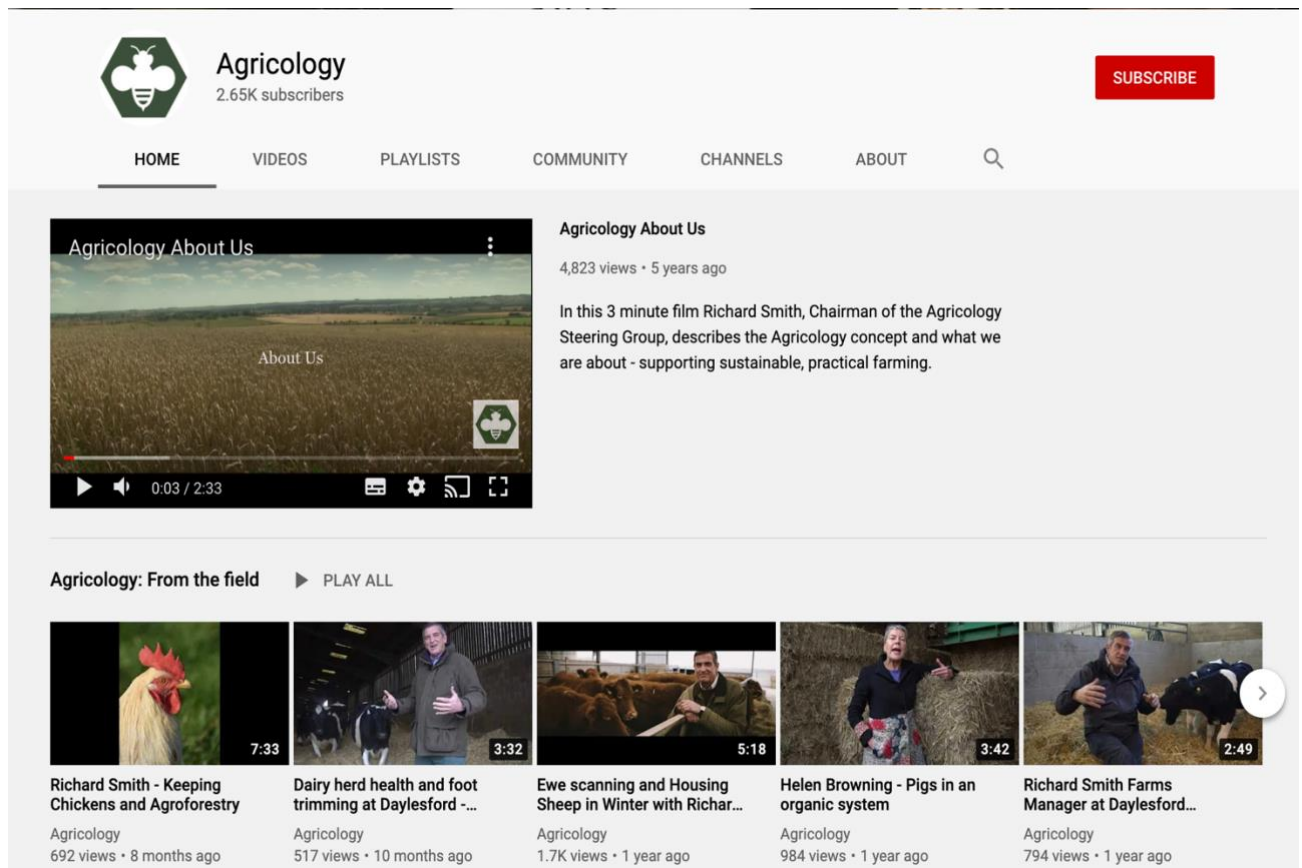# Videos and podcasts as potential approaches for knowledge exchange with farmers: testing their potential role in ELM

Results from a literature review and an empirical study in England

David Christian Rose, Auvikki de Boon, Juliette Schillings, Rachel Smith (University of Reading)

Charlotte Chivers (CCRI, University of Gloucestershire)

Lydia Lishman, Katie Bliss (Agricology, The Organic Research Centre)

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1. Introduction

The Environmental Land Management scheme represents a significant shift in agri-environment scheme delivery in England. Currently, it is envisaged that land managers will construct their own land management plans, possibly with some advisory support (though not for all) and use this as a basis for signing up to the scheme. We know from recent studies that the provision of advice is vital to help farmers understand why they should sign up to the scheme, how they might benefit, how to apply and navigate the bureaucracy, which interventions to deliver, and how to implement these management actions (Hurley et al., 2020; Lyon et al., 2020). However, we also understand the challenges in providing one-to-one, face-to-face advice to land managers, not least because of the current COVID-19 pandemic, but also because of the cost of doing so – both from a taxpayer's perspective if subsidised or from a farmer's perspective who can struggle to pay for and access advice. COVID-19 has closed down key venues in which to exchange knowledge with farmers, such as agricultural shows, peer-to-peer learning seminars, on-farm demonstration events, as well as informal venues like meeting at a local pub.

Videos and podcasts are potential methods of delivering information and advice to land managers that do not rely on face-to-face contact. This test set out to explore how they might be used in the delivery of advice to farmers based on a literature review, analysis of Agricology's video/podcast channels, as well as a survey with 141 English farmers and four focus groups involving an additional 29 farmers. Though there have been many studies exploring the potential role of videos, there has been limited research on the role of podcasts.

Below, we outline the findings from our review and empirical work, with headline messages presented first in an executive summary.

2.   Executive summary

Digital extension methods have received renewed attention with the onset of the COVID-19 pandemic. Based on our empirical research, if videos and podcasts are to be used to deliver information and advice to farmers about Environmental Land Management, the following key messages should guide their design and delivery:

- Farmers tend to prefer information and advice delivered face-to-face, preferably by trusted sources, such as peers or known advisers.

- Digital extension methods, such as videos and podcasts, as well as live interactive events, have been used more by farmers since the COVID-19 pandemic. They can be an effective form of information delivery.

- Benefits of digital events have included reducing the time and resources needed to access in-person events, as well as increasing national and international knowledge exchange.

- Videos and podcasts should seek to recreate some of the hallmarks of trusted, in-person advice delivery – i.e. delivered by trusted individuals and with 'live' or other forms of interactivity delivered through monitored comments sections.

- Videos should use appropriate language for the viewer, be concise, filmed with high-quality visuals and sound, and show how to do something in practice.

- Podcasts may be longer, describing something in detail, and should also use appropriate language and have good sound quality.

- Both videos and podcasts should be clearly indexed and accessible with viewers/listeners knowing where to go to find them.

- Barriers of poor rural connectivity and lack of digital skills need to be overcome. Digital extension should only be one method of information delivery otherwise those who do not use videos and podcasts may be further marginalised.

3. Literature review

The literature review used the following search string in Scopus on 1st May 2020:

((TITLE-ABS-KEY ("video" OR "audio" OR "podcast") AND TITLE-ABS-KEY ("farmer" OR "grower" OR "agriculture" OR "agricultural" OR "landowner" OR "farming") AND TITLE-ABS-KEY ("knowledge exchange" OR "knowledge transfer" OR "social learning" OR "extension")) AND PUBYEAR > 2009

A structured literature search was undertaken to identify literature surrounding the use of videos and podcasts for knowledge exchange with farmers by choosing keywords reflecting the topics being studied. Articles published before 2010 were removed from the analysis due to the significant technological progress made in the last decade. This led to the identification of 118 articles, which were then filtered based on whether they were duplications, inaccessible, conference posters, or if the article did not substantially report on the use of videos or podcasts. This resulted in 47 remaining articles which were supplemented by an additional 32 relevant resources from the academic and grey literature. These resources include work from the PLAID, Agri-Demo F2F, and OK-Net Arable projects, and were suggested by experts.

The literature were analysed thematically, focusing on (1) reasons why videos and podcasts should be used (and should not be used) for farmer knowledge exchange, and (2) factors for effective design and delivery of these videos and podcasts. Considerably more attention has been given to the use of videos than podcasts in existing literature, with much existing research carried out in developing countries (caveat relevance for UK). The subsequent discussion, therefore, focuses on the potential of videos for knowledge exchange with farmers with a short overview of podcasts based on the limited literature which does exist. This review will identify 7 key reasons why videos may offer an effective knowledge exchange mechanism before presenting 10 'top tips' for maximising farmer engagement with these videos.

3.1 Why use videos for knowledge exchange with farmers?

Exploring alternative ways of exchanging knowledge with farmers has become increasingly important in recent years, as traditional face-to-face exchanges, despite

being highly effective, are costly, with resulting written content (e.g. reports) often failing to result in farmer engagement (Cummins, 2013). Some studies have found that farmers find video content as effective as traditional top-down extension (Bello-Bravo and Pittendrigh, 2018; Maredia *et al.*, 2018; Thomas *et al.*, 2018), with many farmers preferring audio-visual formats (PLAID project, 2017; Bello-Bravo *et al.*, 2019). Bliss *et al.* (2019) found that farmers participating in the OK-Net Arable project exhibited a clear preference for visual modes of dissemination, whilst Baugher *et al.* (2017) found that videos shown during workshops were a top-rated learning method alongside on-farm demonstrations, study-circles, farm tours, online courses and interactive workshops according to Hispanic/Latino crop growers. Videos have, therefore, become increasingly relied upon for knowledge exchange; Van Mele (2011) found that 78% of surveyed extensionists show training videos to farmers, with half also watching videos themselves to gather information to disseminate to farmers.

Alongside farmers exhibiting a personal preference for video content, videos offer an effective way of building farmer knowledge and encouraging social learning (Van Campenhout *et al.,* 2021; Stone *et al.*, 2012; Thomas *et al.*, 2018; Karubanga *et al.*, 2019). Bello-Bravo *et al.* (2019) found that videos shown to farmers in Mozambique led to 97.9% and 89% knowledge retention and solution adoption respectively, whilst Zoundji *et al.* (2018) found that 96% of surveyed farmers in Benin (n = 120) found video-mediated learning 'extremely' useful. Moreover, Chowdhury *et al.* (2015) found that video-mediated learning worked better than face-to-face extension, with farmers who were shown videos developing a better understanding of how pesticides control pests. In addition, videos are memorable; Bello-Bravo *et al.* (2019) found that 97.9% of farmers retained information on how to use an improved postharvest bean storage system two years after they were shown videos on this topic. This increased knowledge resulting from video content can lead to practice change, experimentation, and the uptake of new techniques. For example, Van Campenhout *et al.* (2021) found that maize farmers both possessed more knowledge after watching a video and applied more of the recommended practices.

Figure 1: Advantages of audio-visual knowledge exchange through videos

7 REASONS to use videos when engaging with farmers

1 Videos are visually engaging

2 Videos are cheap to make and disseminate

3 Videos can reach large audiences

4 Videos provide an alternative to printed materials

5 Videos can be watched multiple times

6 Videos can be filmed locally

7 Videos foster knowledge sharing

As illustrated in figure 1, there are several advantages of using videos for exchanging knowledge with farmers:

1. **Their visual nature** - a commonly quoted phrase is that '*a picture is worth a thousand words'*. This is, inarguably, true, as humans are neurologically endowed with strong visual sensory abilities. This makes visual images both easier to process and easier to recall than written prose (Dewan, 2015), with humans able to process visual information 60,000 times faster than words. Farmers' preference for audio-visual approaches is, therefore, unsurprising, in particular as farmers rely heavily on visual cues (Bliss *et al.*, 2019). Another key reason why videos, as visual tools, have become a popular way for farmers to receive information (Case and Hino, 2010; PLAID project, 2017) is that they can provide demonstrations of how to perform a new management practice more effectively than a written information sheet can (Van Mele, 2011). The AgriDemo-F2F (EU project) describes the benefits of videos here: *"with a video, a farmer does not only see a tractor on the field but at the same time catches details about the soil conditions, technical capabilities, equipment adjustment and ease of machinery as well as working conditions. Much more information can, therefore, be captured from a well-made concise video than from a written abstract."*

2. **Videos are low-cost and simple to produce** (Vasilaky *et al.*, 2018; Karubanaga *et al.*, 2019). Videos have become increasingly cheap and easy to produce in recent years, with today's smartphones making it relatively simple for anyone to become a 'filmmaker' (Van Mele, 2011; PLAID project, 2017). More specialised filming equipment and editing software have also become increasingly affordable and easy to use in recent years (PLAID project, 2017); as a result, many farmers and advisors already make videos which they often upload to their own YouTube channels (PLAID project, 2017). Videos are also cost-effective; Bentley *et al.* (2016) found that 87 people were reached for every $1 spent on DVD films providing agricultural information, with these DVDs watched by a total of 8640 people.

