). While such participants may abide by the letter of the agreement, they can fail to understand the reasoning behind management prescriptions. This can lead to attempts to 'cut corners', unintentional breaches of agreements and the accusation that AES payments can be 'temporary bribes' (Morris and Potter, 1995).

Burton *et al*. (2008) argue that one of the reasons why AES have not engendered a shift towards a more conservation orientated farming culture is that, in contrast to production-orientated farming where farmers can display their cultural competencies through the visible impact of their management on their fields, yields, and so on, AES effectively de-skills farming practice: '… once the scheme is established, the farmer's ability to display skill through conservation work is

[4] In early September 2013, £1 was approximately equivalent to $US 1.56 and €1.18 (www.xe.com).

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limited' (p.26). Consequently, by removing the need for skilled, production orientated agricultural land management Burton *et al*. argue that AES 'fail to allow farmers to perform identity enhancing behaviour' (p.27). AES prescriptions are often just that; a series of management prescriptions given in a fixed format that limits farmers ability and imagination to deal with the situation and which effectively deskills (to borrow from Burton *et al.* 2008) and disaffects them. That said Burton and colleagues appear not to consider AES options that require on-going and active management. Amongst the various AES options some involve predominantly passive behaviour on the part of land managers (such as low fertility grassland options) and offer participants little opportunity to demonstrate visible conservation skills or those associated with production-orientated agriculture. Others however, require more active and on-going management (e.g. pollen and nectar plants for bees and butterflies or wild bird food resource options) and arguably offer farmers the opportunity to demonstrate agri-environmental management skills and prowess in a way that is visible to others.

It has also been suggested that providing more information to farmers and the provision of training can encourage the development of more pro-conservation attitudes. Wilson and Hart (2001) argued that training would lead farmers to a greater feeling of pride in their environmental management. They argued that educational programmes could help shift farmers from an essentially utilitarian stance towards more conservation-oriented attitudes and that this should be seen as an important indicator of scheme success. It has also been argued that training may be crucial in helping farmers understand *why* certain actions are required as well as *how* to undertake conservation management (Falconer, 2000). Nevertheless, there have been few, if any, attempts to explore how such a shift can be effected through the provision of training, although some research suggests that AES are more likely to succeed where farmers receive expert advice and/or training (e.g. Kleijn *et al*., 2001).

3. Farmer knowledge

Calls for the expansion of provision of environmental training and advice do not imply that farmers are lacking in knowledge. Farming is increasingly a knowledge-rich activity. In addition to farmers' detailed 'local' knowledge of environmental interactions and processes generated through learning from experience, an increasing proportion hold degrees or other HE qualifications in agriculture and closely related subjects – nearly 20% in the UK in 2010 according to the Quarterly Labour Force Survey (Wallace and Jack 2011). Although this is low compared to other sectors it represents a doubling in just over a decade (see Gasson 1998) and because the operators of larger farms tend to be better qualified, the proportion of land farmed by educationally well qualified farmers or managers far exceeds the 20% figure (Brassley 2005). Although many farmers are able to distinguish a species rich wildlife meadow from one that is less so by observing the number of different wildflowers that grow there and the butterflies that fly around, they may be less able to describe the associations of the butterflies' lifecycle and the ecological attributes of particular plant species or plant communities. They may have observed that a greater number of pesticide applications has resulted in less wildlife on their land but they are not necessarily in a position to explain causal processes. Tsouvalis *et al.* (2000), using the example of precision farming, note that 'although many farmers know their fields intimately, the complexity of biophysical processes is such that […] the *'why'* - often remains. This is where science has made its inroads, prompting itself many of the questions it now tries to answer' (p. 917). In the case of AES, farmers are called on to apply management prescriptions that have been devised by environmental experts who hold the knowledge of the invisible '*why*', but the medium they have designed to communicate through offers only the '*how*' (i.e. management prescriptions). AES management practices derived from the disciplines of ecology, biology, landscape ecology and history, and agricultural science form part of a 'a heavily 'scientised', codified, bureaucratized and centralized approach to knowing nature on farms' (Morris, 2006, p. 116) that may prevent or limit farmers' complete comprehension about the purpose of the suggested tasks.

