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Annex to Deliverable 4.3

Video production for agriculture

A guide for farmers, advisors and researchers

WP4: Increasing access through virtual demonstration



PLAID
PEER-TO-PEER LEARNING:
ACCESSING INNOVATION
THROUGH DEMONSTRATION



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ABSTRACT

Video trainings for farmers and consultants were carried out during the PLAID project.

The experiences of these trainings form the basis of this guide. It provides tips on how to produce informative videos using simple means.

This guide follows the three steps of each video production: planning, shooting editing. The focus is on the specific requirements of videos for agriculture.

The guide is targeted to beginners: farmers, consultants, but also researchers in national and international projects who would like to produce simple instructional videos themselves as part of their dissemination activities.



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1. Videos in agricultural knowledge transfer

Videos play an increasingly important role in agricultural education, training and extension. With today's smartphones, a video camera is always present and filming has become very simple. Many researchers, advisors and farmers shoot video clips to capture their observations in the field. In research projects, videos are becoming more frequently used as part of project dissemination activities.

There are excellent textbooks, specialized magazines and fantastic tutorials on YouTube for the production of videos. So why this guide?

This guide has been developed within the framework of the EU project PLAID.¹ The project focused on the learning between farmers and the importance of agricultural demonstration activities in innovation uptake. Videos help to increase the reach of such events. Therefore, video training for farmers and consultants was carried out as part of the PLAID project to further enhance the use of videos in agriculture.

The experiences of these trainings form the basis of this guide. We also build on FiBL's many years of experience in the production of over 300 educational agricultural videos.² In addition, we have adopted parts of a guide that FiBL Germany developed as part of a national project for knowledge exchange.³

This manual provides tips on how to produce informative specialist videos using simple means. First of all, we show different areas of application for videos in agriculture highlighting the main 3 steps for video production which are:

1. Planning
2. Production
3. Editing

This guide follows these three steps. Our focus is on the specific requirements of videos for agriculture. Box 1 lists the most important reasons for producing agricultural videos by yourself.

The guide is targeted to beginners: farmers, consultants, but also researchers in national and international projects who would like to produce simple instructional videos themselves as part of their dissemination activities.

¹ PLAID stands for: Peer-to-Peer Learning: Accessing Innovation through Demonstration

² YouTube channel of FiBL <https://www.youtube.com/user/FiBLFilm>

³ Knoll M., Alföldi T. und Liebl B. 2018: Videos in der Wissenskommunikation – Ein Leitfaden. 27 S mit Anhang.

Box 1: Reasons to produce educational videos for agriculture

- Many agricultural activities are linked to the time of year, such as tillage or harvesting. A video captures the current moment and the content becomes accessible to a wider audience.
- Agricultural videos are popular with farmers. Many farmers even run their own YouTube channels.
- Videos are an excellent way to show the experience of practitioners.
- Demonstration activities, such as machine demonstrations, have a high priority in agricultural knowledge transfer. The reach of such events can be significantly extended with videos.
- Like most people, farmers prefer videos over written resources to inform them about a specific topic or approach.
- After Google, YouTube is the second largest search engine in the world.
- Video equipment and editing software are now inexpensive and easy to use.

2. Fields of application of videos in agriculture

Agriculture offers a wide range of topics suitable for presentation in the form of videos (Fig. 1) which can be shared through videos including:

1. **Machine demonstrations. These** are among the most popular demonstration activities and achieve the highest number of views on YouTube.
2. **Training Videos** which are shot on site, i.e. in the field, in the stable or at a machine.
3. **Tutorials** on more complex topics are preferably realized in a simple studio in front of a so-called green screen (primarily filmed indoors vs training videos which are out door based).
4. **Practical innovations** and individual solutions from farmers.
5. **Event Videos** to convey selected conference contributions or impressions of conferences.
6. **Results of research** communicated to various stakeholders. These are in less detail and often supplement written articles or papers.
7. **Teaser videos** can be used, for example, to announce a new handbook or events.
8. Short video clips on agricultural advisory websites are a valuable addition to **online texts**.