3. **Videos can be accessible to large audiences**; videos distributed online can be viewed by much larger audiences than can be reached face-to-face (Bentley *et al.*, 2016; Bello-Bravo and Pittendrigh, 2018). For farmers with sufficient

internet access, videos are easily accessible and can be accessed via several online platforms (e.g. YouTube, Vimeo, Facebook, Twitter). Moreover, videos can also be shared through DVD copies where internet access is limited (Bentley *et al.*, 2016). They can also be broadcasted live on numerous platforms including Skype, Microsoft Teams, Zoom, Instagram, and Facebook, thus enabling participation by farmers unable to physically attend an event (e.g. Cereals 2020). This has become increasingly important in the context of Covid-19, with various organisations becoming increasingly active at producing digital information and advice.

4. **Videos are suitable for audiences with low print literacy.** Videos bypass the requirement of farmers to read information, thus making it a highly inclusive mechanism for knowledge exchange. Low literacy rates are, of course, of more significance in developing countries, however, UK farmers may suffer from learning disorders (e.g. dyslexia) than the general population (Hurley *et al.*, *in review*) and this can make information overwhelming and hard to digest.

5. **Videos can be watched multiple times and in multiple contexts;** Whilst face-to-face knowledge exchange typically occurs sporadically and oftentimes on an occasional basis, videos can be watched multiple times, thus allowing farmers to digest information at their own pace (Davito *et al.*, 2017); Bentley *et al.* (2016) found that farmers watched the same video 3-15 times. Videos are also convenient for farmers as they can be accessed via several devices (e.g. smartphones, iPads, desktop computers) (Davito *et al.*, 2017) and be watched in various social contexts, including alone at the kitchen table, at farmer events, at facilitated group discussions (Bello-Bravo *et al.*, 2019), or as a family group (Okry *et al.*, 2014). In many cases, group viewings appear preferable due to their ability to incite discussion, increasing the likelihood of farmers to consider changing their practices (Van Mele, 2011; Van Campenhout *et al.*, 2021).

6. **Videos can be produced in local settings**; for example, 'Digital Green' primarily produces facilitated videos within local contexts due to the finding that farmers are more likely to compare against their own fields, thus may see these videos as more relevant (Harwin & Gandhi, 2014 – see also Rose *et al.*, 2018).

7. **Videos foster knowledge sharing;** farmers have been found to share video content and resulting knowledge with their peers, thus increasing their impact

(Bentley *et al.*, 2016; Bello-Bravo and Pittendrigh 2018; Bello-Bravo *et al.* 2019; Maredia *et al.,* 2018). For example, within two months of a video being given to 75 farmers in Burkina Faso, they had been shown to 566 other farmers and transferred onto 239 other mobile devices (Maredia *et al.*, 2018). Knowledge sharing platforms such as Twitter, Facebook, WhatsApp, agricology.co.uk, and The Farming Forum (UK) can help these videos to spread.

3.2 Potential limitations of video knowledge exchange

It is important to note that videos must be used in conjunction with other extension methods and cannot replace existing knowledge exchange approaches as research cautions against the overreliance on non-face-to-face forms of knowledge exchange as it lacks a personal touch (Karumbanaga *et al.* 2019; Klerkx and Proctor, 2013). Despite much research finding that videos are a successful mechanism for knowledge exchange, it remains vital to continue providing traditional extension e.g. face-to-face delivery (Karppinen, 2005; Cummins, 2013; Van Campenhout *et al.*, 2021; PLAID project, 2017; Thomas *et al.*, 2018; Bliss *et al.*, 2019). Videos should complement these existing approaches, as the use of several tools is the most likely way to encourage farmers to translate knowledge into action (Bliss *et al.*, 2019).

As illustrated in figure 2, five potential limitations were identified which may impede the efficacy of videos for farmer knowledge exchange:

1. **The requirement for digital skills:** Engagement with online videos and other digital tools is affected by 'e-readiness' as even where internet is accessible, some farmers may not use it due to a lack of skills, security fears, inclination, or age. However, whilst older people may not have the digital skills or inclination to use the internet themselves, younger people may become active in forming social networks in rural areas, thus becoming information brokers for their elders by showing them videos or disseminating what they've learnt to them (Bentley *et al.*, 2016).

Figure 2: Infographic illustrating the top five potential limitations of videos for knowledge exchange as identified in existing literature.

5

POTENTIAL LIMITATIONS surrounding videos for knowledge exchange

1 Accessing online videos requires digital skills

2 'The digital divide' (varying internet connectivity)

Wi-Fi

3 Potential exclusion of those with lower literacy levels

Loss of fine detail and in-depth information **4**

5 Risk of misinterpretation
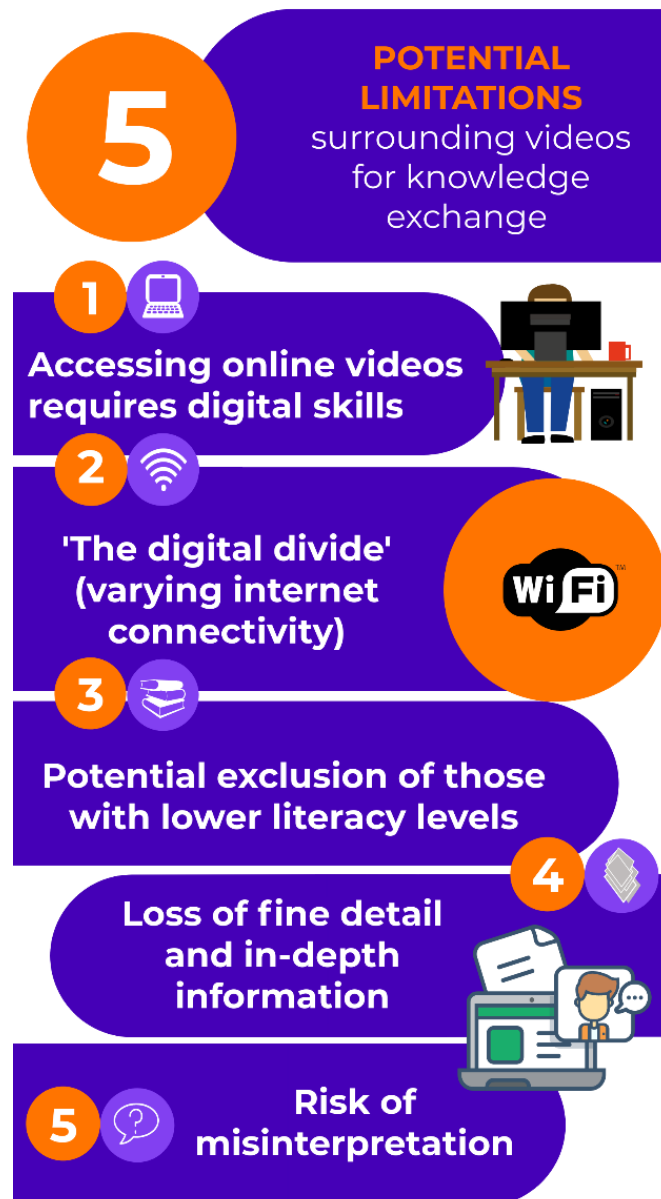
2. **Poor rural connectivity (digital divide)**: Digital divides persist in some rural communities in England due to a lack of internet connection or slow broadband (Lyon *et al.*, 2020), with farmers in rural communities without an ample broadband connection deemed unable to access online video content. In 2018, the NFU ran a survey of 800 members and found that only 16% of respondents had superfast broadband speeds and 19% had reliable mobile phone signal (NFU, 2018). Similar patterns were found in other developed countries,

including in Australia, where over 50% of people in regional areas rate their internet coverage as very poor, thus affecting their ability to connect to ICT-based initiatives (Wright et al, 2018).

3. **Low literacy:** Farmers with low literacy may continue to struggle with videos. If they rely on subtitles. Cuendet *et al.*, (2013) developed 'VideoKheti', a mobile-based system designed for low-literacy farmers in rural India, which uses both graphical and speech-based interfaces to present videos in local languages and dialects. It was found that whilst farmers liked the platform, its efficacy still dependent on education level, with the new interface failing to become fully inclusive for those with low-literacy levels (Cuendet *et al.*, 2013).

4. **Loss of fine detail**: Although videos should be kept short to boost engagement, one minute of video equates to around 100 words; it is, therefore, inevitable that a short video will contain less information than a written article (PLAID project, 2017). Some videos shown in a study by Bliss *et al.* (2019) were, therefore, seen as too simplistic by some, failing to provide enough detail to encourage practical application; one farmer stated '*if someone wants detailed information, a video is not the right thing'.* Videos also risk farmers being unable to pick up on the finer details of videos due to their relatively fast-paced nature (Burbi and Rose, 2016). It is, therefore, crucial that videos are not overloaded with information so that the information which is included can be absorbed by its viewers (PLAID project, 2017). The inherent loss of detail seen in videos can be resolved by, as recommended above, using them in conjunction with other methods. Alternatively, series of videos can be produced, or comments left on online videos can be addressed by a trained extensionist (PLAID project, 2017).

5. **Risk of information being misinterpreted/misunderstood:** Where videos are watched by farmers without an expert present, there is a risk of them misinterpreting their content (Vasilaky *et al.*, 2018). This can be addressed by watching videos in a group context, providing a good summary, or where videos are online, enabling farmers to discuss the videos in a dedicated comments section.

3.3   Success factors for an effective knowledge exchange video

The literature review led to the identification of the following 10 'top tips' for designing videos suitable for communicating with farmers (as illustrated in figure 3):

1. **Videos should be concise:** a video must be long enough to convey useful information, but no longer than necessary as this will lead to disengagement by those with short attention spans. Various ideal video lengths have been suggested, including 2-8 minutes (Bliss *et al.*, 2019), up to 10 minutes for more detailed videos (Fry *et al.*, 2019), or between 5 and 15 minutes (Van Mele, 2011). There is, however, a consensus that short videos may be just as effective as longer ones; for example, Thomas *et al.* (2018) produced a 6-minute video and found it was at least as effective as a 22-minute pre-recorded slideshow, whilst Bliss *et al.* (2019) found that a 20-minute video on mechanical weed control in vegetables was perceived as too long. Furthermore, when analysing viewing analytics of Australian crop pest and disease videos on YouTube, Wright *et al.* (2018) found that videos were accessed and watched on average for 2-3 minutes (constituting 16-41% of the total length of these videos), suggesting that the key messages given at the start of the videos are picked up, with viewers only continuing to watch if they had time or are particularly interested in the topic. Key information must, therefore, be conveyed early in a video; if greater detail is required, the video could link to further resources (including additional videos) for viewers who wish to engage further.

Figure 3: Infographic summarising 10 'top tips' for designing effective videos

Communicating with farmers

HOW TO DESIGN EFFECTIVE VIDEOS

MAKE SURE VIDEOS ARE NOT TOO LONG

USE LOCAL FARMERS IN VIDEOS WHEREVER POSSIBLE

USE APPROPRIATE LANGUAGE FOR THE AUDIENCE

KEEP VIDEOS UP-TO-DATE

CO-DESIGN VIDEOS WHERE POSSIBLE

SHOW MANAGEMENT IN ACTION

TRANSLATE VIDEOS APPROPRIATELY

RELEVANCE TO LOCAL CONTEXT

USE HIGH QUALITY VIDEO AND AUDIO

ENSURE VIDEOS ARE ACCESSIBLE

Remember to use videos with other extension methods

2. **Feature local farmers in videos wherever possible** (not critical): Farmers tend to trust information within videos if the people in the video have similarities with them and are seen as role models (Van Mele, 2011; Van Campenhout *et al.*, 2021). This is because of homophily, the human tendency to bond those similar to ourselves (Harwin & Gandhi, 2014). This allows farmers to directly address their peers, providing trusted testimonials of the practice or information they are sharing (Bentley *et al.*, 2016). Ensuring farmers can relate to the presenter of a video depends not only on the content of the video but also the context in which it is filmed; farmers will pay close attention to the presenter of a video, even down to the outfit worn to determine whether they trust the video (Harwin & Gandhi, 2014). Viewers will use this information to decide whether to perceive material as relevant to them, with featuring local, reputable farmers likely to maximise farmer-farmer learning, the best form of knowledge exchange (PLAID project, 2017).