Knowledge alone however, is not enough to achieve agri-environmental objectives. Research in other areas of environmental policy strongly suggests that awareness raising, education and information are not sufficient to bring about a change in behaviour, which may be subject to a range of other barriers such as a lack of incentive and lack of experience of the positive impacts of a behavioural change (e.g. Barr and Gilg, 2007; Kollmuss and Agyeman, 2002; Maiteny, 2002; Owens, 2000). It has been suggested that for farmers to change the way they farm to benefit farmland birds, they need to go through a process that: increases awareness of the problem of declining birds; promotes understanding that farming methods have caused declines; provides financial incentives to change farming methods; and gives information on approaches to help birds (Smallshire *et al*., 2004). It has also been argued that in order to bring about a change in behaviour, factors such as knowledge, awareness and incentives need to be combined with a strong 'locus of control' (an individual's perception of whether they can bring about the desired change through their own behaviour). A strong internal locus of control is associated with beliefs that environmental action can bring about desirable change (Kollmuss and Agyeman, 2002). In other words, in addition to incentives, information and support, individuals need to *believe* that their actions and behaviour can make a difference.

In the case of agriculture it would be naive to argue that training and education alone will necessarily lead to improved environmental outcomes. However, there are already strong policy signals encouraging the uptake of AES in the form of economic incentives and growing recognition that the supply of rural environmental goods is an important part of the social contract between farmers and taxpayers. Education and training may provide an opportunity to reinforce existing policy signals and help farmers to understand why certain management practices are required. Moreover, demonstrating to farmers the positive environmental outcomes of their agri-environmental management may help

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foster a stronger internal locus of control and create a positive feedback effect. It is against this background that the remainder of this paper considers farmers' confidence in their ability to understand and implement AES management prescriptions (i.e. it identifies if there is a knowledge/skills gap in relation to agri-environmental management) and their response to training in agri-environmental management.

4. Methodology

In order to explore the impact of training for agri-environmental management, two broad groups of farms were selected for study: arable/cereal farms located in the intensively managed landscape of eastern-central lowland England and arable and mixed farms in South West England[5]. In each area, 12 farmers were recruited to take part in the research over a five year period. All farmers recruited in this research were participants in ELS.

In order to explore the impact of training on agri-environmental management it was necessary to identify land management options that require specific and specialised knowledge. For instance, some of the 'passive' low intensity management options such as low input management of permanent grassland (a very popular ELS option) are likely to be easier to undertake in the absence of specialist advice and training than active habitat creation and enhancement options, which arguably require a greater degree of skill and on-going management. In addition, the number of ELS options selected for investigation needed to be limited in order to maximise the potential effectiveness of training and facilitate analysis of the results. Therefore, the study focused on two specific options for arable field margins: the Wild Bird Mixture (WBM) and Pollen and Nectar Mixture (PNM). WBM was designed to provide food for birds by making available a seed-bearing crop in arable landscapes during the winter. PNM aims to boost the number of pollen and nectar feeding insects, including butterflies and bumblebees, by sowing and maintaining a range of selected flowering plants. These options have been proven to provide excellent resources for their target species (Pywell *et al*. 2012; see this as well for a full description of WBM and PNM). They also require moderately skilled management for both the establishment and on-going persistence of the option, including site preparation, choice of seed mixture and weed management. Twelve of the participating farmers had WBM as part of their ELS agreement, 12 had PNM and of these 9 had both options.

24 on-farm face-to-face baseline interviews were conducted in 2007. The interviews typically lasted 60–90 minutes and were recorded for later transcribing. The interviews were designed to explore farmer attitudes to AES in general, their history of environmental management and their attitude towards ELS in particular. In addition, the interviews explored farmer understanding of the management requirements for WBM and/or PNM and identified any concerns that they had regarding their ability to comply with the requirements of these options. The mean age of the interviewees was 48. Fifty-seven per cent had a technical qualification in agriculture and 26% had obtained a degree in agriculture or closely related subject.

Following the baseline interviews, group training events were convened in each study area.[6] The training was provided by a highly knowledgeable, professional trainer who has long experience of providing agronomic and, latterly, AES advice to individual farmers, and of testing and experimenting with agri-environmental options. The training was tailored towards the management requirements of WBM and PNM. The design of the training course was informed by the trainer's previous experience in advising farmers and his discussions with the project team about the aims and scope of the research[7]. Each participating farmer received £50 towards their expenses for attending the training.