Other popular formats in agriculture are **video blogs** (vlogs) in which farmers document and comment on their work on the farm. **Advertising films**, for example for a farm shop or **image films** for organizations, are other formats. We recommend hiring professional videographers to produce PR and commercial films.

Box 2: Tips for choosing a topic (for beginners)

- Start with a simple, clearly defined topic.
- Ask yourself: Is film really the appropriate medium for this topic?
- With every film idea, first consider whether the theme provides enough visual material.
- It should not be necessary to convey too much information at text level that cannot be illustrated. Avoid Talking Heads!
- Find the story behind a topic. Telling stories and evoking emotions are the strengths of videos.
- Know your own limits: Leave complex topics, concepts, PR and advertising films to the professionals.





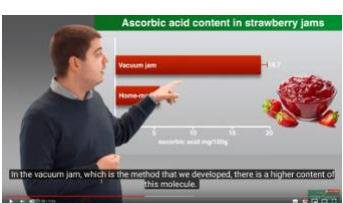

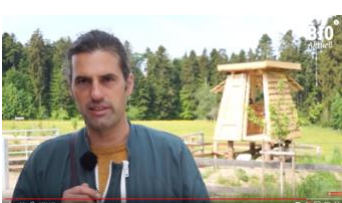









<h3>1 Machine demonstration</h3>		 <p>Scan me</p>	<h3>2 Training videos</h3>		 <p>Scan me</p>
<h3>3 Tutorials</h3>		 <p>Scan me</p>	<h3>4 Practice innovations</h3>		 <p>Scan me</p>
<h3>5 Events</h3>		 <p>Scan me</p>	<h3>6 Research projects</h3>		 <p>Scan me</p>
<h3>7 Teaser</h3>		 <p>Scan me</p>	<h3>8 Addition to online-Texte</h3>		 <p>Scan me</p>

Fig. 1: Fields of application of videos in agriculture

3. Equipment

3.1 Camera

You can choose between smartphones, camcorders or photo cameras with video function (Fig. 2).

Smartphones today usually have an excellent camera built in. In bright sunlight, however, image control on the display is difficult. The most important thing when filming with smartphones is to always film in landscape!

Camcorders are fully designed for filming. They are easy to handle and require little practice. They offer an adjustable display, a big advantage in bright sunlight. Camcorders with viewfinders and eyecups offer even better image control. The zoom lens is another advantage over smartphones.

Cameras (reflex and compact cameras) with video function also offer excellent image quality. Handling, especially focusing, requires more practice than with camcorders.

Important for all camera types: There must be connections for an external microphone and a tripod.



Fig. 2: Smartphone, video camera or photo camera: the image quality is good for all of them. The choice of the right device is determined by the application, budget and personal preference.

Box 3: Tips for choosing the right video camera

- Gain first experience with existing equipment.
- Rent cameras and see what suits your needs best.
- Video camcorders with good image quality are available from 300 Euro.
- Make sure you have inputs for an external microphone and headphones.
- It depends on your budget whether you buy a camera with Full HD or 4K resolution. Editing video in 4K requires a more powerful computer and more storage space.
- If you have a limited budget and high demands, you may want to buy used equipment.

3.2 Additional types of cameras

Here we present three types of cameras that are particularly suitable for the production of agricultural videos (Fig. 3). However, they are not part of the basic equipment for beginners.

Actioncams deliver spectacular images when mounted on a tractor or machine in the dustproof and shock-resistant protective housing supplied. The picture quality is usually very good, but the sound quality is poor.

Drones with good cameras and good flight characteristics are available from 900 Euro. The Mavic Air by DJI, for example, is light, small and easy to operate via smartphone. Aerial photos of fields, machines, herds of animals or farm buildings enhance every video. Sound recordings are not possible. However, drone recordings should only be used where it makes sense and ensure you use them within flying laws/ regulations. Tip: Engage a hobby drone pilot from your friends instead of buying your own drone. Children and adolescents often have more talent with the joystick than adults.

Box 4: Country-specific regulations for the use of drones in Europe

- The legal basis for drones is country-specific and varies in its restrictiveness.
- This website provides a good overview of the regulations in different European countries <http://dronerules.eu/en/recreational/regulations>.
- It is essential to consult the official information office of the country in question prior to use.