3. **Use appropriate language for the audience**: Jargon and complex, technical language should be avoided, with clear language easily understood by its viewers used instead (Dai *et al.,* 2009; Karubanga *et al.*, 2019). Fry and Thieme (2019) used a contractor to capture a video of a field day and attributed the day's success to the extensionist using everyday language and storytelling within an informal social setting

4. **Keep videos up to date:** Videos must be updated regularly to ensure that the information remains accurate and that the latest innovations and practices are advertised (Bliss *et al.*, 2019).

5. **Co-design videos where possible**: Co-designed information can elicit trust by end users (Hurley *et al.*, in review). Video training could be provided to those farmers who are interested in creating videos (PLAID project, 2017) or those individuals included in the storyboard design for a video. For example, Cai *et al.* (2019) held focus groups, finding that a participatory video method encouraged adoption, in part due to its ability to encourage dialogue between stakeholders.

6. **Show management in action**: As stated previously, farmers learn best by seeing demonstrations and real-life examples**.** Fry and Thieme (2019) found that the 'storytelling' narrative seen in videos results in credibility and four types

of social learning: 1) learning by observing others, 2) sharing experiences through storytelling, 3) informal social interactions; 4) being a role model for other farmers. This storytelling allows the audience to learn from other farmers by observing what they do, how they have learnt new practices, and see the practicality of these solutions (PLAID project, 2017; Fry & Thieme, 2019). For example, seeing visual examples of the negative impacts of the overuse of pesticides (e.g. dead frogs in pesticide-contaminated waters) helped farmers to link their practices to their impacts (Chowdhury *et al.*, 2015).

7. **Videos should be translated appropriately**: If videos are to be used within different countries, they must be accurately translated into the first language of intended audiences, preferably by professionals before being checked by locals. This ensures that local dialects have been considered, thus allowing the video to reflect local cultural and agricultural diversity (Fry *et al.*, 2019).

8. **Videos should be clearly relevant to local contexts:** This does not mean that videos must be filmed in all local areas (as this would negate the cost effectiveness of videos), but that the content of the video should be relatable to different farmers in different places (Bentley and Van Mele, 2011).

9. **Use high quality video and audio**: Using an external microphone is highly recommended for avoiding recording ambient noise which is often unavoidable when using in-built microphones (PLAID project, 2017). Moreover, viewers will not see videos with 'shaky' footage as credible, thus a tripod or a gimbal should be used for stabilisation (PLAID project, 2017).

10. **Ensure videos are accessible**: Where videos are distributed online, YouTube is a highly recommended platform as it is the most heavily utilised online platform by farmers (PLAID project, 2017). It must, however, be noted that many farmers don't know how to locate these videos (Van Mele, 2011), in particular as many videos are difficult to find, largely due to the huge array of video content on the internet. For example, Van Mele (2011) found that a Google search for a video on "soil fertility" results in 640,000 hits. As a result, 1 in 6 respondents had used YouTube or Google to find farming videos but either couldn't find what they were searching for or ended up distracted by irrelevant videos. This led to the claim by Van Mele (2011) that web pollution makes finding useful videos like 'looking for a needle in a haystack'. When posting

videos on YouTube, various approaches can, however, make videos easier to locate for farmers. Firstly, a meaningful title consisting of keywords should be used. Secondly, the video description must be informative with tags attached for specific search terms (PLAID project, 2017). Lastly, a bespoke thumbnail using a meaningful screenshot from the video itself should be used (PLAID project, 2017). Where videos are accessible online, they should also be shared across numerous networks including on farming forums, social media, and email distribution lists (PLAID project, 2017) by advisors as farmers, whilst keen to watch videos, are unlikely to spend time searching for them.

3.4   Podcasts as a method of knowledge exchange with farmers

First coined by Adam Curry of MTV (2004), the term 'podcast' combines the words 'iPod' and 'broadcast'. Podcasts are already hugely popular in the general population as they can be produced quickly and easily (Lee *et al.*, 2008). Podcasts were originally developed to overcome issues with bandwidth speeds which made it difficult to broadcast online by feeding in rich media slowly by being permanently online, with recordings made available to listeners once they're uploaded (Lee *et al.*, 2008). This makes podcasts highly convenient as they can be downloaded to various devices (smartphones, tablets, computers) as and when they are published, before being listened to whenever and wherever suits the listener, for example, whilst carrying out tasks on-farm (Lee *et al.*, 2008; Cummins, 2013). For example, the Grains Research and Development Corporation perceive their 'Driving Agronomy' podcasts as being the most effective form of extension they provide (Cummins, 2013).

There are numerous examples of podcasts available to farmers, including the BBC's 'Farming Today', Farmerama Radio, 'Meet the Farmers', Farmers Guardian's 'Ploughing Through Brexit', 'Rock and Roll Farming', run by a Welsh mixed farmer who interviews various stakeholders within the industry, the 'Pasture Pod', whereby a host speaks with farmers about their experiences, and the 'Thriving Farmer Podcast', hosted by an experienced farmer in the USA.

Many of the same principles for effective knowledge exchange (provided in figure 3) are likely to apply for podcasts, in particular including the use of appropriate language,

podcast duration, translation, relevance, and keeping them updated. Information surrounding the use of podcasts for knowledge exchange is, however, limited in existing literature. Regardless, it is clear that a potential disadvantage of podcasts compared to videos is the loss of visual information and associated active demonstration. However, whilst broadcasted radio (e.g. The Archers) reaches large audiences in the farming community, the information it provides is generalised and often oversimplified, thus failing to cater to farmers' needs (Cummins, 2013), whilst podcasts can be more specialised, providing detailed information to its listeners (Cummins, 2013).

Lee *et al.* (2008) explored how co-producing podcasts led to knowledge building amongst students by conducting focus groups with participants once they had created their own podcasts. This finding can be translated into agriculture, whereby encouraging farmers to produce podcasts before sharing them with their peers could stimulate collective learning whilst building trusting relationships.

4.   Social media analytics

This section focuses on the assessment of the Agricology video and podcast platform analytics. The purpose of the research is to understand rates of engagement for different video and podcast formats, and different distribution media. YouTube is the main social media channel used by Agricology for uploading and promoting videos and will therefore be the focus of this section. The Agricology website links to and promotes all published videos on YouTube. This analysis uses YouTube data from the videos uploaded to the Agricology channel from November 2015 to June 2020. The total number of data files available is 311 videos that were uploaded to the channel during this time (total channel lifetime). Podcasts are a recent development at Agricology and as such, there is limited data available but what is available ins included below. For this study, a total of 100 videos were analysed. The data was extracted out of the top 200 videos by views, as this was the greatest number available on YouTube when filtered by views. Of these 200 videos, the top 50 videos by views and bottom 50 videos by views were analysed, leaving a sample of 100 videos. Data were extracted from the YouTube channel analytics which details engagement and audience. The analytics used to analyse engagement is an assessment of all channel users.

- Of this sample, 73% of videos were presented/led by Farmers, 17% by Researchers and 8% by Advisors.
- 68% of videos were filmed in the field as farm walks or demonstrations and 32% were filmed indoors at conferences or agricultural events.

Data has been extracted from the YouTube channel analytics which details engagement and audience. The raw data is available in the accompanying excel (appendix 1). The analytics used to analyse engagement is an assessment of all channel users. The audience demographics are based on YouTube tracking personal data of users as it is a service of Google, through using the IP address and other data available on Google. The Agricology podcasts are analysed to gain insights into engagement for different podcasts formats by looking at the data available from the platforms it is promoted through – including Libsyn, Spotify, iTunes and SoundCloud.

4.1 Engagement with Agricology videos

4.1.1 Audience subscribers and location

A **subscriber** is someone who has chosen to follow the channel and can comment on and share videos. On the Agricology channel, there are 2,106 subscribers. The analytics show however that 88% of users are not subscribed. In terms of **location**: 41% of the views are from viewers based in the United Kingdom (see table 1), based on IP address. Location by country is the highest level of granularity available on YouTube – there is no regional data available. This demonstrates that videos and the platform they are on are accessible to large audiences and are not confined to local geographies. Table 1 illustrates the top five countries of views.

Table 1: Location of Agricology video views 2020 Data – Source YouTube

Country	Views
Total	**52,165**
United Kingdom	21,274 (41%)
United States	6,917 (13%)
Ireland	3,949 (8%)
Canada	520 (1%)
Australia	606 (1%)

4.1.2 Retention and engagement with different types of videos

Out of the sample of 100 videos, the average % watch time was 44%, which means that on average users were viewing less than half the video. The average video length was 6.40 minutes, of which the average watch time was 3.30 minutes. Out of the sample of 100 videos, 26 videos had an average % watch time between 60% and 78%, the average video length in this category was 3.20 minutes, of which the average watch time was 2.00 minutes.

For the top 50 videos by views the average number of views was 1561. The videos had an average length of **6.30 minutes** and an average **% watch time of 54%.** All of these videos were **presented by farmers**, the majority of which were talking one to

one to the camera (40/50); the other videos were Group Talks in a field (4), presentations (3), Narrated over the video (2) and two people in conversation (1). The video format in the top 50 also shows that the majority (42/50) of videos in this sample had been filmed and edited using a **variety of different shots**: these include close-ups, wide shots, action shots and practical demos. The average number of shots was 8 and the most included in any one video was 27.

The bottom 50 videos by views had an average of 167 views. The videos were led **by Researchers, Advisors and Farmers** and delivered in a mixture of formats – the majority of which were **farm walks** the field (where a farmer is demonstrating a practice to a group) or presentations at conferences using **PowerPoint slides**. A small minority (2) of videos were one to one presentation. The rest were made up of Q&A's, Drone Footage or Narrated videos. They had a longer than average video length of 30.09 minutes and although the average watch time was lower, at 33%, the average watch duration was also longer at 13.30 minutes. The average number of shots was much lower – at 1.

Of the top **field-based** videos by views, all were farmer-led videos (where the subject in the video is a farmer), the average watch time was 51%. There was a combined total of 203,300 views across the top 10. The format of these videos was structured with a defined beginning, introducing the farmer and the topic (verbally and with subtitles), including practical demonstrations in the field and had a defined ending. The footage in all these videos was filmed in the context that related to the content topic e.g. field of cows or a tilled field. The videos combined a variety of different shots: medium to wide shots (e.g. farmer in a field speaking directly to the camera), close-ups to show details (e.g. looking at soil type) and action shots (e.g. machinery in the field) as opposed to just stills. The videos in this sample had an average of 6 different sequences, combining the shots above. Most of these videos were 1:1 with the subject talking directly to the camera and again the majority were led by farmers disseminating knowledge and providing advice based on their experiences directly to the camera. Videos of this type with the least number of views were either poorly structured, had poor sound quality or visuals – in some cases a combination of the above.

For conference-style videos, the videos are either presentations with an individual or panel of speakers or involve a discussion, led by a farmer or researcher and

engaging a group of 10 – 30 people. Within the video sample (100), 32 were based indoors – either at a conference or an agricultural event. Total views for the top 10 conference-style videos were 6400 which is lower than field-based videos. All videos had an audience and were either in a formal conference setting with presentations or led as a talk in an outdoor tent. Conference based videos are longer with an average length of 18.00 minutes and have a higher view duration at 4.00 minutes than channel average and field-based formats but a lower % watch time at 28%. Conference led videos often rely on presentation slides which can be difficult to see the detail on video. The sound quality is generally good, due to the indoor or sheltered nature of conferences and in all these videos sound systems were used. The titles were longer (+10 characters) than field-based videos and often contained complicated technical words. All had good sound, but many were unstructured and had just one sequence in the shot.

'Virtual Field Day' Webinars were run as virtual alternatives to field-based events on farms during Covid-19 and were published both as live sessions that were run on Zoom and included participants and as videos that were accessible after the event on YouTube and the Agricology website. The virtual events were well attended - over the course of 8 events over 1300 people attended – an average of 169 people per event. The smallest event was attended by 52 people and the largest event was attended by 702 people. It is not possible to measure the average % watch time on the live videos, however, the events did lead to survey data and feedback that enable us to gain further insight into preferences. The duration of the live event and subsequent YouTube videos was on average 1.5 hours. The webinars included a mixture of farmers and researchers sharing experiences and enabled presentation slide decks to be presented clearly. The visual effect made it more visible than conference-led videos. The virtual event format was based on a panel of speakers – farmers, researchers, and farming advisors – sharing practical experiences with sustainable farming. Titles were long and included subject matter. Thumbnails included the first slide of the presentation.

As a measure of engagement for the webinars, feedback was received via email and on an audience survey - there was a lot of positive remarks about the event concept. One of the benefits of the webinars is that participants can 'chat' which is a useful

knowledge exchange tool and is acknowledged in a comment below. Some of the comments mention that including some or more farmer experiences would be good, which is a strong indicator that farmer-led content is a preference for learning as well as an indication that 'strong evidence' is needed to transition to new practices.