The training day was composed of two parts; the 'theoretical' and the 'practical'. The theoretical part included a general introduction to the background and rationale of agri-environmental schemes, as well as scientific information on habitat management requirements (including a brief introduction to ecological succession). During this part of the training findings from previous scientific experiments and real field situations were presented, as well as suggestions on appropriate management and use of combinations of species under different landscape conditions. As well as introducing the farmers to a number of useful concepts, the purpose of this part of the training was to demonstrate that: agri-environmental management options are based on rigorous research and so have a solid basis; environmental management could coexist with arable farming; farmers through their actions and attention to detail could influence the 'quality' of such environmental management; and a professionalised approach to environmental management could produce results. Accordingly, the trainer opened his session referring to habitat creation:

> *'…today, what we're actually being asked to do is grow a different crop. What [is] a crop? It's something that sticks out of the ground and requires management. Can be wheat, oilseed rape, dickybird food, really doesn't matter.'*

He went on to say that: '… *habitat to me is just another crop. It should be to all of us.*' His message was that farmers should adopt the same professional approach to habitat management as they do to other crops.

The practical part of the training was a farm walk, on a nearby farm, which included a number of stops to examine existing relevant applications of agri-environmental options. The participants had the opportunity to compare on-the-ground examples with the research-based findings presented to them earlier in the day, and to discuss and distinguish between more or less successful management treatments. After the farm

[5] The choice of these two broad locations was in part in order to explore how the local/regional landscape context may influence agri-environmental outcomes (work that is not reported on in this paper) and also to facilitate relatively easy access by different members of the research team, some of whom were based in the south west while others were in central lowland England.

[6] 23 of the 24 farmers attended the training. One farmer was accompanied by his agronomist.

[7] Following on from the training the trainer developed an idea for the production of a DVD with advice on the WBM and PNM options. The DVD was produced under the auspices of Defra and distributed to all farmers who joined or re-joined ES.

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walk the participants engaged in a detailed discussion of issues that arose during the day including technical aspects of implementation such as seed mix, sowing depth and aftercare. Evidence suggests that the interaction between participants in training sessions provides the opportunity to compare attitudes, represents an additional source of information, and increases the probability of making a behavioural/farm management change (Kilpatrick, 2000).

A final set of face to face interviews was carried out in 2010 (although one farmer terminated the interview part way through). The interviews were again conducted on farm and explored participants' experience of managing their ELS options and their ability to recognise successful implementation, gathered detailed information on the implementation and management of options and explored the longer term impacts of training on knowledge, confidence and ability.

5. Farmers' confidence in their agri-environmental land management skills and ability

Many of the farmers participating in the research were familiar with conservation practices, although 11 had not previously been involved in formal voluntary agri-environmental schemes. This is a reflection of the rationale of ELS which is designed to appeal to large numbers of farmers who have not previously participated in schemes. This lack of formal participation experience may have implications in terms of knowledge, familiarity with certain tasks and the necessary confidence to manage habitat creation options such as WBM and PNM. On the other hand, only 4 farmers admitted to being apprehensive about participating in ELS. Most of those who appeared not to be apprehensive had no previous experience of participation in AES. It might be expected that farmers with no previous experience of AES would be more sceptical about their ability to comply with the management prescriptions. Their lack of apprehension may reflect confidence in their ability to manage the options, or perhaps their unawareness of the real objectives and requirements of the scheme. Of those who did admit to feeling apprehensive, this was most often connected to their concerns about the inspection regime and meeting the practical requirements of the scheme.

The baseline interviews included a discussion of the extent to which the interviewee was confident of their ability to meet the management requirements detailed in the ELS handbook at the time. Despite the overall high level of confidence reported above, discussing these more detailed management issues revealed a number of concerns regarding the ability of farmers to comply with specific management requirements. Many (15 farmers) expressed concerns with complying with management prescriptions regarding pesticide applications. As one farmer put it, although they had readily applied to join ELS, it was only when they started implementing their agreement that they realised they were unsure of what to do:

> *'Well when they brought all this Entry Level in… … it's alright handing out a handbook and saying 'put wild bird mixture in, put field corners in, do this, do that'. It was all brought in and we all signed up quickly because we knew the money was going to be there, but we never really had a clue until we started going to the sort of things you are doing'.*

A significant minority (7 farmers or 30%) thought that establishment and/or re-establishment would be difficult as the following example illustrates:

> *'…[L]ike I said… we grew kale, quinoa and triticale. Now, the quinoa and the triticale is finished. The only thing left standing is the kale. Now unless I do something about that in the spring… the only crop that'll be there will be kale. Now you can't plant… triticale or quinoa into a kale crop because the kale will just smother it. You've got to really rip the whole lot up, plough it and do it all again. Now, I'd have to get some advice about that… I'm not quite sure about it because I've never done it before, you see? Because like before we done this we've only ever grown kale on its own, you see?'*

PNM is probably a more demanding option in terms of management input. WBM management is similar to that for game cover crops (although involving a more complex species mix as alluded to above) and includes relatively routine tasks such as annual or biennial re-establishment by drilling seed. In contrast, PNM involves an unfamiliar 'crop' of wildflowers, specific establishment methods, and monitoring to assess when re-establishment is required (after 3 or 4 years). Again, a significant proportion of respondents felt that establishment and re-establishment of the 'crop' would prove difficult as is illustrated by the following quote:

> *'The re-establishment … I suspect that is going to be moderately difficult … not knowing quite when to do it. It goes back to the thing that I had nobody to tell me. And I guess unless we farmers that are doing it get together with some professionals … you know we are not really equipped to know quite how to do that'.*

These comments point to some specific skills/knowledge gaps and when asked, 21 of farmers participating in the research said that they thought that they could benefit from training related to the management tasks for WBM and PNM. It is interesting to note here that 11 out of 12 farmers who had previously participated in AES felt that they needed further advice and attended the training programme. The willingness of these farmers to receive further training and advice on ELS tasks may signify two things. First that they realise that managing their land under the prescriptions of the agreement is not as straightforward as it first appears to be, and second that farmers with more experience recognise the importance of knowledge and become more receptive. In turn, this would imply that engagement with knowledge is associated with attitudinal and behavioural changes.

Attending the group training was, for a number of farmers, an opportunity to see what other farmers were doing and to improve their confidence: '*… [W]ell … to see how others are managing their plots … hum … and really just … to give me a bit of confidence … to make sure I am doing it right.*' Others identified quite specific training and information requirements:

> *'Well, I am hoping that I can… learn whether there is any way we can improve our existing ELS agreement… I would certainly appreciate with the wild bird mix any advice. I know you can get it but there's so many wild bird mixes you can put in, but if*

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someone would say to me, well these really are the bees knees, this is the sort of mix you should be looking at because I haven't had any real advice about that'
'I don't know enough about the different varieties of everything that has been put in there. I mean, you know, I wouldn't know a trefoil even if it bit me [laughs]!… I don't know whether I should be cutting it off or whether I should be leaving it to grow and perhaps it'll reseed itself…'

Another farmer revealed his frustration and confusion regarding the most appropriate management to apply:

'Hum … we took some silage off it but we didn't know whether to top it or not …or leave it as it is. I think we will leave it as it is. … I mean … we have got the topper on … I don't know whether to top it all, or top half of it or top it a bit more or … I don't know what to do really.'

The comments made are in contrast to the argument by Burton *et al*. (2008) that AES removes much of the skill required for managing land. Clearly a number of the farmers recognised that on-going management requires both skill and knowledge. As one farmer put it '*I am a trained cereal grower. I need new input as an environmental land manager*'. More importantly, these comments demonstrate the point that the instructive nature of AES prescriptions, focussing on the *what* rather than the *why,* limits the potential for effective implementation of the scheme. This can be either because not enough information is provided to help farmers successfully perform the tasks, or because the restrictive nature of the prescriptions prevents farmers from experimenting with different approaches.

6. The impact of training for agri-environmental management

The impact of training can be identified in the short term impact on farmers' intentions and the longer term impact on their attitudes and actions towards agri-environmental management. In the short term the training was clearly a success and had a notable impact on the participating farmers. Immediately after the group training events, participants completed an evaluation questionnaire designed to capture information regarding how useful the day was and the likely impact on how participants manage their ELS options. Response to the group training events was very positive with one farmer simply stating '*I wish I could have done that course before*'. The majority (14) reported that the day was 'very enjoyable', and most (16) agreed that the information presented was 'very useful'. One farmer reported that the training: '*Made me look at the ELS from a more informed and hopefully different angle*', while another indicated that the training had provided him with knowledge that he could usefully apply to the management of his ELS land: '*I now have some idea of how to manage the margins that I have sown as no one is going to show me*'. Others felt that the training had provided them with new techniques and ideas for mowing, seed mixtures and overall management. In addition, 21 of the farmers felt that the training would influence the way which they manage their ELS land, with some evidence that they would adopt a more professionalised approach to agri-environmental management, for example, '*I will now try and make more time to treat ELS options as I do the rest of the farm.*'