360° cameras offer the viewer a comprehensive spatial experience, which is controlled by the viewer himself on the display or by means of VR glasses. There is significant potential in the area of virtual training courses and virtual tours. However, producing virtual reality videos requires both experience and good planning.



Fig. 3: Popular in agriculture: Actioncams, drones and 360° cameras.

3.3 Microphone

A good sound is just as important as a good image. Especially in interviews, the built-in microphones of video cameras and smartphones do not meet this requirement. As the distance between camera and sound source increases, the sound quality decreases rapidly. Moreover, ambient noise or wind often spoil such sound recordings. The solution here is to use an external microphone.

Microphones with cable connections and wireless microphones are available in various price classes (Fig. 4). We also distinguish between lavalier (Lapel) microphones and handheld microphones. Wireless lavalier microphones are well suited for agricultural contexts. The RodeLink wireless microphone offers a very good price-performance ratio and costs around 300 Euros.

It is important to always control the sound via headphones. It can happen that there is noise, that the battery is empty or that you forgot to switch on a wireless microphone. When buying a video camera, make sure that there are inputs for the microphone and headphones (Fig. 4, right).

Another advantage of external microphones is the use of a synthetic fur windbreaker which helps to prevent rattling noises that make sound recordings unusable even in light winds.

In addition to a lavalier microphone, we also recommend a handheld microphone. This is needed when interviews have to be conducted in situations with a lot of ambient noise.



Fig. 4: Simple microphones with cables for smartphones are already available from 20 euros. The RodeLink radio link offers a good price-performance ratio. When buying a video camera, make sure that there are connections for microphone (red jack) and headphones (green jack). Unfortunately, these connections are only available for a few models in the consumer segment.

3.4 Tripod

Shaky videos look unprofessional and exhaust the viewer. Therefore, a tripod should always be used. There are a variety of options which can be used (Fig. 5) including:

- Simple rigs for smartphones are available from 20 Euro.
- Gimbals which produces especially soft and dynamic movements ("steady cam")
- A shoulder tripod or a monopod are recommended for many changes of location when there is no time to set up.

The tripod is the ideal solution for many applications. Thanks to a special video head and with a bit of practice they allow for smooth pans.



Abb. 5: Shaky shots expose the beginner. A tripod belongs thus to the basic equipment.

4. Planning a video

As mentioned earlier, every video production consists of three steps: planning, shooting and editing. Of course, you can also shoot a video without planning. However, good planning avoids stress and increases the quality of your video. Depending on the topic and experience, you will have to allow 2-4 hours for the planning phase. More complex topics will take more time to plan.

4.1 Select a topic

The first question is: Is my idea suitable for a film at all and can the content be visualized well? Next, you have to narrow down the topic and what action-oriented elements are there for you to include in your video?

The main theme "Biodiversity in agriculture" is transformed, for example, into "Creating areas to promote biodiversity on an arable farm" or even more specifically "Planting hedges" or "Maintaining hedges". As a general rule, only one topic should be dealt with per video.

4.2 Structuring the topic

During the planning phase, the most important points you want to get across to the audience should be written down. First as keywords and afterwards as formulated sentences. This gives a first indication of the duration of the video. As a rule of thumb: 100 words make 1 minute of film.

The formulated content must then be structured. Like any story, a film needs a beginning (intro), a main part and an ending (outro) (Fig. 6). The intro introduces the theme and its relevance. During the first 30 seconds, the viewer must understand why it is worth watching this video. In addition to the topic, the main speaker and, if necessary, the location should also be introduced.

In the following main part solutions are presented or recommendations for action are shown. It is often useful to divide the main part into short chapters.

At the end, a short conclusion should be drawn or, for example, reference should be made to further sources of information (call for action). This basic structure is recommended for all video formats.