4.1.3 Keyword searches for videos and traffic source

Based on YouTube statistics, 42% of channel traffic comes from 'Suggested Videos' (suggestions appear alongside or at the end of other videos), 17% comes from 'YouTube Search', indicating that keywords and titles are important considerations when publishing videos, 14% from browse features sources (videos that appear on homepage display based on a user's subscriptions and watch history) and 13% comes from external sources (e.g. Agricology website 32%, Google Search 21%, Facebook 8%, Twitter 3%).

The most common keywords are displayed in Table 2.

Table 2: Most popular keyword searches to find Agricology videos on YouTube

2020	*2019*	*2018*	*2017*
Agroecology	Agroecology	Charles Dowding	Sheepdog Training
Sainfoin	Sainfoin	Beef Farming UK	Sainfoin
Intercropping	Beef Farming UK	Aberdeen Angus	Aberdeen Angus
Beef Farming UK	Groundswell 2019	Sheepdog Training	How to train Sheepdog
Aberdeen Angus	Intercropping	Jake Freestone	Lleyn Sheep

In terms of **device type (Figure 4),** 42% of users watch YouTube on their mobile device – these are users 'on the go' resulting in shorter session times (2:42 mins) when compared to the 34% watching from a computer with a longer session time of 3:25 mins and 12% from a tablet (3:11 mins).

Figure 4: Device used to access Agricology videos on YouTube

Audience Device Type
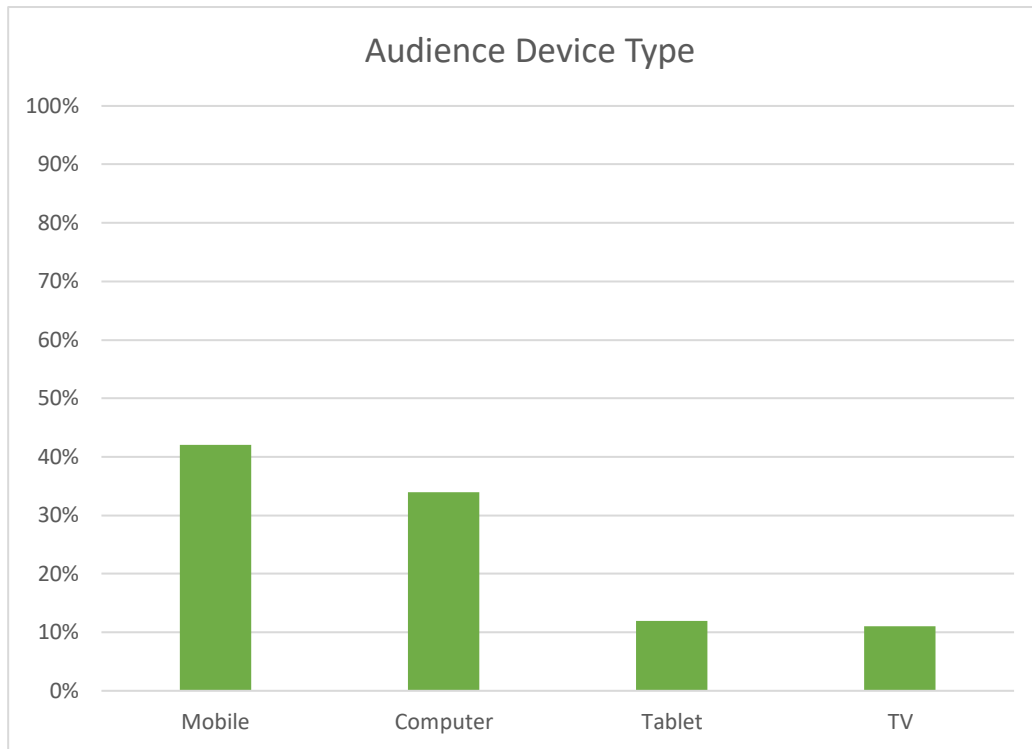
4.1.4 Likes, Comments, Shares

Users comments on the YouTube videos include opinions, reactions, questions and other farmers sharing their own experiences. Likes indicate a positive response to a video and shares demonstrate a willingness to recommend to peers. Of the 100 videos analysed, there were over 2694 engagements - 1638 likes, 876 shares, 132 comments and 122 dislikes.

Of the videos with the most comments – the top 10 of which were looked at in detail, there were a total of 71 comments. On analysis of the comments, they were broken down into 'positive' remarks of which there were 71, 'Inspired to change' of which there were 13, 'Knowledge exchanged' of which there were 14 and 'Questions' asked of which there were 30. These demonstrated that farmers are willing to engage with the content, seek further advice from a trusted source and share their ideas. It is also positive to see that there are farmers who indicated they are willing to implement a practice that has been demonstrated in a video.

Here is a quote from a viewer who was inspired to change as a result of watching a video:

> Hi Richard, been following your vlog for some time now and have taken the plunge and planted 15ac of sainfoin in August after spring wheat . Established very well and is motoring on nicely

4.2 Podcasts

Agricology podcasts are formatted in two different ways (i) interviewing a guest 'farmer' who discusses practices used on their farm, describes their farming system and motivations for adopting their approach (ii) agroecological practice focused discussions with a number of people from across the industry sharing their knowledge and experiences. The duration of a single podcast episode is longer than videos – from 30 up to 60 minutes. One podcast is released each month and shared on Libsyn, which pushes the content to destinations including Apple Podcasts, RSS Feed, Google Podcasts and Soundcloud. Agricology also shares podcasts on social media (Facebook and Twitter) and the website.

The Agricology podcast launched in June 2020. With six episodes in total, there was a limited amount of data to analyse and therefore it must be noted that there is not enough to draw a conclusive understanding of the use of podcasts. There were further limitations of this section of the report is that unlike videos, podcasts have fewer parameters available to be analysed. Therefore, we are unable to analyse listening time, retention time and demographics to give an indication of audience preferences and engagement. What can and has been assessed is content type, podcast length, and format. The podcasts on Agricology's channels were assessed using the following metrics:

Key Findings:

(i) **Unique Downloads:** these are the number of times an episode has been downloaded. It does not count the number of times the episode has been played. Agricology's podcasts had a total of 1,103 downloads between June and December 2020. The podcast with the most downloads was 'Getting Started with Agroecology' (released June 2020, 264 downloads), followed by a discussion on 'Land Sparing and Land Sharing' (released September 2020, 188 downloads) and Farm System Health – Iain Tolhurst (released November 2020, 178 downloads).

(ii)   **Length of the podcast:** the average length of a single podcast was 48 minutes.

(iii) **Format and content:** The majority of the Agricology podcasts were one to one interviews that involved a farmer and an interviewer. The only one that was not was a discussion that involved a variety of participants.

4.3   Summary and key recommendations

The statistics suggest that shorter videos are more popular. There was a preference for those demonstrating agroecology in practice – machinery in action, shots of soil/crops and impact of different methods. It also illustrates the importance of videos having captivating content and of getting to the point quickly, if viewers are not going to watch the whole video. The importance of simple titles, without overly technical words, and the quality of recording are also important. There is limited information available on which to draw conclusions about podcasts, but these are likely to be longer than videos.

Our key recommendations based on this section are:

1. **Practical demonstrations** in the field are attractive to farmers wanting to learn.
2. Produce **short concise** videos, in a field setting**, led by a local farmer** (narrating over the footage, directly to camera or a mixture of both).
3. Use a **mix of visuals**, including wide shots to set the scene, action shots to demonstrate a practice and close-ups to capture the detail.
4. Ensure the **narrative is audible** throughout. It is recommended that lapel microphones with wind blockers are used for filming outdoors.
5. If producing videos from conferences, it is advised to cut videos into shorter sections based on speakers/topics. It can be a good way to capture events for those unable to attend, ensure the footage is filmed to allow the visuals of the PowerPoint display.
6. Running Virtual Events as webinars is a useful and engaging format for disseminating information to farmers at little expense to hosts and participants. Ensuring there are farmers in the speaker panel is important to gain the participants' trust.

5.   Study methodology

5.1   Survey

We used the findings of the literature review to help structure questions for a survey. We conducted an online survey using Qualtrics answered by 141 farmers in England[1]. The survey was piloted by five farmers before being distributed. The survey was distributed online and through organisations connected with the Organic Research Centre, Agricology, and the University of Reading. Farmers could be entered into a prize draw for filling in the survey, which drew three prizes. Survey answers were removed if they were clearly not from an English farmer, for example with foreign IP addresses and a suspiciously quickly filled-in survey with suspicious answers. All surveys were anonymous and contact addresses for the prize draw were not linked with responses. The survey was live between July and November 2020 and responses were analysed using SPSS software. It was approved by the University of Reading's ethics committee in the School of Agriculture, Policy and Development.

We received responses from a range of farm sizes, types, location and age/gender (see Table 3). One of the concerns with distributing the survey only online (due to COVID-19 restrictions) was the possibility of a biased sample. However, we found that 66% of our respondents watched videos to gain knowledge on farming practices, with just 41.8% using podcasts. Thus, our sample was not comprised just of those farmers who used videos and podcasts – indeed, most of our respondents did not use podcasts. This was important to understand both reasons for use and non-use. Respondents were not always shown all of the same questions – for example, if respondents ticked that they did not use videos, they were not asked some of the questions delving further into videos, and likewise for podcasts (so n can vary per question).

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[1] One incomplete response was entered as a complete response by the survey software, but we included this in the analysis as some questions were completed.

Table 3: Population characteristics of the survey responses (N=141)

Demographics	Frequency
Age	
18-30	17 (12.1%)
31-40	24 (17.0%)
41-50	33 (23.4%)
51-60	42 (29.8%)
61-70	18 (12.8%)
71<	7 (5.0%)
Gender	
Male	101 (71.6%)
Female	38 (27.0%)
Prefer not to say	2 (1.4%)
Farm location	
(could pick more than one if farm straddled border)	
South East	21 (14.9%)
South West	33 (23.4%)
West Midlands	21 (14.9%)
North West	9 (6.4%)
North East	6 (4.3%)
Yorkshire and the Humber	18 (12.8%)
East Midlands	11 (7.8%)
East of England	25 (17.7%)
Farm size (hectares)	
1-39	26 (18.4%)
40-79	28 (19.9%)
80-119	15 (10.6%)
120<	72 (51.1%)
Type of farming	
Organic	25 (17.7%)
Conventional	108 (76.6%)
Other* (mix etc.)	16 (11.3%)
Farming enterprise	
(could pick more than one)	
General cropping/cereals (arable)	73 (51.8%)
Upland livestock (beef/sheep)	13 (9.2%)
Lowland livestock (beef/sheep)	70 (49.6%)
Dairy	20 (14.2%)
Swine	14 (9.9%)
Poultry	17 (12.1%)
Horticulture	9 (6.4%)
Other**	14 (9.9%)

5.2   Focus groups

To explore some of the themes from the survey in more detail, we conducted four online focus groups. These were conducted with between six and eight farmers, with 29 farmers participating in total. Farmers were recruited from different regions of England, covering a range of farming enterprises. The focus groups were conducted via Zoom, and lasted up to 90 minutes; farmers were given £100 to cover their time, which included answering three questions beforehand to help us understand the range of views amongst participants before conducting the focus groups. Though online focus groups were not the first choice of method given their potential to bias the sample towards farmers who are comfortable with online technologies, there was no other choice. This was because agricultural shows and other events did not run during the study period due to the COVID-19 pandemic. However, focus group participants were not all avid users of videos or podcasts. In total, 83% of participants did use videos although not all regularly, and only 50% used podcasts (both higher figures than the survey sample). The focus groups were recorded with permission, transcribed, and analysed thematically and were given ethical approval from the University of Reading's ethics committee in the School of Agriculture, Policy and Development.

5.3   Results

5.3.1 Preferred methods for gaining knowledge on farming

In the survey, we asked farmers about their preferred methods for gaining knowledge on farming practices. Figure 5 shows the percentage of farmers picking each method. Reading (89%) (paper or online) was the most popular method used by farmers to gain knowledge on farming practices, but face-to-face methods such as talking to other farmers, advisers, or demonstration events/workshops were also important (all undertaken by over 70% of respondents). In terms of videos and podcasts, 66% of farmers used videos, whilst listening to podcasts was the least popular method (42%).

