

# LERNFELD: GOOD PRACTICE IN CLIMATE CHANGE

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# LERNfeld: Highly topical subjects



# Learning activities close to research: e.g. climate extremes

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**Biogeosciences**

## Response of temperate grasslands at different altitudes to simulated summer drought differed but scaled with annual precipitation

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**Abstract.** Water is an important resource for terrestrial ecosystems. Climate scenarios for Switzerland predict a reduction of 20% in summer precipitation until 2050. Understanding ecosystem responses to water shortage, and its effects on plant productivity, is of major concern. The effects of simulated summer drought on grasslands along an altitudinal gradient in Switzerland (2005 to 2007, representing typical management) were assessed at the respective altitude. We assessed the effects of simulated drought on above- and below-ground plant structure (LAI and vegetation height) and on biomass and water. Responses of community above-ground biomass to reduced precipitation input differed at the three sites but scaled positively with total annual precipitation at the sites ( $R^2=0.85$ ). Annual community biomass productivity was significantly reduced at the alpine site receiving the least annual precipitation, while no significant decrease (increase) was observed at the pre-alpine site receiving the most precipitation amounts in all three years. At the intermediate site (intermediate precipitation sums), biomass significantly decreased in response to drought in the second and third year, after showing increased abundance of tolerant weed species in the second year. Change in below-ground biomass productivity was not significantly affected at any of the sites in response to simulated summer drought. However, vegetation carbon isotope ratios ( $\delta^{13}C$ ) were significantly more negative under drought conditions, indicating an increase in water use efficiency. We conclude that there is no general drought response of Swiss grasslands, but that sites with lower annual precipitation seem to be more vulnerable to summer drought.

of terrestrial ecosystems might vary dependent on vegetation composition and local environmental conditions.

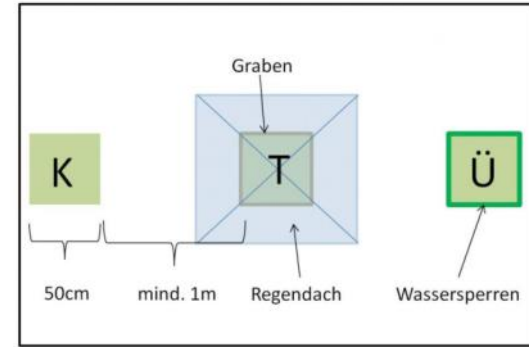
While research on drought effects on grassland species has often been carried out under controlled conditions (e.g. Arp et al., 1998; Karsten and MacAdam, 2001), research at the ecosystem level in the field used two approaches: (1) naturally occurring droughts and their impact on the long-term field trials (Weaver et al., 1935; Gibbens and Beck, 1988;

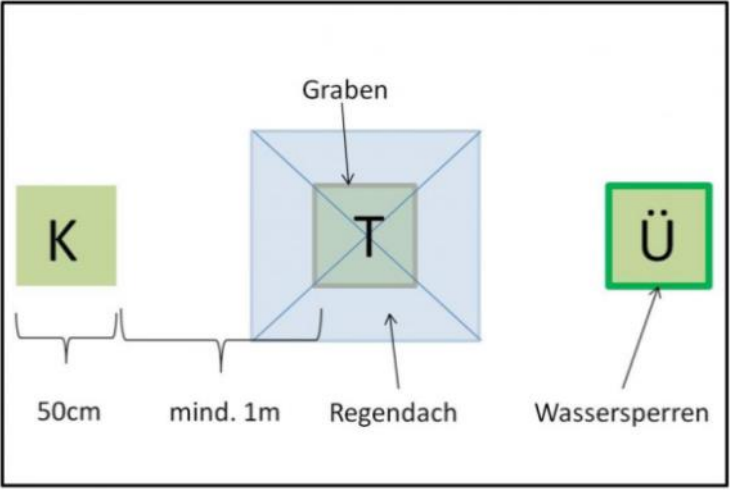
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**Conversion to learning activity**





# Earthworm abundance and carbon sequestration



# Digestion and feeding of cattle (ruminants)

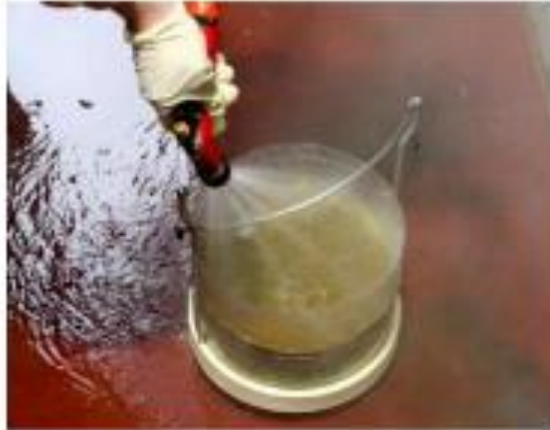


Cows are observed and the number of chewing per bolus is counted

# Determination of not digested fibres in cow dung



Collection of dung



Washing out dung



Weighing fractions of fibres





Dialog with experts:  
students discuss with farmers  
and young scientists





# 1 MILLION YOUTH ACTIONS Challenge



## The Challenge

### Mission

Initiated by the Swiss Agency for Development and Cooperation (SDC), the 1 Million Youth Actions Challenge (1MYAC) aims at mobilizing youth (between 10 and 30 years old) from all over the world to implement concrete actions for a more sustainable future. The objective is to reach 1.000.000 youth actions. The Challenge was officially launched on 3 September 2021 at the [IUCN World Conservation Congress](#) in Marseille.

### Focus

1MYAC focuses on the following four [United Nation's Sustainable Development Goals](#) (SDGs) to address both climate change and the depletion of natural resources worldwide: **SDG 6** on 'clean water and sanitation', **SDG 12** on 'responsible consumption and production', **SDG 13** on 'climate action' (climate change) and **SDG 15** on 'life on land' (biodiversity).