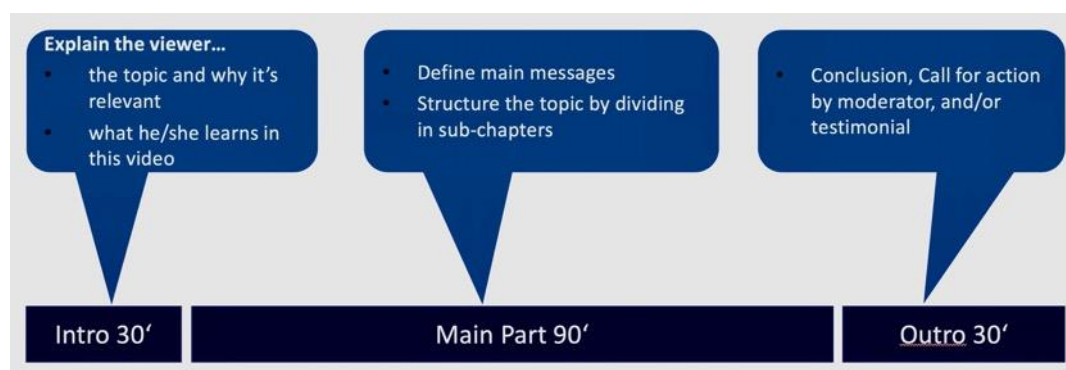


Fig. 6: Basic structure of a short video of 2-3 minutes. Whether a further subdivision is needed in the main part depends on the complexity of the topic.

4.3 Speaker, presenter or text inserts

Once the content has been determined, it must be decided whether it should be told by one or several people. In the case of agricultural videos, for example, farmers, researchers or advisors can be considered. As experts, they can convey the content in an authentic and credible way.

An alternative is to have the main points written and then read by a speaker as voice-over. Both methods have advantages and disadvantages (Fig. 7).

Off-camera speakers and original voices of experts are often combined.

In short videos, pictures can also be supplemented with short text insertions or subtitles. Especially on social media, videos are often viewed without sound so subtitles are very advantageous in these videos.

	Advantages	Disadvantages
 Presenter	<ul style="list-style-type: none"> • efficient • authentic 	<ul style="list-style-type: none"> • suitable person • good planning • no corrections afterwards • editing time consuming
 Off-speaker	<ul style="list-style-type: none"> • writing afterwards • precise formulations 	<ul style="list-style-type: none"> • suitable voice • writing needs more time
Combination: Moderator and off-speaker		

Fig. 7: Advantages and disadvantages of presenter and off-speaker.

4.4 Planning A-Roll and B-Roll

Whether you let the content be narrated by an interviewed person or whether a speaker is off video: It is important to plan the video both at a narrator and image level. The narrator's level is also known as the A-Roll. The image level is referred to as B-roll or footage (Fig. 8).

Once the you know what the narrator will say, it is necessary to plan the appropriate images to compliment the narrator level. This is important so that all the images required can be filmed on the same shooting day. If there are gaps in the planning, existing image material - photos or clips - must be used. It is important to list all the pictures you need so that you don't forget anything during the shooting. A template for an outline is shown in fig. 9.

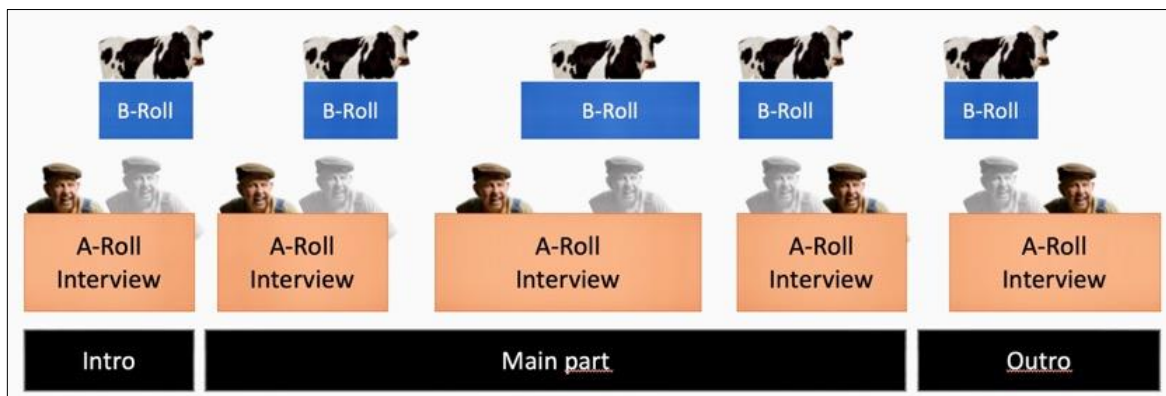


Fig. 8: The backbone of a video is the A-Roll, i.e. the essential statements of an interviewee. With the B-Roll, what has been said is illustrated.