Though we acknowledge a fairly small sample, following a significant Cochran's Q test (p <.000), pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons. Adjusted p-values are presented. Farmers were significantly more likely to watch videos (66.0%) than listen to podcasts

(41.8%) (p < .001). Farmers were also significantly more likely to attend on-farm events (71.6%)(p < .000), talk to an adviser (78.0%)(p <.000), attend seminars and workshops in person (79.4%)(p <.000), talk to other farmers (85.5%)(p <.000) and read (88.7%)(p <.000) than listen to podcasts. Farmers were significantly more likely to talk to other farmers (85.8%)(p =.021) and read (88.7%)(p =.003) than watch videos (66.0%).

These statistics suggest that reading or face-to-face contacts are more important methods of learning for farmers than watching videos or podcasts, but that watching videos is more preferable to listening to podcasts.

Figure 5: Methods used to gain knowledge on farming practices (n-141)

What methods do you use to gain knowledge on farming practices?
(% of farmers selecting each option, N=141)
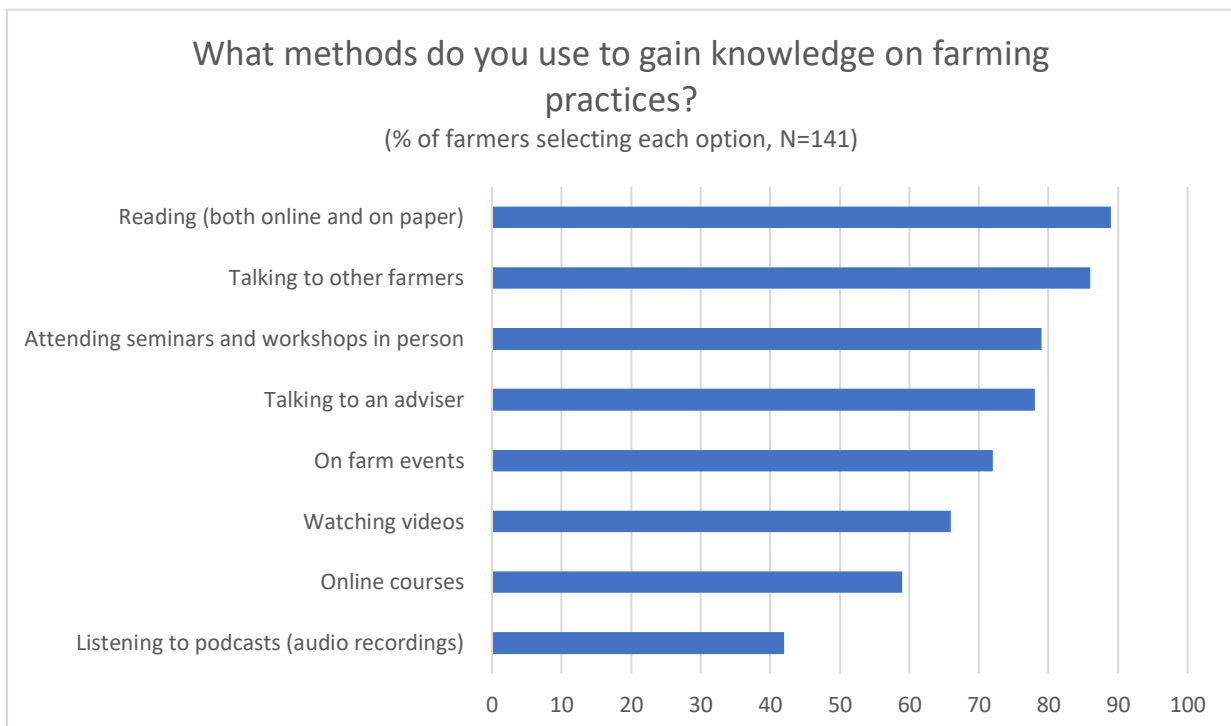
In the focus groups, we asked farmers about the kind of person who was best at delivering advice about farming practices, as well as to comment further on the usefulness of different forms of learning. Farmers generally considered other farmers to be the best person to deliver advice because they were generally perceived as being honest and having no agenda/bias. As one farmer said:

*'I'm looking for review and recommendation and I want that from my peers
- Generally they have no bias, no commercial interest: if I want to choose*

between wheat variety A or B or tractor A or B. They tend to be to the point and tell it like it is.'

Additionally, whoever the person was presenting information, farmers said that they must have good presentation skills, be respected by the audience, with good facilitation and without coming across as a sales pitch.

In terms of preferred methods for learning, focus group respondents concurred with the findings of the survey which suggested that **in-person, face-to-face events** were the best form of learning. One farmer, for example, said that they *'prefer face-to-face'* because they get a *'better idea if the person is talking shit'* if they can look them in the eye. The visual benefits of face-to-face learning and demonstration events were stressed at length, but the opportunity for interactivity, such as asking questions, was highlighted as a benefit that videos (another form of visual learning) could rarely provide. One farmer said that the ability to have *'side conversations'* at in-person events as opposed to online videos was important:

'*You go to a meeting the topic might not be as interesting, but you usually come away having learnt something even if not to do with the topic in hand – it's that interaction with other people who were there and who were interested in the same sort of thing really, that's where you get most value out of those meetings.*'

Picking up body language was another important feature of in-person events that could not be replicated elsewhere. One focus group participant said:

'*It's also body language that you pick up from physical meetings. Webinars such as zoom meetings have been good for continuing that knowledge flow, but you can't ask questions the same you don't get the same feeling for body language and things when people are talking.*'

Another farmer said he didn't think anything would be better than an on-farm meeting and presentation:

'*The best way of learning is on farm or a small meeting you learn more about a subject by speaking to people who are attending. We got a lot of livestock so it's not always possible to attend despite our best efforts to make it. Online is another way of doing it. Perhaps just got to get used to it more than in the past. I don't think anything will ever beat an on-farm meeting and presentation, but this is the second-best route for me.*'

A further farmer said that "*I get a lot more out of a conversation of 5 minutes than hours of looking through internet looking for videos*' as '*it goes into your brain much more.*" On-farm demonstration helped to demonstrate what happens on the ground and how to actually put something into practice. This practical element of learning was appreciated by all in the focus groups.

However, the farmers did highlight one drawback of in-person events that could be addressed through the use of online videos or podcasts. Many raised the problem of travelling long distances to access in-person events, the cost of fuel, the loss of time, which meant that many opportunities could not be accessed. These problems are exacerbated if the event is not of good quality. Two farmers are quoted below on this issue:

> '*I get a bit more annoyed if I've driven two hours to get somewhere and turn up to a group of people that aren't pulling in the same direction as me. You can't necessarily extract yourself without appearing very rude.*'

> '*Inaccurate description of the event. You might get up early, travel two hours to an event and then you find it's not what they said it's going to be and you've wasted a day completely just due to the right of being incorrect - quite often it's because it just isn't innovative enough*'

We return to these issues in more detail when discussing the benefits of videos and podcasts in later sections, but the flexibility of accessing these forms of learning, plus alternatives like virtual farm walks, and of saving time was commonly stressed. One farmer said that:

> '*I joined a couple of virtual farm walks during lockdown, one was organic farming - which was fab. Wasn't sure what to expect. The prospect of me driving far, I wouldn't have done it. That was really good. It was just 45 minutes between other jobs – could go back to it later. It was really really good. It's a shame they don't do that more really. I found that really useful.*'

In fact, not relying on face-to-face methods of learning could also increase the possibility of sharing lessons globally.

'[…] *actually it's been a positive thing – we have more members that joined than before, we've been able to access a lot of the bigger name speakers that might have been expensive (e.g. fly to the UK, stick in a hotel - international) It's been very simple to get their knowledge in front of a number of farmers.'*

Social media (including farming forums) was highlighted as a useful method of learning about farming practices in the focus groups. Benefits stressed included the cost (free), the ability to access global audiences and find contacts and to 'graze' across several different subjects. Social media was also seen as a source of personal support and motivation. The limitations of social media were noted, however, if the people you followed led to echo chambers and the problem of too much information. One farmer said:

'I'm a recent convert to Twitter- it gives you an ability to snack – graze lightly across an awful lot of subjects. there's some really good things you can follow up on. Someone did describe Twitter to me as the converted preaching to the converted. I don't know what drives the twitter algorithm but you do tend to find yourself in a really like-minded pack at times and I'm not sure - maybe it's who I follow but I'm not sure I get the contrast across the farming industry that I thought I would but maybe it's something behind what's driving Twitter.'

Farming forums (e.g. The Farming Forum) were seen as excellent venues for discussing specific issues with peers, offering flexibility at no cost, and access to a huge deal of international and locally specific information.

5.4   Video specific results

5.4.1   Most popular platforms for watching videos

Figure 6 shows that YouTube was the most popular platform used by 88% of farmers to gain knowledge on farming practices using videos (same patterns across all age groups). It also shows that Vimeo was the least popular platform of those options presented in the survey.

Figure 6: Popular platforms to access videos (n=92)

Most popular platforms for accessing videos
(% of farmers picking each option, n=92)

Platform	Value
YouTube	~88
Farming Forums	~65
Twitter	~45
Facebook	~36
Instagram	~20
Vimeo	~7
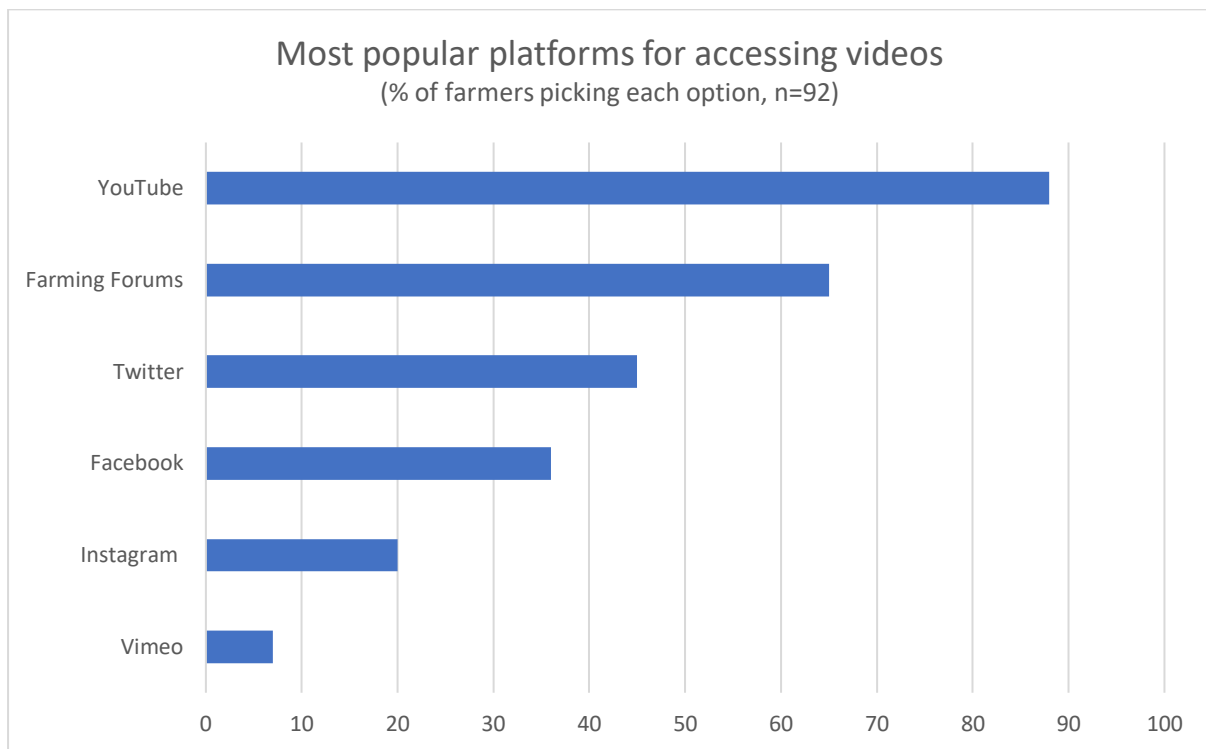
5.4.2   Suitability of internet connection to watch videos

From our survey, 84% of farmers said that their internet connection allowed them to easily access videos (figure 7).