The comments made by the farmers also indicate that the training began to address some of the issues regarding knowledge, experience and confidence that emerged from the baseline interviews. For instance a number indicated that the training would have an impact on their locus of control, reporting that they had more confidence in their abilities and a sense that their actions could make a difference in terms of biodiversity. For example,

'It made me trust that I can do a better job for wildlife'
'I feel more confident that the effort I put in will be rewarded with results.'

These comments indicate that in the short term the training had an impact on farmer attitudes, suggesting that the participants would be willing to put more effort in to agri-environmental management and that they had a greater sense that their effort could yield improved results. In addition it also addressed some knowledge gaps on technical aspects of management.

Despite these positive responses offered in the enthusiastic aftermath of a successful training event, it is only over the longer term that it is possible to identify the more enduring impacts of training. During the final round of interviews in 2010 the majority (18) reported that the training had a significant or very significant impact on the management of their of ELS options. This indicates that the short term training effect identified above had sticking power. The training impact can be seen both in technical aspects of management (such as seed mix and handling different types of seed at the same time), in farmers' attitudes and in a sense that they can do a better job on environmental management. Few reported that they had not implemented any of the training provided. Reasons for this varied from feeling that they were already doing a good job and did not need to make any changes to one farmer who admitted that although he was initially keen, ultimately he just did not bother to make much effort to manage his ELS options.

For those farmers who did implement the training, changes to the seed mix used was by far the most frequently applied aspect of the training followed by other technical elements such as the mowing regime. In addition to impacts on technical aspects of agri-environmental land management in some instances the training encouraged farmers to modify their essentially utilitarian attitude towards participation. For instance:

'…. the thing that really struck me the most was that … I was looking in from a farmer's point of view and not in terms of what I was trying to achieve. I was just trying to get the money and do it as cheaply as I could. And, then I realised, well they are giving me the money for a reason. I should actually be managing it to create habitats for birds. Not just for the money. So, I think that is the biggest thing that came out [of the training].'

Another reported a very similar impact resulting from participating in the training:

'I think you are more inclined then to do it. Hopefully you will try and do it well. Whereas before it was 'they have made me do it to get this money'. But you know, why bother really?… and I think,

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you know, it all brought it home that actually it is possible to do some good, yes, and it is not just the figment of some bureaucrats imagination, you know?'

The training was also able to help address some of the issues raised in the first round of interviews concerning a lack of confidence due to being unsure of quite what was being asked of ELS participants and why:

'… seeing it we were given encouragement. That was the greatest thing because otherwise you are just left on your own to get on with it and you don't really actually, not many farmers I think know what they are doing or what they are trying to do … and just explaining all the whys and the wherefores. Why you are putting in two different seeds, you know, for the two different winters and all that sort of stuff and again we picked up tips about establishment.'

Another farmer commented that '*Well it is not how, it is the why. That is the important thing that we got out of it.*' Another recognised that although the skills and techniques required were essentially those of farming:

'…. obviously that is something, almost like a new crop that you haven't ploughed before. … Although there was nothing in there that was sort of like new. What you are trying to achieve and do was new. So obviously it was a different approach.'

It would seem therefore that carefully designed training has the potential to influence the performance of agri-environmental management and the attitudes of farmers.

7. Conclusions

The body of research on farmer engagement with AES points to the apparent failure of the approach to bring about meaningful and enduring changes in farmer attitudes and behaviour regarding environmental management (eg Burton *et al* 2008) which in turn frequently leads to calls for training and awareness raising (e.g. Wilson and Hart, 2001). AES management prescriptions are derived from 'scientised' and codified environmental knowledge. In communications with farmers, the knowledge flow of AES is dominated by '*how*' issues which results (particularly in the case of ELS) in an instructive approach, treating farmers as agri-environmental technicians, with an emphasis on 'what to do' with much less concern given to explaining the '*why*' of environmental management requirements. If farmers are to fulfil the role of knowledgeable and professional environmental managers, questions of how, what and why all need to be addressed (Ingram 2008).