Outline for Video (title):

Format: _presenter _narrator (voice-over) _only titles _other

Content 100 words=1 Minute	Picture level
<p>Intro Explain the problem, say what will be shown in the Video</p> <p>Keywords:</p> <ul style="list-style-type: none"> - - - - - - <p>Estimated time:</p>	<p>e.g. presenting farmer, crop</p>
<p>Main part: Explain your innovation step by step</p> <p>Keywords:</p> <ul style="list-style-type: none"> - - - - - - - - - <p>Estimated time:</p>	<p>e.g. machines in action, details, photos</p>
<p>Outro: recommendations, call for action, statements of farmers etc.</p> <p>Keywords:</p> <ul style="list-style-type: none"> - - - - - - <p>Estimated time:</p>	

Fig. 9: Template for an outline to plan a video.

5. Video shooting

5.1 Shooting of A- and B-Roll

During the video shooting itself it is also helpful to think in both levels A- and B-roll respectively. Which part you shoot first depends on the situation. For a machine demonstration, for example, one usually films the machines "in action" first, i.e. footage images or the B-roll. This includes details and long shots, hands examining the worked soil, people around the machines, etc.

It is usually not recommended to film the live commentary that the organizer makes for the visitors on the field as an A-Roll. This is because the sound quality is often too bad and the explanations are usually too long. Therefore, if possible, the explanatory commentary should be recorded in a separate step as an interview with a competent person (if possible, clarify it during preparation).

Ideally, the commentator should be able to explain the individual machines directly in front of the machines. The expert describes the working methods, advantages and disadvantages of the machines just presented. The person must speak in the present tense and formulate the sentences as if they were commenting on the subject live. This then sounds like: "Here we see machine XY...", "As you can see, it works somewhat less deeply than machine XY...".

This will ensure comments fit exactly behind the pictures of the machines. That's why the commentary is usually recorded only after the demonstration: the commentator must first have seen the machine in operation under the current conditions.

In other situations, e.g. when a farmer explains a routine process, the explanatory comment ("A-roll") can be recorded first and the illustrative pictures ("B-roll") can then be filmed. If the commentator can show actions, speaking and acting are often ideal. In order to be able to edit such recordings well afterwards, the commentary should be recorded as a whole without action. Afterwards, the details of the action are filmed.

5.2 A-Roll: 10 tips for conducting interviews



[Link to tutorial "How to conduct interviews"](#)

An explanatory commentary is often recorded in the form of an interview. Here are some tips for conducting interviews.

1. **Relaxed atmosphere:** Always ensure a relaxed atmosphere between you and the person you are interviewing.
2. **Sitting or standing:** Normally the person to be interviewed should stand; sitting only during long interviews as well as for people who move strongly.
3. **Image composition:** In the interview, the eye line must lie on the upper third line (rule of thirds). If the eye line is lower, the person appears unnaturally small (Fig. 10). You are responsible for ensuring that the person to be interviewed looks professional (hairstyle, clothing, etc.).
4. **Direction of sight:** The interviewee should not look directly into the camera, but slightly laterally past it, into the eyes of the interviewer. Only if the interviewee has a moderation role should he or she look directly into the camera.