Figure 7: Internet connection and access to videos (N=140)

Does your internet connection allow you to easily access videos? (N=140)

■ Yes ■ No ■ Don't know
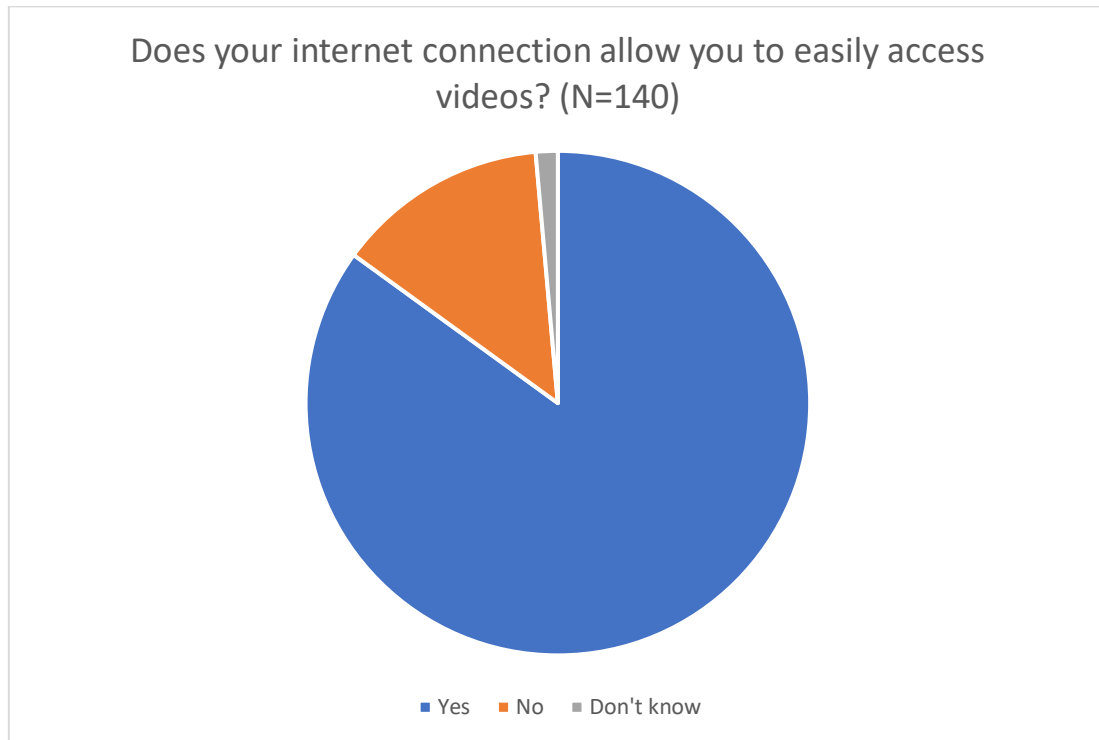
5.4.3 Devices used to access videos on farming practices and location of view

The most popular device selected for watching videos was a computer (81.5%), followed by phone (71%), and tablet (38%). In terms of where farmers were located when watching videos on farming practices, it was mostly at home (91%) with in the office (41%) and in the field (26%) considerably lower (all n=92).

5.4.4 Use of videos since the COVID-19 pandemic

With face-to-face venues for knowledge exchange restricted during the COVID-19 pandemic, we thought that the use of videos to gain knowledge on farming practices would have increased. This was supported by the survey responses (n=90) with 75.5% of farmers reporting an increase in their use of videos, with no one selecting that there had been a decrease (Figure 8).

8

Figure 8: Use of videos since COVID-19 pandemic (n=90)

Since the COVID-19 pandemic, how has your rate of using videos to gain knowledge on farming practices changed?
(n=90)

■ Increased   ■ Remained the same
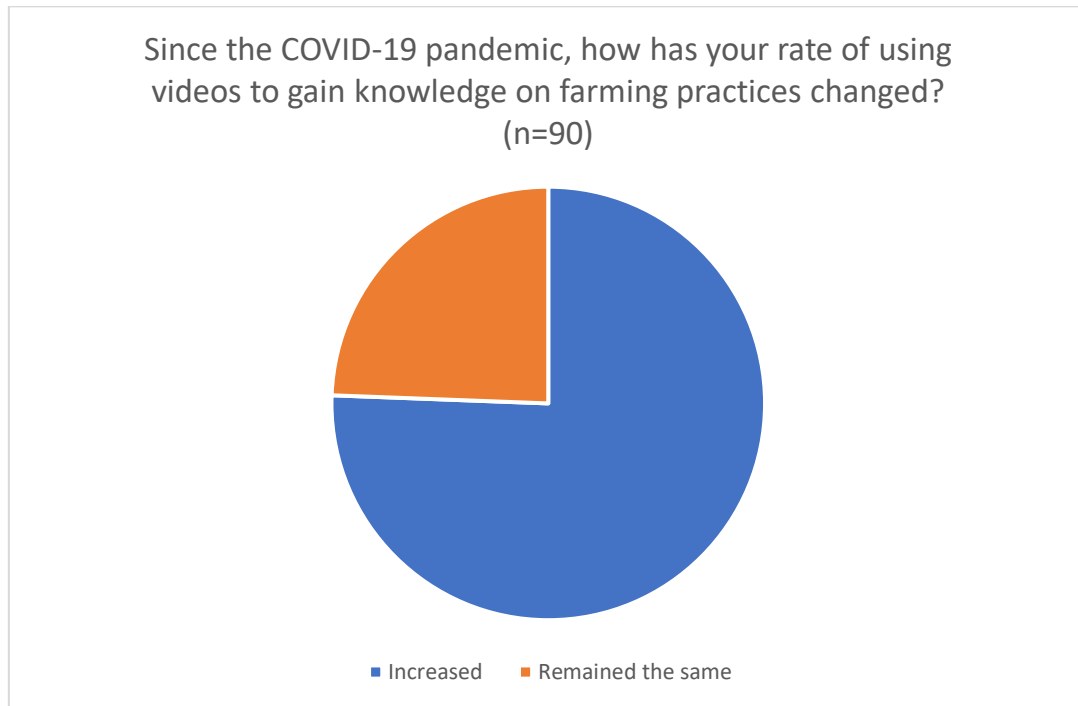
5.4.5 Effectiveness of videos compared to other methods

We asked survey respondents to compare the effectiveness for learning of videos compared to other methods - 1 (less effective), 2 (as effective), 3 (more effective). Table 4 shows the results, which suggests that across all respondents, videos were seen as being similarly effective to all other methods listed. An additional question saw 77.8% of respondents say that were either extremely likely or somewhat likely to implement a practice they had learned by watching video (n-90), which suggests that they are an effective method for learning.

Table 4: Effectiveness of videos compared to other methods

Age group			In terms of effectiveness for learning, how do the use of videos to gain knowledge on farming practices compare to:						
			Attending seminars and workshops in person	Listening to podcasts	Reading (books, magazines, blogs, etc. - both online and on paper)	Talking to an adviser (e.g. agronomist, vet, environmental adviser)	Talking to other farmers	Online courses (seminars, workshops, etc.)	Attending an on farm event
18-30	n = 13	Median	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00
31-40	n = 12	Median	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	Less effective/ As effective - 1.50	As effective - 2.00	As effective - 2.00
41-50	n = 21	Median	As effective - 2.00	More effective - 3.00	More effective - 3.00	As effective - 2.00	As effective – 2.00	As effective - 2.00	As effective - 2.00
51-60	n = 30	Median	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00
61-70	n = 11	Median	Less effective - 1.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	Less effective - 1.00
71<	n = 3	Median	Less effective - 1.00	As effective - 2.00	As effective - 2.00	Less effective - 1.00	More effective - 3.00	As effective - 2.00	Less effective - 1.00
Overall	n = 90	Median	As effective – 2.00	As effective – 2.00	As effective – 2.00	As effective – 2.00	As effective – 2.00	As effective – 2.00	As effective – 2.00

5.4.6 Ideal length of a video

Excluding 'don't knows', Figure 9 shows that most respondents felt that the ideal length of a video to gain knowledge on farming practices was under ten minutes.

Figure 9: Ideal length of a video (n=90)
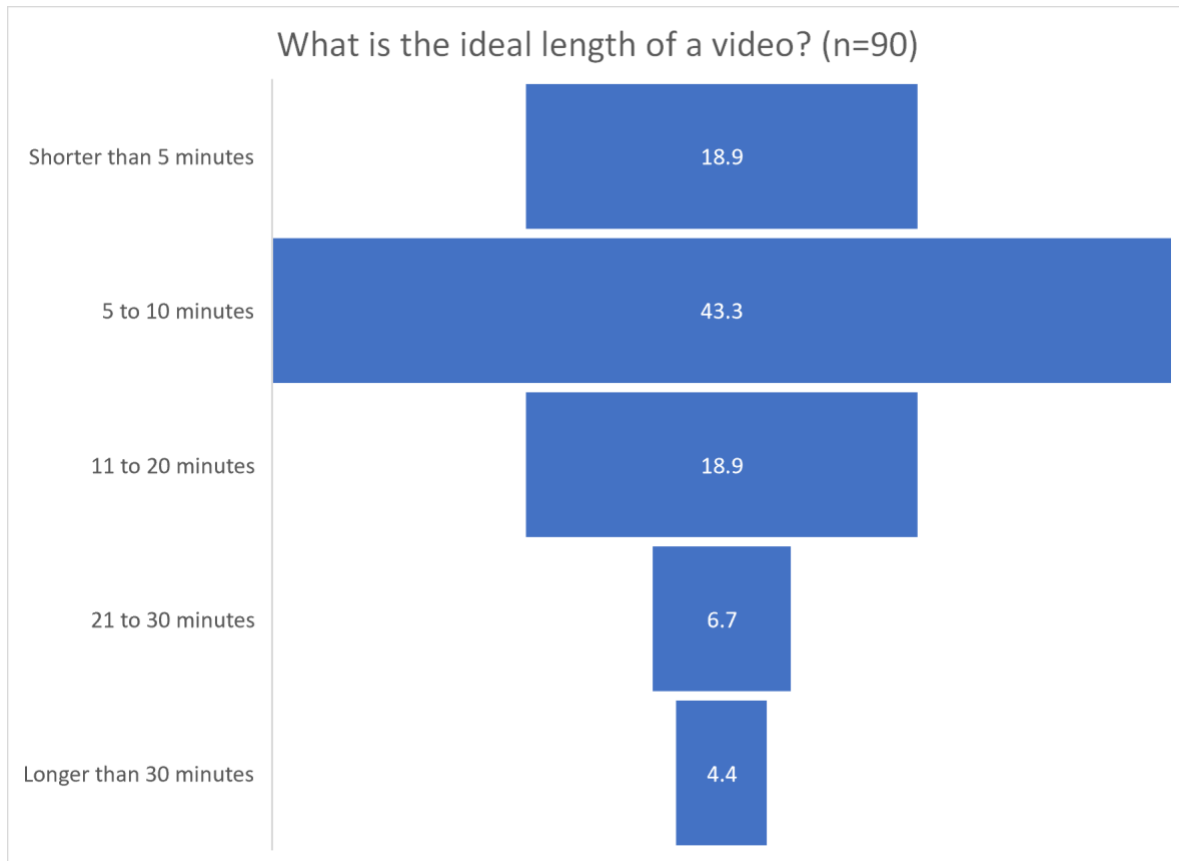
5.4.7 Ranking most important aspects of a video

In the survey, farmers were asked to rank the most important aspects of a video from most to least important on the following scale: Extremely important (1), Very important (2), Moderately important (3), Slightly important (4), and Not at all important (5). The lower the score, the higher the importance.

The factors were ranked from top to bottom as follows (n=90), with the most important first:

1. The language is easy to understand (Mean 1.79)
2. The video shows the effectiveness of a specific technique (1.86)
3. Farmers have contributed to the content of the video (2.24)
4. The video includes a practical demonstration (2.27)
5. The person presenting is a farmer (3.28)
6. Farm advisors have contributed to the content of the video (3.33)

7. The person presenting is a farm advisor (3.71)

Two factors were, therefore, scored as very important or above – the language is easy to understand and the video shows the effectiveness of the technique.

Focus group participants were also asked to discuss the factors that made a video useful to learn about farming practices. Important characteristics of videos highlighted were:

1. **Short/concise/tight, punchy, to the point** (not filled with irrelevant content).

   'The videos that I watch are […] to the point. And then if you want to learn more, if there are enough comments and interaction they do sometimes bring out another video for people that actually want to go more in depth. Any content needs to be to the point, the bits you don't need to know need to stay away from the video. Needs to be short and snappy.'

2. **Clear presentation**: well-thought through content, clear from the outset, filmed well (professionally produced and presented), not shaky, good image (e.g. drones, no blurry picture) and microphone quality, clear language.

   'Sound quality is really important. You see a lot of farmers on videos where suddenly you have wind noise and you can't understand a word they're saying. If out in a field, if needed, voice it over and edit afterwards, keeping an eye on wind levels.'

