

# Communicating knowledge on grassland management using videos and the internet

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## Abstract

Digital information is of growing importance to farmers and land managers, as a survey of stakeholders in 2020 revealed. However, too often the practical implications of scientific research are not communicated to non-scientists. To close the gap between science and practice, we produced various educational videos and web contents about pasture management and maintenance in a participatory process. Each 10 min video features a farmer and an expert, each of whom presents for about half of the time. Implementing peer and expert teaching facilitates knowledge transfer to the heterogeneous agricultural community. We established a standardized procedure. Before creating videos and web content, we gathered all available knowledge and elaborated take-home messages. These were discussed in a group of experts (scientists and farm advisers) and together with farmers to elaborate a coherent and understandable scenario. Special emphasis was placed on adapting pasture management and mechanical intervention rather than the use of herbicides. The standardized participatory procedure to produce educational videos and web contents has proven to be cost and time-efficient. We are convinced that communicating scientific knowledge by means of digital channels will improve the adoption in agricultural practice.

**Keywords:** pasture management, educational video, knowledge transfer, communication, website, YouTube

## Introduction

Digital information is of increasing interest to farmers and land managers (Chivers *et al.* 2021; Hoffer and Mettler, 2021). Scientists do a lot of research on providing advice and solutions for farmers. However, these results are too often not accessible to non-scientists. We decided to close the gap between science and practice by presenting the information in an easily accessible medium. Therefore, we produced several educational videos and web contents about pasture management and maintenance.

A severe gap in knowledge transfer was identified for weed control on alpine summer pastures (Hoffer and Mettler, 2021). These grasslands, covering a third of the agriculturally used land in Switzerland (Lauber *et al.*, 2013) provide important ecological and cultural values and are important for the Swiss identity. However, these areas are under pressure from problematic plants that are reducing the forage quality and ecological value of the pastures. Therefore, direct payments to alpine summer farms require careful management of pastures in order to maintain biodiversity, openness and beauty (Swiss Ordinance 910.13).

Due to its seasonal nature, work on alpine pastures is frequently carried out by external staff without formal training (Calabrese *et al.*, 2014). Staff sometimes change on an annual basis, impeding knowledge accumulation and transfer. Unfortunately, advisory documents concerning pasture management and weed control are scattered in different formats and from different organizations. Therefore, we set up a project to synthesize existing knowledge and to make this information easily accessible through a new website and educational videos.

## Materials and methods

### *Selection of topics*

The activities were launched on the topic of problematic plants on alpine pastures. Species were prioritized and selected for a first series of videos. The videos of around ten minutes duration always featured a farmer and an expert, presenting for about half of the time. Combining both the peer and expert teaching, facilitates knowledge transfer to the heterogeneous community of alpine staff (Franz *et al.*, 2010). Special emphasis was placed on adapting pasture management and mechanical intervention rather than the use of herbicides.

### *Video production*

Videos were prepared in a standardized participatory procedure involving scientists, farm advisers and farmers (Table 1): (1) Gathering the available knowledge by literature reviews and interviews was time-consuming since information was often scattered in scientific literature and in practical experience. It was, however, used for the video production and the web contents. (2) The video production was planned by elaborating a screenplay, which listed messages and contents to be presented, together with ideas for possible image settings. (3) The video was usually filmed during one day. A second day was occasionally required for additional scenes, especially if several seasonal aspects of the plant needed to be captured. Filming was carried out using a single-lens reflex camera with external microphone and complemented by a drone for overview scenes. (4) The video was edited and (5) the draft version was revised by the group of authors. (6) The final version was edited. (7) Finally, speeches were transcribed. Because no automated speech-to-text translation was available for Swiss German, this needed to be done by hand. The video was subtitled in German, French, Italian and English, and released on YouTube.

### *Background information*

Alongside the video, detailed information was prepared for release on the new website. As for the videos, a standardized format was established. The primary sections were (A) occurrence and distribution of the problematic plant, (B) situation analysis, (C) regulation measures, (D) adjustment of management, (E) mechanical intervention and (F) chemical regulation. After consultation within the editorial team and with additional experts and practitioners, the information was published on the web.

## Results and discussion

The website [www.patura-alpina.ch](http://www.patura-alpina.ch) (Figure 1) was released in summer 2019 and is freely available in two languages (German and French). In 2021, it contained information about six plant species groups, commonly perceived problematic on alpine pastures: (1) alpine dockweed (*Rumex alpinus*), (2) white helleborum (*Veratrum album*), (3) rush (*Juncus effusus* and *Juncus inflexus*), (4) alpine ragwort (*Senecio*

Table 1. The seven key steps to a successful video and the amount of time approximately needed per video by the editorial team (ET) and the filming team (FT).

Action	Who	Time (days)
1 Summary of available knowledge (scientific literature and farmers experiences)	ET	3-5
2 Elaborate key messages in form of a video script, planning of video	ET/FT	1-1.5
3 Filming	FT	1-2
4 Raw video editing	FT	1-1.5
5 Consultation round	ET	1
6 Final video editing	FT	0.5
7 Transcript and translation of subtitles and release on YouTube	FT	1-2
Total per video		8.5-13.5

*alpinum*) (5) bracken (*Pteridium aquilinum* and *Dryopteris filix-mas*) and (6) dwarf shrubs (*Juniperus communis* and *Rhododendron hirsutum*). Further videos and website contents on thistles (*Cirsium palustre* and *Cirsium arvense*) and green alder (*Alnus viridis*) are scheduled for release in early 2022. The website is continually updated and complemented with testimonies of farmers. Information is also available in the smartphone app of Agridea, the Swiss centre for agricultural advisory and extension services. Since the website was released, the videos have been viewed nearly 15,000 times in total (Table 2). Each video was viewed 3.3 times per day. Direct feedback received from farmers and farm advisers was generally positive.



Figure 1. Websites like [www.patura-alpina.ch](http://www.patura-alpina.ch) make information easy to access.

Table 2. Date of release and number of views of the videos on 1.12.2021.

Topic	Date of release	Days	Views	Views day <sup>1</sup>
<i>Rumex alpinus</i>	10.04.2019	966	3,201	3.3
<i>Veratrum album</i>	09.04.2019	967	3,863	4.0
<i>Senecio alpinus</i>	26.10.2019	767	1,232	1.6
<i>Juncus effusus</i> / <i>J. inflexus</i>	25.12.2019	707	1,978	2.8
<i>Pteridium aquilinum</i> and <i>Dryopteris filix-mas</i>	02.11.2019	760	2,631	3.5
Dwarf shrubs	06.02.2021	298	1,848	6.2
Total			14,753	

## Conclusions

Communicating to farmers by means of video and web contents is a contemporary means of knowledge transfer. The standardized participatory procedure involving scientists, extension services and farmers, to produce educational videos and web content may inspire similar approaches on other topics in grassland science.

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