5. **Fully automatic:** If the interview is conducted by only one person (simultaneous camera and interview conducting), the camera must be mounted on a tripod and operated in fully automatic mode. That is the only way you can fully concentrate on the person to be interviewed and the content of what is said.
6. **Do not turn off the camera:** We recommend that you let the camera run through the entire interview. Turning the camera on and off will distract you and can increase nervousness every time. In addition, there is a risk of forgetting to switch it on.
7. **Silent nodding:** During the shooting, the focus must be on the interviewee and the content. Communicate by eye contact and non-verbally, for example by nodding your head. The interviewer must not make any intermediate remarks such as "Yes," while the person to be interviewed is speaking. They cannot be removed.
8. **Crisp statements:** Very few people can describe something concisely and precisely. Therefore, it is recommended to plan at least two rounds. The first serves to get an overview of the topic and to reduce nervousness. The second round focuses on the relevant aspects and formulates them as concisely as possible.
9. **Integrate the question into the answer:** In order to save time, the question is often cut out at post-production. In order for the viewer to understand the context, the interviewee must integrate the keyword of the question into their answer.
10. **Follow-up without insisting:** If questions are not answered in an optimal way, it is necessary to follow up. Individual shots should be repeated until the result meets expectations. Sometimes, however, it is helpful to skip a question and pick it up again at the end.



Fig. 10: In the interview, the eye line must lie in the golden section, i.e. on the upper third line. If the eye line is lower, the person appears unnaturally small.

5.3 B-Roll: Ensure varied image settings



[Link to tutorial "How to create varied footage"](#)

The motifs for the B-roll should have been roughly defined in the outline beforehand. There are a variety of settings which can be used as B-roll (Fig. 11). The individual clips should last at least 30 seconds without zoom and pans, so that they can be used afterwards in the editing without problems.

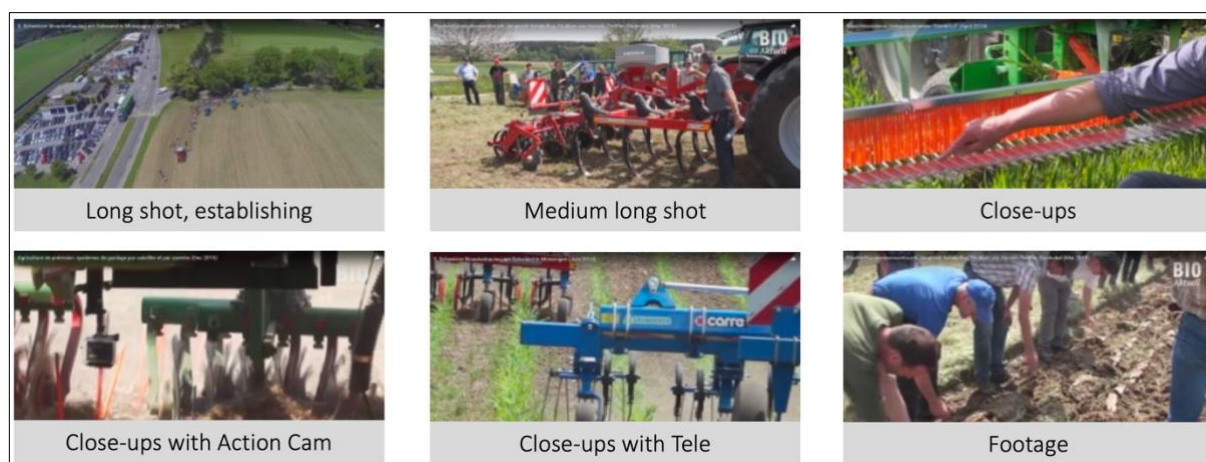


Fig. 11: Varied camera settings of B-Roll motives are the basis for an interesting editing.

B-Roll clips can include:

1. **Long shots as opening a scene:** At the beginning the viewer should get an overview of the place of the event (establishing shot). A long shot either from the ground or drone shot is suitable for this purpose.
2. **Medium long shot:** This setting is ideal for machine shots but can become boring if used frequently or for too long.
3. **Details, close-ups:** Long and medium shots should be supplemented with close-ups. These can be produced in different ways: By getting close with the camera or zooming in on details with the Tele lens. An action cam mounted on machines also provides exciting perspectives which live viewers do not have.
4. **Additional image material:** Additional material such as farmers in conversation, hands in the ground, plants, landscape shots are very helpful for editing and improve the quality of the video.