   'I think you want an engaging speaker. It can be dull sometimes. People that like that they'd rather be doing anything than doing the video. It doesn't help you absorbing the information and good technical information.'

3. Using **farmers** works best

   'The rule of thumb we always went by was farmer-to-farmer learning, making videos of farmers telling us about something they were doing and we would edit and put together for other farmers. Views were much better if it was a video of a farmer explaining something rather than when it was a researcher or even a vet. Having a farmer there used to have a lot more interest.'

4. **Honesty**

'And also an honest appraisal of pros and cons – not just good bits. Great to hear the downsides which are more believable. Three times as helpful as just the good bits'

5. **Be practical, showing visually how to do something**

'I was watching a video today on roller crimpers for finishing off cover crops – I defy anybody reading a book about roller crimping and get as much as what I got it in 2 minutes watching a video seeing a tractor pull one across 20m. You go 'oh ok that's how it works'. All of the sudden you're up to the workshop 'I might be able to do that myself with this old roller I got''.

5.4.8 Main reasons for using videos to learn about farming practices

The survey and focus groups asked about the main motivations of using videos to gain knowledge on farming practices. Findings were similar from both methods. The most common reasons for using videos were:

1. **Visualisation of an action**

This was the major motivation of farmers using videos to learn. Farmers liked being able to see what other people are doing, gaining reassurance by watching other farmers using specific techniques, and the accessibility of seeing in practice exactly how to do something. One farmer said in the focus group that

*'**if a picture paints a thousand words, then a video paints a million words.** You can get so much more from a video than on a picture, PowerPoint or in a manual.'*

Another said:

'the only videos I would watch would be very practical ones, things like stock fencing, or steel framing – it's really practical ones where it's difficult to read and visualize what actually is happening. Whereas if you can see a very practical one on a video, that just brings it to life.'

2. **To learn lessons from other places, including internationally**

The ability to learn from farmers around the globe was seen as something that videos could offer, as well as building general knowledge about farming practices (including specific things). They offer the chance to hear from farmers you wouldn't be in contact otherwise. As one focus group farmer said:

'You can grab 5 minutes and you can learn about how to grow cherries regeneratively in the US – things you wouldn't been able to access previously – I see that as hugely positive.'

3. Flexibility and convenience

The ability to access videos on-demand, at no cost, watch it again, whilst stopping and starting it at any time was seen as valuable. One farmer said in the focus group that *'you can go back and watch it again which is another beauty of these things. You can watch it repeatedly if you didn't get it the first time.'*

5.4.9 Reasons for not using videos and suggestions to overcome barriers

The survey and focus groups asked those who did not say that they used videos to explain the reasons why, as well as what might encourage them to start using them. Common barriers to watching videos were:

1. **Lack of time** to watch them (especially if videos did not get to the point)

2. **Not knowing where to find them**

   'I would love to overcome that issue. We really struggle knowing where to go. Presumably once you start it feeds back and you get links etc. It's knowing where to start productively. I'm not benefiting as much as others, hard to know where to start and find good leads.'

3. **Limited interactivity**

   'you can use the comments section, but it depends on how much traffic there is on the video. If there's not much you get rarely get a response. E.g. under than 500 views. It's hard to have a kind of rapport in the comments section.'

4. **Poor connectivity** meaning that videos could not be watched easily.

5. **Personal habit**

'My father is not ancient but will not look at videos. Doesn't matter how much you try to convince him it wouldn't happen. Important not to leave behind the people it doesn't work for.'

6. **Adverts and bias** which disrupt the flow of the video and bombard the viewer with advertising.

The following suggestions were given as ways of encouraging the use of videos in the survey:

1. **Linked to a scheme/credits/points/training**
2. **Ensure videos are information-rich and reliable**
3. **Increase relevance of videos**
4. **Ensure that videos are not biased**
5. **Deliver information in videos concisely and efficiently**
6. **Improve accessibility of videos by putting them in one place**

5.5 Podcast specific results

5.5.1 Most popular platforms for listening to podcasts

Figure 10 shows that Apple Podcasts was the most popular podcast platform used by 44% of farmers to gain knowledge on farming practices, closely followed by YouTube (40%). It also shows that SoundCloud is the least popular platform of those option.

Figure 10: Platforms used to listen to podcasts (n=57)
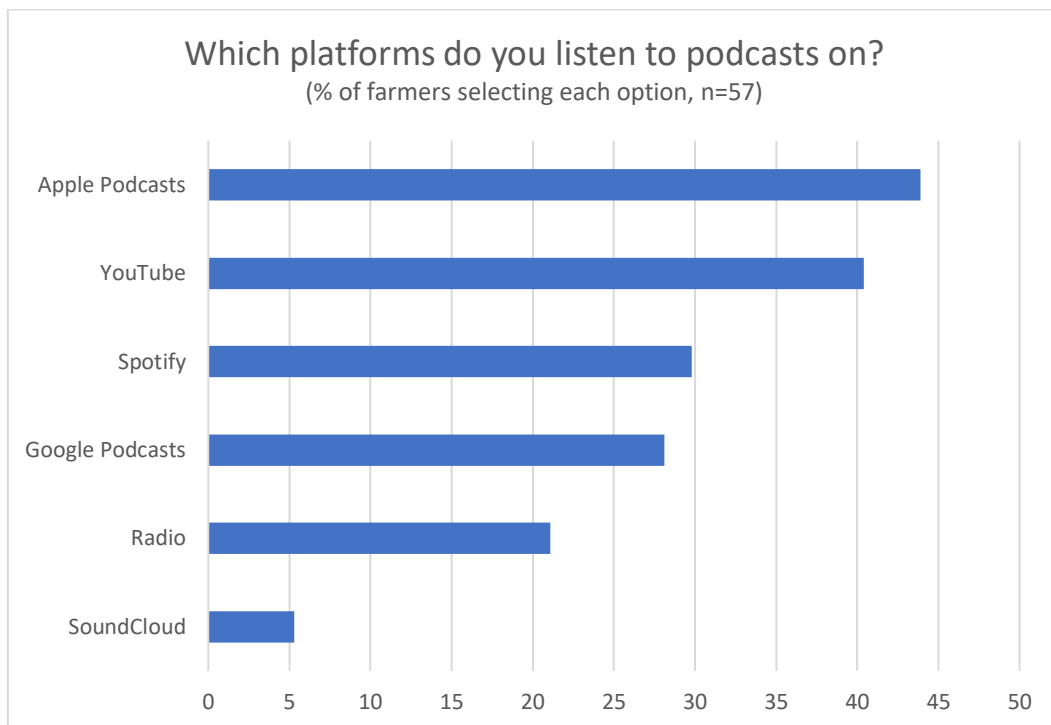
Specific podcasts mentioned included Rock N Roll Farming, No Till Growers, Farmers Weekly, Agricology, ReGenAg Chat, Regenerative Agriculture (John Kempf), Meet the Farmers, Crop It Like It's Hot, Dewing Grain, and Farming Today.

5.5.2   Suitability of internet connection to listen to podcasts

In total, 79.4% of respondents (n-140) thought that their internet connection would allow them to listen to podcasts (Figure 11).

Figure 11: Internet connection and access to podcasts (n=140)

Does your internet connection allow you to easily access podcasts? (n=140)
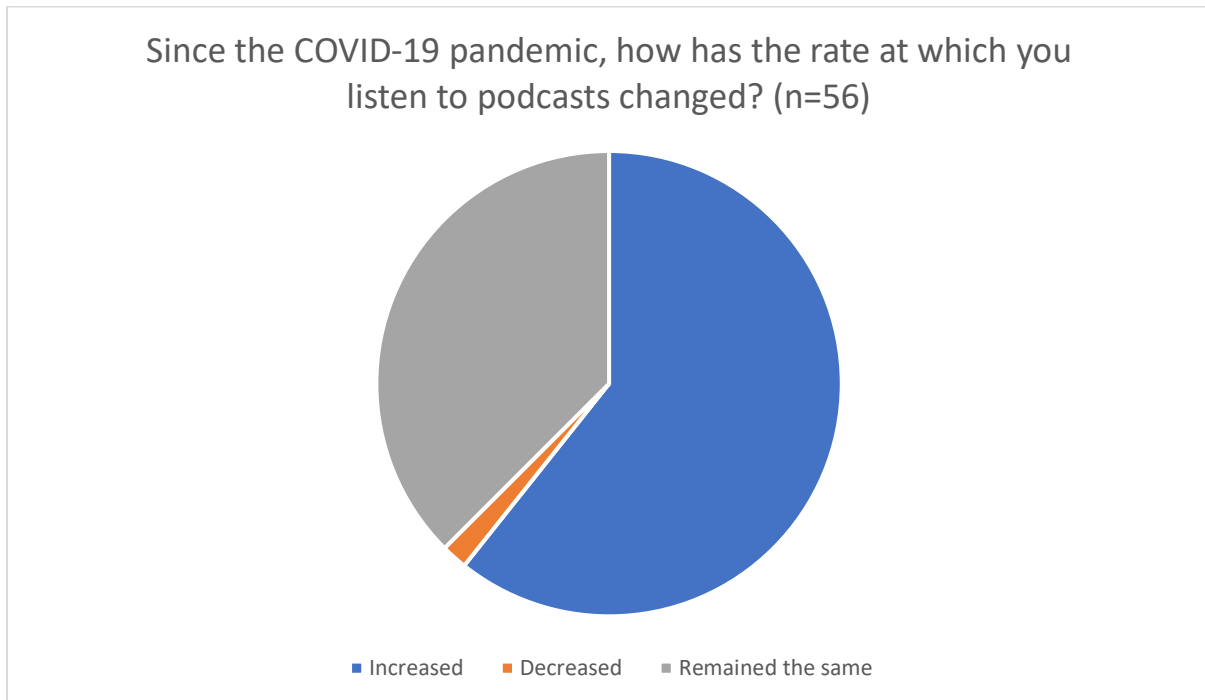
■ Yes ■ Don't know ■ No
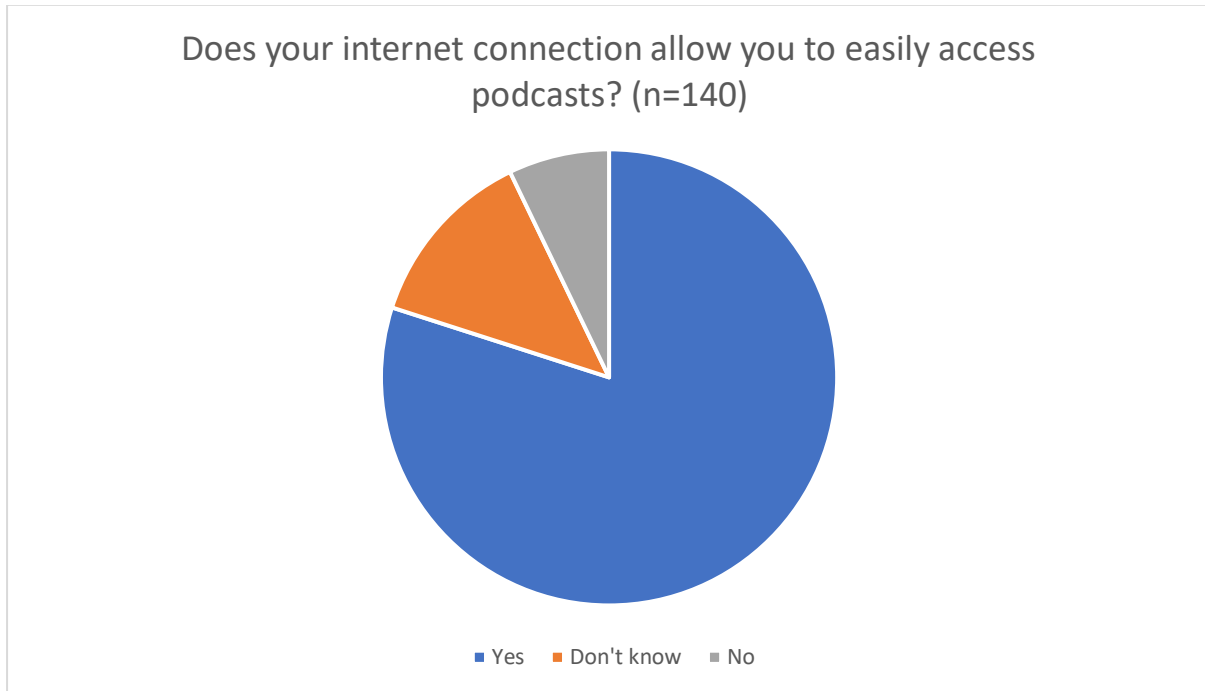
5.5.3 Devices used to access podcasts on farming practices and listen location

The most popular device selected for listening to podcasts was a phone (82.5%), followed by a computer (29.8%), tablet (26.3%) and radio (19.3%). In terms of where farmers were located when listening to podcasts on farming practices, it was mostly at home (71.9%) followed by 'while driving' (59.6%), in the field (47.4%) and in the office (36.8%) (all n=57).

