



Impacts of future climate scenario and summer extreme events on above-ground biomass, quality and functional groups of perennial grassland.

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At the end of the century, climate scenarios indicate increases of air temperature and atmospheric CO₂ concentration as well as a decrease of summer precipitations (IPCC, 2007). These mean changes will probably be associated with the occurrence of extreme event such as the 'summer 2003 heat wave'. Permanent grasslands supply forage for ruminants in quantity and quality, support high level of biodiversity and store high quantity of soil C. In this context we study how above-ground biomass, quality of forage and functional groups are modified by future climate scenario (reduction of precipitations combined with night-time warming: passive warming) and summer extreme event and how this grassland ecosystem is resilient one year after. We manipulated in field conditions (Massif-central, France) the microclimate of permanent grassland with curtains to increase night-time air temperature (+2°C) and decrease precipitations (Beier et al 2004) to mimic four regionalised climatic scenario (Control without extreme; Control with extreme; scenario 2050 without extreme; scenario 2050 with extreme). The extreme corresponded to both reduction of precipitations during one month (-37%) and active warming (+6°C leaf temperature) with radiators during two weeks (Kimball, 2003). Furthermore, two frequencies of defoliation were applied in each treatment to test if management may mitigate or not the impacts of the extreme. Results of above-ground biomass, proportion of grasses, legumes and dicots, as well as forage quality will be presented during and one year after the extreme event.