6. Post-production

Post-production primarily means editing. In addition, dissemination via YouTube is also discussed.

6.1 Editing software

There are many editing software programs available on the market. Free programs such as iMovie on Apple devices, Movie Maker for PC or comprehensive programs such as [Hitfilm](#) or [Shotcut](#), are available.

Nevertheless, we recommend to use payable programs in the price range between 50 and 100 Euro such as [Adobe Premiere Elements](#). With free programs you quickly reach your limits and the extensive free programs like [Hitfilm](#) are often too complex to use for beginners.

6.2 Editing



[Link to tutorial "How to edit your video"](#)

A- and B-roll are joined together during editing and the story is created (Fig. 12). Efficient editing requires practice and some discipline. Beginners often lose themselves in the fine cut before the rough cut is done. You should always work from rough to fine and observe the following steps:

1. **Rough cut A-Roll:** Normally you start with editing the A-Roll, i.e. the commentary track. All clips are listened to and the best versions are selected. The commentary is structured according to the plans and shortened to the essentials. When shortening, it is advisable to make several runs and always ask the following questions: Is this sentence relevant for the understanding of the topic? Does the sentence drive the story forward? This step takes between 1 and 4 hours, depending on the amount of material filmed.
2. **Fine cut A-Roll:** Once the "scaffold" of the A-Roll is in place you can cut out the misspells and "äähms".
3. **Insert B-Roll:** In this step, you select the image material from the B-Roll and place it over the appropriate position of the A-Roll. The cuts of the A-Roll will be covered by these clips and thus made invisible. In addition, what has been said is clarified and emphasized with appropriate images.
4. **Provide rhythm:** This step is about providing the film with a rhythm. This means, for example, determining the duration of the A-roll sequences, deciding when B-roll images appear, adjusting B-roll cuts to the rhythm of the voice. Now music, intermediate titles and pauses should also be inserted so that the viewer has time to catch their breath. The film should flow and have no unnatural breaks.
5. **Vision:** The (almost) finished version should then be shown to an outside person. This will indicate if it is easy to follow and understand, the length is right and any parts which need to be amended. After these last corrections have been made, the video can be published on YouTube.



Fig. 12: Arrangement of A- and B-roll in the editing program. Images of the B-roll are used to cover cuts in the A-roll and to visually support what has been commented on in A-roll.

6.3 Ideal length of online-videos

There is no general rule about how long an online video should be but generally, a duration of 2-3 minutes is recommended. In contrast to professional films, the image quality and the presence of the film protagonists is often not as high a quality rather its strength lies in the technical content. In order to avoid unnecessary lengths, the finished videos should be shown to third parties who can point out any unnecessary sections of the video prior to publication.

6.4 Music

Suitable background music can enrich videos but music should be used sparingly. Only royalty-free music may be used. YouTube offers a large selection of royalty-free music in its audio library. Popular pieces of music appear again and again in YouTube videos and gradually wear out. For higher demands, music can be purchased from payment providers such as audiojungle.net or premiumbeat.com prices range from 20 to 50 USD per piece of music.

6.5 Dissemination on YouTube

For agricultural videos, distribution via YouTube is recommended because it is the most popular platform in agricultural circles. In order to upload videos, you must have your own channel or open a new one. Every day, thousands of new channels are opened and millions of new videos uploaded. Therefore, some efforts are needed to make the uploaded videos known and to ensure optimal distribution.

The following measures help to make a YouTube video easier to find.

1. **Title:** This should be meaningful and contain the most important keywords.
2. **Description:** Briefly describe the content of the video; here you can provide further links.
3. **Tags:** Specify keywords, also translate the most important ones.
4. **Thumbnail:** Do not use the thumbnails suggested by YouTube, but upload your own meaningful screenshot from the video.

Particularly with newly launched YouTube channels, it is difficult to generate many views at the beginning due to the small number of subscribers. In the beginning, a YouTube channel serves more as an online video archive. From here the videos should be embedded into existing websites and made known through social media networks. Depending on the topic, the quality of the videos produced, and the existing networks, it can take months, if not years, for a new YouTube channel to be accepted by the audience.

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