Despite the original intention that ELS could operate as a 'broad and shallow', 'hands off' scheme with little or no specialist advisory and/or training input required, interviews with farmers in two different areas of England revealed concerns regarding technical aspects of both the establishment and on-going management of particular options. To some extent this is because ELS has achieved what it set out to do. It has brought a group of farmers without previous agri-environmental management experience into a broad-based entry scheme. Such farmers have sometimes underestimated the management requirements of the scheme and they often lack the experience and confidence to manage their ELS options for maximum environmental benefit. The instructive, prescriptive nature of ELS may restrict farmers' freedom to implement imaginative solutions but unfamiliar seed mixtures (and seed sizes) establishment and maintenance practices have also created a need for training and highlighted specific areas for improving knowledge exchange between farmers and AES experts.

It is perhaps not surprising then that the farmers taking part in this research were mostly very receptive to the idea of agri-environmental training. The training provided impacted both upon farmer's technical competencies and also upon their attitudes towards AES. The group training events were popular with farmers and created a positive attitude towards ELS management. The farmers also benefited from being with peers in a similar position to themselves and by being able to share their experiences of managing ELS options. The training addressed a number of concerns farmers had expressed in earlier interviews, boosting confidence and providing practical knowledge of techniques, seed mixtures, etc. A number of the comments made about the training suggest that it impacted on farmers' locus of control, in that it gave them the skills, knowledge and confidence that their management actions could produce an improved environmental benefit. To this extent the training began to supply answers to the missing '*why*' questions and by demystifying some of the environmental science began to provide participants with the 'feel for the game' identified by Bourdieu (1985) as so important for linking conceptual knowledge with one's practical everyday activities. This involves the application of newly acquired knowledge but often it is perhaps more prominent when existing knowledge has to be applied in different ways such as in sowing a mixture of unfamiliar seeds at unfamiliar depths. Moreover it involves a shift in the way of thinking about agri-environmental management and a willingness to treat 'environmental land' in the same way as the rest of the farm. In contrast to deskilling this provides confidence for a more professionalised approach to agri-environmental land management, itself an aspect of a wider professionalisation of agriculture (Brassley 2005).

It would be costly to roll out a programme of small group training to all AES participants and as we have argued above the type of training developed for this research is more relevant to options requiring active and specialised management. Training targeted towards farmers with the type of options requiring specialist knowledge and active on-going management, could be delivered relatively cheaply in the context of the overall AES budget. One approach would be to make receipt of AES funds conditional on taking part in a short training course. Although this has some appeal it could alienate some farmers and if it was only associated with 'active management' options it could lead to reduced take up of such options. An alternative would be to develop an optional training course designed to appeal to those with certain options in their AES agreement. It would also be possible to design a course and subsequent refresher courses so that they accrued ELS points and contributed to the required 30 points per ha. Further research would be necessary in order to identify the most appropriate and effective content for such a course. Consideration would also have to be given to

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the identity of the trainers. The trainer used in this research was quickly able to demonstrate both his farming and environmental management credentials. He was also independent of the government departments and agencies associated with delivering AES. This may have given him more credibility from the perspective of the farmers.

Having established that the training provided for this research had an impact on techniques, ability and attitudes further work is required to identify the range of options that might be responsive to the training effect and significantly, it will be important to explore the extent to which the impact of training is reflected in environmental outcomes.

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REFERENCES

Barr, S. and Gilg, A. (2007) A conceptual framework for understanding and analyzing attitudes towards environmental behaviour. *Geografiska Annaler* B, 89 (4), pp 361–379. DOI: 10.1111/j.1468-0467.2007.00266.x

Brassley, P. (2005) The Professionalisation of English Agriculture? *Rural History*, 16 (2), pp 235–251. DOI:10.1017/S0956793305001494

Bourdieu, P. (1985) *Outline of a Theory of Practice*. Cambridge University Press, Cambridge.

Burton, R. and Paragahawewa, U. (2011) Creating culturally sustainable agri-environmental schemes. *Journal of Rural Studies*, 27, pp 95–104. DOI:10.1016/j.jrurstud.2010.11.001

Burton, R., Kuczera, C. and Schwarzet, G. (2008) Exploring Farmers' Cultural Resistance to Voluntary Agri-environmental Schemes. *Sociologia Ruralis*, 48 (1), pp 16–37. DOI: 10.1111/j.1467-9523.2008.00452

Defra – Natural England (2008) *Environmental Stewardship Review of Progress*. http://collections.europarchive.org/tna/20081027092120/http:/defra.gov.uk/erdp/schemes/es/es-report.pdf last accessed 10/05/2013.