5.5.4 Use of podcasts since the COVID-19 pandemic

Of those farmers who listened to podcasts, we asked in the survey how their listening levels had changed since the COVID-19 pandemic. Figure 12 shows that 61% of farmers said that they were listening more to podcasts since the pandemic started with just 2% saying that there had been a decrease. This decrease could be explained by a decrease in travelling time due to the pandemic, as many would listen to podcasts while on the road (see below).

Figure 12: Use of podcasts since the COVID-19 pandemic (n=56)

Since the COVID-19 pandemic, how has the rate at which you listen to podcasts changed? (n=56)

■ Increased ■ Decreased ■ Remained the same

5.5.5 Effectiveness of podcasts compared to other methods

We asked survey respondents of the effectiveness of podcasts compared to other methods for gaining knowledge on farming practices – 1 (less effective), 2 (as effective), 3 (more effective) (Table 5). Across all ages, they were rated 'as effective' on average, although some age groups rated them as less effective than face-to-face events, such as attending seminars, talking to advisers and other farmers, and attending on-farm events. The majority of those who watched podcasts (55%) said they were somewhat likely to implement a practice they had learned by listening to a podcast.
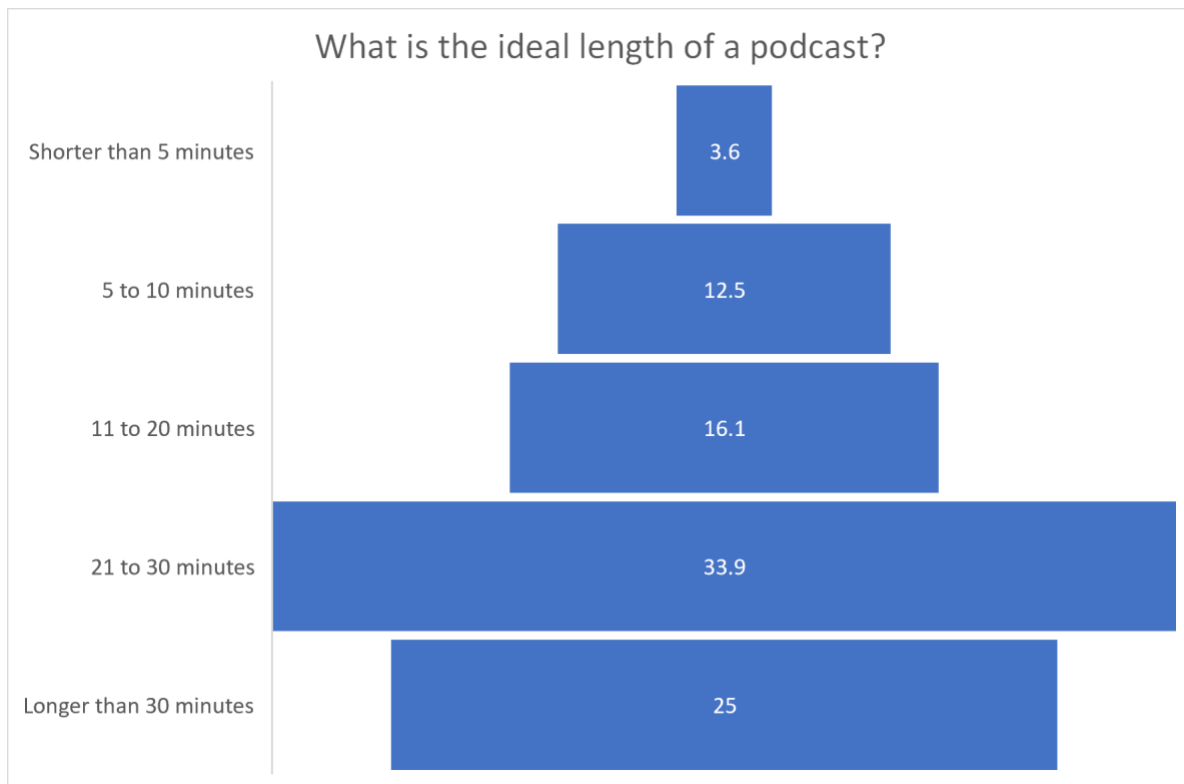
Table 5: Effectiveness of podcasts compared to other methods

Age Group			In terms of effectiveness for learning, how do the use of podcasts to gain knowledge on farming practices compare to:						
			Attending seminars and workshops in person	Watching videos	Reading (books, magazines, blogs, etc. - both online and on paper)	Talking to an adviser (e.g. agronomist, vet, environmental adviser)	Talking to other farmers	Online courses (seminars, workshops, etc.)	Attending on-farm event
18-30	n = 11	Median	Less effective - 1.00	As effective - 2.00	As effective - 2.00	Less effective - 1.00	As effective - 2.00	As effective - 2.00	As effective - 2.00
31-40	n = 9	Median	Less effective - 1.00	As effective - 2.00	As effective - 2.00	Less effective - 1.00	Less effective - 1.00	As effective - 2.00	Less effective - 1.00
41-50	n = 15	Median	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective − 2.00	As effective - 2.00	As effective - 2.00
51-60	n = 15	Median	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00
61-70	n = 5	Median	Less effective - 1.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	Less effective - 1.00
71<	n = 1	Median	As effective - 2.00	As effective - 2.00	As effective - 2.00	Less effective - 1.00	As effective - 2.00	As effective - 2.00	Less effective - 1.00
Overall	n = 56	Median	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00	As effective - 2.00

5.5.6 Ideal length of a podcast

Excluding 'don't knows', most survey respondents felt that the ideal length of a podcast was longer than videos, ideally over 21 minutes, with just 3.6% saying they should be under 5 minutes in length (Figure 13).

Figure 13: Ideal length of podcasts

What is the ideal length of a podcast?

Length	%
Shorter than 5 minutes	3.6
5 to 10 minutes	12.5
11 to 20 minutes	16.1
21 to 30 minutes	33.9
Longer than 30 minutes	25

5.5.7 Ranking most important aspects of a podcast

In the survey, farmers were asked to rank the most important aspects of a podcast from most to least important on the following scale: Extremely important (1), Very important (2), Moderately important (3), Slightly important (4), and Not at all important (5). The lower the score, the higher the importance.

The factors were ranked from top to bottom as follows (n=56), with the most important first:

1. The language used in podcast is easy to understand (1.91)
2. The podcast discusses the effectiveness of a specific technique (2.13)
3. Farmers have contributed to the making of the content (2.21)
4. The podcast discusses a practical demonstration (2.79)
5. Farm advisers have contributed to the making of the content (3.37)
6. The person presenting the podcast is a farmer (3.5)
7. The person presenting the podcast is a farm advisor (3.93)

One factor was, therefore, scored as very important or above – the language is easy to understand.

In the focus groups, the following aspects of a podcast were seen as important, mirroring some of the findings from the survey:

1. **Length:** must be long enough as farmers tend to use podcasts while on the road or tractor (although some mentioned being often distracted by something else, as podcasts were often used while 'multi-tasking' – see below). Podcasts give an opportunity to provide detail. One farmer said:

   'The NZ beef and lamb [podcasts] go deep into particular topics. Some have been some of the most useful information I got from videos/podcast. You can easily listen and go back to it at the right time. […] One I really like is the pasture pod, has good technical stuff and interview really good farmers and it's entertaining as well.'

2. **Clear language and engaging**: the language must be easy to understand and the podcast engaging.

   '*It's down to the person you are listening to. I was interviewed on a podcast – the interviewer was dull, she sent me to sleep. If you use a podcast to put information out there, just have a good presenter that are good at presenting the show.* '

   'The speaker has more emphasis. If you got nothing to look at, you concentrate solely on that voice. They have to be really engaging to keep you interested in the subject matter.'

6.5.8 Main reasons for using podcasts to learn about farming practices

The main reason for using podcasts from both the survey and focus groups was the **ability to multi-task whilst listening**. Indeed, this was by far the most commonly talked about advantage of podcasts. Podcasts can be listened to whilst doing other jobs, including driving. They can be used in the background, listened to for entertainment, and do not demand undivided attention. Three farmers said:

   'I can listen whilst doing other things on the go after downloading for the cab. Generally if driving I will listen to podcasts as I can continue working whilst listening.'

> *'So I really enjoy podcast primarily because I drive a lot. It's a great way to kill the boredom of driving and learn. It signposts me to verify what I hear with either advisers, peers or colleagues'*

> *'For me listening to audio whilst on the go it's more to pass the time rather than looking to learn from that or some of the webinars on in the evenings. […] It's more audio first for me, and if something picks my interest, I would look for more visual learning'*

Other motivations for listening to podcasts included to learn from other farmers, the convenience of listening to them at any time, keeping up with current affairs, and learning from international or local farmers. Speaking of current affairs in farming, one farmer said:

> *'the reason I listen to farming today is to learn about the parts of agriculture I don't have contact with e.g. dairy or market gardening, honey production, niche projects they cover and that I don't do. I find it interesting and I am learning about that, gives me a wider view of my industry in general rather than what I am in.'*

5.5.9 Reasons for not using podcasts and suggestions to overcome barriers

One of the primary reasons for not using podcasts outlined in the survey was that farmers did not understand what a podcast was, where to find them, or which ones were relevant to them. In the focus groups, podcasts were not discussed widely, but the following answers were typical:

> *'There's probably some specific ones out there but same technological problems unless I know what I'm looking for I struggle to find them. You have to know whether they are interesting and quality before spending time on them really'.*

> '*I haven't used any podcast yet, but I'd really like to. I don't know how you go about finding where the interesting content is. I spend a lot of time sat on a woodchipper, not moving. I quite like to be learning in that time and making better use of it, but I don't know where you find the interesting content.'*

In a similar vein to videos, farmers also criticised podcasts for lacking interactivity, not always presenting interesting or relevant content, as well as the time and concentration to listen to them (podcasts can be long), poor connectivity, and habit.

The following suggestions were given as ways of encouraging the use of podcasts in the survey:

1. **Linked to a scheme/credits/points/training**
2. **Letting farmers know where to find them and which ones are relevant**
3. **Improved connectivity**
4. **Ensure that they are not too opinionated**

6 Conclusion: the place of videos/podcasts for ELM KE

This short concluding section does not focus on repeating key lessons from the literature review – these are available in the executive summary. Instead, we present brief learnings from the focus groups, which asked farmers to discuss the place of videos and podcasts in knowledge exchange surrounding the new Environmental Land Management scheme. Much of the advice was rooted in the views they gave about the use of videos and podcasts in general and thus the lessons contained in the executive summary should be taken forward (e.g. language, length, quality).

If videos and podcasts are going to be used for ELM, they must be easy to find, preferably in one place. The general use of both videos and podcasts would be improved according to our participants if one could '*centralise all the information in one place where people can find it'.* If this could not all be centralized, Defra should work with trusted third parties who can recommend content to farmers. Content should be created by those with experience of doing so (e.g. BBC and others) so that it is of high quality.

Videos could be useful if any aspect of ELM required visual explanation, either showing farmers how to navigate the application system, or develop a land management plan, or implement a management practice. Where possible, videos should allow farmers to ask questions in a comments section and receive responses. They need to be concise, to the point, and potentially link to further detail elsewhere. The language used should be targeted to farmers (and not be oversimplified) while being accessible and may consider using farmers in the video who have signed up to ELM and overcome any challenges of getting involved. The challenges should not be glossed over. As one farmer said:

> *'If you have a video of a couple of farmers discussing how they've implemented an option, how does it work, what works or not. A video has to be brave enough and mention the negatives. It doesn't have to be all bad but discussing both good and bad things. People may trust it more.'*

There were much fewer suggestions about using podcasts. Some farmers thought detailed, longer podcasts might be better to talk through the aims of ELM. This summarises the main conclusion of this report that videos are usually best for the 'how', showing viewers how to do something, and podcasts might be better at explaining the 'why' (or 'the how') in more detail.

Farmers were clear, however, that Defra should account for different learning styles and differing abilities to access online content or willingness to use videos and podcasts, so face-to-face delivery of information would also be important.

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