Defrancesco, E., Gatto, P., Runge, F. and Trestini, S. (2008) Factors Affecting Farmers' Participation in Agri-environmental Measures: A Northern Italian Perspective. *Journal of Agricultural Economics*, 59 (1), pp 114–131. DOI: 10.1111/j.1477-9552.2007.00134

Department of Agriculture, Fisheries and Food (2007) *Terms and Conditions of the Rural Environment Protection Scheme (REPS)*. http://www.agriculture.gov.ie/farmerschemespayments/ruralenvironmentprotectionschemereps/reps4/ last accessed 10/05/2013.

Falconer, K. (2000) Farm-level constraints on agri-environmental scheme participation: A transactional perspective. *Journal of Rural Studies*, 16, pp 379–394. DOI: 10.1016/S0743-0167(99)00066-2

Gasson, R (1998) Educational Qualifications of UK Farmers: A Review. *Journal of Rural Studies*, 14 (4), pp. 487–498. DOI.org/10.1016/S0743-0167(98)00028-X

Henderson, I.G., Vickery, J.A. and Carter, N. (2004) The use of winter bird crops by farmland birds in lowland England. *Biological Conservation*, 118, pp 21–32. DOI:10.1016/j.biocon.2003.06.003

Hodge, I. and Reader, M. (2010) The introduction of Entry Level Stewardship in England: Extension or dilution in agri-environment policy? *Land Use Policy*, 27, pp 270–282. DOI: 10.1016/j.landusepol.2009.03.005

Ingram, J. (2008) Are farmers in England equipped to meet the knowledge challenge of sustainable soil management? An analysis of farmer and advisor views. *Journal of Environmental Management*, 86, pp 214–28. DOI: 10.1016/j.jenvman.2006.12.036

Juntti, M. and Potter, C. (2002) Interpreting and reinterpreting agri-environmental policy: communication, trust and knowledge in the implementation process. *Sociologia Rurali*, 42 (3), pp 215–232. DOI: 10.1111/1467-9523.00212

Kaljonen, M. (2006) Co-construction of agency and environmental management. The case of agri-environmental policy implementation at Finnish farms. *Journal of Rural Studies*, 22 (2), pp 205–216. DOI: 10.1016/j.jrurstud.2005.08.010

Kilpatrick, S. (2000) *Education and training: Impacts on farm management practice*. Centre for Research and Learning in Regional Australia, University of Tasmania.

Kleijn, D., Berendse, F., Smit, R. and Gilissen, N. (2001) Agri-environment schemes do not effectively protect biodiversity in Dutch agricultural landscapes? *Nature*, 413, pp 723–72. DOI: 10.1038/35099540

Kollmuss, A. and Agyeman, J. (2002) Mind the Gap: why do people act environmentally and what are the barriers to pro-environmental behaviour? *Environmental Education Research*, 8 (3), pp 239–260. DOI: 10.1080/13504620220145401

Lobley, M. and Potter, C. (1998) Environmental Stewardship in UK Agriculture: a comparison of the Environmentally Sensitive Area Programme and the Countryside Stewardship Scheme in South East England. *Geoforum*, 29, pp 413–432. DOI: 10.1016/S0016-7185(98)00019-0

Lowe, P., Ward, N. and Potter, C. (1999) Attitudinal and institutional indicators for sustainable agriculture. In: Brouwer, F. and Crabtree, B. (Eds), *Environmental Indicators and Agricultural Policy*. CABI, Wallingford, pp. 263–278.

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Maiteny, P. (2002) Mind in the Gap: summary of research exploring 'inner' influences on pro-sustainability learning and behaviour. *Environmental Education Research*, 8 (3), pp 299–306. DOI: 10.1080/13504620220145447

Morris, C. (2006) Negotiating the boundary between state-led and farmer approaches to knowing nature: An analysis of UK agri-environment schemes. *Geoforum*, 37 (1), pp 113–127.

Morris, C. and Potter, C. (1995) Recruiting the new conservationists: farmers' adoption of Agri-environmental Schemes in the U.K. *Journal of Rural Studies*, 11, pp 51–51. DOI: 10.1016/j.geoforum.2005.01.003

Natural England (2010) *Environmental Stewardship Update, February 2013*. http://www.naturalengland.gov.uk/Images/lmupdate10_tcm6-35362.pdf. Last accessed 10/05/2013.

Owens, S. (2000) 'Engaging the public': information and deliberation in environmental policy, *Environment and Planning A*, 32 (7), pp 1141–1148. DOI: 10.1068/a3330

Potter, C. (1998) *Against the grain: agri-environmental reform in the United States and the European Union*. CABI, Wallingford.

Potter, C. (1988) Environmentally sensitive areas in England and Wales: an experiment in countryside management. *Land Use Policy*, 5, pp 301–313. DOI: 10.1016/0264-8377(88)90037-3

Primdahl, J., Vesterager, J., Finn, J., Vlahos, G., Kristensen, L. and Vejre, H. (2010) Current use of impact models for agri-environment schemes and potential for improvements of policy design and assessment. *Journal of Environmental Management*, 91, 1245–1254. DOI:10.1016/j.jenvman.2009.12.012

Pywell, R., Heard, M., Bradbury, R., Hinsley, S., Nowakowski, M., Walker, K. and Bullock, J. (2012) Wildlife-friendly farming benefits rare birds, bees and plants. *Biology Letters*, DOI:10.1098/rsbl.2012.0367

Pywell, R., Warman, E., Carvell, C., Sparks, T., Dicks, L., Bennett, D., Wright, A., Critchley, C.N.R. and Sherwood, A. (2005) Providing foraging resources for bumblebees in intensively farmed landscapes. *Biological Conservation*, 121, pp 479–494. DOI:10.1016/j.biocon.2004.05.020

Pywell, R., Bullock, J., Hopkins, A., Walker, K., Sparks, T., Burke, M. and Peel, S. (2002) Restoration of species-rich grassland on arable land: assessing the limiting processes using a multi-site experiment. *Journal of Applied Ecology*, 39, pp 294–309. DOI: 10.1046/j.1365-2664.2002.00718.x

Riley, M. (2011) Turning farmers into conservationists? Progress and prospects. *Geography Compass*, 5 (6) pp 369–389. DOI: 10.1111/j.1749-8198.2011.00423.x

Schenk, A., Hunziker, M. and Kienast, F.(2007) Factors influencing the acceptance of nature conservation measures: a qualitative study in Switzerland. *Journal of Environmental Management*, 83 (1), pp 66–79. DOI: 10.1016/j.jenvman.2006.01.010

Smallshire, D., Robertson, P. and Thompson, P. (2004) Policy into practice: the development and delivery of agri-environment schemes and supporting advice in England. *Ibis*, 146, pp 250–25. DOI: 10.1111/j.1474-919X.2004.00367.x

de Snoo, G., Herzon, I., Staats, H., Burton, R., Schindler, S., van Dijk, J., Lokhorst, A., Bullock, J., Lobley, M., Wrbka, T., Schwarz, G. and Musters, C. (2013) Toward effective nature conservation on farmland: making farmers matter. *Conservation Letters*, 6, pp 66–72. DOI: 10.1111/j.1755-263X.2012.00296.x

Tsouvalis, J., Seymour, S. and Watkins, C. (2000) Exploring knowledge-cultures: precision farming, yield mapping, and the expert - farmer interface. *Environment and Planning A*, 32, pp 909–924. DOI:10.1068/a32138

Wallace, M.C. and Jack, C.G. (2011) On-Farm and Off-Farm Returns to Education among Farm Operators in Northern Ireland, Paper presented to 85th Annual Conference of the Agricultural Economics Society, Warwick University.

Whitby, M. (ed.) (1994) *Incentives for Countryside Management: The Case of Environmentally Sensitive Areas*. CABI, Wallingford.

Wilson, G.A. and Hart, K. (2001) Farmer Participation in Agri-Environmental Schemes: towards conservation-oriented thinking? *Sociologia Ruralis*, 41, pp 254–274. DOI: 10.1111/1467-9523.00181

Wilson, G.A. (1996) Farmer environmental attitudes and ESA participation. *Geoforum*, 27 (2), pp 115–131. DOI: 10.1016/0016-7185(96)00010-3

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